Tool types and the establishment of the Late Palaeolithic (Later Stone Age) cultural taxonomic system in the Nile Valley

Alice Leplongeon1,2
1 Centre for Archaeological Research of Landscapes, Department of Archaeology, KU Leuven, Leuven, Belgium
2 Histoire naturelle de l’Homme Préhistorique, CNRS – MNHN – UPVD, Paris, France
alice.leplongeon@kuleuven.be

Abstract
Research on the prehistory of the Nile Valley has a long history dating back to the late 19th century. But it is only between the 1960s and 1980s, that numerous cultural entities were defined based on tool and core typologies; this habit stopped after the 1980s when the region saw an interruption of research on the later Palaeolithic periods. Many of the cultural entities of the later prehistory in the Nile Valley (Late Palaeolithic [LP]) were defined based on different types of cores, backed pieces and truncations. These types often relied on subjective shape criteria, using a non-standardised vocabulary, making comparisons with new material or recent reanalysis of older assemblages difficult. In the Nile Valley, some LP assemblages have been recently re-analysed but factors of lithic variability in the LP remain poorly understood and may be clouded by the use of a too rigid taxonomic cultural system. This study aims to explore the influence of the definitions of cultural entities on current research and the consistency of their definitions, in order to maximise comparability between previous and recent research data.

Key-words: Lithic Taxonomy, History of prehistory, Late Palaeolithic, Nile Valley

1. Introduction
North-Eastern Africa is a key region in research related to hominin dispersals
within, out of and back-into Africa, with the River Nile forming a ‘natural’ way out of Africa from Eastern Africa (e.g., Garcea 2016; Van Peer 1998; Vermeersch 2001; A. Leplongeon 2022b). However, and perhaps paradoxically, the archaeological record of the Nile Valley has rarely been subject to systematic comparisons with other regions of the African continent (e.g., but see A. Leplongeon et al. in press; A. Leplongeon and Goring-Morris 2018). This article seeks to shed light on some of the reasons for this state of affairs, and particularly to what extent the history of research on the later Pleistocene archaeology of the Nile Valley has followed a unique trajectory, that may have contributed to a lack of comparability of archaeological data produced during the 20th century in the Nile Valley and other regions. Studying the historical and scientific context of how the first cultural taxonomies were constructed in the Nile Valley may highlight biases that still have an impact on the use of these taxonomies and current interpretations of the archaeological record.

In the Nile Valley, the cultural taxonomy remained quite fixed since the 1960s, despite being based on ways to analyse lithic artefacts that are somewhat different from current approaches to lithic data. This article discusses the scientific context of these (dis)continuities in the cultural taxonomy of the Nile Valley, focusing on the later Palaeolithic taxonomic framework, and provides avenues of thoughts on how to overcome biases stemming from it.

A note on the Late Palaeolithic versus Later Stone Age terminology

A long-standing debate exists over which terminology should be used in Northern Africa, where historically the European terminology (Middle and Upper Palaeolithic, Epipalaeolithic or Mesolithic, Neolithic) has predominated. Some researchers argue that the use of this terminology leads to biased interpretations of the archaeological record, where similarities with the European record are inferred rather than demonstrated (Garcea 2004b; 2004a; 2009; Kleindienst 2001; 2006; Dibble et al. 2013), and that the Africanist terminology Stone Age should be favoured. In addition, different labels for microlithic industries of the end of the Pleistocene in North Africa have been used, leading to a lack of comparability, so that researchers propose to group them under the term Later Stone Age (Hogue and Barton 2016). While this terminology appears to be now more and more adopted (e.g., Barton et al. 2013; Inglis et al. 2018; Bouzouggar, Humphrey, and Barton 2020), a consensus has however not been completely reached yet (e.g., Poti and Weniger 2019). Interestingly, in Northeastern Africa, the use of the label ‘Later Stone Age’ for the industries of the end of the Pleistocene is still rare (e.g., Kleindienst et al. 2020; Garcea 2020), with some researchers
arguing for the upholding of the European terminologies due to the actual similarities with the Eurasian record, for the Upper Palaeolithic for example (Van Peer and Vermeersch 2007; Wurz and Van Peer 2012; Vermeersch 2020, but see A. Leplongeon and Pleurdeau 2011). In light of studies showing that the Late Palaeolithic industries of the Nile Valley seem to mainly represent local developments with few potential links with the North-Western African or Central African Later Stone Age (Close 1978; Marks 1968b; F. Wendorf 1968b; Schild and Wendorf 2010), and no demonstrated link with the Levantine Epipalaeolithic (A. Leplongeon and Goring-Morris 2018), the general adoption of the Later Stone Age terminology for the North-Eastern African industries at the end of the Pleistocene appears warranted. As this paper approaches the topic of taxonomy through an historical lens, the terminology ‘Late Palaeolithic’ is however kept throughout for consistency.

