SUDAN & NUBIA

The Sudan Archaeological Research Society Bulletin No. 2 1998

ASWAN
1st Cataract
RED SEA
EGYPT
Karanog
Aniba
Qasr Ibrim
Ballana
Faras
Qustul
Buhen
2nd Cataract
Amara West
Firka
Soleb
Sesebi
3rd Cataract
Dabaki
Northern Dongola Reach
ABU HAMED
Nile
Kiliseikal
Kurgus
Suakin
Kawa
4th Cataract
5th Cataract
Jebel Barkal
KAREIMA
Old Dongola
Bakheit
Jebel Nakharu
Soniyat Istabel
GABOLAB
Wadi Howar
Wadi Muqaddam
Meroe
el Kadada
Atbara
6th Cataract
Naqa
Jebel Umm Marrahi
Geili
OMDURMAN
KHARTOUM
Soba East
Blue Nile
White Nile
ERITREA
Sennar
ETHIOPIA
0
250 km

SUDAN & NUBIA

The Sudan Archaeological Research Society   *Bulletin No. 2*   *1998*

Contents

Front Cover: Ceramic statue of the goddess Beset from Kawa.

Introduction

Vivian Davies

Members will note that this second issue of *Sudan & Nubia* is already considerably larger than the first, a clear signal, I am pleased to say, both of our Society's commitment to fieldwork and of the growing interest in Middle Nile archaeology in general. With the four-year programme of survey in the Northern Dongola Reach completed, we began last season a significant new project at Kawa (see Derek Welsby below), a major Pharaonic and Kushite cult-centre and one of the most important archaeological sites in the Sudanese Nile Valley, now threatened by modern development. At the same time our interest in the hydrological research on the Nile palaeochannels in the Dongola Reach continues (Mark Macklin and Jamie Woodward), and we have also supported archaeological survey both in the Bayuda desert in advance of the building of a new road (Michael Mallinson, Laurence Smith and Dorian Fuller) and at the site of Kurgus, the point where the Egyptians appear to have marked the southern boundary of their empire in the New Kingdom (Vivian Davies and Isabella Welsby Sjöström).

Among our guest contributors, two of our Sudanese colleagues report on valuable rescue projects, one on a site affected by the building of the Shendi-Atbara road (Abdel Rahman Ali Mohamed), the other in the area of the Fourth Cataract, where a new dam is being planned (Mahmoud el-Tayeb). Also under threat is the site of Soniyat in the Debba Bend, now very plausibly identified by a Polish expedition as the 'Tergedum' mentioned in Book II of Pliny's *Natural History* (Bogdan Zurawski). Rescue is also very much the theme of the Egypt Exploration Society's latest excavations at Qasr Ibrim, the last remaining site in Egyptian Nubia, where an unexpected rise in the level of Lake Nasser/Lake Nubia is damaging strata previously thought to be safe, necessitating urgent work on those areas (Pamela Rose and David Edwards). Fortunately there is no such threat to the Wadi Howar, a long dried-up tributary of the Nile, evocatively known as 'the Yellow Nile', where a German research project is producing fascinating new data on changes in environment and shifts in settlement patterns (Birgit Keding). A different kind of research, on the records of an important early traveller, is represented in our final paper (John Ruffle). Lord Prudhoe, its main subject, will be familiar to many of our readers for his association with the two great lion sculptures from Gebel Barkal, which now grace the Egyptian Sculpture Gallery of the British Museum.

Alluvial architecture and luminescence dating of Holocene palaeochannels in the Northern Dongola Reach of the Nile

Mark Macklin and Jamie Woodward

Introduction

This paper outlines recent progress on geomorphological and stratigraphical investigations undertaken by the authors in the Northern Dongola Reach following fieldwork in the 1995/1996 and 1996/1997 seasons. We present new data on the age and sedimentology of the Holocene palaeochannel systems in the area and briefly explore the significance of our geomorphological work for the interpretation of the archaeological record and particularly the Kerma Period.

