SUDAN & NUBIA

The Sudan Archaeological Research Society

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ASWAN
1st cataract
Hisn al-Bab
Egypt
RED SEA
Afyeh
Wadi el- Allaqi
Gebel Adda
2nd cataract
Wadi Gabgaba
Amara West
Sedeinga
Sai
3rd cataract
Tombos
ABU HAMED
Sudan
Nile
El-Ga'ab
Basin
H29
5th cataract
KAREIMA
4th cataract
Abu Sideir
Napata
Wadi Abu Dom
Dangeil
ED-DEBBA
ATBARA
Wadi Howar
Gala
Abu Ahmed
Meroe
Atbara
Qalaat Shanan
Wadi el- Melik
Wadi Muqaddam
6th
cataract
Jebel Sabaloka
OMDURMAN
KHARTOUM
KASSALA
Eritrea
Blue Nile
MODERN TOWNS
Ancient sites
WAD MEDANI
White Nile
GEDAREF
KOSTI
SENNAR
N
Ethiopia
South
Sudan
Azaza
0
250 km

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Contents

Front cover: Excavations in progress in the *Kerma Ancien* cemetery at site H29 in the Northern Dongola Reach (photo D. A. Welsby).

Sudan & Nubia is a peer-reviewed journal

Re-assessing the abandonment of Amara West: the impact of a changing Nile?

Neal Spencer, Mark Macklin and Jamie Woodward

An island town

Amara West, a well-preserved town of the late New Kingdom downstream of Sai, was excavated by the Egypt Exploration Society before and after the Second World War, and is currently the focus of a British Museum research project. The town comprises housing, administrative and storage buildings, and a decorated sandstone temple, all within a brick enclosure wall, but also extra-mural buildings including several villas (Spencer, P. 1997; Spencer, N. 2009; 2010; in press a). Bricks in the town wall, founded on alluvial deposits, are stamped with the cartouches of Seti I (*c.* 1306-1290 BC; see Spencer, P. 1997, 15-17, pl. 8), and excavations have revealed no evidence for earlier occupation at the site. The discovery of a formal building with inscriptions naming several holders of the title 'deputy of Kush' (e.g. Spencer, P. 1997, pls 151, 153 [b], 166) has led, reasonably, to the site being identified as the seat of the pharaonic administration of Kush (i.e. Upper Nubia) in the Ramesside Period (*c.* 1306-1070 BC), a region under Egyptian control since around 1500 BC (Smith 2003, 83-96).

Plate 1. Google Earth image with locations of Amara West, Ernetta and Abri.

The walled town, set within an enclosure of 108 x 108m, is provided with two main gateways, in its northern and western sides, but an additional entrance, with forecourt, is provided for the cult temple in the north east of the town (Spencer, P. 1997, 17-19, 33-5, pl. 3). The direction of the last two gateways, and the apparent lack of an opening towards the current Nile channel, prompts consideration of the nature of the ancient landscape at the time of the town's foundation. Presently, the archaeological site is framed to the south by the main channel of the modern Nile, which here flows eastward (Plate 1). The river bank consists of a steep incline of exposed inter-bedded alluvial and dune deposits, capped by a large dune system lined with tamarisk trees (Plates 4 and 7). In contrast, the northern and eastern edges of the ancient site are defined by a low-lying depression, notable for the lack of anthropogenic material and metamorphic bedrock outcrops.

This setting led H. W. Fairman, director of the EES excavations in 1938-9 and 1947-8, to suggest that the ancient town was once located upon an island in the Nile (Spencer, P. 1997, 1), and aerial photographs published as part of the CNRS survey (Vila 1977a, 9 fig. 1) support this interpretation. Field observations and analysis of high-resolution satellite imagery allows a reconstruction of this island, interpreting the low-lying depression north of the site as a defunct river channel, bounded by the desert escarpment (Figure 1; Plate 1). The dynamic nature of the Nile in northern Sudan has created a large number of permanent and semi-permanent islands, many of which are now merged with older Holocene alluvial deposits of the Nile valley (Welsby *et al.* 2002; Woodward *et al.* 2001; Edwards and Osman 2012, 23-5). If Amara West was located upon an island, and moreover one downstream of a significant change in the river's direction, it would mirror the positioning of other new settlements founded at this era, including Kom Firin in the western Nile Delta (Spencer in press b, Chapter 2) and the central core of the royal residence city at Per-Ramses (Bietak and Forstner-Müller 2011, 25-6, fig. 2)