2. Cultural taxonomy during the early 20th century (before WWII)

2.1. The Upper and Late Palaeolithic of the Nile Valley during the first half of the 20th century

At the end of the 19th century, prehistoric research in Egypt is at the end of a heated debate opposing Egyptologists and Prehistorians over the antiquity of stone artefacts found in the Nile Valley and adjacent deserts. It is generally considered that this debate is put to an end with the publication of the two volumes of Recherches sur les origines de l’Égypte by Jacques de Morgan in 1896 and 1897 (Morgan 1896; 1897). However, they represent the culmination of almost thirty years of prehistoric research in Egypt by various European scholars (Arcelin 1870; Tristant 2007; Hamy 1869; Lubbock 1875; Pitt-Rivers 1882; Arcelin 1869a; 1869b).

At the beginning of the 20th century, the scientific community reaches a broad consensus over the existence of a Stone Age in Egypt, even if there is still much concern put on finding artefacts in stratigraphy (e.g., Seligman 1921). Early 20th century works share a focus on finding archaeological evidence associated with geological and stratified data, in parallel with the development of geomorphology as a field of study (see Nicoll et al. 2021). Nonetheless, palaeolithic research in Egypt
remains a minor component of the archaeological research in the country.  

Early 20th century Palaeolithic research in Egypt is undertaken by mostly European (in particular French and British) scholars and their results are communicated mainly within the European prehistorian community (e.g., A. Leplongeon 2022a). However, this takes place in a context where a limited but growing number of Egyptian scholars are also increasingly involved in fields of study that were until then dominated by European scholars, in parallel with the development of the Egyptian University in Cairo (Reid 1990). In particular, Mustafa Amer (1896-1973) (Bierbrier 2019) is seen as the first Egyptian prehistorian (Huzayyin 1941, XXXII). He graduated in geography at the university of Liverpool (BA in 1921 and MA in 1923), and was also considered as one of the first Egyptian professional geographers. He participated in the formation of the Egyptian university’s geography department (Reid 1993, 558, 561). He was also the first Egyptian director of the Antiquities service from 1953 to 1956 and was President of the Egyptian Geographic Society. He conducted archaeological excavations at the predynastic sites of Maadi (1930-35) with O. Menghin and then on his own (Menghin and Amer 1936; Amer and Menghin 1932; Amer 1936), of Heliopolis (1950) and of Wadi Digla (1950-53). Following his example, Soliman Huzayyin (1909-1999) graduated from the Egyptian University in 1929, then graduated in geography from the University of Liverpool in 1933 and obtained a PhD in 1935 from the Victoria University of Manchester, with a thesis on The place of Egypt in Prehistory: A correlated study of climates and cultures in the Old World (Abulezz 2001; Huzayyin 1941), showing the strong link between (pre-)history and geography at that time. Huzayyin then became a professor at the Egyptian university and President of the Egyptian Geographical Society. He created the University of Asyut and became Minister for Culture. However, despite the contributions of these prominent Egyptian scholars, the study of Egyptian prehistory, and in particular its Palaeolithic archaeology, mostly remained a field practiced by European scholars.

At the beginning of the 20th century, European prehistory therefore forms a reference framework for the study of the prehistoric record of Egypt. This is particularly apparent in the fact that the same debates and discussions characterising the European Palaeolithic are present in the study of the Egyptian Palaeolithic. This includes for example debates on the existence of a ‘Tertiary Man’ associated with ‘eoliths’ (Schweinfurth 1905; Angevin 2012), or on the existence of a pre-Acheulean industry, the ‘Chalossian’ (Passemard 1927; Bovier-Lapierre, Vignard, and Vayson de Pradenne 1931; Passemard et al. 1930; A. Leplongeon 2022a). It is also at that time that the first broad cultural framework for

---

1 This is already apparent in Morgan’s first volume where only 14 pages address the Palaeolithic Man in Egypt (Morgan 1896, chapter IV), whereas there is abundant discussion of the Neolithic (Neolithic Man, (Morgan 1896, chapter V)). See also discussion in (A. Leplongeon 2022a)
the Egyptian and Sudanese Palaeolithic is proposed. In particular, the works of Edmond Vignard (1885-1969) in the Kom Ombo Plain (Vignard 1921; 1922; 1923), of Gertrude Caton-Thompson (1888-1985) and Elinor Wight Gardner (1892-1981) at Kharga Oasis (Caton-Thompson and Gardner 1932; Caton-Thompson 1952), and of Soliman Huzayyin in his attempt to correlate the cultural sequences in Egypt, North Africa and Europe (Huzayyin 1941) contribute to establish the first chrono-cultural framework for the Egyptian Palaeolithic.

