# SUDAN & NUBIA

The Sudan Archaeological Research Society

*Bulletin No. 16* *2012*


Egypt
RED SEA
ASWAN
1st cataract
Hisn al-Bab
Afyeh
Wadi el- Allaqi
Gebel Adda
2nd cataract
Wadi Gabgaba
Amara West
Sedeinga
Sai
3rd cataract
Tombos
Sudan
ABU HAMED
Nile
El-Ga'ab
Basin
H29
5th cataract
Abu Sideir
KAREIMA
4th cataract
Napata
Wadi Abu Dom
Dangeil
ED-DEBBA
ATBARA
Wadi Howar
Gala
Abu Ahmed
Meroe
Qalaat Shanan
Atbara
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

# Preliminary report on the exploration of Jebel Sabaloka (West Bank), 2009-2012

*Lenka Suková and Ladislav Varadzin*

Jebel Sabaloka emerges like a rocky island out of the vast dusty plains of the Central Sudan *c.* 80km downstream of the confluence of the Blue and White Niles at Khartoum where it constitutes a prominent geomorphological feature in the relatively monotonous terrain. From the point of view of pre-Quaternary geology, this area is amongst the best known regions in the Sudan (Almond and Ahmed 1993, 1). Prior to 2009 however, only limited attention had been paid to the regional evidence of former human occupation (cf. Arkell 1949, 116; 1953, vii, 108; Chittick 1963; Al-Sanjak 1978; Paner 1997, 59-60; Gatto 2006-2007). In 2009, Jebel Sabaloka became the object of interdisciplinary research by the Czech Institute of Egyptology (Faculty of Arts, Charles University in Prague) and the Institute of Geology (Academy of Sciences of the Czech Republic) devoted to the study of the history of the Nile, climatic and environmental changes during the Holocene, and the interaction between man and the (changing) environment in the past.

In the first phase of the exploration of Jebel Sabaloka,[1] the Nile alluvial deposits within the Sabaloka Gorge were investigated in detail (see Lisá *et al.* 2012) and the varied landscape units on both banks of the Nile (Almond and Ahmed 1993, 6-16) were examined for the first time from the point of view of landscape archaeology. The survey of the selected sections of the *jebel* and its vicinity carried out during two field campaigns[2] brought to light *c.* 100 archaeological sites – settlements, cemeteries and isolated graves, stone features and structures, forts, quarries and occupation scatters – tentatively dated on the basis of the surface finds to the prehistoric (Palaeolithic, Mesolithic, Neolithic), Meroitic and Post-Meroitic, and Christian and Funj periods (cf. Suková *et al.* 2010; 2011a; Suková and Cílek forth.).

Since the autumn of 2011, the scientific activities of the Czech Institute of Egyptology at Jebel Sabaloka have been confined to the west bank of the Nile where the expedition has been assigned an archaeological concession for detailed exploration of prehistoric occupation in the scope of the Sabaloka Dam Archaeological Salvage Project.

This article[3] presents the results of the exploration into the prehistoric occupation of Jebel Sabaloka and its vicinity on the west bank of the Nile since 2009 and offers some comments on the evidence for occupation of the research area in post-Neolithic times.

## Research area

The Czech archaeological concession within the Sabaloka Dam Archaeological Salvage Project (SDASP) covers nearly 40km of the west bank of the Nile between Wadi el-Abyad (upstream of Sabaloka) and the village of el-Huqna near the Sixth Cataract. In addition to the whole western part of Jebel Sabaloka, it includes a zone *c.* 10km in breadth extending from the riverbank towards the west and north-west.

During the two field campaigns carried out within the SDASP up to now,[4] the efforts of the Czech interdisciplinary team[5] were devoted to a more thorough exploration of the interior and outskirts of Jebel Sabaloka where a number of prehistoric occupation sites had been recorded during previous fieldwork by our team[6] and by the NCAM survey unit.[7] The area selected for detailed exploration features a number of diverse landscape types, each one of which constitutes a specific ecological zone and is likely to have supported a dif-

[1] The first phase of the Sabaloka Project was made possible thanks to financial support from the Grant Agency of Charles University in Prague (research project No. 15009) and the Academy of Sciences of the Czech Republic (research projects No. M100130902 and AV0 Z 30130516).

[2] The field campaigns lasted from 26th October until 6th November 2009 and from 17th February until 26th February 2011. In both seasons, the team consisted of Václav Cílek (geologist), Lenka Lisá (sedimentologist), Pavel Lisý (technician), Mahmud Almahi (cook), Murtada Bushara (NCAM inspector) and Lenka Suková (research director, egyptologist).

[3] This study was supported by the Charles University Scientific Development Programme No. 14: Archaeology of non-European areas, Sub-project: Ancient Egyptian civilization research: cultural and political adaptations of the North African civilizations in Antiquity (5,000 BCE - 1,000 AD).

[4] The field campaigns lasted from 27th October until 27th November 2011 and from 1st March until 3rd April 2012.

[5] The team consisted of Aleš Bajer (geologist, sedimentologist), Miroslav Bárta (egyptologist), Václav Cílek (geologist), Jamal Ibrahim (driver, cook), Mahmud Almahi (cook), Murtada Bushara (NCAM inspector), Jan Novák (palaeoecologist, specialist in anthracology), Martin Odler (egyptologist), Jan Pacina (surveyor), Adéla Pokorná (archaeobotanist), Petr Pokorný (palaeoecologist, biologist), Jaroslav Řídký (prehistorian), Seif Eldawla Ahmed (NCAM inspector), Lenka Suková (research director, egyptologist), Zdeňka Sůvová (archaeozoologist), Ladislav Varadzin (archaeologist, field director) and Anna Wodzinska (pottery specialist). In addition, four trainees took part in the fieldwork: Hamad Muhammad Hamdin and Muhammad Al Badri Suleyman (Department of Archaeology, University of Khartoum) and Abir Yahya Adam and Selma Muhammad Omar (Sudan National Museum).

[6] These include the occupation scatters designated as AD 11/01, AD 11/02, AD 11/05A, AD 11/06, AD 11/08, AD 11/10, AD 11/11, AD 11/15, AD 11/17, AD 11/18, AD 11/19, and an exceptionally rich Mesolithic and Neolithic settlement site marked as AD 11/13, AD 11/22, and AD 11/23 in the system of numbering adopted by the Czech team in the spring of 2011 (cf. Suková *et al.* 2011a, 33-41).

[7] The prehistoric sites recorded by NCAM in April 2011 are: SBK.W-7, SBK.W-8, SBK.W-9, SBK-W.10, SBK.W-16/B (= Czech expedition's field number AD 11/23), SBK.W-17, SBK.W-20/A (= AD 11/22), SBK.W-20/B (= AD 11/13A), SBK.W-21 (= AD 11/13C), SBK.W-22, SBK-W.23, and SBK.W-24 (= AD 11/11, AD 11/12). Cf. Table 1: Recorded Archaeological Sites in the Western (Left) Bank – Sabaloka Dam Region – in NCAM's Final Report on its archaeological reconnaissance of the Sabaloka Dam Region (Khartoum 2011).