Data sources in the Northern Dongola Reach

Much of our work is based on detailed observation of the Holocene river sediments facilitated by excellent 3D exposures available in groundwater pump pits. Agricultural development in the desert away from the Nile is based on the exploitation of groundwater resources and many hundreds of pits/well-holes (to house diesel pumps) have been dug in the area. These square pits can be over 6m deep and are typically 4 to 5m wide. We have inspected over 150 sections and have recorded in detail the stratigraphy and sedimentology at 31 well-holes (WH1 to WH31) (Fig. 1).

Our stratigraphic records now cover much of the archaeological survey area stretching from WH29 on the eastern margin of the Seleim Basin in the north to WH24 in the southern portion of the survey area near Barqat Kuluf, approximately 6km from the modern Nile. The entire survey area is underlain by Nile alluvium, which ranges from <2m to >7m in thickness, with Nubian sandstone bedrock present at the base of several of the well-hole sections. Optically Stimulated Luminescence (OSL) techniques have been used to date the alluvial sediments and three of the dated sections are described below.

Alluvial Stratigraphy and OSL Dating

Well-hole 18 (19° 07' 26" N, 30° 33' 09.5" E)
Well-Hole 18 is located approximately 7km due east of the modern Nile close to the southern edge of the Seleim Basin (Fig. 1). This site lies on the right bank of a major palaeochannel about 4km downstream of the confluence of the Alfreda and Hawawiya palaeochannel belts (cf. Welsby 1995). Nubian sandstone bedrock is exposed at the base (0 65cm) of this pit and is overlain by 20cm of well rounded fluvial gravels that fine upwards to coarse sand. These gravels represent a bed load lag deposit from a high discharge of the Late Pleistocene or early Holocene Nile. The overlying sequence consists of >5m of well sorted fine sand alternating with units of fine sandy silt (Fig. 2). The prominent fine sand units have proved to be ideal for OSL dating. The lower sample (5.15m) yielded an age of c. 2500 BC and the upper sample (1.45m) was dated to c. 790 BC (Table 1). These ages demonstrate that the alluvial sequence at this site dates from the beginning of the Early Kerma Period until sometime in the early part of the 1st millennium BC, more than 700 years after the end of the Final Kerma Culture (Table 2).

Pit No.	*Depth*	*OSL Age*	*Culture*
23	1.30 m	510 AD ± 100	Post-Meroitic
18	1.45 m	790 BC ± 100	Kushite
18	5.15 m	2500 BC ± 300	Pre/Early Kerma
14	0.75 m	1190 BC ± 300	New Kingdom/Kushite
14	4.40 m	2060 BC ± 300	Early/Middle Kerma
07	1.60 m	3170 BC ± 530	Pre Kerma
24	1.55 m	3680 BC ± 300	Neolithic/Pre Kerma
04	2.55 m	5060 BC ± 430	Neolithic
05	2.30 m	5100 BC ± 1090	Neolithic
		5490 BC ± 1120	Neolithic

Table 1. The OSL dates from Nile alluvial sediments within the palaeochannel complex of the Northern Dongola Reach. Sample depths from the top of the logged section (modern land surface) are also given. See Figure 1 for pit locations.

Well-hole 14 (19° 02' 31.4" N, 30° 36' 16.5" E)
WH14 is located approximately 3.5 km from the bedrock plateau in the east of the survey area within the Alfreda Nile palaeochannel system (cf. Welsby 1995). This pit exposed 5.70m of fine-grained Holocene alluvial sediments. This sequence is similar to WH18 and consists of well sorted fine sands (Fig. 3) that commonly grade upwards into fine sandy silts. Two OSL dates have been obtained from this sequence (Fig. 3 and Table 1). The lower part of this exposure has been dated to an Early/Middle Kerma age of 2060 BC. The upper part of this sequence (0.75m from the modern land surface) has been dated to just after the Final Kerma Period with an age of 1190 BC. It is interesting to note that this pit is close to the isolated building at Site P4 that was excavated in the 1996/1997 field season (Welsby 1997) that may be of Classic Kerma age (1750–1580 BC). These OSL dates indicate that this channel belt was active throughout the Kerma Period.