As part of the current research project at Amara West, evidence was sought to support this interpretation, but particularly to provide a chronological framework for when this northern channel ceased to flow regularly. Such a framework would potentially answer some key archaeological questions. Was the new town of Amara West set on an island? When did the flows in the northern channel cease to be perennial? May the abandonment of the town have been related to the failure of this channel, and attendant changes to living conditions? This paper presents Optically Stimulated Luminescence (OSL) dates from a sondage through deposits

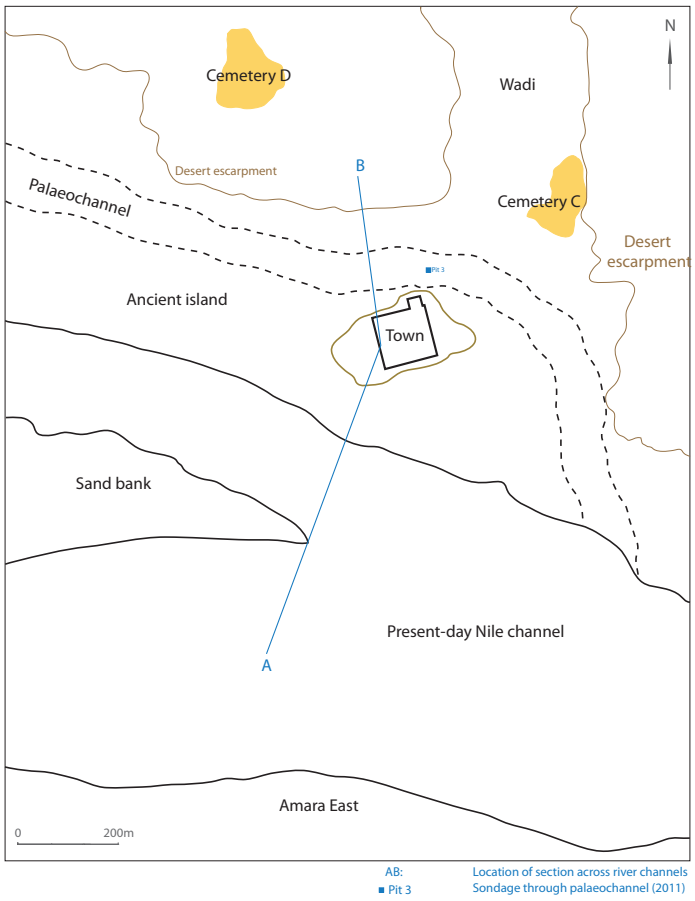

Figure 1. Map of town site with reconstruction of island.

in the palaeochannel, and a consideration of their potential significance, ahead of further investigation into river histories at and around Amara West.

OSL dates from the palaeochannel

In January 2011, a circular sondage was dug into the fill of the palaeochannel, north east of the temple gateway (Figures 1-2; Plate 7). Approximately 2m in diameter, the excavation of this sondage was made particularly challenging due to the absence of mechanised digging equipment, and the nature of the deposits, primarily loose sand. Sandbags and saturation of the sondage edges with water prevented collapse during excavation and sampling. The sondage (Figure 3) reached a depth of 3.76m below the present surface (196.22m ASL) and exposed 1.12m of wind-blown sand overlying a 2.74m thick sequence of alternating sandy and silty fluvial sediments. Detailed logging showed that sand (130-780mm thick) and silt (20-80mm thick) units formed distinctive couplets, seven of which were evident in the section (designated A-G). These are formed of cross-bedded sands with small scale scour

Plate 3. Detail of a silt and reworked sand flood couplet.