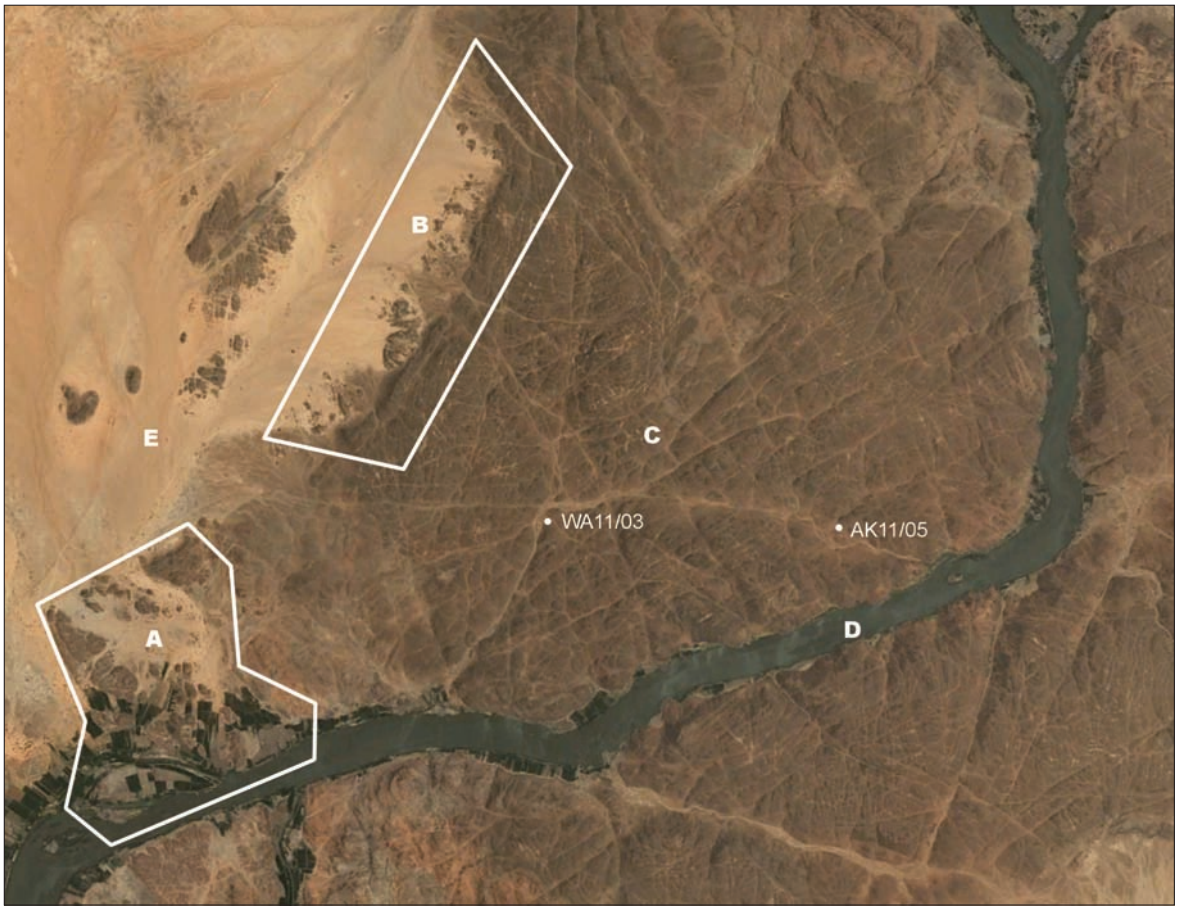


*Plate 1. Jebel Sabaloka on the west bank of the Nile – area of the Czech exploration of the Mesolithic and Neolithic occupation: A – Lake Basin area, B – Rocky Cities area, C – Interior of the massif, D – Riverine landscape within the Sabaloka Gorge, E – Desert areas to the west of the concession (Source: Google Earth 2012).*

ferent type of occupation allowing for varying exploitation in prehistoric times (Plate 1).

The first of these landscape types is the "Lake Basin" area which adjoins the massif of Jebel Sabaloka from the south west and extends over *c.* 2.2 x 1.5km (Plate 2). This micro-environment is closely connected to the Nile the waters of which used to submerge the lower reaches of this area during the annual floods in prehistoric times. This landscape type is formed of more than 20 mostly granite rock outcrops in the intrusion of the ring-dyke suite (Almond and Ahmed 1993, 15-17). The rocky knolls, which vary in their size and in the number of natural terraces and platforms suitable for occupation, are arranged around a depression on the bottom of which remains of a seasonal lake, fed in prehistoric times by the flood waters of the Nile, have been identified by our team (Plate 3).

The second landscape type is located in an embayment in the north-western slope of Jebel Sabaloka and covers approximately 3 x 1.3km (Plate 4). It is dominated by granite outcrops that have been modelled by the action of wind into picturesque forms. These give to the observer on the ground a strong impression of ancient cities turned into stone, hence the name of this area the "Rocky Cities". This landscape type

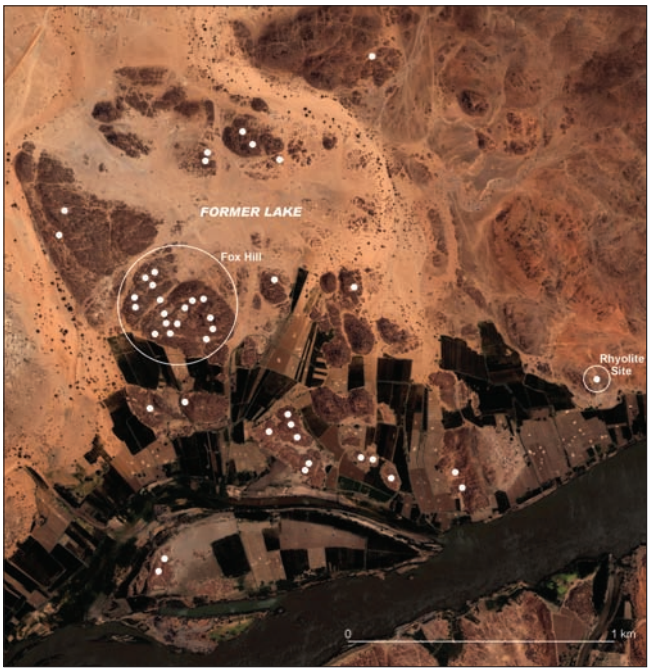


*Plate 2. Lake Basin area with two main settlements and significant secondary occupation sites (only sites with pottery finds are shown) (Source: Google Earth 2012).*

*Plate 3. View of the extinct prehistoric lake taken from Fox Hill (photo L. Varadzin).*

is not and even in the past never was directly dependent on the Nile, which is located at a distance of 4km. At present, this area is an uninhabited arid landscape with only a sparse cover of desert vegetation. The areal occurrence of a subsurface layer of black soils suggests, however, that during the climatically more favourable periods of prehistory the Rocky Cities constituted a specific ecological zone, distinct from the aforementioned Lake Basin area, and offered definite subsistence potential.