For what concerns the later Palaeolithic in particular, Vignard is the first to propose – contra Morgan (Morgan, Capitan, and Boudy 1910; Morgan 1922a, 8) – the existence of an Upper Palaeolithic occupation in the Nile Valley, based on the data he collected in the Kom Ombo area between 1911 and 1923 (Vignard 1921; 1922; 1923). In 1921, he publishes his observations on a surface assemblage from Nag Hamadi, which he describes as having similarities with the European Aurignacian. He uses typologies, which were created to describe the French Upper Palaeolithic, to classify the different types of burins and endscrapers found in the assemblage. This leads him to conclude that the industry at Nag Hamadi is morphologically Aurignacian, and that it probably is the product of a human migration from Europe (Vignard 1921). This interpretation is however not accepted by the scientific community (Morgan 1922b; Huzayyin 1941, 237; Smith 1966a, 44). Despite its late publication of another site, Menchia, which he attributes to the Middle Aurignacian (Vignard 1954, 2), Vignard’s ‘Aurignacian’ never formed part of the cultural sequence of the Egyptian Palaeolithic.

Vignard’s most significant contribution to the construction of the chrono-cultural sequence of the late Pleistocene prehistory of Egypt is the definition of the Sebilian industry in the Kom Ombo area (Vignard 1923; 1928; 1955a; 1955b, fig. 1). He defines three successive chronological stages [niveaux] within this industry based on the geomorphological settings of the assemblages and their typological characteristics. The following description reflects the different stages of the Sebilian as described by Vignard in the Kom Ombo plain (Vignard 1955b; 1955a). The first stage (Sebilian I) takes place at a time where a lake was present in the Kom Ombo Plain. It corresponds to a ‘Levalloisian’ industry characterised by the use of diorite, Nubian sandstone and quartz for the production of Levallois flakes and points. The specificity of this industry is that the proximal part of these Levallois products is often removed by an abrupt retouch. When an abrupt retouch also affects the side, this leads to large tools with a triangular or trapezoidal shape (see fig. 2). The second stage (Sebilian II) corresponds to a period with a significant drop in the lake level. Lithic artefacts are then made from flint as flint outcrops were now exposed. Levallois production still forms an important part of the assemblages, along with

Only Smith (1966b, 336) proposes to include it in the Palaeolithic cultural sequence and call it the ‘Menchian’.
bladelet production. The toolkit is composed of numerous endscrapers, flakes with a trimmed base, retouched flakes, with trapezoidal or triangular shape (see fig. 2). Lunates, and artefacts that Vignard call ‘prototypes of microburins’, related to the trimming of the base of the flakes, appear. The third stage (Sebilian III) concerns occupations located near localised ponds, as the lake levels dropped again. It is characterised by similar tool types than in the second level, but in a diminutive form. Levallois production persists although as a minor component. The number of endscrapers decreases compared to the second stage, but microburins, lunates and geometric tools in general increase (see fig. 2). Vignard correlates the changes in the toolkit of the third stage with changes in the faunal assemblage (and reduced water supply).

With this succession of industries, Vignard sees a gradual change from Mousterian to microlithic industries, which he tentatively places around the Last Glacial Maximum, and which he sees as representing the origins of the microlithic industries of the end of the Upper Palaeolithic in Europe. In his study, he relies on the notion of a local linear development, with tool types gradually drifting away from each other (Levallois point with a trimmed base to a point with a geometric form manufactured using ‘proto’- microburins, to microlithic geometrics manufactured using the microburin technique). If his interpretation of the Sebilian as the origins of European microlithic industries of the end of the Upper Palaeolithic did not convince the prehistorian community (e.g., Huzayyin 1941), the Sebilian as a formal taxonomic unit of the Late Palaeolithic of the Nile Valley remained.
Figure 1. Map with main localities mentioned in the text. 
Figure 2. Sebilian artefacts. Sebilian I artefacts modified after (Vignard 1955b, fig. 5), Sebilian II artefacts modified after (Vignard 1955b, figs 4 & 5), Sebilian III artefacts modified after (Vignard 1955a, figs IX, XdXII), Sudanese Sebilian (Sebilian I/II) artefacts after (Marks 1968b, fig. 8)
2.2. The Sebilian’s legacy in the taxonomic system of the Late Palaeolithic of the Nile Valley until the Nubia Campaign

The history of the Sebilian is significant in that it shows that one of the first formally defined taxonomic unit of the Late Palaeolithic of the Nile Valley was defined using typologies that were used to describe French Upper Palaeolithic industries at the beginning of the 20th century, in a theoretical framework where the notion of progressive linear typological change dominates, and which, ultimately, is interpreted as representing an independent local development, possibly at the origins of later Upper Palaeolithic industries in the Mediterranean basin.