structures that fine upwards into flat-bedded or gently dipping silty sands and laminated clayey silts, which complete the couplet sequence (Plate 3). The upper surfaces of the silt units have well developed vertical cracks (up to 5mm wide and infilled by sand), which in plan view form a polygonal pattern. These sedimentary structures are desiccation cracks that form as muddy sediment dries and contracts, associated with the drying up of a pool or similar isolated water body disconnected from the main river. Rolled and sub-rounded clayey-silt rip-up clasts are commonly incorporated into overlying sand units. We have observed small rip-up clasts (*c.* 10 to 20mm in length) close to their site of origin, indicating relatively low local flow velocities (Plate 3). These sand-silt couplets are most likely to represent single large flood events with coarser sands transported under rising and peak flows, and finer-grained clayey-silts deposited as flood level fell. On the basis of the desiccation cracks developed in the upper silt units, after each flood event the channel north of the town site dried out and was partially infilled by blown sand, subsequently reworked by later floods. In many respects these flood deposits are similar to slackwater sediments that have been used to reconstruct Holocene flood histories in bedrock

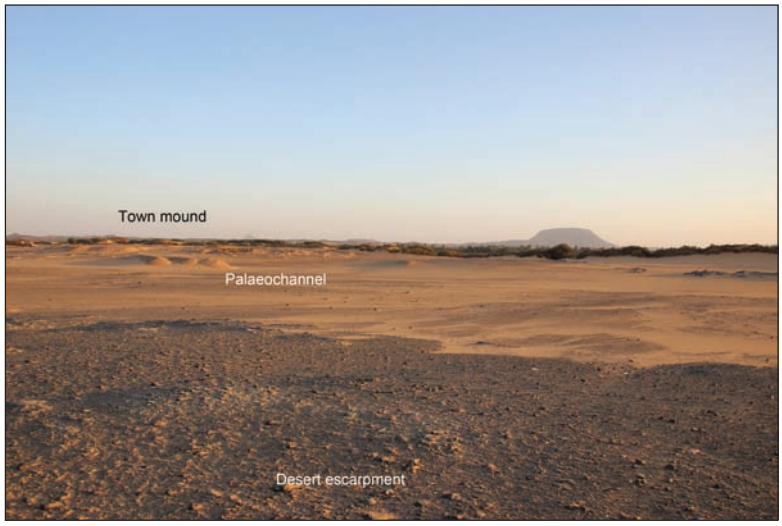

Plate 2. View south from desert escarpment, with palaeochannel and town behind.

Figure 2. Schematic profile across the ancient town site, main Nile channel and palaeochannel.

confined rivers of the American South West (Ely *et al.* 1993).

To establish the age of the flood events and to determine when the northern channel ceased to flow, three samples were collected for OSL dating from thick sand units in the sequence (Figure 3).[1] Samples were collected by inserting steel tubes into the section. These were then excavated and sealed at each end to prevent exposure of the sediment to sunlight. The uppermost sample (OSL 2011/04) was taken at 800mm below ground level within the aeolian sand unit. OSL samples were also taken from the sand units of flood couplets C (OSL 2011/03, 1.65m below ground level) and F (OSL 2011/02, 2.85m below ground level). The lower part of the wind-blown sand unit gave a date of 205 BC (age range 385-25 BC), while flood couplet C can be associated with a date of 405 BC (age range 740-70 BC). The earliest flood couplet for which a reliable date could be obtained (F) is dated to 1270 BC (age range 1485-1055 BC). OSL dating, therefore, indicates that 2.74m of sedimentation in the channel to the north of Amara West took place over a millennia, between *c.* 1270 and 205 BC and was very probably the result of at least six major flood events. The lower half of the wind-blown sand that buries these flood sediments is dated to *c.* 205 BC and demonstrates that the channel has not been affected by later floods. Moreover, by *c.* 1270 BC (age range 1485-1055 BC), flooding was no longer perennial: the northern channel and branch had become ephemeral and was only re-occupied during very large flood events, perhaps separated by 100-200 years.