The interior of Jebel Sabaloka constitutes another landscape type within the research area. The dark, distinctly polygonal *jebel* rises above the surrounding terrain by *c.* 50 to 100m. The mass of the *jebel* formed of tough and resistant volcanic rocks is sliced into two unequal parts by the Nile which passes through the mountain in a straight-lined zigzag gorge (Almond and Ahmed 1993, 8). The smaller part of the *jebel* on the west bank of the Nile, where it covers an area of *c.* 8.5 x 6.8km, is further dissected by several larger *wadis* and smaller, steep-sided *khors* into a system of plateaus at altitudes between 450m and 550m. The broader *wadis* are further divided by smaller streams into numerous flat or gently inclined gravel terraces. Numerous paths intersect in the *wadis* that cut across the *jebel* and secure connection between the outer periphery of the mountain and the Nile. The limited subsistence potential of the interior of the mountain could be compensated for by the occurrence of outcrops of rhyolites and basalt. It is especially thanks to these raw materials suitable for the manufacture of lithics and stone implements that Jebel Sabaloka first entered the archaeological literature (cf. Arkell 1949, 108; 1953, 25, 31).


*Plate 4. Rocky Cities area with the main settlement and significant secondary occupation sites (only sites with pottery finds are shown) (Source: Google Earth 2012).*

The fourth landscape type – the riverine landscape within the Sabaloka Gorge – is only a little more than 500m wide. The alluvial plain within the gorge is continuous on neither side of the river. It occurs only in small patches of green where the bare and inhospitable rocky slopes of the *jebel* recede from the banks. Larger tracts of floodplain are located at present only at the mouth of the broader *wadis*. They are used for limited cultivation and grazing of animals and are the locations of small hamlets, animal pens, and temporary shelters of palm fronds and wood. Neither of the banks in the Sabaloka Gorge is passable along its full length and it is the river which constitutes the main artery of communication through the interior of the mountain (see Plate 20). Due to the periodic flooding of these areas during the climatically more favourable early Holocene, one can presuppose that the riverine landscape constituted only a peripheral area for Mesolithic and Neolithic occupation; this has been confirmed by our reconnaissance and survey work.

The aforementioned four landscape types are complemented by the desert areas extending from Jebel Sabaloka's margins towards the west. In the Mesolithic and Neolithic periods, the present-day hyper-arid dusty plains were savannahs drained by numerous *wadis* and overgrown by vegetation which allowed for the grazing of wild animals and herds of domesticated animals.

## Fieldwork

The research area was fieldwalked for the first time as part of the on-foot survey of the varied landscape types on both banks of the Nile, as defined by Almond and Ahmed (1993, 6-16), during the first phase of exploration of Jebel Sabaloka (Suková *et al.* 2010; 2011a). In the course of the survey, locations of all archaeological sites and evidence of former human occupation were recorded using a hand-held GPS. Surface features, artefacts, and landscape contexts were described and photographed and in some cases, sketches and plans were drawn. No trial excavations were undertaken at this stage of research. Where needed, samples of pottery and other archaeological material (both artefacts and ecofacts) were collected from the surface. Lithics were not studied systematically and only several pieces were collected together with samples of rocks from the local outcrops for the purposes of comparison. In the course of the fieldwork, local names of hamlets, *wadis*, *khors*, hills, and various topographical features not marked on maps were inquired about and

documented, together with the stories and legends attached to some of them.[8]

Based on the findings of this general archaeological reconnaissance, the fieldwork has been concentrated since the autumn of 2011 on a more thorough exploration of the prehistoric evidence in the Lake Basin and the Rocky Cities areas (Suková *et al.* 2011b; 2012). The two areas were surveyed in a systematic manner and several occupation sites were selected for an analytical surface artefact survey. This form of survey, which consists of the recording of surface finds according to strictly set rules in defined polygons or along defined lines and of the subsequent statistical and functional evaluation of the finds (Kuna 2004, 330-332), was adjusted to the specific conditions of the research area. This method constitutes a powerful tool for uncovering the intra- and inter-site differentiation which enables one to discern the functions of individual sites. However, for the application of this method to be successful, a good understanding of post-depositional processes and verification of the surface data by sondage work is required. For this reason, the surface survey was accompanied by the excavation of smaller test pits and larger soundings at two primary settlements designated Fox Hill and Sphinx (altogether 150m$^2$ at Fox Hill and 23m$^2$ at Sphinx; for the locations of the test pits and larger soundings, see Figures 1 and 2) and by the excavation of seven test pits (1 x 1m) at six selected occupation sites.[9] The excavation was performed according to arbitrary layers or, where possible, by stratigraphical units. The fills of the soundings were dry-sieved using a 4mm or finer mesh and finds were sorted for study. Where desirable, field flotation (mainly to obtain macrofossil remains) was undertaken.

As we are convinced that the future of prehistoric research lies in the large-scale engagement of natural sciences in the solving of archaeological problems, a major emphasis has been put in our research project from the beginning on exhaustive co-operation with diverse natural-scientific disciplines. The geological and petrological research focused on determination of raw materials used for the manufacture of lithics and stone implements, on the evaluation of their technological and functional properties from the point of view of petrological and structural composition, and on the first identification of rock outcrops in the Sabaloka region exploited in the prehistoric times as the sources of raw materials for the manufacture of stone tools. The sedimentological and

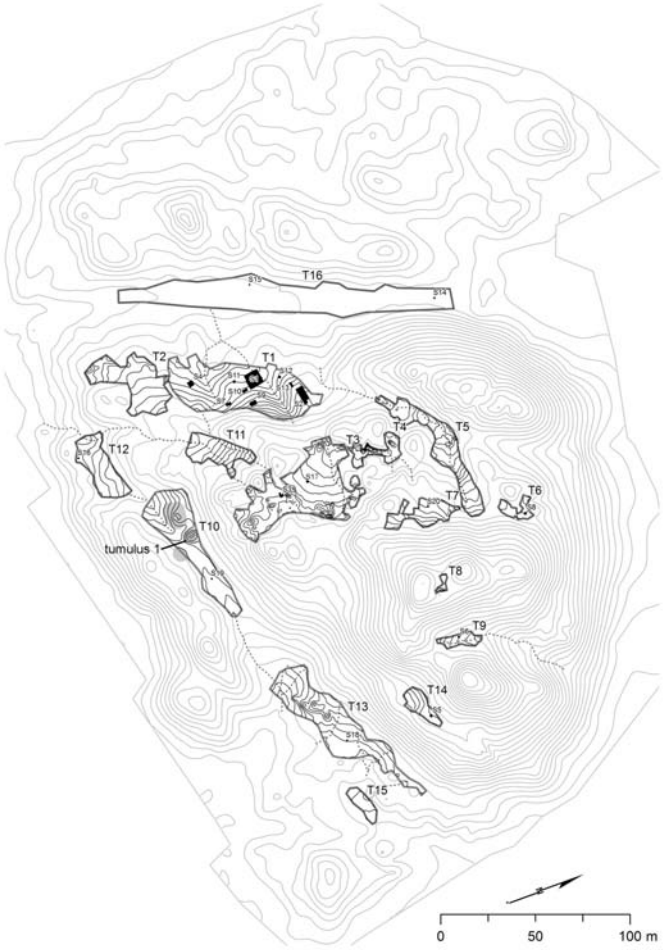


*Figure 1. Contour plan of Fox Hill with the system of occupation platforms and terraces (T1-T16) and the locations of soundings (S1-S20) (scale 1:4000) (J. Pacina* et al.*).*

