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Angus Graham – Kristian D. Strutt – Morag Hunter – Sarah Jones – Aurélia Masson – Marie Millet – Benjamin Pennington

Reconstructing Landscapes and Waterscapes in Thebes, Egypt

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Waterscapes; geophysics; geoarchaeology; canals; River Nile; temples; festival processions.

Introduction

The Egypt Exploration Society Theban Harbours and Waterscapes Survey (THaWS) carried out their first full season of work between February and April 2012 using geophysical and geoarchaeological techniques to collect subsurface data.[1] The aim of the project is to advance our understanding of the past locations and migrations of the river Nile in the Theban Region over the last five millennia, and locate any basins and canals that may have been excavated to connect palaces and temples on the West Bank to the River Nile, including the enormous basin known today as Birket Habu. On the 'East Bank' our work continues to clarify interpretations of the geomorphological origins and development of the complex of temples at Karnak[2] as well as investigating a further possible lake, 'Birket el-Hubeil/Birket Luxor' to the southwest of Luxor city.[3] The paper will present the background to the work on the West Bank, the methodology, the work undertaken and some preliminary findings.

Research Background

Previous reconstructions of the Theban floodplain[4] have been based upon the modern river location combined with ancient textual sources as well as scenes from New Kingdom (c. 1550–1060 BCE) Theban tombs. However, to date there is a lack of any geoarchaeological and geophysical foundation to these reconstructions.

We know that the Festival of the Valley saw the images of Amun, Mut and Khonsu journey from Karnak to the West Bank to visit royal cult complexes and the necropolis on the West Bank in an act of reunion and reintegration between the living and the dead.[5] Although we have a number of textual sources providing important evidence for the festival and many suggestions from scholars about the itinerary of this festival from the time of Montuhotep II (c. 2055–2004 BCE), to date there has been no investigation of the floodplain to locate possible canals or land routes that may have been used by this festival. A number of scenes depicted on the walls in the tombs of the New Kingdom (1550–1060 BCE) elite on the West Bank show basins in front of temples and chapels, some with canals and often with a tribune or reception platform. This is supported by evidence of a number of actual extant platforms associated with temples in Egypt.[6]

1 Graham 2011.
2 Bunbury, Graham, and Hunter 2008; Ghilardi and Boraik 2011; Graham 2010a; Graham 2010b; Graham and Bunbury 2004; Graham and Bunbury 2005.
3 Graham 2011.
4 e.g., Aufrère, Golvin, and Goyon 1997.
5 Bell 1997, 136–137; Foucart 1924; Graefe 1986; Nims 1965; Schott 1953.
6 Jaritz 2005, 345–349; Schlüter 2009.

Canals of kings Thutmose I and Thutmose III from the 15th century BCE are listed on the so-called Red Chapel of Hatshepsut and are thought to link their respective Memorial Temples on the west edge of the Nile Valley with the Nile,[7] but their existence remains to be verified archaeologically.

Recent cartographic and satellite studies combined with photographic archives have clearly shown the dynamic nature of the River Nile in the Theban region over the last two centuries with the Nile migrating eastwards back towards Karnak since the late 1790s when Napoleon's geographers surveyed the Nile Valley.[8] A series of enormous spoil heaps enclose a huge area (2.4km by 1km) known today as Birket Habu (see Fig. 1), which is now under cultivation but once held a lake/basin associated with the palace complex of Amenhotep III at Malkata.[9] Excavations in 1971 and 1973 through the spoil heaps have enabled an estimate to be made of spoil for the southern half of the basin of c. 5.56 million cubic metres. This equates to excavating almost 6m from the original floodplain surface, based upon the southern half of the basin measuring 850m by 1100m. Kemp and O'Connor[10] concluded that it would be unusable for roughly six months a year between February and July. However, inscriptions accompanying the scenes in the tomb of Kheruef (TT192) documenting the events of Amenhotep III's first and third jubilees show Amenhotep III and Queen Tiy being towed in the morning and evening barks of Ra[11] and may suggest a perennial lake based upon the coincidence of the jubilee in the annual cycle of the Nile.