It is interesting to note that in the Dongola reach of the Nile, major floods have also been dated to the 8th century BC, suggesting that this was a period of exceptionally high floods in Upper Nubia. These may be equivalent to Flood Units D or E but further dating is needed to test this hypothesis. The date at which flow in the northern channel at Amara West switched from perennial/seasonal to ephemeral is presently unknown but based on our preliminary OSL dating it must have occurred before *c.* 1270 BC (age range 1485-1055 BC). We aim to date this change, and establish more precisely when this channel started to dry out. Future work will include a deeper sondage to discover whether the distinctive sedimentary record of perennial Nile flows recorded elsewhere in northern Sudan (Woodward *et al.* 2001) is present.

[1] The OSL analyses was carried out by Dr Jean-Luc Schwenninger in the Luminescence Dating Laboratory at the Research Laboratory for Archaeology and the History of Art, University of Oxford following the procedures set out in Briant *et al.* 2006.

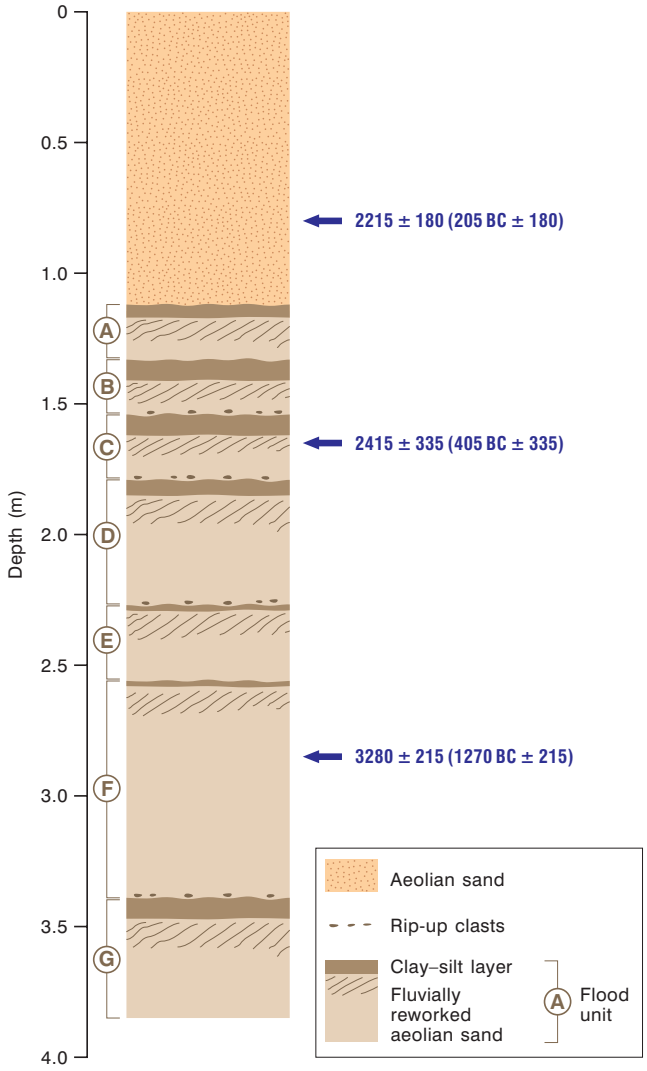

Figure 3. A schematic section of the sediments exposed in the palaeochannel sondage north of Amara West, for location see Figure 1. The fluvially-reworked sands in each flood unit include cross beds and small-scale scour features throughout. All of the sand units show evidence of reworking by fluvial processes apart from the uppermost aeolian sand unit (above Flood Unit A) that extends upwards to the modern surface of the palaeochannel depression. OSL dates from three samples discussed here are indicated.