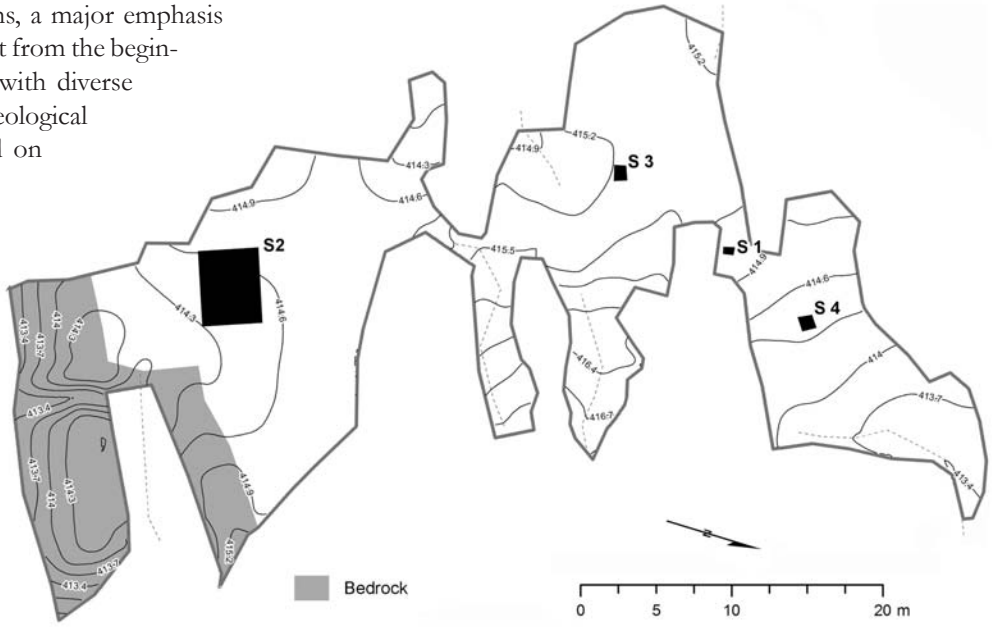


*Figure 2. Contour plan of Sphinx with the locations of soundings (S1-S4) (scale 1:500) (J. Pacina* et al.*).*

[8] In 2009, the most important informant was Zaki Mustafa from the village of Miseiktab.

[9] These were: SBK.W-24/25, SBK.W-55, SBK.W-56 (2 pits), SBK.W-57, SBK.W-58 (the Rhyolite Site) and SBK.W-59 (the Crystal Site).

micro-morphological research concentrated on the issues of stratigraphy and genesis of deposits of both anthropogenic and non-anthropogenic origin. Primary attention was devoted to the detection of the maximum level of the Nile floods in the Lake Basin area in prehistoric times and to the study of deposits of the former prehistoric lake. This was pursued by sondage work at selected sites and by the excavation of two continuous sections through sediments, one (depth 8m) at the boundary between the Lake Basin area and the Nile and the other (depth 2m) at the bottom of the extinct lake. In addition, remains of fossil soils were mapped and sampled.

The environmental-archaeological research concentrated on the collection of data in the form of sub-fossil biological remains and traces of action of organisms found in the course of the archaeological and sedimentological exploration. At the same time, samples were taken for the purposes of building up reference collections of present-day vegetation (herbarium supplemented by seeds, wood and whole plants for phytolith analysis) and animals (especially fish). These are indispensable for the identification of finds obtained through excavation as they cannot be compared with any published herbaria and atlases.

## Prehistoric occupation: results of exploration

The marked concentration of prehistoric evidence – omnipresent lithics on a wide spectrum of raw materials accompanied in many cases by pottery sherds and other stone implements – recorded in the Lake Basin area and the Rocky Cities area indicate that these two micro-environments constitute prehistoric landscapes *par excellence*.[10]

The relatively small Lake Basin area is significant for the high density and variability of prehistoric evidence, which is found mostly at higher elevations on the platforms and terraces of many of the rocky outcrops surrounding the extinct lake and on the slope of the mountain (see Plate 2). The sites, dated on the basis of the pottery finds to the Mesolithic, are distributed more or less evenly across the whole area, while the sites attributable to the Neolithic are less numerous and are located mostly at a shorter distance from the Nile. Two sites – Fox Hill and Rhyolite Site – stand out in the identified settlement structure as the main settlements of this area on account of the larger extent of the occupation debris, density of surface finds and thickness of archaeological deposits (see below). The occupation sites at higher elevations are supplemented in the Lake Basin area by artefact (mostly lithics) scatters of extraordinary interest which line the shore of the prehistoric lake over a length of several hundred metres. The shore represents a type of occupation zone that has been so far little explored in Central Sudan. It is justifiable to suppose that the annual flooding of the Nile and the periodic renewal of the lake in the centre of the Lake Basin area constituted one of the determining factors for the occupation of this area in prehistoric times. In this respect, the establishment of the level of the maximum height of the annual Nile floods during prehistoric times, which was achieved by our sedimentological investigation, constitutes one of the main keys for decoding the system of prehistoric land use of this area.

The survey of the Rocky Cities area, on the other hand, brought to light occupation sites dated on the basis of the pottery only to the Mesolithic period (see Plate 4). The total number of sites located in this area is considerably lower in comparison with the Lake Basin area. This could be explained by the confinement of occupation to a shorter period of time (only the Dotted Wavy Line horizon at most sites) and by the distinct ecological potential of this zone. Notwithstanding this, of major interest is the fact that just as in the Lake Basin area one site – Sphinx – can be deemed to represent the main (core) settlement on the basis of the marked density and variability of surface finds, thickness of archaeological deposits and presence of a cemetery (see below).

### *Fox Hill* [11]

The site is located on an approximately oval-shaped granite outcrop situated about 1.2km from the Nile. It is structured on 16 terraces and platforms, the total surface area of which is 11,650m$^2$ (Figure 1). The terraces and platforms are well delimited by the exposed bedrock and boulders and vary in size, elevation and ease of access. For the archaeology of Central Sudan, where prehistoric sites are commonly found on mounds or on ancient terraces of the Nile (cf. e.g. Caneva *et al.* 1993; Sadig 2009), Fox Hill with its complex geomorphological structuring offers an excellent opportunity to explore the internal disposition and differentiation of functions, types, and intensity of activities at a prehistoric settlement.[12]

The surface finds of pottery attest to a limited occupation of Fox Hill as early as the Incised Wavy Line horizon and to an intensive occupation and activities within the Dotted Wavy Line horizon and the Neolithic and Late Neolithic periods. The analytical surface artefact survey brought to light evidence of occupation during the Mesolithic on all of the terraces and platforms, which, however, differed both in extent and intensity. During the Neolithic, the occupation was confined to only some of the platforms and terraces situated at lower elevations, but still the debris is abundant

[10] Insignificant scatters of lithics on white quartz, petrified wood, sandstone, rhyolite, and other raw materials, but no prehistoric pottery, were noted also on some of the platforms and terraces located in the bottoms of the *wadis* in the interior of the mountain. As compared with the evidence from the outskirts of Jebel Sabaloka, they may represent the remains of more ephemeral use of the *wadis* during the prehistoric times, e.g. for routes through the mountain or as the locations of specific (extractive) activities.

