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► **To cite this version:**

William Harcourt-Smith, Francigny Vincent, Alex De Voogt. Northern Sudan and Paleoanthropology: Historical Perspectives and Preliminary Results from the AMNH 2011 Survey. *Der Antike Sudan*, 2012, 23, p. 29-33. halshs-02539113

**HAL Id: halshs-02539113**

**<https://shs.hal.science/halshs-02539113>**

Submitted on 15 Apr 2020

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## NORTHERN SUDAN AND PALEOANTHROPOLOGY: HISTORICAL PERSPECTIVES AND PRELIMINARY RESULTS FROM THE 2011 AMNH SURVEY

### ABSTRACT

During the winter 2011 American Museum of Natural History (AMNH) interdisciplinary anthropological expedition to Northern Sudan, a number of potentially fossiliferous localities were inspected between Khartoum and Karima, and surface finds were collected. Based on a first evaluation, we discuss the potential of the Sudanese territory for paleoanthropology, and present some preliminary findings from a Pleistocene assemblage.

### INTRODUCTION

Historically the record of Plio-Pleistocene hominin activity in the Sudan is somewhat meagre. This is mainly due to a lack of comprehensive surveys and expeditions in both Sudan and South Sudan, political unrest during the last forty years, and successful development of field research in the more stable Great Lakes area. While Sudan offers excellent conditions for archaeological cooperation and fieldwork investigations, especially with the threatening context of dam constructions in the Nile valley, so far no program of research has been fully oriented on seeking fossil remains.

For Sudanese fossil hominins, nearly all known specimens have been found either within the Nile's present banks, or in raised river terraces nearby. Some associated faunal (Robinson 1966) and archae-

ological remains have been collected in a few localities (Fig. 1), but nonetheless, for such a geographically vast region very little has been recovered to date.

Given the antiquity of the Nile, the extensive Pleistocene deposits nearby, and the continuous record of hominin activity in much of north-eastern Africa for several millions of years the potential for sustained paleoanthropological research in both Sudan and South Sudan is likely to be significant.

### PALEOANTHROPOLOGY IN SUDAN

Compared to neighbouring countries, such as Kenya and Ethiopia, there has been very little in the way of paleoanthropological exploration and discovery in Sudan. Historically, the strongest evidence for hominin activity has been archaeological, with numerous Lower Palaeolithic artefacts discovered along the Nile from Wadi Halfa in the far north of the country to Wadi Afu on the White Nile (Arkell 1949). While at that time it was thought that a lack of evidence existed between the Second Cataract and the area of Abri (Hayes 1964, 52-53), recent fieldwork on Sai Island confirms the presence of human occupation prior to 200,000 years BP (Van Peer 2004). Because of its Lower and Middle Palaeolithic stratigraphic context, Khor Abu Anga continued to be one of the most promising sites in the Khartoum area (Arkell 1949; Carlson and Sigsted 1967). Other discoveries have also been recorded at Gebel Brinikol, Abu Simbel and Arkin (Chmielewski 1968), at Abu Hugar (Bate 1951; Wells 1963; Ziegert 1981), at el-Multaga (Garcea 2003; 2004) and at Singa (Arkell 1949) on the Blue Nile, a region that has recently offered new perspectives (Fernandez *et al.* 2003). A few Late Palaeolithic sites have also been located near the Atbara River, such as Khasm el-Girba (Marks *et al.* 1987; Peters 1992), but in general, very little has been found away from the Nile or its previous