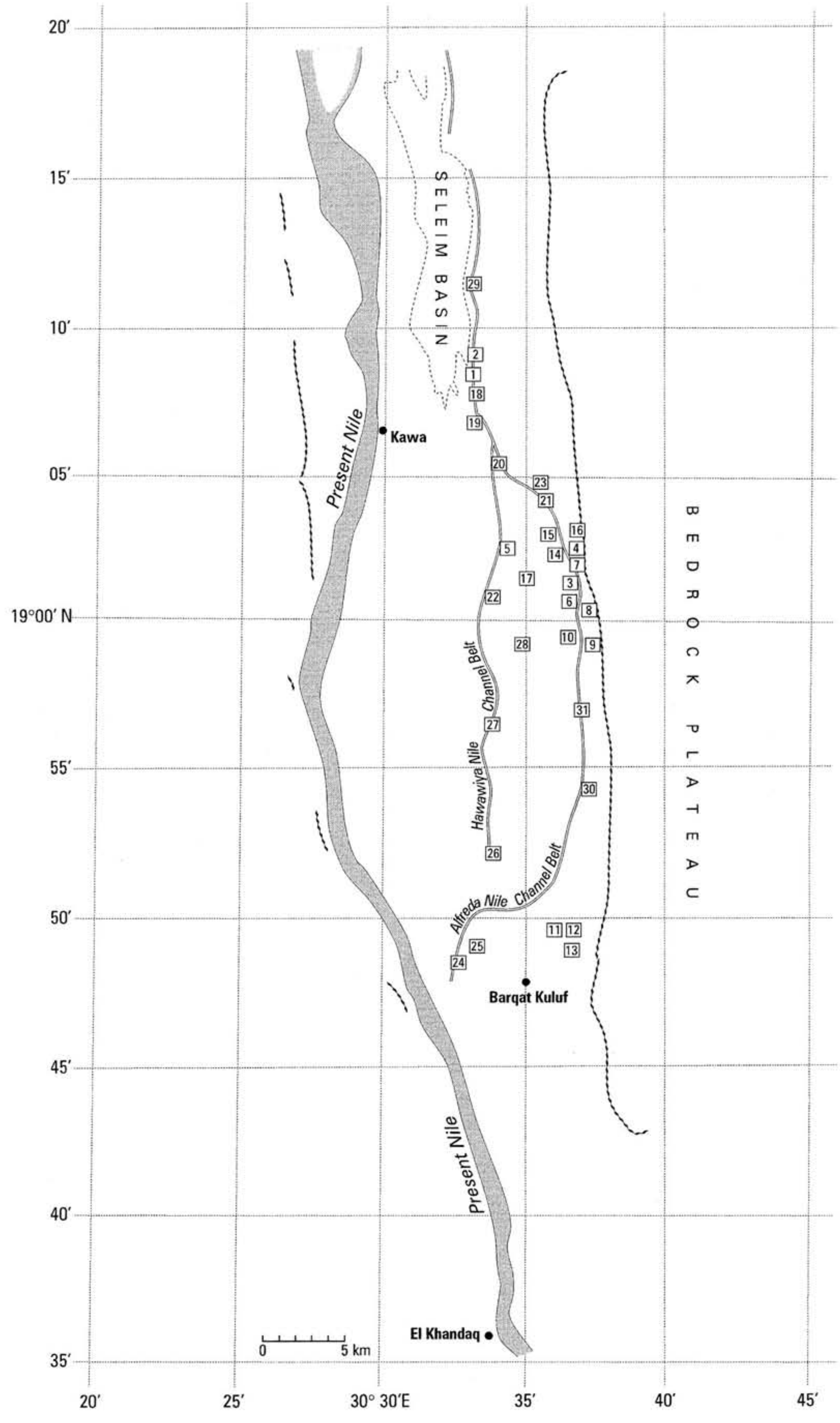

Figure 1. The location of the ground water pump pits (well-holes) in the Northern Dongola Reach selected for detailed study by the authors. The alluvial stratigraphy at each site has been recorded and sampled in the manner described in Macklin and Woodward 1997.