Survey Methodology

We have begun to investigate the ancient landscapes, waterways and location of the River Nile within the Theban region using geophysical techniques, principally Electrical Resistivity Tomography (ERT), followed up by hand augering along the geophysical profiles in order to ground-truth the results.

During past surveys in the Egyptian Nile valley we found ERT to be a very effective tool for detecting sub-surface features and former channels at Karnak[12] and in the Edfu floodplain.[13] For the ERT surveys in these seasons a Geoscan Research RM15 resistance meter was configured with a PA3 probe array to take readings using an expanding Wenner array.[14] In the 2012 season an Allied Associates Tigre 64 multi-probe system was used. All the data has been processed using the Res 2D Inv software program. All the ERT profiles (and all other work e.g. hand augering and magnetometry) have been geo-referenced using a Total Station and the topographic data has been incorporated in the processing of the profiles.

To complement this work we also made limited use of magnetometry to map potential near-surface archaeological features in broader 2-D area survey. As magnetometry is limited to collecting data to only 1.5 to 2m below the surface we plan to further complement this with the use of Ground Penetrating Radar (GPR) in coming seasons.

Our geophysical work was followed by geoarchaeological investigation. Locations were selected based upon the results of our geophysical survey data for hand augering in order to assess what the resistance readings corresponded to below the ground. An

7 Gessler-Loehr 1983, 94–95; Hölscher 1932, 8; Jaritz 2005, 345 N. 27; Lacau and Chevrier 1977, 80–81; Nims 1955, 114–115; Stadelmann 1979, 306.
8 Bunbury, Graham, and Hunter 2008, 356; Graham 2010b, 130. 133; Hillier, Bunbury, and Graham 2007; Pimpaud (forthcoming).
9 Kemp and O'Connor 1974, 108.
10 Kemp and O'Connor 1974, 128.
11 Johnson 1998, 86; The Epigraphic Survey 1980, pl. 24.
12 Graham 2010b.
13 Bunbury, Graham, and Strutt 2009.
14 Aspinall and Crummett 1997; Bates and Bates 2000.