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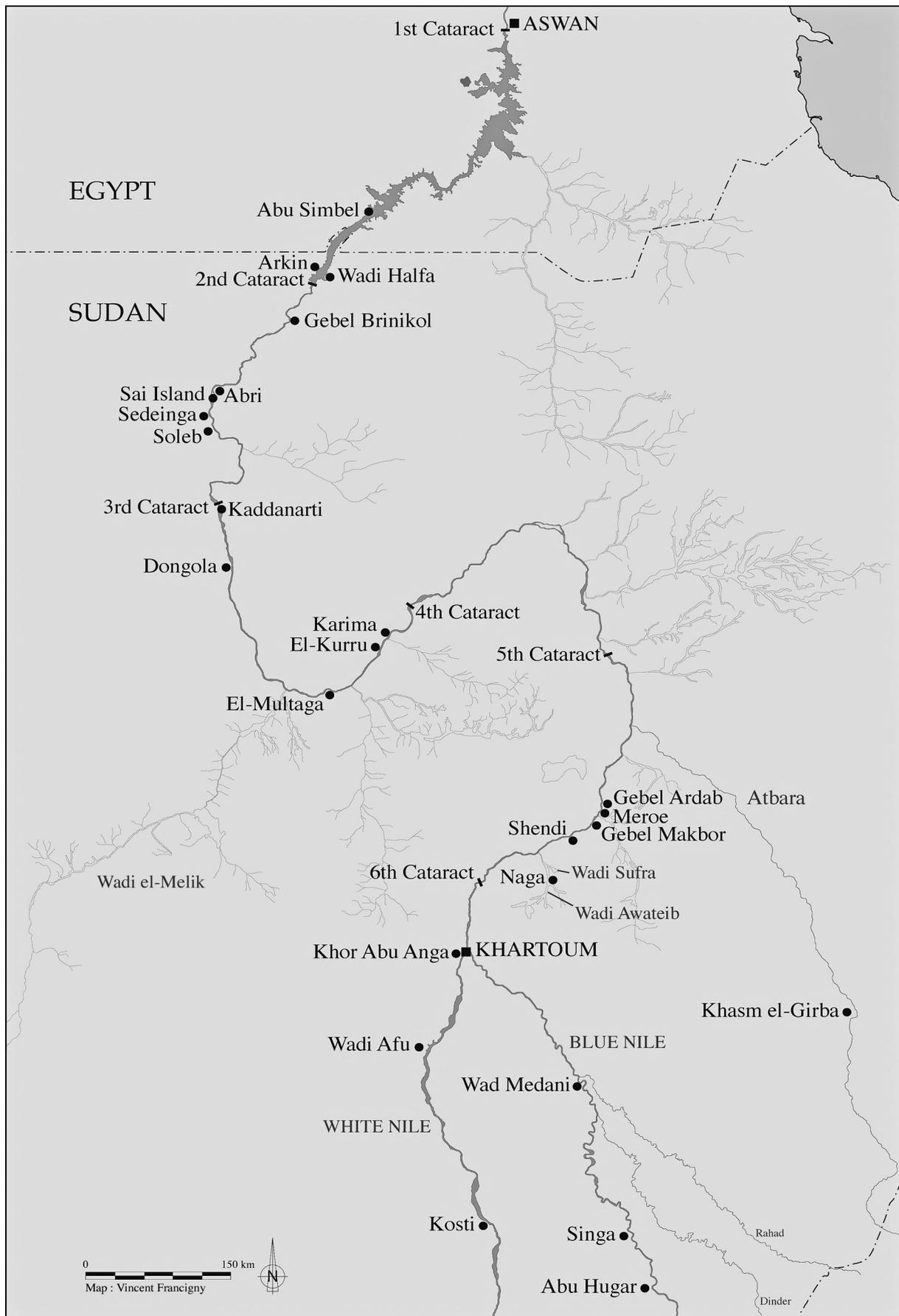


Fig. 1: Map of the sites.



courses. While Arkell provided the first comprehensive review of major stone-tool bearing localities, the oldest stone tools have recently been found at Kaddanarti (northern Sudan), possibly dating to as far back as 1.6 Ma (Chaix *et al.*, 2000).

Toward the end of the 19th and at the beginning of the 20th century, a number of discoveries of faunal remains, supposedly from the Pleistocene, appear in the literature of the Anglo-Egyptian Sudan. While most of them can be disregarded because of the lack of information about the age of the geological deposit where they were found, a first collection of mammal remains was secured by Arkell, during the dig of a well in its garden at Kosti (Bate 1951). Later, faunal remains from the Middle Palaeolithic, such as fish, crocodiles, warthogs, gazelles and giraffes, were found at Soleb (Sausse 1975). Remains of porcupines and buffalos were also discovered at Abu Hugar and Singa (Bate 1951), while elephant bones were uncovered at Khasm el-Girba (Shiner 1971).

Paleoanthropologically, the evidence is extremely scarce. The most notable hominin specimens are a cranium from the site of Singa on the banks of the Blue Nile (Woodward 1938; Arkell 1949; Wells 1951; Schwartz and Tattersall 2003), which is a modern *Homo sapiens* specimen dated to the Late Pleistocene (McDermott *et al.* 1987), and a *Homo sapiens* mandible from the site of Wadi Halfa near the Egyptian border, that was associated with Upper Palaeolithic tools (Armélagos, 1964; Hewes *et al.* 1964). Other localities have yielded possible early Pleistocene mammalian faunal remains at Kaddanarti, 60 miles north of Dongola, (Chaix *et al.* 2000), and a Pleistocene cercopithecoid monkey skull near Wad Medani on the Blue Nile (Simons, 1967).

Further south, in the new country of South Sudan, little is known of the extensive Late Tertiary deposits. No recent expedition has ventured into this paleoanthropological *terra incognita*, as political tensions are still vivid and accessibility to remote places cannot be guaranteed. Mine fields also represent a threat for pedestrian surveys, but there is no doubt that the future stability of the southern state provinces will attract many researchers working in the great lakes area, and will promote the development of a service dedicated to the protection and the promotion of the historical heritage of South Sudan.

