

## WHAT FORCED THE PREHISTORIC CATTLE-KEEPERS TO EMIGRATE FROM THE RED SEA MOUNTAINS?

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### Abstract

Today's desert area of Red Sea Hills is now inhabited by a Beja-Bisharin tribe, the camel breeders. In prehistoric times, this area was inhabited or penetrated by pastoral communities engaged in cattle breeding. Their occupation is primarily marked by thousands of engravings with representations of long-horned cattle, which were discovered in a rock art gallery in Bir Nurayet, one of the largest rock art galleries in Africa and the whole world. We still do not know when the shepherds and their herds abandoned the area. This issue can be addressed by geoarchaeology and investigation of sediments discovered in Wadi Diib, i.e. silts. As we believe, they record climate and environmental changes taking place in recent millennia, which probably to a large extent determined the socio-cultural processes in the area.

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**Key words:** cattle-keepers, Red Sea Hills, Sudan, chronology of rock art

### INTRODUCTION

The aim of this paper is to present some issues regarding the chronology of the archaeological site Bir Nurayet, discovered lately in Sudan which, as we believe, can be addressed with the help of geoarchaeology.

Bir Nurayet is a name of a place located in the Red Sea Hills at the foot of a lonely mountain Jebel Magardi. This beautiful mountain with a characteristic phallic shape dominates in the landscape of Wadi Diib. In the vicinity of the Magardi there is one of the largest rock art galleries on the African continent, accompanied by relics of camps, settlement sites and cemeteries of communities living in the area from the early prehistory until modern times.

The concentration of rock art was discovered at the turn of 1998/1999 by the Polish archaeologist Krzysztof Pluskota and the Dutch writer and photographer Arita Baaijens, who penetrated the area while travelling with a camel caravan along the route of ancient gold mines (Pluskota, 2003, 2006). During three research seasons in 2010, 2011 and 2012, the Group for Research on Prehistory and Early Civilization of Africa from the Poznań Branch of the Institute of Archaeology and Ethnology of the Polish Academy of Sciences launched a new project (*Bir Nurayet*) of systematic studies of rock art and the settlement in the area. The work was supervised by Przemysław Bobrowski, accompanied by Maciej

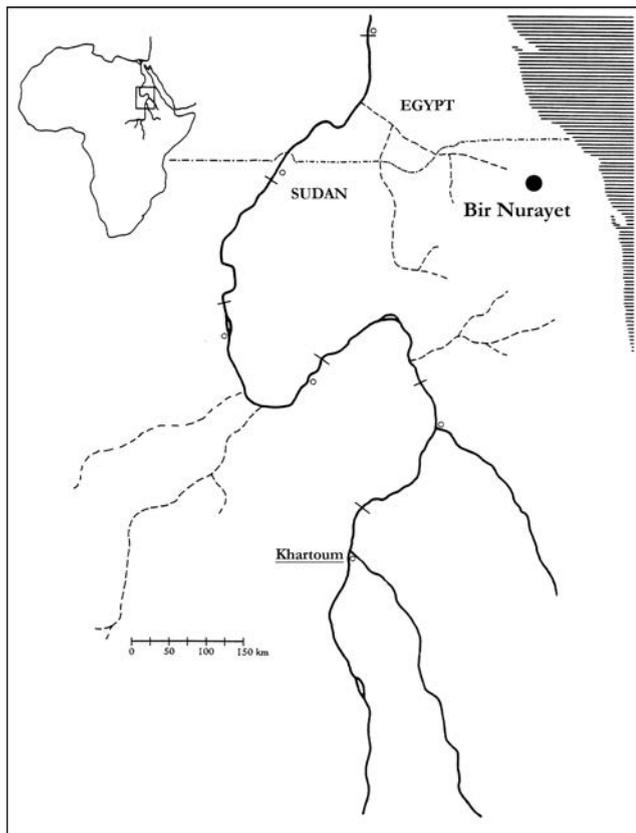
Jórdeczka, Michał Kobusiewicz, Marek Chłodnicki (seasons 2010, 2011), Krzysztof Pluskota (season 2010), Paweł Wiktorowicz (season 2011), the inspector of the Sudan Antiquities Service Mohammed Hassan Adam El Tayeb and our sponsors in 2013 season: Jacek Jurek, Maciej Korobacz and Dominik Pijański from Advertising Agency JUST.