Shortly after the first publication of the Sebilian, Sandford and Arkell include the Sebilian in their observations of the archaeological record of the Sudanese Valley and the Fayum (Sandford and Arkell 1928; 1933). In their work, the Sebilian is however almost interpreted as a geological stage containing diminutive Levallois artefacts. Their use of the Sebilian was challenged by Caton-Thompson and colleagues (Caton-Thompson, Gardner, and Huzayyin 1936). In her review of ‘Levalloisian industries of Egypt’, Caton-Thompson concludes however that based on existing evidence, there is reason to consider that the term ‘Sebilian’ as defined by Vignard’s collections at the type station is valid only for Southern Upper Egypt and Nubia (Caton-Thompson 1946, 112). In Caton-Thompson’s views, the end of the Levalloisian (Middle Palaeolithic) in Egypt is characterised by a series of independent regional developments from Levalloisian industries to microlithic, backed-blade industries, which would denote *far-separated palaeolithic groups* (Caton-Thompson 1946, 118). She groups them under the term *Epi-Levalloisian*, at the end of the Middle Palaeolithic, within which the Sebilian (Stages I and II) in Southern Egypt and the Khargan at Kharga Oasis, both characterised by diminutive Levallois forms and basal truncations, and other northern Egypt equivalents (e.g., Huzayyin 1941) are found (see also Kleindienst 2020 for a review of the Khargan Complex). In her view, they are overlapping with the Aterian industry documented at Kharga, then considered as an Upper Palaeolithic industry.

Most scholars at that time considered the beginning of the Egyptian ‘Upper Palaeolithic’, *which included* the Epi-Levalloisian (Sebilian I and II, Khargan) and the Aterian, as broadly contemporaneous to fully-fledged blade industries of the European Upper Palaeolithic (Huzayyin 1941, 265, table XVII). As such, the later Palaeolithic record in Egypt was seen as a persistence of Levalloisian traits, and as “retarded” or “stagnant” compared to the European and Near Eastern Palaeolithic record (see discussion in Smith 1966b). This remained the prevalent idea in the
3. Cultural taxonomy during the second half of 20th century

3.1. The Upper and Late Palaeolithic of the Nile Valley during the second half of the 20th century

3.1.1. The Nubia Campaign (1960-1971)

After the pioneering works of the first half of the 20th century, archaeological research in Egypt came to a stop, which is in part due to World War II and the subsequent political unrest with the Fall of Monarchy, the beginning of war with Israel and conflicts around the rise to power of Nasser, and the declaration of the Republic of Egypt in 1953 (Gayffier-Bonneville 2016). Renewal of prehistoric archaeological investigations in Egypt occur in the 1960s in link with the building of the Aswan High Dam, which gave rise to an extremely ambitious programme of salvage archaeology starting in 1960 and until 1971, the Nubia Campaign (Hassan 2007).

For what concerns Palaeolithic research in the frame of the Nubia Campaign, the main contributions were brought by the Combined Prehistoric Expedition (CPE, jointly sponsored by the Southern Methodist University (USA), Institute of Archaeology and Ethnology, Polish Academy of Sciences, and Geological Survey of Egypt and directed by F. Wendorf, Schild and Wendorf 2002), along with the Joint Scandinavian, University of Colorado, University of Pennsylvania, Yale University and Indian and Soviet Union parties prehistoric expeditions. The publication of the two volumes of *The Prehistory of Nubia* by the CPE in 1968 represents one of the most significant contributions to the building of a chrono-

---

3 This occurred despite Caton-Thompson’s arguments that the Epi-Levalloisian might be contemporaneous with the Mousterian and Chatelperronian in Europe (Caton-Thompson 1946, 117). At that time, chronometric dating did not exist yet.
cultural framework for the prehistory of the region (F. Wendorf 1968d), but it is not
the only one (Kleindienst 1972; Irwin, Irwin, and Wheat 1968; Smith 1967a; Reed
et al. 1967, and see contributions in the journal Kush).