[11] This designation coined by the Czech expedition embraces the following locations of prehistoric occupation debris recorded in the course of previous surveys (Suková *et al.* 2011a, 33-41): AD 11/13A (now Terrace 1), AD 11/13B (now Terrace 3), AD 11/13C (now Terrace 10), AD 11/22, and AD 11/23.

[12] A similar opportunity, albeit to a lesser extent, is afforded by most of the occupation sites located on the granite outcrops in the Lake Basin area.

and extensive (Plate 5). During both periods, the occupation concentrated on Terraces 1 and 3.

On Terrace 1, sondage work consisting of two soundings (Sondages 1 and 2) of 64m² and 35m² respectively, and seven minor soundings measuring from 2.25m² to 9m² (see

*Plate 5. Fox Hill, Terrace 10. Neolithic pottery (photo L. Varadzin).*

Figure 1 for the location of the soundings) confirmed the hypothesis of occurrence of midden-deposit in the northern part of the terrace put forward on the basis of the surface survey. Furthermore, the sondages showed that the terrain of this terrace had been markedly more uneven during the prehistoric period than it appears at present. This can be demonstrated by comparison of the sections revealed in Sondages 1 and 2: whereas in Sondage 2 the natural substratum begins to appear below deposits merely 400mm in thickness, in Sondage 1, located only 30m further to the south, the bedrock is found in the depth of *c.* 1.5m. The visible differences in the character of the layers point to a differing genesis of the deposits in both soundings; nevertheless, this can be clarified in full only after evaluation of the ongoing micro-morphological analyses. In Sondage 1 (Figure 3), the exploration brought to light a group of strata 3-6 which according to the preliminary results of the micro-morphological analyses (Lenka Lisá 2012, written comm.) constitutes a locally formed layer of ash. This group of strata sealed the previous stratigraphical development represented by Layer 7 (Plate 6), which is of importance for the dating of the finds on the basis of stratigraphical sequence.

Two smaller soundings (Sondage 3 and 17) of 3.5m² and 1m² respectively were opened also on Terrace 3 where

*Plate 6. Fox Hill, Terrace 1 (main settlement platform), Sondage 1. View of Layer 7 representing the earliest intact settlement horizon (highlighted with water; the southern part of the sounding features the remains of a 1x1m test pit excavated in 2011) (photo L. Varadzin).*

surface finds attested to relatively intensive occupation during the Mesolithic and Neolithic. The sondages failed to reveal discernable original layers datable to the Mesolithic and/or Neolithic periods, but they brought to light the existence of a burial ground in the southern part of the terrace. Of the three skeletons uncovered in Sondage 3, one was in a tightly

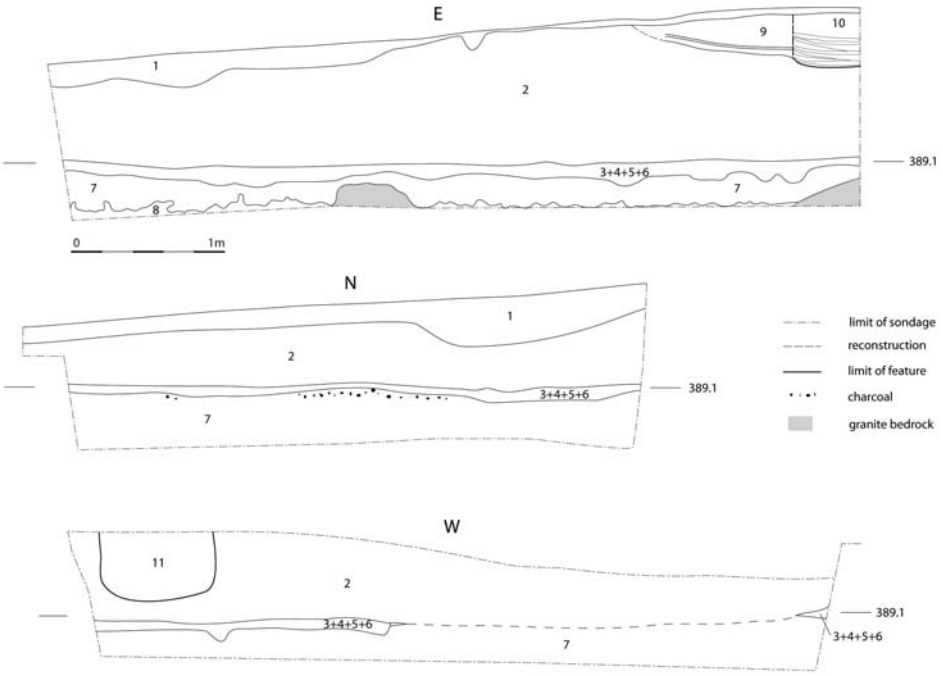


*Figure 3. Fox Hill, Sondage 1, sections. 1 – surface layer rich in artefacts; 2 – dark-grey soil with calcareous concretions; 3-6 – carbonised layer overlaid with grey ashy layer; 7 – hard grey-brown soil; 8 – very hard calcareous layer (scale 1:50) (drawing L. Vařeková).*

*Plate 7. Fox Hill, Terrace 3. Burial 2 (photo L. Varadzin).*

contracted position (Plate 7) and none was accompanied by grave goods. For this reason, the burials can be attributed only generally to the Mesolithic-Neolithic period. Nevertheless, burial activities at Fox Hill had not been confined to Terrace 3. One burial containing an individual in a contracted position with no grave goods was found in Sondage 5 on Terrace 14 the surface survey of which, however, yielded only small amount of occupation debris. Moreover, a mandible found in a secondary position on Terrace 1 (Sondage 9) implies that burial activities may have taken place in this part of the site as well. For the time being, the exact motivations underlying the selection of particular parts of Fox Hill for burial activities remain obscure.

In addition to omnipresent pottery sherds and lithics, represented *inter alia* by large numbers of gouges and stone axes, the surface survey and exploration of stratigraphical deposits on the main platforms and terraces yielded considerable amounts of stone implements (in particular stone rings, grinding stones, grinders, pounders, palettes, and rubbers), bone implements (numerous fragments of unilateral harpoons and some awls and points), potter's tools (serrated shells, fish-bone combs, stone polishers), several pieces of daub, two fragments of clay figurine(s), only a few items of personal decoration (beads, pendants) and insignificant quantities of pigment. Ecofacts were represented by seeds and remains of vegetative parts of plants (wood/charcoal, impressions of roots and leaves) on the one hand and by high numbers of bones of large mammals (including elephant, hippopotamus, cattle and ovicaprids), large quantities of bones of *Synodontis* sp. and other species of fish, and shells of land and water snails and bivalves.