### REGIONAL SETTING

Bir Nurayet is located in the Red Sea Hills (north-eastern Sudan), in the central part of Wadi Diib (Valley of Wolves), which constitutes an axis of an immense drainage system of this part of the mountains that drains seasonally its waters into the Red Sea near Marsa Abu El Qasim (Egypt), approximately 130 km north of Nurayet. It is the heart of the Beja Bisharin tribe's territory, circa 60 kilometers south of the Egyptian-Sudanese border, 100 kilometers west of the Red Sea Shore and 500 kilometers east from Nile Valley (Fig. 1).

### MATERIAL AND METHODS

In the vicinity of Bir Nurayet the eastern edge of Wadi Diib is made of extensively partitioned and eroded hills built of sandstone (unpublished petrographic analyses by M. Mrozek-Wysocka, Institute of Geology, Adam Mickiewicz University, Poznań, 2012). The western edge, on the other



**Fig. 1.** Map of Egypt and Sudan with research places marked.

hand, is made of a widespread rock massif built of consolidated Nubian sandstone, constituting vertical walls from the side of the wadi (the eastern and partially the south-eastern ones). The eastern part of this massif is divided by numerous

erosional cuts, which form a few hundred meters long valleys going inside, as well as rock cirques surrounded by vertical walls and rubble of stone blocks. These very walls and blocks along erosional valleys and the edges of wadi are covered with thousands of rock engravings.

The main motif was the representation of long-horn cattle i.e. cows and bulls herding together or shown separately, sometimes attacked by beasts of prey, scenes of milking cows or fighting bulls (Figs 2, 3). They are sometimes accompanied by men with bows and arrows and by some wild animals like elephants (Fig. 4), lions, gazelles, antelopes, warthogs and ostriches. Although camels are also frequently depicted on rocks (Fig. 5), it is certainly the cattle that is by far the most numerous and most important motif at the site.

The engravings of the Bir Nurayet region are of palimpsest nature. Two general periods of their formation have been identified, namely *the cow period* and *the camel period*. The possibility of their co-occurrence during the first centuries of the Common Era is still open to debate. However, both varied degree of patination and different themes represented by their authors, point to different chronology of the engravings. In case of the dominant representations of cattle at least three general artistic styles may be distinguished (realistic, degenerated and schematic). They may reflect chronological differentiation of the rites. Similar stylistic and chronological variety was also observed in representations of camels and people.

The reason why prehistoric people covered the slopes with so many depictions of cattle is, we believe, the fertility cult and the magic way of thinking in which multiple images of herds of cattle will cause the appearance of herds of real, living cows. The location of numerous images of cattle was provoked by the presence of the above mentioned phallic shaped Jebel Magardi. The long lasting fertility cult in this



**Fig. 2.** Bir Nurayet: one of the biggest panels with cattle.



Fig. 3. Bir Nurayet: example of a panel with cattle, camels and wild animals.