In 1960, Fred Wendorf is the Director of Research and Associate Director of the
Museum of New Mexico. He has at that time no previous experience in African
archaeology but has a solid expertise in salvage archaeology in the USA, and is
very interested in becoming involved in the Nubian campaign (F. Wendorf 2008b;
2008a, chap. 14). In an autobiographical account of these years, F. Wendorf
mentions that his first action was to go to Europe and search for promising,
experienced, young prehistorians who would join [his] staff in Egypt or Sudan.
[He] needed to hire several people who knew European Paleolithic typology. [His]
first stop was in Bordeaux to see François Bordes (F. Wendorf 2008b, 317). This
citation shows the preponderance of the European (and in particular French)
approach to lithic studies in the Old World at that time, as well as the assumption
that the Egyptian prehistoric record would be comparable to the European record,
despite earlier works underlining the specificities of the Egyptian Palaeolithic
record (see above). It is also interesting to note that none of the early members of
the team had previous experience in other regions of the African continent. Perhaps
as a consequence, the typology of the Epipalaeolithic of the Maghreb published by
Tixier in 1963 (Tixier 1963) was not used for the description of new Late
Palaeolithic industries, as it was not known to most of the team members. Wendorf
will regret this in a later publication where he states:

That the contacts [between team members in the field] were not more
frequent was unfortunate because Schild had just spent several months
in France where he learned the new, then still unpublished Late
Paleolithic typology developed by Tixier (1963). Unaware of Tixier’s
work, Marks and Shiner developed their own typology based in part on
the one developed by Madam Bordes for the Late and Final Paleolithic
in the Levant. I did not hear about Tixier’s typology until after all our
classifications were completed and the results were soon to be
published. (F. Wendorf 2008b, 323)

The two volumes of The Prehistory of Nubia form a milestone in the study of the
prehistory of the Nile Valley as they define a chrono-cultural framework, which is
in a large part still used today. In particular, for the Late Palaeolithic, they add a
significant body of radiocarbon dates, and define numerous Late Palaeolithic
industries (e.g., Halfan, Ballanan, Qadan, Arkinian, Gemaian). The CPE was not
the only team who contributed to the taxonomic system of the Late Palaeolithic of
the Nile Valley (see Table 1). The Silsilian and Sebekian industries were defined by
the Canadian Prehistoric expedition (Smith 1966a), led by PEL Smith, and these industries were also recognized at other sites in the region (Phillips and Butzer 1973; Butzer and Hansen 1968). Smith also defined the Menchian, an industry with typological characteristics consistent with what Vignard once called Aurignacian (Vignard 1954), but which according to the stratigraphic position of the occurrences observed by Smith could be attributed to the end of the Pleistocene (Smith 1966a). This industry is however only described at a few sites in the Kom Ombo area. Similarly, the university of Colorado Nubian Expedition documented in Wadi Halfa an industry with no apparent parallels with others described during the Nubia Campaign and named the Dabarosan (Irwin, Irwin, and Wheat 1968).

3.1.2. The Sebilian during the Nubia Campaign

These renewed investigations in the Nile Valley, and in particular the addition of chronometric dates mark a shift in the interpretation of the Late Palaeolithic in the Nile Valley, as can be seen from the re-interpretation of the Sebilian industry. Marks (1968b) reports on nine sites identified by the CPE during the Nubia Campaign in northern Sudan, on the northern end of the second cataract, and north of Wadi Halfa on the east bank of the Nile. While relying on Vignard’s (1955b) initial definitions of Sebilian tool types, which were based on the shape of their outline and given geometrics names (e.g., triangles, trapezes), but which were in practice difficult to apply to Sebilian tools, Marks takes a different approach and groups retouched tools in categories defined based on whether the tool shows a basal truncation, oblique truncation, backing, or a combination of these features (Marks 1968b, 463). Based on these criteria, Marks tentatively correlates the Sudanese Sebilian with the Kom Ombo Sebilian and finds more similarities with Sebilian I, even if the microburin technique is present in the Sudanese Sebilian sites (see fig. 2).

Chronometric dates published in 1968 place the Sudanese Sebilian (Sebilian I) at the very end of the Pleistocene, between 12600 and 13100 cal BP (Marks 1968b; A. Leplongeon 2021 Suppl. Info. 1c). Interestingly, at around the same time, Smith reports on several Sebilian sites in the Kom Ombo area as part of the investigations of the Canadian Prehistoric Expedition, and in particular the site of Sebil VII, which presents intermediate characteristics between Vignard’s Sebilian I and II, and with radiocarbon dates on shells between 13850 and 16900 cal BP (Smith 1967a; 1967b; Suppl. Info. 1c A. Leplongeon 2021). This suggests a terminal Pleistocene age for the earliest stage of the Sebilian.
Based on the chronometric dates for the Sudanese Sebilian sites and their geomorphological position, Marks argues that these new data make the filiation proposed by Vignard (and Caton-Thompson) between the latest Mousterian and the Sebilian unlikely. Marks instead develops the working hypothesis that the peculiar characteristics of the Sebilian might be explained by some connections between the Sebilian and Central African industries (e.g., Tshitolian, (Clark 1963)), although data from regions located between the Nile Valley and Central Africa are needed to confirm this hypothesis (Marks 1968b, 526–31).