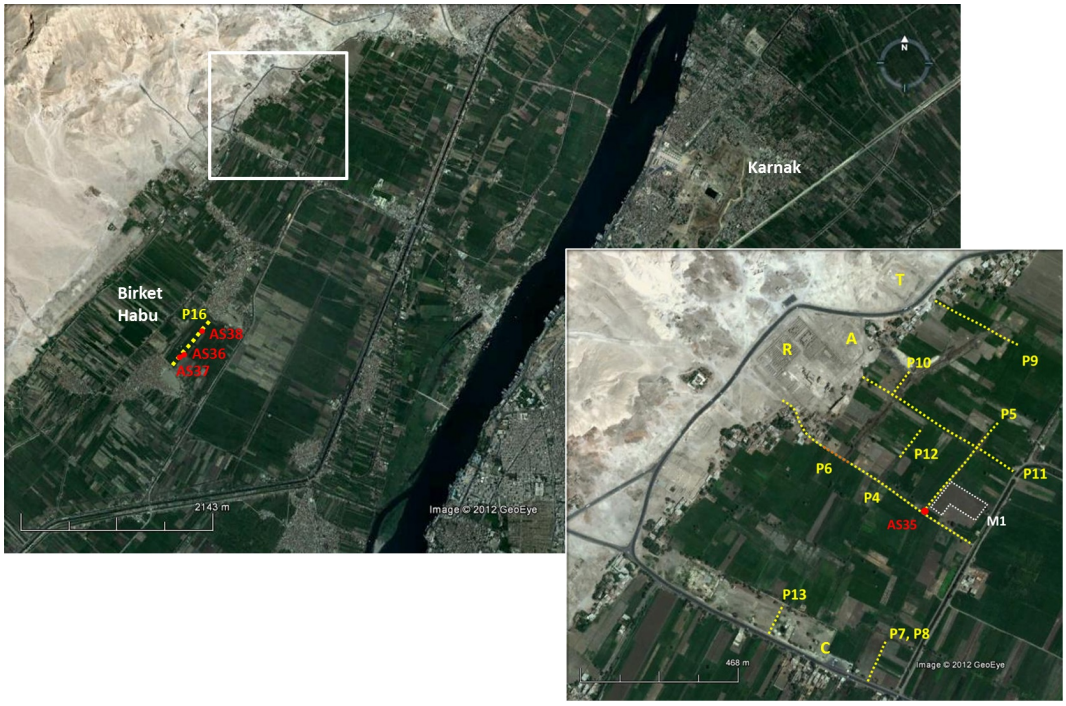

Fig. 1 | The larger satellite image shows the location of the spoil mounds of Birket Habu on the West Bank with our ERT and augering located across the entrance and Karnak on the East Bank. The inset image shows the locations of ERT profiles in the floodplain in front of the Memorial Temple of Thutmose III (T), Amenhotep II (A) and Ramesses II (R) as well as the area of the Memorial temple of Amenhotep III with the colossal statues (C) and auger site AS35 and magnetometry area 1 (M1) marked on the image (Background images © Google Earth).

Eijkelkamp hand-auger was used to retrieve sediment from the floodplain to a depth of 8m. The sediments are recorded on-site immediately after retrieval and all sediment is sieved using 2mm and 4mm mesh to recover any artefacts (e.g. ceramic and stone fragments) and non-artefacts (e.g. other stones, rhizocretions etc).[15] These small fragments of evidence are all studied to help date the sediments and build up an understanding of the environment in which they were found. The ceramic fragments are treated as arteclasts as well as artefacts and their abrasion and roundedness are recorded as they can be a useful indicator of the conditions of transport and deposition.[16]

2012 West Bank Survey

This season 11 ERT profiles were carried out on the West Bank (P4-P13 and P16). Resolutions of each profile varied, with probes set at 1m, 2m and 3m spacings according to length of the profile, the required depth, time constraints and the questions that each profile hope to illuminate. Lengths of ERT profiles range from 60m to >800m going to depths of 6.5m to 19.5m (on the East Bank depths up to 32m were recorded). For example, a short 60m profile (P6—see Fig. 1) with probes at 1m spacing taking readings to a depth of 10m, was placed across the line of a trench dug in recent years as part of the dewatering system in order to assess the readings recorded from such a feature.

Much of our focus was in the floodplain between the Memorial Temples of Thutmose III and Ramesses II and also at the building work of Amenhotep III, in and in front of his Memorial Temple (P7, P8 and P13) and also across the entrance to his enormous

15 Bunbury, Graham, and Hunter 2008, 359–360.
16 Rapp and Hill 2006, 51–52.

project of Birket Habu (P16). This reflects a mixture of planning and pragmatism given the generous access to floodplain path and field boundaries by farmers where we carried out our work.

One of our initial findings this season was the relocation of a rectangular 'structure' identified and placed on a map by Gardner Wilkinson.[17] High resistance readings in the area of the junction between P4 and P5 suggested an interesting anomaly and the curvature in the dirt road at this point was distinctive. In the southwest corner of the magnetometry (M1) a linear feature was visible. Augering (AS35) retrieved rounded sandstone fragments to >2m below the surface up to phi -6 in size and angular to sub-rounded limestone fragments in smaller quantities to >3m below the surface. These clasts with the matrix were contributing to the higher resistance readings seen in the ERT. All these findings were checked with Alban-Brice Pimpaud, who has geo-rectified Wilkinson's map, showing that they fit the location with high precision, providing us with a degree of confidence in our methodology.

We are currently undertaking a complete analysis of the survey and auger data and further results will follow.

17 Wilkinson 1830.

Bibliography

Aspinall and Crummett 1997
A. Aspinall and J.G. Crummett. "The Electrical Pseudosection". *Archaeological Prospection* 4 (1997), 37–47.

Aufrère, Golvin, and Goyon 1997
S. Aufrère, J.C. Golvin, and J.C. Goyon. *L'Égypte restituée. Tome 1 : Sites et temples de Haute Égypte*. 2. Edition. Paris: Errance, 1997.

Bates and Bates 2000
M.R. Bates and C.R. Bates. "Multidisciplinary Approaches to the Geoarchaeological Evaluation of Deeply Stratified Sedimentary Sequences. Examples from Pleistocene and Holocene Deposits in Southern England, United Kingdom". *Journal of Archaeological Science* 27 (2000), 845–858.