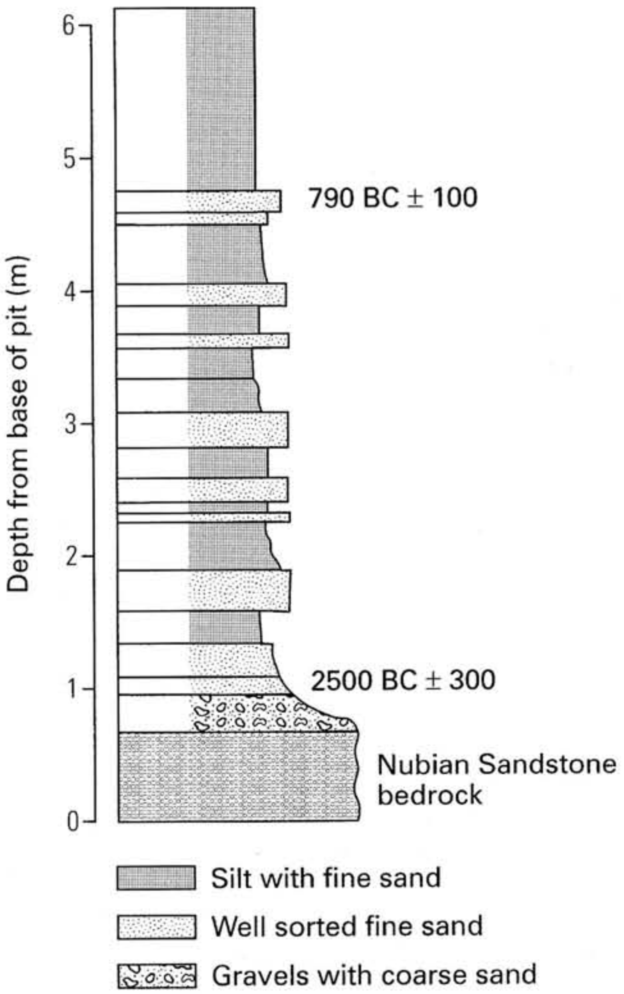

Figure 2. Simplified sediment log and OSL dates from Well-hole 18.

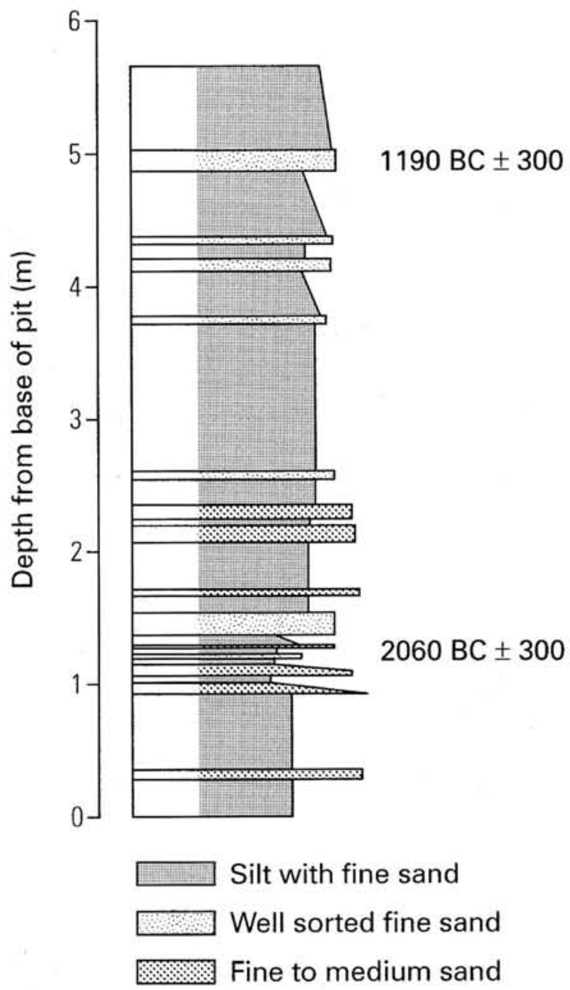

Figure 3. Simplified sediment log and OSL dates from Well-hole 14.