#### AMNH SURVEY

In November of 2011 a small interdisciplinary team of scientists from the American Museum of Natural History, New York, visited Sudan with the purpose

of surveying a number of archaeological sites along the Nile, from Khartoum northwards to Abri, in order to gather documentation about ancient faunal assemblages in the Butana and Nubia areas.<sup>4</sup> Mainly focused on animal representations, the expedition also conducted a survey on fossil remains in the regions of Shendi and Karima. A cursory amount of field-walking was conducted at several localities along the way, most notably around the Wadi Awa-teib near Naga, the Wadi Sufra and in the area of the royal necropolis of Meroe, between the Gebel Makbor and the Gebel Ardab.

In the Kabushiya district, in the section of the river directly west of the ancient Meroitic capital and necropolis, we also conducted interviews with local people, confirming that fossil material was often found either in the banks of raised bluffs on either side of the current course of the Nile, or on islands currently within the river. In both cases, it was indicated that discoveries were usually made after the flood and associated with farming practices. The modest development of tourism around the pyramid fields at Meroe has resulted in a regional fossil hunt by local villagers who sell them to potential visitors. Some of these specimens were also inspected during this survey.

#### FOSSIL REMAINS

The collection of fossils gathered during the AMNH survey was brought to Khartoum and stored at the French Unit of the NCAM, to allow further analyses and comparisons in the near future.

The fossils found in the Nile fluvial deposits are well mineralized, well-preserved and undistorted, and clearly represent for some of them a Plio-Pleistocene faunal assemblage, although it cannot be determined if all fossils belonged to the same stratigraphic horizon. Of note, three mammalian fossil specimens as well as two sea fossils are presented here with a brief description:

1. Partial fragment of a large right scapula (Colour-Fig. 1). The glenoid and coracoid process are completely preserved. Part of the blade is present, inclu-

<sup>4</sup> We would like to thank the National Corporation for Antiquities and Museums in Khartoum for permission to conduct our research, and the American Museum of Natural History, New York, and in particular the Niarchos Foundation for their financial support. In addition we thank John Maisey, Melanie Stiasny and Neil Landman for their insight and advice and Claude Rilly for his hospitality in Sudan.



ding the start of a spine. The sample is a close match to extant Rhinoceros. The humeral (i.e., cranial) view of a glenoid is a little more like Black rhino than White rhino.

2. The right distal radio-ulnar including part of the shaft (Colour-Fig. 2). The fossil is rather worn. The articular facet for carpus appears wide medio-laterally, and narrow antero-posteriorly. Three distinct facets on the distal surface are visible, with clear facet boundaries. The specimen is somewhat similar to the radioulnar of extant cameloids in size and shape, but may belong to an older, extinct species distinct from those found in the valley today.

3. Fragmentary bovid upper molar, including part of crown (Colour-Fig. 3). Due to its large size, it is possibly a size 4 Bovini (Pers. Comm. J. Tyler Faith).

4. Fossil ammonite (Colour-Fig. 4). It was found in the wadi to the back of the North Cemetery at Meroe, and was likely washed into it from nearby Cretaceous marine deposits towards the east. Late Cretaceous ichthyofaunal remains were also uncovered in the Wadi el-Melik (Werner and Gayet 1997).

5. Echinoid (Colour-Fig. 5). Near Karima, other sea fossils, such as an echinoid, were recovered from funerary deposits accompanying some of the deceased in the graves of the royal cemetery at el-Kurru. Later, during the Meroitic period, a few examples of fossil fishes were also deposited in local graves, as shown by some teleost vertebrae discovered at Sedeinga (Colour-Fig. 6).

#### CONCLUSION

While extremely cursory, these finds are clearly consistent with other Plio-Pleistocene faunas from northern Kenya and Ethiopia, with the camelid sample possibly indicating a fairly dry, open environment. Although the recovered specimens are few in number, the excellence in preservation is promising when considering possible future survey and excavation at targeted localities. Combined with the meagre but interesting archaeological and paleontological record of artefacts and associated fossils (including hominins) recovered along the present and past banks of the Nile, it is likely that more thorough and longer expeditions (most crucially involving excavation) to the Plio-Pleistocene fluvial deposits in the north Sudan region will reap significant results.

This expedition did not visit Southern Sudan, but a careful examination of geological maps of the region,<sup>5</sup> combined with a visual inspection of high-resolution satellite imagery shows that there are extensive Late Tertiary deposits, particularly in the far south of the country near the Kenyan border. Given the high productivity of hominin-bearing localities in northern Kenya, especially around Lake Turkana, it is an exciting prospect to consider future paleoanthropological expeditions to South Sudan.

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#### ZUSAMMENFASSUNG

Die Erforschung von spät-tertiären und pleistozänen Fossilien im Sudan steckt, im Gegensatz zu Forschungen in Kenia und Äthiopien, noch in den Kinderschuhen. Bei einem ersten Survey des American Museum of Natural History im Winter 2011 konnten in der Butana (um Meroe, im Wadi Sufra und im Wadi Awateib) und in der Region von Karima einige fossile Reste entdeckt werden, darunter von drei Säugetieren (Rhinozeros, ein kamelartiges Tier, ein Bovide) und von Meeresbewohnern (Ammonit, Seeigel und Fisch).