Few Sebilian sites have been identified after the Nubia Campaign. They include two sites on the Dishna Plain (Hassan 1972) and one site near El Kihl (Hassan and Wendorf 1974) (see fig. 3). Based on the data published by Marks and these new data, Hassan proposes to include in the Sebilian only what was originally defined by Vignard as Sebilian I or Lower Sebilian. According to Hassan, the Middle and Upper Sebilian are very different and belong to another industry (Hassan 1978; Hassan and Wendorf 1974). This therefore marks another rupture in the consideration of the Sebilian as a gradual evolutionary stage between the Mousterian and microlithic industries. However, despite being considered as the most widely recognized Egyptian Palaeolithic industry (Hassan and Wendorf 1974, 211), no further sites belonging to the Sebilian were identified in the region (except for a few artefacts at one site in Wadi Kubbaniya, (Hill, Wendorf, and Schild 1989)), and the many questions around this industry remain open. In particular, most research following Vignard’s research on the Sebilian focused on the earlier stage of the Sebilian (Sebilian I, considered as ‘true’ Sebilian by Hassan), and Vignard’s Sebilian III remains without parallel. It is tempting, however, to draw some parallels between the Sebilian III and the Afian industry, the only other Late Palaeolithic industry characterized by microlithic geometrics and the use of the microburin technique (Close, Wendorf, and Schild 1979; A. Leplongeon 2017). But detailed comparative research alone will be able to confirm or infirm this hypothesis.

This short overview of the history of the Sebilian shows that the Sebilian as it is defined in the 1970s has few in common with Vignard’s 1928 definition, especially for what concerns its interpretation and significance for the Egyptian Palaeolithic.
Figure 3. Location of sites attributed to the Sebilian after the Nubia Campaign. Count of sites is based on an arbitrary grid defining square areas of 5*5km. Made using QGIS 3.14. Background: ESRI World Imagery.
3.1.3. The Upper and Late Palaeolithic of the Nile Valley after the Nubia Campaign

Besides their work in the Nubia campaign, the CPE conducted major new prehistoric fieldwork projects in an area of Esna and Dishna, north of the High Dam, leading to the definition of new Late Palaeolithic industries (e.g., Levallois-Idfuan, Afian, Isnan) and to tentative correlations of geological formations along the Nile (F. Wendorf and Schild 1976; Hassan 1974; Lubell 1974; Close 1977). After a short stop of their research in Egypt in 1969-1972 in the context of the conflict between Egypt and Israel, the CPE resumes field research in Egypt with fieldwork in Dakhla Oasis in 1972-1973 (Schild and Wendorf 1977) and then in Bir Sahara and Bir Tarfawi (F. Wendorf, Schild, and Close 1993; Schild and Wendorf 1981). However, for what concerns the Late Palaeolithic, the main contribution of the CPE after the Nubia campaign is their work at Wadi Kubbaniya, which provided the best chronometrically dated complex of sites and a detailed palaeoenvironmental model for the Late Palaeolithic of the region, together with the definition of a new Late Palaeolithic entity, the Kubbaniyan (F. Wendorf, Schild, and Close 1980; 1989). Field research at Wadi Kubbaniya has been ongoing until recently in the frame of the Combined Prehistoric Expedition Foundation and the Aswan-Kom Ombo Archaeological Project (CPEF/AKAP, Banks et al. 2015).

Other major works for the Late Palaeolithic of the area were conducted by the Belgium Middle Egypt Prehistory Project (BMEPP) in Middle Egypt in the 1980s, which led to the recognition of early Upper Palaeolithic sites at Nazlet Khater 4 and Shuwikhat, which were each assigned to distinct industries (Khaterian and Shuwikhatian). Other Late Palaeolithic sites were assigned to one of the industries previously defined or left without further labelling than ‘Late Palaeolithic’ (Vermeersch 2002; 2000). Works by the Kharga Oasis Prehistory Project and by the Dakhlah Oasis Project led to the recognition of a number of sites that they attribute to the Later Stone Age, but limited data is available as to their lithic characteristics (Kleindienst et al. 2020), as most of the work of the KOPP and DOP focused on earlier periods of the Palaeolithic. However, it is interesting to note that if methods used by the CPE and the BMEPP in the Nile Valley derived from the methods used to describe the European Palaeolithic record, a different approach is taken by the KOPP and DOP projects where the Africanist terminology is used and the later prehistory is referred to as the Later Stone Age. The use of European terminology and methods to describe the Egyptian record has been strongly criticized by M. Kleindienst:

“As an Africanist, I regard Pleistocene Europe as a relatively unimportant cul-de-sac at the westernmost tip of Eurasia, and the Near
East as the 'hinterland of Africa', if not a direct geographic extension of Africa. (…) These are certainly not the views that are expressed, for example, when members of the Combined Prehistoric Expedition (CPE), working in the Nile Valley or the Western Desert, use the words 'Mousterian' and 'Middle Paleolithic' synonymously (…); or when the Belgian expedition working in the Nile Valley automatically regards a blade-based lithic industry as necessarily 'Upper Palaeolithic' (…), although it dates to over 30,000 years ago, and there are many other blade-based industries in Africa, some much older than that. An Africanist view is not taken when Francois Bordes' European typology and techniques (Bordes, 1961; 1967) are the only ones used by most prehistorians across northern Africa without any convincing demonstration of the comparability of the material to European prototypes (…).” (Kleindienst 2001, 4).

Despite this diversity of approaches, most of the Late Palaeolithic industries of the Nile Valley were defined by the CPE, and this may lead to the assumption that these industries have been defined in a uniform way, using the same criteria. This assumption is further investigated below.

3.2. A uniform way of defining Late Palaeolithic taxonomic entities in the Nile Valley?

For the later Pleistocene archaeology of Egypt and Sudan, most of the data available come from a stretch of the Nile Valley comprised between Sohag in Egypt and the 2nd cataract in Sudan. There has been a long standing debate in the literature over whether the desert was inhabited during the later Pleistocene, focusing on the chronological attribution and validity of the Terminal Middle Stone Age Khargan Complex as an archaeological entity (Vermeersch 2009; Kleindienst 2020; Kleindienst et al. 2020). In particular, Kleindienst (2020) and Kleindienst et al. (2020) review in detail the “Khargan quandary”. As mentioned above, the Khargan was first documented at Kharga Oasis, and was seen by Caton-Thompson as being a late development of the Levalloisian succession (Caton-Thompson 1946). The Khargan was later identified in other oases of the Western Desert (Dakhla, Kurkur and Dungul (Hester and Hobler 1969; Kleindienst 2020)), and possibly in the Nile Valley and west of the Nile Valley (Debono 1971; 1972; 1973; and Olszewski,
cited in Kleindienst 2020). Taking into account Khargan occurrences’ settings, and state of the artefacts work by KOPP suggests that they postdate the Aterian and, provisionally, chronologically places them during MIS 3, where ESR (Electronic Spin Resonance) dates on freshwater pond snail shells document water availability in these areas (Kleindienst 2020). The Khargan Complex is therefore considered as a Terminal Middle Stone Age entity. Only three Later Stone Age localities were identified in Kharga, and their material remains unpublished (Kleindienst et al. 2020, 66). Although palaeoenvironmental data seem to point to periods with water availability in the oases of the Western Desert around the same time than the Late Palaeolithic in the Nile Valley, direct association with archaeological material is at the moment lacking. If partial overlap between the Khargan and Later Stone Age in the Western Desert oases and the Upper and Late Palaeolithic in the Nile Valley were to be confirmed, this would open a whole new set of research perspectives on regional interactions between the Nile Valley and adjacent deserts at that time.

Currently, however, for the end of the Pleistocene, dated archaeological evidence is only available from the Nile Valley. Out of 18 taxonomic entities defined for the Late Palaeolithic the Nile Valley, 11 were defined by the CPE, who also contributed to the re-interpretation of the Sebilian (See tables 1 and 2). Besides some chronological patterning, some are only found in southern Egypt north of the first cataract, others only between the first and the second cataract (see table 1 and fig. 4). When cases for strong similarities between industries north and south of the first cataract were made, the industries were merged (such as the Ballanan-Silsilian). Four (the Khaterian, the Darbarosan, the Menchian and the Sebekian) were only defined at one site or localized group of sites. Because most of these Late Palaeolithic entities were defined by the same research group, we could assume a certain homogeneity in the ways of describing lithic industries. This is true up to a certain extent. The approach used by the CPE to define these industries in the 1960s relied on the grouping of assemblages based on their core and retouched tool typologies. In addition, within each defined industry, gradual, directional changes in terms of relative increase or decrease of the proportions of specific core or tool types are expected to occur with time, the latter defined by the relative stratigraphic position of each assemblage. This is particularly apparent for example in the description of the Halfan lithic development within the Halfan industry (Marks 1968a). For the industries defined after the end of the Nubia campaign in the Prehistory of the Nile Valley, published in 1976, a similar approach seems to have been taken by the CPE, albeit using Tixier’s 1963 typology. Indices such as the Levallois index as well as proportions of specific types of tools such as...
burins, tools with ochtata retouch or backed elements are used to characterize differences between assemblages. For example, three stages were defined within the Isan industry, suggested by both the relative stratigraphic location of the sites and their tool composition with lower frequency of endscrapers and higher percentage of burins (F. Wendorf and Schild 1976, 291).