Political and environmental agency

Prior to the British Museum commencing research at Amara West, the following historical framework for Amara West was widely accepted, based on the available archaeological and epigraphic evidence, informed by a bias towards interpreting evidence from a pharaonic viewpoint. The Egyptian town,

Plate 4. Riverbank at Amara West, with tamarisk and dune complex.

founded in the reign of Seti I, was occupied for most of the remaining Ramesside Period, with a year 6 inscription of Ramesses IX (*c.* 1125 BC) recognised as the latest known royal inscription in Upper Nubia. It is generally assumed that Egypt lost control of its Nubian empire shortly afterwards, and Amara West was abandoned by its 'Egyptian' inhabitants. Caution is of course required in designating the inhabitants of Amara West as 'Nubian' or 'Egyptian': architecture and material culture from both town (Spencer 2010) and cemeteries (Binder *et al.* 2011; Binder 2011) indicate that the population comprised individuals who both created and experienced Egyptian, Nubian and mixed cultures.

The architectural phases revealed by the EES excavators were interpreted in terms of the reigns of pharaohs (summarised in Spencer, P. 1997, 217-21). Thus the earliest phase ('Level Four') was assigned to the reign of Seti I, followed by 'Level Three' under Ramesses II, with 'Level Two' designating the ongoing use and refurbishment of the previous phase. 'Level One' was most problematic for the archaeologists to interpret, especially in the area south of the temple. A tentative dating to the 25th Dynasty (750-657 BC) was suggested, on the basis of the truncated architecture of the phase below, and intervening layers of wind-blown sand, in some places 1m deep.[2] The use of the term 'squatters' to characterise the later inhabitants speaks volumes about the Egyptological bias inherent in this interpretation. Yet the post-New Kingdom tombs do not suggest a significant change in access to precious materials, nor a decline in the health of the population, compared to the Ramesside burials. In summarising the implications of the data retrieved from the early excavations, it was proposed that 'the inhabitants … seem to have taken with them anything of value when they left for Egypt. A deliberate abandonment of the town would help to explain the lack of 'fine objects". Considering the later occupation phase south of the temple, it is suggested that the area was 'occupied by the local population … for an undefined but probably quite lengthy, period of time' (Spencer, P. 1997, 220-1).

A group of letters found at Thebes, dating to the reign of Ramesses XI, reflect a dynamic political situation of shifting allegiances between pharaoh, Theban high priests, the Viceroy of Kush and Nubian troops (Wente 1990, 171-204). The end of Egyptian control over the area may have been a complex, drawn-out, phenomenon, and its effect on the inhabitants of the area (Egyptian or Nubian) is far from clear. In addition to the bias to the accepted historical reconstruction, the excavators – and subsequent discussions – were influenced by the perceived dearth of evidence for significant settlement in Upper Nubia during the early first millennium BC. This was partly due to an inclination by excavators and subsequent commentators to assign artefacts and ceramics to one of the 'well-known' historical eras that dominated the literature: the Ramesside Period or the 25th Dynasty. Recent work at Kawa (Welsby 2010, 48-50), Hillat el-Arab (Vincentelli 2006), Sai (Thill 2007), Tombos (Smith 2007) and in the southern Dongola Reach (Klimaszewska-Drabot 2003) is, however, now providing evidence for settlements and cemeteries across Upper Nubia in the early part of the first millennium BC.

Current excavations at Amara West have focused on a group of houses inside the north-western part of the walled town, and extra-mural buildings to the west. Though the architecture is principally contemporary with the Ramesside period, as far as it is possible to ascertain, evidence of later occupation is encountered. For example, a room cut (2251) into one of the town wall's buttresses yielded post-New Kingdom pottery, including restricted jars in a Nubian style (C2030, C2031). Across the southern part of the town, as yet unexcavated, surface survey identified clusters of later pottery, including forms typically dated to the early Napatan era, with a higher proportion of marl vessels than found in New Kingdom levels. The cemeteries provide more explicit evidence of post-New Kingdom occupation of this area. In cemetery C, on an alluvial terrace adjacent to a *wadi* north east of the town, chamber tombs with multiple burials were in use during the late New Kingdom but continuing into the 8th century BC (Binder 2011, 50-1). The other cemetery (D), which features pyramid-chapels of the 19th Dynasty, also remained in use, perhaps as late as the 7th century BC (Binder *et al.* 2010, 57-60).