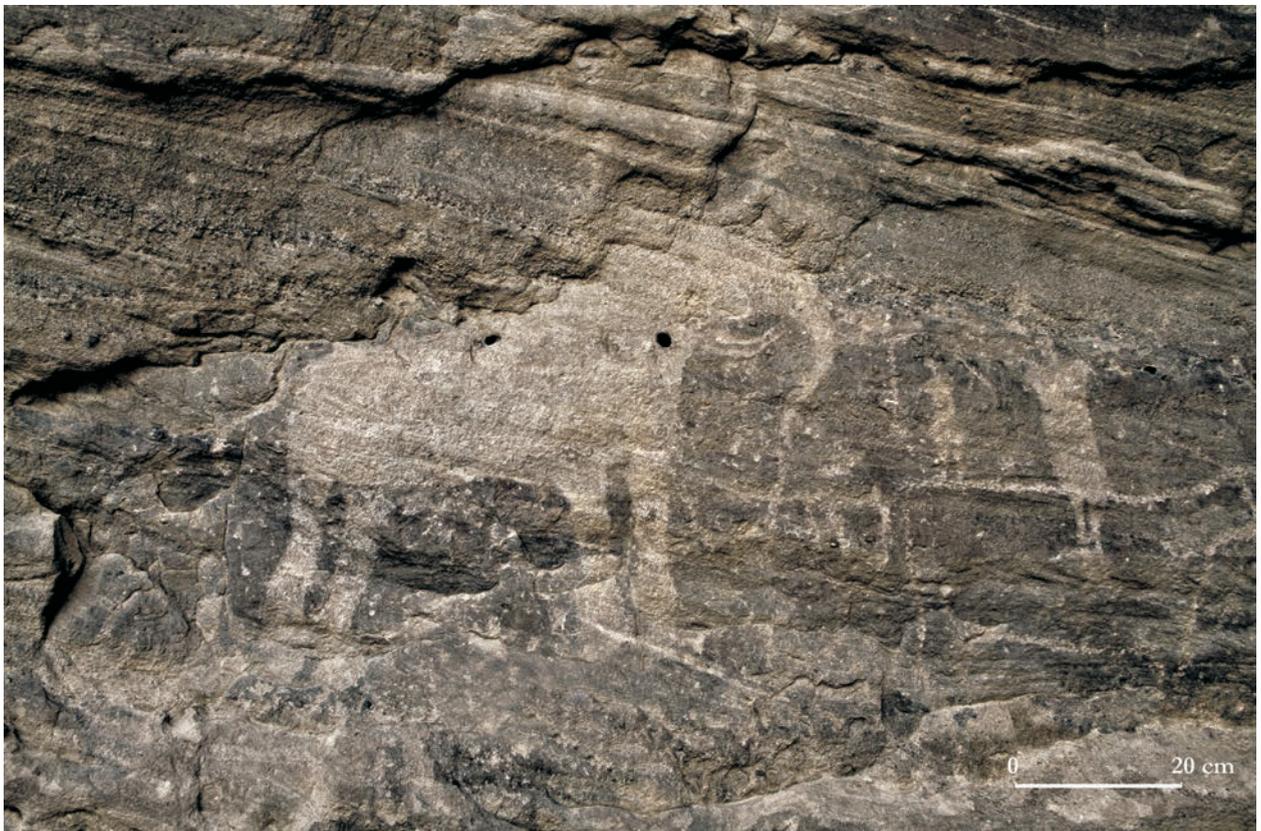


Fig. 4. Bir Nurayet: scene of hunting for an elephant.



**Fig. 5.** Bir Nurayet: scene with camels and cattle.



**Fig. 6.** Bir Nurayet: wadi with the remains of silt layers.

place has additionally been proven by other discoveries such as, for example, the deposit of almost a hundred of phallic shaped terracotta figurines of humans and animals placed in a type of box constructed of flat sand stone slabs located in the front of Jebel Magardi towering above its surroundings. This deposit is dated by radiocarbon analysis to the sixth century A.D. Another proof is the representations of the jebel itself, incised deep in sandstone slopes, always apart from usual pictures. They are also other finds proving the practice of fertility cult but there is no space to present them all here.

The age of rock art is always difficult to determine. Though we discovered a number prehistoric and early historic sites which can be dated, starting from Lower Paleolithic till the Islamic period, some of them adjoining the images, we are not able to connect them to the rock art.