### *Rhyolite Site (SBK.W-58)*

The second most important occupation site in the Lake Basin area is situated at massive outcrops of high-quality red rhyolite on an elevated corner spur on the boundary between the Lake Basin area and the Nile Valley (see Plate 3). The occupation debris covers an area of 160 x 80m. The surface survey brought to light large quantities of lithics and pottery of predominantly Neolithic and Late Neolithic date, only a negligible amount of grinding stones and grinders, and several other finds (a potter's tool?, a stone plaque). The minor sondage work (one test pit 1 x 1m) revealed the presence of archaeological deposits at least 400mm in depth containing sherds of pottery of Neolithic date, small amounts of lithics, fragmentary animal bones and no molluscs. On the basis of these finds, the occupation of the Rhyolite Site is tentatively dated to the Early and Late Neolithic periods. The underrepresentation of grinding equipment and apparent absence of molluscs noted during the exploration might point to a different subsistence strategy of the Neolithic occupants of this site. Nevertheless, more intensive exploration is required for verification of this hypothesis as well as for better understanding of the character of occupation on this site.

### *Sphinx (SBK.W-60)*

The most significant settlement in the Rocky Cities area is located on a granite outcrop that lacks the complex geomorphological structuring, observed at Fox Hill. The outcrop features only one platform of 940m$^2$ situated *c.* 15m above the surrounding terrain and divided into three parts (Figure 2). The analytical surface artefact survey revealed a similar high density of occupation debris as recorded on Terrace 1 at Fox Hill; as opposed to the latter site, however, the surface finds at Sphinx attest to occupation of this site only during the Mesolithic. Three test pits (1 x 1m) excavated in the central and northern part of the site brought to light at least three intact horizontal stratigraphical units, which reached as deep as 1.2m and contained only settlement debris. In the fourth, more extensive sounding (Sondage 2, 20m$^2$) excavated in the southern part of the site (Plate 8), comparable horizontal stratigraphy was lacking due to destruction by intensive burial activities.

Altogether 24 skeletons of individuals of both sexes and varied age groups (including one infant)[13] were uncovered in Sondage 2 in the depth of 0.5-1.2m. The deceased were placed in (tightly) contracted, flexed, or extended positions (one case). Specific attention appears to have been paid neither to the side on which the bodies were arranged, nor to the orientation of the burials (nevertheless, the general west-east/east-west orientation prevailed). In several cases, the deceased were encircled by medium-sized stones that had been put in place after deposition of the bodies. The superimposition of up to three burials was recorded in three cases and the cutting of peripheral parts of earlier burials was not uncommon (Plates 9 and 10). These remarkable features suggest that attempts had been made at concentrating the burials over a considerable period of time in the southern part of the site. Five deceased were found to have been pro-

[13] More details of the biological characteristics of the deceased will be available after completion of the ongoing anthropological examination (Department of Anthropology, National Museum in Prague).

*Plate 8. Sphinx. View of the southernmost part of the occupation platform with Sondage 2. The flat horizontal surface of the exposed granite outcrop on the edge of the elevated platform features numerous cup-marks (photo L. Varadzin).*

vided with modest grave goods in the form of small pieces of lithics (lunates) of quartz, a hammerstone and bivalve shells (*Unio elongatus*), known to be associated with Mesolithic burials explored at other sites in the Sudan (cf. Arkell 1949,

*Plate 9. Sphinx, Sondage 2. Burials 21-23 (photo L. Varadzin).*

*Plate 10. Sphinx, Sondage 2. Burials 5, 7-9, 12, 14 (photo L. Varadzin).*

31-33; Caneva 1983, 21-24; Haaland 1995, 161; Honegger 2004, 27-28). The shell found as the funerary equipment in one of the stratigraphically earliest burials (B5) yielded the first $^{14}$C date for this site: 8220 ± 40 BP (7335-7078 cal. BC). Since only Incised or Dotted Wavy Line pottery was found in the fill of the grave pits (Plate 11) and the analytical surface artefact survey brought to light no evidence of reoccupation

*Plate 11. Sphinx, Sondage 2. Pottery from the fill of the graves (photo A. Wodzińska).*

of Sphinx during the Neolithic, the intensive burial activities concentrated in the southern part of the platform fall exclusively into the Mesolithic period.

In addition to abundant finds of pottery and lithics, the surface survey and the sondage work brought to light the following categories of finds. Stone implements included numerous grinding stones, grinders, rubbers, pounders and whetstones, but only one fragment of a stone ring, which is remarkable in comparison with Fox Hill where this type of find is represented in large numbers. Bone implements

comprised awls and points and fragments of artefacts decorated with incised geometric designs, some of which have no published parallels in the Sudan (Plate 12). Noteworthy is the absence of bone harpoons at Sphinx, which are well

*Plate 12. Sphinx, Sondage 2. Bone implements decorated with incised geometric designs found in the fill of the graves (photo M. Frouz).*

represented at Fox Hill. Items of personal decoration comprised large quantities of finished beads, or beads in different stages of manufacture, made of ostrich egg-shell, shell, and bone, and several pieces of oval- or drop-shaped pendants made of shell or egg-shell. Other finds included pieces of mica, one of which had been shaped into a rectangular plate (*c.* 20 x 60mm) and could have been used as a small mirror, large amounts of pigments (ochre in varied colour values and hematite), and several pieces of daub. As far as ecofacts are concerned, these consisted of large quantities of shells of snails. Bones of fish and mammals, on the other hand, were represented only in insignificant amounts.

## Preliminary overview of the Mesolithic and Neolithic occupation

The sherds of Incised Wavy Line pottery found at Sphinx, Fox Hill and at several other sites in the Lake Basin area provide evidence of a human presence on the outskirts of Jebel Sabaloka already during the Early Mesolithic period. The most significant remains of occupation of the Lake Basin area and the Rocky Cities area, however, fall within the Late Mesolithic (Dotted Wavy Line horizon). During this period, there was always only one main (core) settlement in each of the two ecological zones – at Fox Hill and at Sphinx. These are recognised by the quantity and wide spectrum of artefacts and ecofacts, thickness of archaeological deposits and by the presence of cemeteries (attributable to the Late Mesolithic at least in the case of Sphinx). However, the variation in the spectrum of ecofacts and toolkits so far noted at the two core settlements indicates differences in subsistence of their occupants.

At Fox Hill, large quantities of bones of diverse species of fish, large mammals (including elephant and hippopotamus), shells of land and water snails and bivalves, and numerous bone harpoons and other fishing equipment (such as pottery net-sinkers) attests to a considerable dependence of the Mesolithic inhabitants of this area on fishing, hunting of wild animals and gathering of molluscs. This was not only determined by the proximity of the Nile, but also facilitated by the existence of a seasonal lake in the Lake Basin area which, as an easily accessible source of water for wild animals and easily exploitable source of seasonal foods in the form of fish, water snails and bivalves, increased and diversified the subsistence potential of this area. At the core settlement at Sphinx, on the other hand, shells of land and water snails (in particular *Pila* sp.) are present in large quantities, while bones of wild animals and fish are clearly under-represented. For this reason it can be presumed that the subsistence of the inhabitants of Sphinx consisted predominantly of vegetal food, which was supplemented with an indeterminable number of molluscs. This assumption is not contradicted by the hitherto attested absence of harpoons and net-sinkers as well as by the large quantities of lower grindstones, grinders and rubbers documented at this settlement. Recent analyses have shown that the latter group of artefacts had been used during the Mesolithic for a variety of purposes, including the processing of vegetal foods (cf. Fernández *et al.* 1997, 25). In this connection it is also interesting to note that at Sphinx the exposed bedrock features much higher numbers of cup-marks as compared with Fox Hill (see Plate 8). The presence of the two main Mesolithic settlement sites in two distinct ecological zones, whose inhabitants subsisted on different sources of food available in the hinterland of their respective settlements, permits one to postulate the existence of two adjoining hunting-gathering territories, appertaining either to two separate groups or exploited seasonally by one and the same community.

