Quaternary Science Reviews xxx (2015) 1–13

Contents lists available at ScienceDirect

Quaternary Science Reviews

journal homepage: www.elsevier.com/locate/quascirev

Nile behaviour and Late Palaeolithic humans in Upper Egypt during the Late Pleistocene

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ARTICLE INFO

Article history:
Received 2 January 2015
Received in revised form
17 March 2015
Accepted 26 March 2015
Available online xxx

Keywords:
River Nile
Late Palaeolithic
Egypt
Geomorphology
Late Glacial Maximum (LGM)
Late Pleistocene
Endorheic environment

ABSTRACT

The reconstruction of the environment and the human population history of the Nile Valley during the Late Pleistocene have received a lot of attention in the literature thus far. There seems to be a consensus that during MIS2 extreme dry conditions prevailed over north-eastern Africa, which was apparently not occupied by humans. The Nile Valley seems to be an exception; numerous field data have been collected suggesting an important population density in Upper Egypt during MIS2. The occupation remains are often stratified in, or at least related to, aeolian and Nile deposits at some elevation above the present-day floodplain. They are rich in lithics and animal bones, mainly fish, illustrating the exploitation of the Nile Valley by the Late Palaeolithic inhabitants. The fluvial processes active during that period have traditionally been interpreted as a continuously rising highly braided river.

In this paper we summarize the evidence thus far available for the Late Pleistocene on the population densities in the Nile Valley, and on the models of Nilotic behaviour. In the discussion we include data on the environmental conditions in Eastern Africa, on the aeolian processes in the Western Desert of Egypt derived from satellite images, ^{14}C and OSL dates, in order to formulate a new model that explains the observed high remnants of aeolian and Nilotic deposits and the related Late Palaeolithic sites. This model hypothesizes that, during the Late Pleistocene, and especially the LGM, dunes from the Western Desert invaded the Nile Valley at several places in Upper Egypt. The much reduced activity of the White Nile and the Blue Nile was unable to evacuate incoming aeolian sand and, as a consequence, several dams were created in the Upper Egyptian Nile Valley. Behind such dams the created lakes offered ideal conditions for human subsistence. This model explains the occurrence of Late Palaeolithic hunter–fisher–gatherers in a very arid environment with very low Nile flows, even in late summer.

1. Introduction

In the scientific literature of the last decades, much attention was paid to movements of modern *Homo sapiens* from East Africa to the rest of the world (Carto et al., 2009; Stewart and Stringer, 2012). It is obvious that the Nile Valley and probably also Arabia (Petraglia and Rose, 2009; Armitage et al., 2011), thereby may have played a prominent role. The Nile Valley is indeed, within an often extremely dry North Africa, an oasis right through the Sahara (Wendorf et al., 1989; Phillips, 1994; Camps and Szmidt, 2009; Garcea, 2010, Drake et al., 2011). It should therefore come as no surprise that the population of the Nile Valley may have played a prominent role during the Late Pleistocene. DNA analyses have produced numerous conjectures how the Late Pleistocene population of the Nile Valley was subject to movements from north to south and vice versa (Manni et al., 2002; Lucotte and Mercier, 2003; Fadhlaoui-Zid et al., 2011). The understanding of the changing climate and its influence on the Nile regime and on human population densities, has made great progress. Field research in the Nile Valley has collected data that allow us to understand how the Nile Valley reacted to the changing climate and could create a favourable environment for Late Pleistocene humans.

In this paper, we will summarize the existing information on the Palaeolithic occupation of the Upper Egyptian Nile Valley, in order to describe the population densities through time, in particular of the Late Palaeolithic. Furthermore we examine the

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http://dx.doi.org/10.1016/j.quascirev.2015.03.025

geomorphological situation of the Late Palaeolithic sites within the Nile Valley and reconsider the radiocarbon dates available in the literature to link these phenomena with climatic conditions. After describing the environmental reconstructions of the Nile Valley and the related models of Late Pleistocene Nilotic behaviour published by earlier authors, we finally propose a new model of Nilotic behaviour. This model is based on our own observations made during fieldwork since 1968, on interpretation of satellite images of the Western Desert of Egypt and the Nile Valley and on literature data about environmental conditions in Eastern Africa and the sedimentation rate from the Nile in the Mediterranean.