The investigation of the degree of patination or the stratigraphy of images, which sometimes cover each other, may only help to establish relative chronology, while attempts to use pictures of wild animals, the presence of which could sometimes tell something about the age, also produced disappointing results. The occurrence of the elephant or other species of the Ethiopian fauna visible on rocks suggests that they must have been drawn during the moist period. Yet the sequence of the climate in this area is still unrecognized. Be-



**Fig. 7.** Bir Nurayet: sampling of silt.

sides, the Ethiopian species did not have to be present in the area during the time of art creation. Instead, some of the artists could have travelled south and having seen the animals, depicted them on rocks.

In terms of chronology, it is only certain that the representations of herds of cattle were drawn after the domestication of these animals, which probably happened in the nowadays Nile Valley in the Late Pleistocene/Early Holocene. The bones of large bovid animals present in several excavated Early Holocene sites have caused animated discussion on the domestication of *Bos primigenius* in the eastern Sahara (e.g., Gautier, 1984, 1987, 2001, 2007; Smith, 1984, 1986, 1992, 2005; Clutton-Brock, 1993; Muzzolini, 1993; Close, 1996; Wendorf et al., 1987; Schild & Wendorf, 2001, 2010; Wendorf & Schild, 1994, 2003; Marshall & Hildebrand, 2002; Wengrow 2003; Jórdeczka et al., in print). The hypothesis of domestication was published for the first time by Wendorf et al. (1976: p. 106). A more detailed description of the finds appeared a few years latter (Gautier, 1980: p. 332). The report contained osteometric data implying domestication as well as the suggestion that the very low carrying capacity of the area precluded the possibility that it was inhabited by large wild ungulates. No such assemblages containing aurochs have ever been reported from pre-Neolithic Africa. Even the hartebeest, a faithful companion of auroch in the Nile Valley, was not present in the South-West-

ern Desert (compare Gautier, 2001: p. 629), although its tolerance of aridity is greater than that of cattle (Kingdon, 1982), as cattle need to drink water every other day. This reasoning led to the proposition that the early Neolithic bovinds of Nabta could have been introduced to this inhospitable environment through human practice. Further work at Nabta Playa, especially between 1990 and 2010, yielded additional material pertaining to large bovid remains.

In more recent periods, a number of new data provided by DNA studies suggest an independent African center of early cattle domestication (e.g., Bradley et al., 1996; Hanotte et al., 2002; Edwards et al., 2004; Beja-Pereira et al., 2006) on one hand; and/or support the idea of one Near Eastern center of the taurine cattle domestication, on the other. A possibility of local introgression from wild aurochs (compare summary in Achilli et al., 2008) has also been considered. Studies in linguistic stratigraphy of Nilo-Saharan languages by Ehret (1993, 2001, 2006) indicate a very early appearance of words pertaining to cattle pastoralism in the eastern Sahara, perhaps before 8500 BC. A precise dating of root words, however, can be deceptive.

Recently Chaix & Honegger (2011) and Linseele & Chaix (2011) reported the discovery of domestic cattle in Wadi el-Arab, Kerma Area, Northern Sudan. The site presents a long sequence of archaeological beds firmly placed between about 8200 and 6500 cal years BC. In the sequence, the first domestic cattle remains appear about 7200 cal years BC. These dates would place the Kerma Area finds of the taurine



Fig. 8. Bir Nurayet: remains of silt lying on a rock.

cattle somewhere in the very end of the El Adam occupation of the South-Western Desert and/or in the subsequent dry Post-El Adam Arid Phase, certainly before the appearance of the El Ghorab settlers in the same area (Schild & Wendorf, 2001: p. 52).