In both areas, the prime settlement sites are surrounded by other occupation sites from the Late Mesolithic which are of smaller size and are characterised by a lower density and spectrum of surface finds. These minor sites differ in their characteristics not only from the two core settlements, but also from one another. At this stage of research, some of them can be tentatively viewed as temporary settlements located in the vicinity of specific types of target subsistence resources and others as special-task sites, where the first processing of raw materials, manufacture of stone tools, or working of wood may have taken place. In the case of the Crystal Site (SBK.W-59), a small Mesolithic settlement located at a minor outcrop of jasper-quartz dyke near the passage through the mountains between the Rocky Cities and the Lake Basin area (Plates 13 and 14), one may even suggest that it functioned as a watch post in an elevated position with clear views in all directions.

In Neolithic times, the structure of occupation of the outskirts of Jebel Sabaloka appears to have undergone considerable changes. The Rocky Cities area was entirely abandoned, while in the Lake Basin the settlement was reduced to a few sites located closer to the Nile. One of these was Fox Hill where numerous finds of Neolithic and Late Neolithic date attest to intensive re-occupation of this earlier Mesolithic core settlement. Into the same period also falls the flourishing of another large settlement in the Lake Basin area – the

*Plate 13. View of the Crystal Site (Late Mesolithic) taken from Sphinx (photo L. Varadzin).*

Rhyolite Site – which represents the only site in the western part of Jebel Sabaloka established at the massive outcrops of high-quality red rhyolite. The first study and analyses of the lithics at the settlements explored in the research area suggest comparatively extensive exploitation of red rhyolites (as well as other high-quality raw materials, such as basalt and silicified sandstone), deriving from the outcrops localised within Jebel Sabaloka, already in the Late Mesolithic period.[14] During the Neolithic period, however, the demand especially for the red rhyolite from Sabaloka, utilised first of all for the production

*Plate 14. Crystal Site. Surface finds of pottery (photo L. Varadzin).*

of the characteristic axes and gouges, must have reached a more significant scale. It is in the exploitation and perhaps in the control of distribution of the red rhyolite that we see the main function of the Rhyolite Site.

The high density and discernable hierarchy of settlement and occupation sites revealed in the two distinct ecological zones represented by the Lake Basin area and the Rocky Cities area, in which one or two sites can be regarded as main (core) settlements, appear to have no published parallel in Central Sudan. As such, it constitutes instructive evidence for macro-spatial behaviour of prehistoric populations. Nevertheless, as the settlement pattern brought to light in these two micro-environments no doubt represents the sum of several successive settlement networks superimposed one over the other in the course of at least several centuries, if not millennia, further research is necessary to determine the function of the individual sites more accurately and to establish their more precise dating in order to fully understand and interpret this evidence.

## Some notes on the post-Neolithic occupation

As the detailed overview of occupation of the whole region of Sabaloka during the post-Neolithic (Meroitic, Post-Meroitic, Christian and Funj) period is presented elsewhere (see Suková and Cílek forth.), only a brief summary of the evidence explored in the varied landscape types surveyed on the west bank of the Nile is offered here.

The sondage work on Terrace 1 at Fox Hill revealed a dense concentration of dozens of features of a more or less uniform character. All of the features were of a circular ground-plan with the maximum diameter varying from 0.3 to 1.1m and had a bowl-shaped bottom. Many of the features were bell-shaped in cross-section (Figure 4), on the basis of which we consider them to represent storage pits.[15] Unfortunately, dry-sieving of the fills and field flotation of

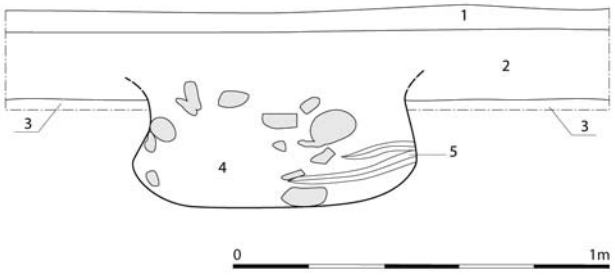


*Figure 4. Fox Hill, Sondage 1, section through Feature 7 (scale 1:20) (drawing L. Vařeková).*

the lowermost layers of the features yielded no evidence of the stored products. The tentative dating of the features to the Meroitic or later periods is suggested on the basis of the occurrence of intrusive sherds of Meroitic pottery in the fill of some of the features. One feature of this type was uncovered also in the test pit excavated at the Rhyolite Site (SBK.W-58) (Plate 15).[16]

The re-occupation of the Lake Basin area during the post-Neolithic period is further evidenced by large numbers of tumuli and other grave monuments of Meroitic, Post-Meroitic and possibly also later date. Isolated or clustered tumuli with a wide spectrum of superstructures are distributed in the

[14] The presence of these raw materials at Mesolithic settlements located as far as 200km from Sabaloka (cf. Clark 1989) further suggests some kind of distribution taking place already during Mesolithic times.

[15] It is noteworthy that these pits share a number of morphological features with the storage pits excavated on Sai Island; the latter are, however, dated by the excavator to a considerably earlier period (cf. Geus 2004).

[16] These features will be evaluated in more detail in a separate article.

*Plate 15. Rhyolite Site, Sondage 1. Storage pit (photo L. Varadzin).*

low-level rocky desert of the Basement Complex, on the relics of former river terraces, at the bottom of the depression occupied in prehistoric times by the seasonal lake, and in the rocky landscape of the ring-dyke intrusion intensively occupied during the prehistoric period (cf. Suková *et al.* 2011a, 33-41). One of the rare examples of tumuli erected on the site of former (prehistoric) occupation was excavated on Terrace 10 at Fox Hill (Tumulus 1, see Figure 1). The roughly circular mound (9m in diameter) of sediments encased on the top and along the outer perimeter with loose blocks (*c.* 300-400mm) of local red granite was found to be covering an internal hemispherical core (cairn) erected from blocks of the same type up to the height of 1.4m (Plate 16). Below the central stone cairn, an intact burial of an archer was found in a north-south oriented burial niche accessed from the east through a descending short ramp. The deceased, interred in a contracted position, with the head to the south and facing east, was equipped for the afterlife with a "beer-jar", six iron arrowheads, an iron spearhead, a stone archer's loose, a necklace of beads in faience and stone, and a leather quiver with relief surface decoration preserved only in fragments (Plate 17). A large quantity of botanical remains was obtained through dry-sieving and field flotation which might suggest

*Plate 16. Fox Hill, Terrace 10. Tumulus 1 after removal of the mound made of sediment (photo L. Varadzin).*


*Plate 17. Fox Hill, Tumulus 1. Burial of an archer (photo L. Varadzin).*

the presence of plant offerings or matting made of grass. The burial is dated to the late Meroitic – early Post-Meroitic period.[17]

Two extensive cemeteries of presumably Meroitic or Post-Meroitic date occupy the gently inclined pediment in the north-western corner of Jebel Sabaloka (to the east of Khor er-Radam and to the west of the village of el-Huqna) and at the south-western edge of the mountain above the Lake Basin area. The former consists of more than 100 tumuli with superstructures of two different types distributed in several groups or clusters. Apart from several tiny sherds of decorated pottery, no archaeological material that could be safely associated with the use of this place as a burial ground was found in this area. Most of the tumuli with the superstructures in the form of stone mounds heaped on a matrix of sands, sediments and gravel up to the height of *c.* 3m have been robbed in recent times.