2. Setting

2.1. Late Pleistocene Nile Valley population

Research during the last decades regarding the Palaeolithic occupation of the Upper Egyptian Nile Valley (Vermeersch et al., 2000, 2006; Vermeersch, 2006, 2009, 2010; Schild and Wendorf, 2010; Van Peer et al., 2010) has made it clear that an expanded population was present during the Middle Stone Age (MSA, Middle Palaeolithic). Whereas very large chert extraction sites of the MSA have been recorded (Vermeersch, 2002), suggesting an important need for chert blanks, very few such sites of the Upper Palaeolithic have been found. The best explanation of this observation is that, during the Late MSA and the Upper Palaeolithic there was a low demand for raw materials because during MIS 4 and MIS 3 the population density in Upper Egypt declined sharply. Traces of humans dated later than 60,000 years ago became rare (Fig. 1). However, from about 24 ka calBP an important population increase is registered by the presence of numerous Late Palaeolithic sites. During the LGM there is indeed an abundant presence of humans along the Nile Valley in Upper Egypt. Numerous Late Palaeolithic sites are known (Vignard, 1923; Butzer, 1967; Smith, 1967, 1968; Wendorf, 1968; Wendorf and Schild, 1976; Kabacinski and Usai, 1999; Paulissen and Vermeersch, 2000) with Nilotic silts and clays deposited well above the present flood plain (See Supplementary Data 1). They are situated some metres above the present floodplain, most often where Nilotic clays meet local deposits (Fig. 2). Several human groups can be identified such as the Fakhurian, the Kubbaniyan, the Idfuan, the Sebekian, the Silsilian, the Afian and the Isnan, all of them characterised by fishing–hunting camps located in the present lower desert along the Upper Egyptian Nile (Smith, 1967; Wendorf et al., 1989; Vermeersch, 2010). Several sites have been excavated and, as the faunal remains are mainly of fish, attest the presence of intensive fishing activities. Mammalian fauna is very restricted and consists of aurochs (*Bos primigenius*), hartebeest (*Alcelaphus buselaphus*), dorcas gazelle (*Gazella dorcas*), hare (*Lepus capensis*) and hippopotamus (*Hippopotamus amphibius*).

Several clayey deposits with Late Palaeolithic sites date from around 14 ka calBP. Their origin was explained by high inundations of a "Wild Nile" (Paulissen and Vermeersch, 1987, 1989; Butzer, 1997). After 14 ka calBP there is an abrupt end of the human occupation presence. After that period indications of human presence in the Nile Valley are indeed very scanty and, with the exception of some rare Epipalaeolithic sites dating at about 9.0 ka calBP, the valley seems to remain empty until the end of the Saharan wet Holocene (Vermeersch, 1978).

In other parts of North Africa, the Upper Palaeolithic population seems to have been particularly low in number (Cremaschi and di Lernia, 1999; Barton et al., 2005; Linstädter et al., 2012; Douka et al., 2014). Upper and Late Palaeolithic people seem to be absent from the Saharan desert, or at least no sites attributed to such groups have been detected. Often the cause of the population decline has been interpreted as being the result of an increasingly drier climate. This situation contrasts heavily with that of the Upper Egyptian Nile Valley with its numerous sites.

2.2. Late Palaeolithic site chronology

From the calibrated conventional and AMS available ^{14}C dates (Fig. 3 and Supplementary Data 1), some of which are now rather old with a large standard error, and for some probably without an adapted fractionation, it can be observed that mainly two periods of occupation are present; a first from about 23 until 20 ka calBP and a

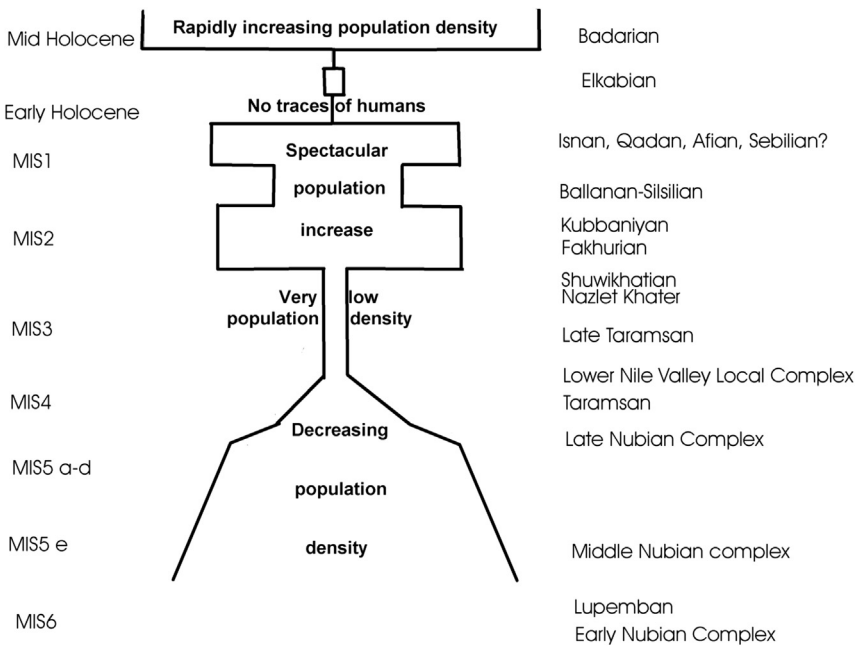

Fig. 1. A sketch of the evolution of population density in the Nile Valley in Upper Egypt (compiled from Wendorf et al., 1989; Vermeersch, 2009, 2010; Van Peer et al., 2010).

Please cite this article in press as: Vermeersch, P.M., Van Neer, W., Nile behaviour and Late Palaeolithic humans in Upper Egypt during the Late Pleistocene, Quaternary Science Reviews (2015), http://dx.doi.org/10.1016/j.quascirev.2015.03.025