Yet, it does not mean that the domestication of *Bos primigenius* happened at the same time in the Red Sea Mountains. Of course, the custom to depict cows did not have to start with the moment of domestication. It must be mentioned here that most probably the ecological conditions in the discussed area at the time in question were different than those

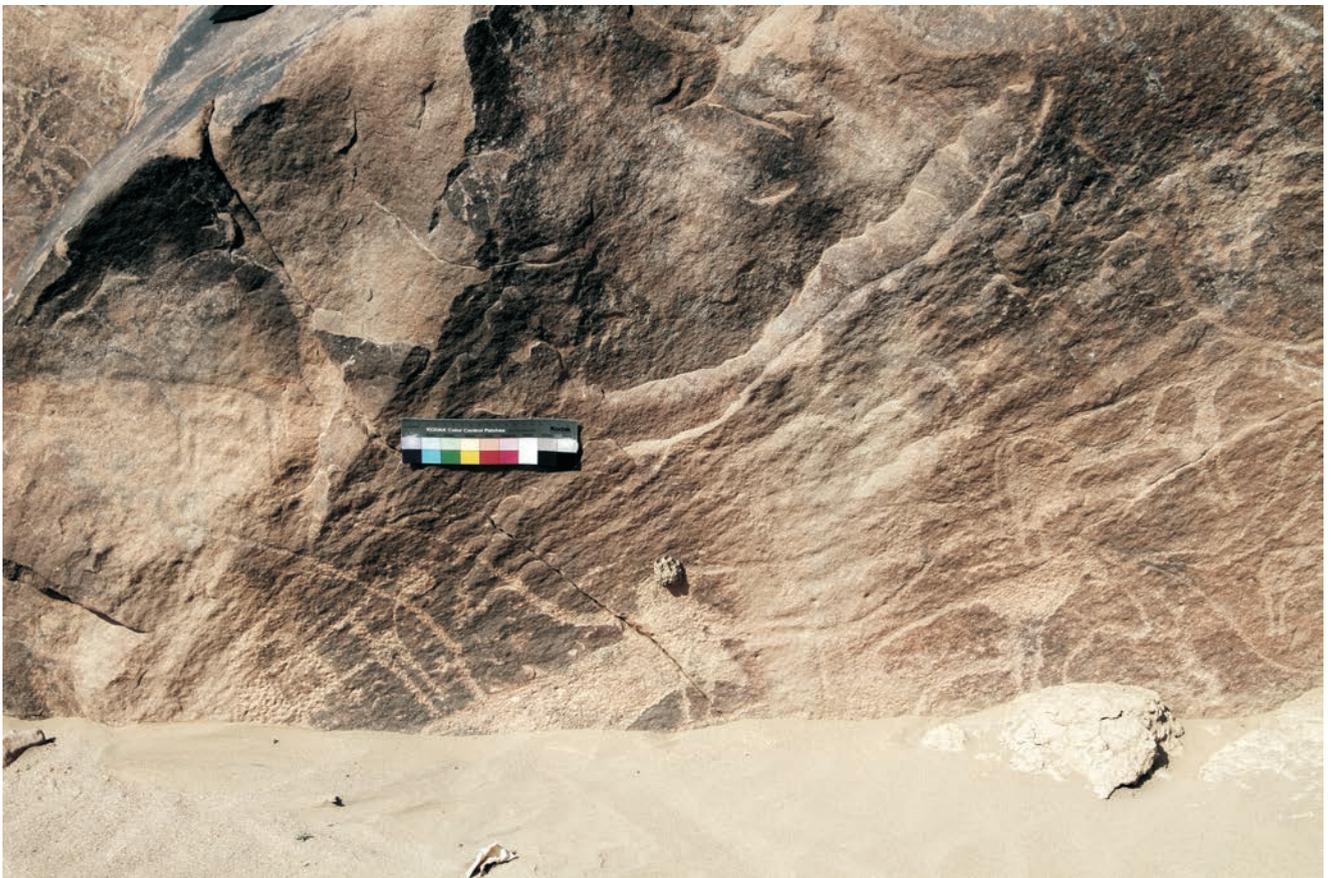


Fig. 9. Bir Nurayet: one of the panels with rock art covered with silt.



**Fig. 10.** Bir Nurayet: sampling of silt in a test trench.

in the Western Desert. It is even more difficult to determine the time of the disappearance of cattle drawers from this area.