Pit 23 (19° 04' 38'' N, 30° 34' 53.2'' E)
Pit 23 was dug into the bed of a palaeochannel with the aim of dating the last time that this channel was active. A 1.90m section was exposed and a sediment sample for OSL dating was collected from a depth of 1.30m below the present land surface from the uppermost fluvial silty sand unit in this sequence. This gave a date of AD 510, which appears to be the last time there was significant flow in this channel (Fig. 4). Interestingly, recent research conducted within the NERC Tigger Project (Terrestrial Initiative in Global Environmental Research) has shown that a major shift to a more 'drought-ridden' regime occurred in the sub-Saharan Sahel at around the same time. This highlights the wider significance of these data and the sensitivity of the Nile basin to large-scale climatic fluctuations.

Channel Morphology

A number of transects were surveyed by the authors across the principal palaeochannels in the Northern Dongola Reach during the 1996/1997 field season. One of these transects (Colour Plate X) runs across the palaeochannel where Pit 23 was excavated and covers a distance of almost

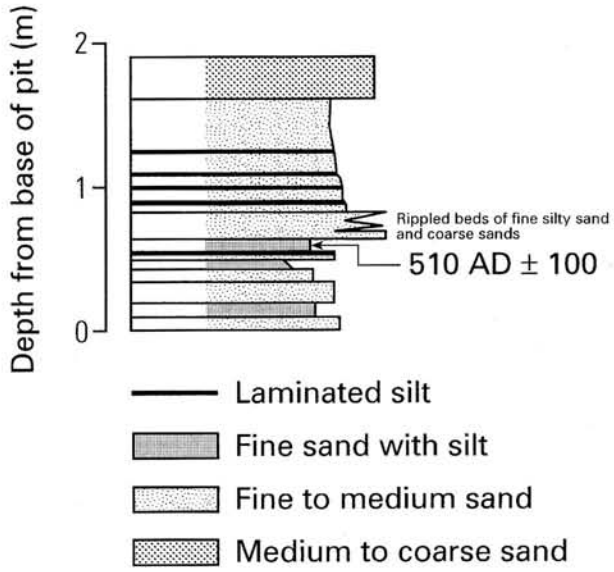

Figure 4. Simplified sediment log and OSL date from Pit 23. The upper part of the sequence is dominated by aeolian sands.

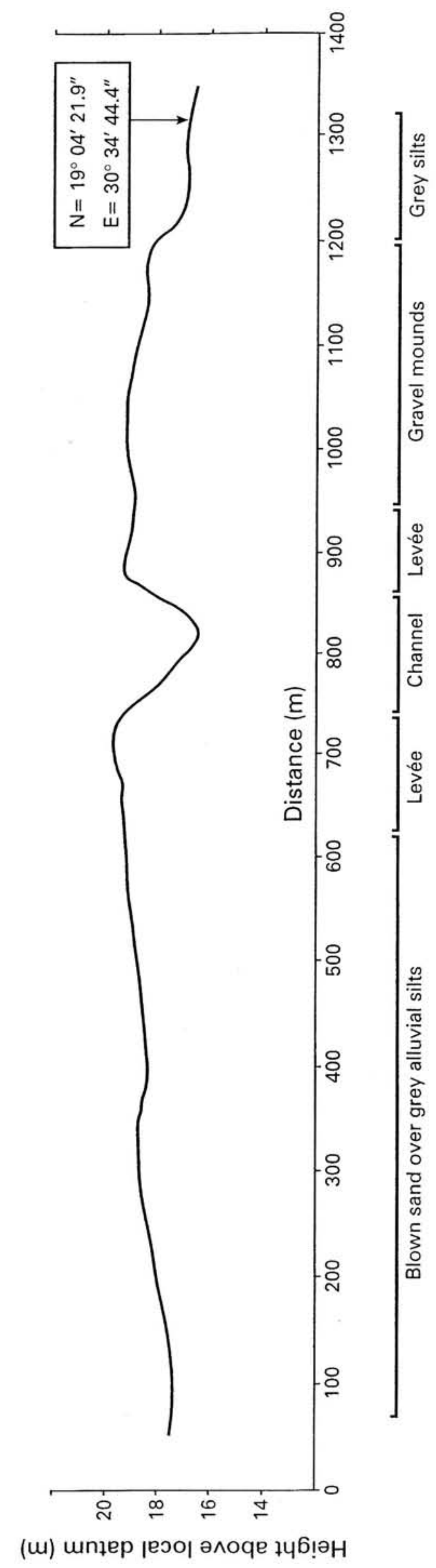

Figure 5. Transect across a palaeochannel and levee near Pit 23.