Bell 1997
L. Bell. "The New Kingdom «Divine» Temple. The Example of Luxor". In *Temples of Ancient Egypt*. Ed. by B.E. Shafer. New York: Cornell University Press, 1997, 127–184.

Bunbury, Graham, and Hunter 2008
J.M. Bunbury, A. Graham, and M. Hunter. "Stratigraphic Landscape Analysis. Charting the Holocene Movements of the Nile at Karnak through Ancient Egyptian Time". *Geoarchaeology* 23.3 (2008), 351–373.

Bunbury, Graham, and Strutt 2009
J.M. Bunbury, A. Graham, and K.D. Strutt. "Kom el-Farahy. A New Kingdom Island in an Evolving Edfu Floodplain". *British Museum Studies in Ancient Egypt and Sudan* 14 (2009), 1–23.

Foucart 1924
G. Foucart. "Études thébaines. La belle fête de la vallée". *Bulletin de l'Institut Français d'Archéologie Orientale* 24 (1924), 1–209.

Gessler-Loehr 1983
B. Gessler-Loehr. *Die heiligen Seen ägyptischer Tempel. Ein Beitrag zur Deutung sakraler Baukunst im alten Ägypten*. Hildesheimer ägyptologische Beiträge 21. Hildesheim: Gerstenberg Verlag, 1983.

Ghilardi and Boraik 2011
M. Ghilardi and M. Boraik. "Reconstructing the Holocene Depositional Environments in the Western Part of Ancient Karnak Temples Complex (Egypt). A Geoarchaeological Approach". *Journal of Archaeological Science* 38.12 (2011), 3204–3216.

Graefe 1986
E. Graefe. "Talfest". In *Lexikon der Ägyptologie, Stele – Zypresse*. Vol. VI. Ed. by W. Helck and E. Otto. Wiesbaden: Harrassowitz Verlag, 1986, 187–189.

Graham 2010a
A. Graham. "Ancient Landscapes Around the Opet Temple, Karnak". *Egyptian Archaeology* 36 (2010), 25–28.

Graham 2010b
A. Graham. "Islands in the Nile. A Geoarchaeological Approach to Settlement Locations in the Egyptian Nile Valley and the Case of Karnak". In *Cities and Urbanism in Ancient Egypt. Papers from a Workshop in November 2006 at the Austrian Academy of Sciences*. Ed. by M. Bietak, E. Czerny, and I. Forstner-Müller. Denkschriften der Gesamtakademie 60. Wien: Verlag der Österreichischen Akademie der Wissenschaften, 2010, 125–143.

Graham 2011
A. Graham. "Ancient Theban Waterways". *Egyptian Archaeology* 38 (2011), 3.

Graham and Bunbury 2004
A. Graham and J.M. Bunbury. "Pottery from the Alluvial Environments at Karnak North". *Bulletin de Liaison du Groupe International d'Étude de la Céramique Égyptienne* 22 (2004), 55–59.

Graham and Bunbury 2005
A. Graham and J.M. Bunbury. "The Ancient Landscapes and Waterscapes of Karnak". *Egyptian Archaeology* 27 (2005), 17–19.

Hillier, Bunbury, and Graham 2007
J.K. Hillier, J.M. Bunbury, and A. Graham. "Monuments on a Migrating Nile". *Journal of Archaeological Science* 34.7 (2007), 1011–1015.

Hölscher 1932
U. Hölscher. *Excavations at Ancient Thebes 1930/31*. The Oriental Institute of the University of Chicago Oriental Institute Communications 15. Chicago: University of Chicago Press, 1932.

Jaritz 2005
H. Jaritz. "Die Tribünen vor ägyptischen Tempeln der 18. Dynastie bis zur Römerzeit. Ein Deutungsversuch zur Funktion". In *Structure and Significance: thoughts on Ancient Egyptian Architecture*. Ed. by P. Jánosi. Denkschriften der Gesamtakademie 33. Wien: Verlag der Österreichischen Akademie der Wissenschaften, 2005, 341–400.