## RESULTS

Here, unusual geomorphological structure observed in Bir Nurayet region may help address this issue. The bottom of Wadi Diib, in its deepest, western part, including the surrounding of Gebel Magardi, is filled with alluvial sediments in the form of layered silts, which thickness reaches at some places up to 3–4 meters. The side erosional valleys in the rock massif are also to some extent filled with the same sediments (Figs 6, 7). In some places they cover rocks or rock blocs covered with engravings (Figs 8, 9). The beginning of these deposits may be linked with the process of drastic climatic changes and desertification of this part of Africa which took place after the climatic optimum of the Holocene. Single absolute TL, OSL and IRSL datings done during the latest research estimated the time of their origin to approximately 4200–550 years ago.

The first results of TL dating for the Bir Nurayet site were obtained using the Mikrolab RA'94 reader (total-bleach procedure, preheat AT 80°C for 24 hours, HA-3 optical filter). The samples taken from the depth of 40, 80 and 120 cm (Fig.10) were dated to  $2099 \pm 197$ ,  $2117 \pm 201$  and  $3763 \pm 357$  years, respectively (TL measurements were carried out, three months after irradiation). The results of luminescence OSL and IRSL dating were obtained using the Risø

DA-20 reader (SAR protocol). The postIR OSL, 125°C procedure yielded the following results:  $554 \pm 38$ ,  $1042 \pm 93$ , and  $4196 \pm 222$  years before 2013. Two IRSL procedures were also used: post IR IRSL 225°C and postIR IRSL 290°C. Probably because of too high temperature of preheating and luminescence reading only one series of results was obtained from four series of measurements. We expected analogous results for the samples from the other part of Bir Nurayet site (Wadi Diib).

Undoubtedly, these sediments constitute a specific register of changes in natural environment which proceeded over the last millennia. These changes must have influenced to a great extent the cultural processes in that region. The presence of savannah animals and raising cattle in the region of Bir Nurayet is bound to be connected with the presence of permanent or seasonal plant cover, and consequently the wet climatic episode.

## DISCUSSION AND CONCLUSIONS

On the basis of the TL dating of silts in some spots covering petroglyphs we can state that at least some of the rock art is older than 2200 years BC which corresponds with the Nubian Kerma Culture (Gratien 1978). The time when art representing cows definitely ceased to be practiced has not been determined yet. It must have happened during the moment when cattle disappeared from the Bir Nurayet area. Today there is no single cow in this area. Nowadays, the local

Beja people inhabiting this land are camel-keepers only. The nearest cows can be seen by Kassala, some seven hundred kilometers south.

What caused this emigration? We believe that the reasons can be sought in serious environmental changes, i.e. the drought resulting in the disappearance of pastures. The onset of the drought will be the *terminus post quem* for all images representing cattle. Nevertheless, we still do not know when it has happened.

The environment of the Red Sea Mountains is different than the environments of the today's Eastern, all the more Western Desert, or than the Nile Valley where the climate events are relatively well recognized and dated (e.g. Haynes 1987; Haynes et al. 1989; Schild and Wendorf 2001, Kuper and Kröpelin 2006; Wendorf and Schild 2006, Pöllath and Peters 2007). But unfortunately, it is not the case when the area in question is concerned, which is and has always been strongly influenced by the Red Sea. The historical changes of climate, the wet and desert periods which, with no doubt took place in the Red Sea Mountains are not recognized and not dated. More intensive and multidisciplinary studies are thus needed to answer our questions. Their results will permit us to determine the date of the end of the cattle-keeper period of the rock art in Bir Nurayet. On the other hand, the archaeological research of this, from the point of view of archaeology, almost *terra nova* territory, will certainly be helpful for any investigations carried by other branches of geoarchaeological sciences.

The aim of this paper is to show once more how much collaboration of geoarchaeological sciences is needed to resolve the problems troubling archaeologists.

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