1.4km. This profile highlights the convex form of these channel belts with well developed levees bordered by low relief inter-channel flood basins (Fig. 5). It is likely that this channel was part of a larger divided channel network that conveyed water and sediment during wetter periods of the Holocene.

Alluvial Geoarchaeology and the Kerma Culture

The four chronological periods of the Kerma culture are shown in Table 2. The ten OSL dates on Nile alluvium reported here cover a time range of about 6000 years from the sixth millennium BC to the first millennium AD (Table 1). The Kerma culture spans only a small part of this period (2500 to 1500 BC) and these data demonstrate for the first time that the palaeochannel belts of the Northern Dongola Reach carried water and sediment for much of the Holocene before, during and after the major phase of Kerma Period occupation, as the OSL dates indicate that some of these channel belts were active until at least 800 BC and, perhaps episodically, up to about AD 500.

Name	*Date*
Pre-Kerma	3500-2500 BC
Early Kerma	2500-2050 BC
Middle Kerma	2050-1750 BC
Classic Kerma	1750-1580 BC
Final Kerma	1580-1500 BC

Table 2. The four chronological periods of the Kerma culture (after Bonnet 1992).

It is not yet possible to comment upon changes in flood frequency and magnitude, but the demise of the Kerma culture in this part of the Nile Valley may not have been driven solely by climate change. The pottery data from the Kerma sites may allow a more detailed chronology of cultural activity to be established and further OSL dates from the palaeochannels will help to refine the relationship between human activity and river behaviour.

Future Geomorphological Work in the Northern Dongola Reach

Many of the palaeochannels are clearly visible from the air (Colour Plate XI) and the project has recently purchased a multispectral SPOT satellite image of the Northern Dongola Reach. This will allow us to map the geomorphology of the entire survey area and establish the extent and planform of the palaeochannel belts before fresh fieldwork commences in 1999/2000. The utility of other types of remotely sensed imagery such as Synthetic Aperture Radar (SAR) will also be investigated.

Ground Penetrating Radar (GPR) will be employed during the next field season, both to map sub-surface features at the Kawa excavations and to clarify the relationships between archaeological and geomorphic /stratigraphic features within the palaeochannel belts. A further objective is to survey several long-distance east-west transects from the bedrock plateau to the modern Nile to establish the height relationships between the ancient channel belts and the modern system. These data will form an important part of any climatic or tectonic explanation for the abandonment of the palaeochannels in the Northern Dongola Reach and for the concentration of flood flows in the incised main channel in more recent times.

Acknowledgements

We are grateful to SARS for financial support and to Derek Welsby and his team for logistical support and hospitality in the field. We also thank the School of Geography at Leeds for contributing to the cost of OSL dating and SPOT satellite imagery. Mark Bateman (Sheffield Centre for International Drylands Research) carried out the OSL analyses.

Bibliography

Bonnet, C. 1992. 'Excavations at the Nubian royal town of Kerma: 1975-91', *Antiquity* 66, 611–625.

Macklin, M. G. and J. C. Woodward 1997. 'Holocene Alluvial History in the Northern Dongola Reach of the Nile: the 1996/1997 field season', *Sudan & Nubia* 1, 13–15.

Welsby, D. A. 1995. 'The Northern Dongola Reach Survey, the 1994/95 season. a: The Survey', *SARSN* 8, 2–7.

Welsby, D. A. 1997. 'The Northern Dongola Reach Survey: the 1996/7 season: Excavations at Sites O16, P1, P4 and P37', *Sudan & Nubia* 1, 2–10.

Plate X. The Northern Dongola Reach. Looking eastwards across the Kerma settlement at P5, adjacent to the Alfreda channel system, to the bedrock plateau.

Plate XI. The Northern Dongola Reach. Aerial view of the palaeochannel belts taken in February 1998.