Johnson 1998
W.R. Johnson. "Monuments and Monumental Art under Amenhotep III. Evolution and Meaning". In *Amenhotep III. Perspectives on His Reign*. Ed. by O'Connor and E.H. Cline. Ann Arbor: University of Michigan Press, 1998, 63–94.

Kemp and O'Connor 1974
B.J. Kemp and D. O'Connor. "An Ancient Nile Harbour. University Museum Excavations at the 'Birket Habu'". *The International Journal of Nautical Archaeology and Underwater Exploration* 3.1 (1974), 101–136.

Lacau and Chevrier 1977
P. Lacau and H. Chevrier. *Une chapelle d'Hatshepsout à Karnak I*. Paris: Publications de l'Institut français d'Archéologie orientale du Caire, 1977.

Nims 1955
C.F. Nims. "Places about Thebes". *Journal of Near Eastern Studies* 14 (1955), 110–123.

Nims 1965
C.F. Nims. *Thebes of the Pharaohs. Pattern for Every City*. London: Elek Books, 1965.

Pimpaud (forthcoming)
A.-B. Pimpaud. "Étude cartographique et topographique en Thébaïde". In *Archéologie du paysage. L'Egypte et le monde méditerranéen. Proceedings of the International colloquium on Geoarchaeology (Cairo, Egypt, 19-21 September 2011)*. Ed. by Y. Tristant and M. Ghilardi. Bibliothèque d'étude. Le Caire: Publications de l'Institut français d'Archéologie orientale du Caire. Forthcoming.

Rapp and Hill 2006
G.R. Rapp and C.L. Hill. *Geoarchaeology. The Earth-science Approach to Archaeological Interpretation*. 2. Edition. New Haven/ London: Yale University Press, 2006.

Schlüter 2009
A. Schlüter. *Sakrale Architektur im Flachbild. Zum Realitätsbezug Von Tempeldarstellungen*. Ägypten und Altes Testament 78. Wiesbaden: Harrassowitz Verlag, 2009.

Schott 1953
S. Schott. *Das schöne Fest vom Wüstentale. Festbräuche einer Totenstadt*. Abhandlungen der Geistes- und Sozialwissenschaftlichen Klasse / Akademie der Wissenschaften und der Literatur, Jahrgang 1952 11. Wiesbaden: Verlag der Akademie der Wissenschaften und der Literatur in Mainz, in Kommission bei Franz Steiner, 1953.

Stadelmann 1979
R. Stadelmann. "Totentempel und Millionenjahrhaus in Theben". *Mitteilungen des Deutschen Archäologischen Instituts, Abteilung Kairo* 35 (1979), 303–321.

The Epigraphic Survey 1980
The Epigraphic Survey. *The Tomb of Kheruef. Theban Tomb 192*. The University of Chicago Oriental Institute Publications 102. Chicago: Oriental Institute of the University of Chicago, 1980.

Wilkinson 1830
J.G. Wilkinson. *Topographical Survey of Thebes, Tape, Thaba, or Diospolis Magna*. London: Royal Geographical Society, 1830.

Angus Graham (corresponding author), Field Director, Egypt Exploration Society, 3 Doughty Mews, London, WC1N 2PG, United Kingdom, angus_graham@yahoo.co.uk

Kristian D. Strutt, Geophysical Researcher, Department of Archaeology, University of Southampton, Highfield, Southampton, SO17 1BF, United Kingdom

Morag Hunter, Sedimentologist, Department of Earth Sciences, University of Cambridge, Downing Street, Cambridge, CB2 3EQ, United Kingdom

Sarah Jones, Head of Geomatics, Museum of London Archaeology, Mortimer Wheeler House 46 Eagle Wharf Road, London N1 7ED, United Kingdom

Aurélia Masson, Research Associate, Division of Archaeology, University of Cambridge, Downing Street, Cambridge, CB2 3DZ, United Kingdom

Marie Millet, Project Curator, Amara West Project, Department and Ancient Egypt and Sudan, British Museum, Great Russell Street, London, WC1B 3DG, United Kingdom

Benjamin Pennington, Geologist, alumnus Department of Earth Sciences, University of Cambridge, Downing Street, Cambridge, CB2 3EQ, United Kingdom