Why should the loss of Egyptian political authority in the area necessarily impact upon local population levels and settlement patterns? The evidence from Buhen, and other

[2] Excavations in housing area E13.3 (ongoing since 2009) have shown that layers of sand can accumulate within short timeframes, and that widespread truncation of buildings occurred at intervals, to allow construction of new buildings on a different layout. Thus the situation encountered by the EES excavators does not have to be interpreted as a significant abandonment interval.

Middle Kingdom forts, indicates both Egyptian and local populations continuing to inhabit the settlements throughout the Second Intermediate Period (Edwards 2004, 97): the loss of pharaonic control of the region did not cause abandonment. In fact, stelae from the town attest to individuals in the service of the ruler of Kush (Save-Söderbergh 1949). Though the political entity or entities ruling Upper Nubia after the end of New Kingdom pharaonic control may not have been as powerful as the Kerma kingdom which ended Middle Kingdom rule, of relevance here is the continuity of occupation through a period of political change. Egyptian settlements founded in Nubia during the New Kingdom, such as Sai, Sesebi, Dokki Gel and Kawa, continued to flourish in the Kushite era, and for many centuries later. While the end of Egyptian rule does not seem to have prompted abandonment of Amara West, though in contrast to elsewhere, the site was no longer occupied by the 7th century BC. Thus factors other than political control deserve consideration. The OSL dates presented here indicate that by 1270 BC (± 215) the northern channel at Amara West was only flowing intermittently and by 205 BC (± 180) had dried up completely. What were the consequences of a changing Nile?

Plate 5. View west along of secondary channel north of Ernetta island (January 2008).

Consideration of the modern Nile landscape around Amara West is informative: as the river level drops in the winter and spring, small islands, sandbars and clusters of boulders are revealed. The sandbars shift from year to year, reworked by the energy of the river at high flood. But the area is also characterised by a number of more significant islands, such as Ernetta, just 1km upstream of Amara West (4km east-west, 1km north-south; Plate 1). In many ways, it represents a similar island to that on which the ancient town of Amara West was founded, though somewhat larger: of similar form, with a narrow northern channel (Plate 5), which in summer becomes inactive and is reduced to a series of disconnected pools. Currently occupied with a scatter of villages, Ernetta comprises sandy areas, and a dense patchwork of fields along either edge, with the banks comprising steep terrace fronts exposing thick alluvial deposits (Plate 6). Crucial factors in making Ernetta an attractive place to live are the northern river channel and line of tamarisk trees on the left bank of the Nile, both of which reduce the effects of wind, and sand carried by it, from the desert which stretches for hundreds of kilometres to the north. In many ways, Ernetta is an agricultural idyll, admittedly one whose productivity is now enhanced with diesel water pumps.

Plate 6. South bank of Ernetta island (January 2009).

Returning to Amara West, when the northern channel flowed on a regular basis, living conditions and the agricultural potential of the island may have been similar to aspects of present-day Ernetta. The botanical evidence suggests a similar range of flora: Christ's thorn, sycamore fig, acacia, tamarisk, dom palm, sedges and rushes, alongside cultivated plants (emmer, barley, lentils, flax, legumes) no longer grown on the island (Ryan *et al.* 2012). Once the channel ceased to flow regularly, the landscape would have changed within a short time frame, as the elevated barrier of trees and a dune complex along the north bank of the palaeochannel would disappear. Combined with the lack of water in the channel, wind-blown sand would have become an acute and ever-present factor in the town. Though the town was protected by high walls, these would have been subject to considerable erosion, and within the town itself, there is ample evidence

Plate 7. Pit 3 in the palaeochannel, town mound in background left.

for doorways being blocked in the last phases of occupation, in response to rising deposits outside houses, including thick layers of wind-blown sand. In one case, the entrance porch of a large extra-mural villa was blocked, and stairs down into the living level were constructed, presumably due to the accumulation of sand deposits outside (Spencer, N. 2009, 51, pl. 8). The large dune system that lies on the edge of the modern Nile means that one cannot now see the river from the town (Plate 8). When the northern channel was flowing, however, this dune complex would not have been present, and the town may have offered clear sight lines both upstream and downstream, particularly from the top of the town walls.