Remains of occupation by humans and animals during post-Neolithic times were recorded also in the two major *wadis* – el-Kheyariya (AK) and Wadi Asunut (WA) – that cut across the *jebel* on the west bank of the Nile (see Plate 1). They have the form of varied stone structures and features (see Suková and Cílek forth.) which occupy most of the terraces and platforms dissected in the bottoms of the *wadis* by numerous smaller streams and which attest to the use of these locations both for settlement and burial purposes (Plate 18). While it may be possible that the settlement and

[17] The archaeological, archaeobotanical, and other aspects of this find will be addressed in more detail in a separate article.

*Plate 18. One of the three tunnel graves (type FM01 according to Borcowski and Welsby 2009, 11) recorded on terrace WA 11/03 in Wadi Asunut (photo L. Suková).*

funerary features noted in a close proximity on some of the terraces may be contemporary, it seems more probable that the close spatial relationship between these features is the result of use, reuse, and alterations of the terrain by groups separated in time (cf. Wolf and Nowotnick 2006, 25). The occupation debris associated with many of the stone structures and features includes scatters of heavily worn decorated and undecorated sherds mainly of cooking pots and utility ware, some of which are of Meroitic and Post-Meroitic date (Dobiesława Bagińska 2011, pers. comm.), small numbers of grinding equipment, and – on the terrace AK 11/05 (Plate 19) – a *tetradrakhma* coined in Alexandria in the 2nd half of the 3rd century AD (David Lužický 2011, written comm.). The surface finds allow the placing of at least some of the occupation of the broader *wadis*, which might have been exploited as suitable grazing land by small groups of herders, in the Meroitic and Post-Meroitic periods. The same use of the *wadis* in more recent or even modern times is indicated by the presence of temporary shelters, enclosures and animal pens with stone foundations recorded in the mouth and upper reaches of the two *wadis*. They facilitate the interpretation of some of the stone structures and features noted on the occupation terraces and, at the same time, point to a considerable conservatism as to the structures and building techniques employed by herders deriving most probably from practical considerations as well as from local geology as the determining and restricting factors.

In the riverine landscape of the narrow Sabaloka Gorge (Plate 20), remains of former human occupation were recorded on the terraces and platforms on the slopes above the patchy tracts of alluvium by the Nile and on the edges of the plateau of the bare and inhospitable *jebel*. The finds

*Plate 20. Sabaloka Gorge. View from Wad Abu Agib of the constricted riverine landscape in the interior of the massif. The steep slopes of the* jebel *were the locations of settlements provisionally dated to the Funj period. They are recorded in the gorge on both banks of the Nile at intervals of 2-3km (photo L. Suková).*

*Plate 19. View from north of the most interesting occupation terrace (AK 11/05) in el-Kheyariya in the interior of the massif with settlement and burial structures and features of varied types and dates (photo L. Suková).*

were scattered on cleared activity areas or found in association with several types of stone structures and features (see Suková and Cílek forth.). At Wad Abu Agib (between the mouth of Wadi Asunut and el-Kheyariya) and Wad el-Hajj (upstream of and above the village of Abu Shambara), the occupation debris included omnipresent pottery material – undecorated and decorated sherds of cooking pots, utility jars of various sizes, finer serving bowls, and decorated incense burners – a multitude of grinding equipment of varied types and on diverse raw materials, several spindle whorls, a fragment of a glass bracelet (cf. Elzein 2004, 83, fig. 53), fragments of faience and glass vessels, glass beads and an insignificant number of animal bones and fresh-water shells. The variability of the surface finds suggests a wider spectrum of activities that could have taken place at these sites. The location of the settlements on the

protective slopes and plateaus above the patchy tracts of alluvium, from where commanding views could be obtained over the entire Sabaloka Gorge, and the man-made paths connecting the settlements with the Nile attest to a partial reliance of the occupants on the river for water and subsistence. Nevertheless, the presence of features for rainwater harvesting or limited cultivation on the top of the plateaus (Plate 21) suggests that the occupants might have been forced

*Plate 21. Wad el-Hajj. Water harvesting features or catchment areas recorded on the top of the plateau above an extensive settlement provisionally dated to the Funj Period (photo L. Suková).*

to search for alternative resources of water and subsistence as well. As the limited agropastoral potential of the constricted riverine landscape within the Sabaloka Gorge is unlikely to have supported regular settlement on the slopes and plateaus of the *jebel*, it is tempting to suggest that these peripheral areas could have been sought out as a safe haven for settlement by inhabitants from the surrounding areas during times of internal or external crises (cf. Taylor and Bieniada 2007).[18] The marked predominance of pottery and other archaeological material corresponding to finds reported from the fortified village at Jebel Irau (cf. Al-Sanjak 1978, 87-90) and other sites in the Sudan (see e.g. Elzein 2004, 70-73; Phillips 2003, 432-436; Taylor and Bieniada 2007) allows one to place the apogee of the occupation and activities on these terraces in the Islamic (Funj) period. Fragments of vessels with appliqué decoration in the form of a punctuated corded collar ridge or with incised or scratched decorative patterns may point to some activities on these terraces already during the Christian period (Dobiesława Bagińska 2011, pers. comm.).

## Sabaloka Archaeological Project

Although the area of Sabaloka contains numerous interesting finds dated to the post-Neolithic period, the main potential of this area consists in particular in the possibility it offers to attain a more profound understanding of prehistoric occupation evidenced in this area by impressive and in some cases even unparalleled remains. The Sabaloka Archaeological Project, carried out in recent years by the Czech Institute of Egyptology, constitutes a natural consequence of a shift from simple recording of sites and finds to a targeted systematic exploration that focuses on key issues of the Mesolithic and Neolithic periods in Central Sudan and in North-East Africa. The form and dynamics of development of the settlement structure, economy of foraging and pastoral societies, exploitation and distribution of high-quality raw materials encountered sometimes at a distance of several hundred kilometres from their sources and the reconstruction of the environment and climatic changes – these are some of the themes the elucidation of which, based on the evaluation of the plentiful archaeological and environmental data concentrated in a rather small, but exceptionally instructive and still largely neglected region, will be pursued as the prime objective in the coming years.

[18] The evaluation and interpretation of these settlements and the water-harvesting features is the subject of a separate article entitled "Agriculture on the fringe: the case of Wad el-Hajj, Jebel Sabaloka (Sudan)" (Suková *et al.* forth.).


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