Plate 8. Excavation in town, with dune complex and tamarisks along the Nile. View south west.

The OSL dates presented here would suggest the northern channel was only flowing intermittently by 1270 BC (± 215), which would imply that the town was no longer on a permanent island by the early part of the reign of Ramesses II (1279-1210 BC). Yet this was the period during which the town gate and temple were decorated, both of which face the northern channel. Erring towards the lower end of the OSL date range would imply ephemeral channel flow was a feature in the late New Kingdom, which would correlate well with the geoarchaeological evidence, such as accumulations of wind-blown sand becoming more common. In contrast, if the upper date range is accepted, it would imply the town, when founded, was not located on an island, with the river flow becoming irregular during the 18th Dynasty, if not before. This seems unlikely given the orientation of the town, its north gate, and the decorated temple.[3] Further OSL dates are needed from the local alluvial record to test these ideas.

The limited scope of excavations in the cemetery precludes any assessment of whether the population was decreasing over time, but what is clear – from both necropoleis and settlement – is that occupation in the area persisted for around two centuries after Egypt lost political control over the region. The collapse of Egypt's Nubian empire did not entail a complete abandonment of the area around Amara West. Given that the OSL dates indicate a date range of the late second and first millenniums BC for the last seven floods that inundated the northern channel at Amara West, it becomes possible that climate related changes in river flow and the resultant shift in local landscape dynamics may have been a key, though perhaps not the only, factor which led to the abandonment of the settlement. This channel had stopped flowing on a seasonal basis sometime towards the end of the second millennium BC; what remains unknown is when perennial flow last occurred, and future fieldwork will seek to address this.

Regional settlement distribution around Amara West has remained broadly within this framework ever since. Sai retained its prominence as an urban centre into Ottoman times (Alexander 1997), afforded the environmental benefits of an island location. The survey conducted by Vila recorded pre-Kerma sites in the desert north of Amara West,[4] in all likelihood associated with an early Nile channel, while Kerma and New Kingdom evidence clusters closer to the current channel (Vila 1977a, 15-17). Significant sites of the late first millennium BC or later are, in contrast, found on the opposite bank (Vila 1977b, 14-15).[5] A more recent phenomenon of migration from large islands to the mainland has been noted upstream in the Third Cataract region (Edwards and Osman 2012, 27). Modern settlement around Amara West, almost exclusively, clusters along the right bank of the river, away from the desert and wind-blown sand. This settlement pattern may be radically altered in the coming years, facilitated by tarmac roads and large-scale mechanised irrigation projects.

Acknowledgements

The fieldwork at Amara West is undertaken through per-

[3] It is possible an earlier Kerma settlement existed here or nearby, given that Egyptian towns were often founded near Kerma settlements (Kerma, Sai and possibly Sesebi). A *Kerma Moyen* grave (G308) has been found in cemetery D at Amara West, but no pre-19th Dynasty occupation has been identified in the town.

[4] A recent re-assessment of the prehistoric sites in the desert north of Amara West, led by Elena Garcea, identified Middle Stone Age, Khartoum Variant and Pre-Kerma/Abkan sites (Garcea *et al.* 2011).

[5] These surveys need to be treated with caution, especially the interpretation of features as 'New Kingdom' or 'Napatan' on limited evidence. Current work at Amara West has proved the continuous use of the cemetery from the 13th through 7th centuries BC (Binder *et al.* 2011; Binder 2011). Furthermore, a grave tentatively dated to the 'X-group' by Vila (1977a, 32-3) is identical in form with post-New Kingdom tombs excavated by the current project (Binder 2011, 46-7, fig. 8). Within the survey area around Amara West, only two Christian sites were identified: a modest cemetery, and a small settlement with 'Christian' pottery (Vila 1977a, 99 [2-S-34], 120 [2-S-40]).

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