There has been some differences however, on how members of the CPE interpreted the meaning of these different entities defined on the basis of typological differences. As faunal assemblages associated with these industries appear similar, Wendorf and colleagues generally adopted the working hypothesis to consider assemblages within each industry as the product of a group of closely related social units that shared a common way of life (F. Wendorf 2008b). Lubell (1976, 123) however, based on his study of the Fakhurian assemblages, proposes that an alternative way of interpreting this variability might be to view certain of these industries as seasonal variants. This alternative interpretation is somewhat influenced by the Bordes-Binford debate on the significance of Mousterian variability taking place at the time (Lubell 1976, 122).

Functional analyses themselves are however little developed for what concerns the Late Palaeolithic of the Nile Valley, although the ones available have led to a re-evaluation of categories of artefacts based on typology only (e.g., Jensen et al. 1991; Becker and Wendorf 1993; Longo 1997). This suggests that future studies integrating functional analyses have the potential to contribute to the meaning attached to the definition of these taxonomic entities.

But it is the work of Angela Close, who developed and applied a stylistic approach to lithic variability to lithic assemblages from the Late Pleistocene in North Africa, that first challenges the idea of the industries representing distinct social groups. In particular, she states that it is difficult to interpret the significance of typological similarity between assemblages, and simplistic to assume it to be a universal indicator of the social affinity of their makers (Close 1977, 4).

In her work, she considers all Late Palaeolithic / Epipalaeolithic industries of North Africa to be part of the same techno-complex sensu Clarke (1968) (Close 1977). She uses the concept of style (Sackett 1977), which is the idea that different ways exist to arrive at the same end (e.g., a specific stone tool). Instead of considering inter-assemblages typological differences, her work is based on the definitions of attributes that are primarily stylistically determined among the commonest tool-types found within the Late Palaeolithic / Epipalaeolithic industries of North Africa, i.e., backed bladelets (Close 1977), but also end-scrapers, truncations, trapezes or triangles (Close, Wendorf, and Schild 1979). The results of her cluster analyses of assemblages based on stylistic similarities are broadly consistent with the grouping of assemblages in industries defined on typological criteria. However, she highlights that
differences between some industries in the Nile Valley are better explained by other factors than socio-cultural ones (e.g., functional, for example between the Afian and the Ballanan-Silsilian, or regional, with for example, the Halfan and the Kubbaniyan, which could be regarded as regional ‘facies’ of the same industry) (Close 1977, 234; 1980, 257; Close, Wendorf, and Schild 1979, 231; Close 1989, 764; but see also Close 2002).

While there has been some debates on the significance of typological approaches in the definition of taxonomic entities of the Late Palaeolithic of the Nile Valley with the work of Close and Lubell within the CPE, taxonomic entities (industries) defined based on tool and core types have prevailed and remained in use (e.g., Schild and Wendorf 2010). The way the industries were initially defined can therefore be considered as mostly uniform (see also Table 2). However, from the 1980s onwards, the rise of technological approaches to lithic assemblage led to problems when discussing the place of newly excavated assemblages in this framework.

While there has been some debates on the significance of typological approaches in the definition of taxonomic entities of the Late Palaeolithic of the Nile Valley with the work of Close and Lubell within the CPE, taxonomic entities (industries) defined based on tool and core types have prevailed and remained in use (e.g., Schild and Wendorf 2010). The way the industries were initially defined can therefore be considered as mostly uniform (see also Table 2). However, from the 1980s onwards, the rise of technological approaches to lithic assemblage led to problems when discussing the place of newly excavated assemblages in this framework.

Table 1. List of all Upper and Late Palaeolithic industries defined in North-Eastern Africa. Bold values in chronological range show industries with five or more chronometric dates (excl. minimum ages) (Data after A. Leplongeon 2021).

<table>
<thead>
<tr>
<th>UP/LP industry name</th>
<th>Team</th>
<th>Main references</th>
<th>Geographic area</th>
<th>Chronological range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Khaterian</td>
<td>BMEPP</td>
<td>(Vermeersch et al. 1982; Vermeersch, Paulissen, and Vandebeken 2002; A. Leplongeon and Pleurdeau 2011)</td>
<td>Nazlet Khater</td>
<td>Ca. 35-40 ka cal BP</td>
</tr>
<tr>
<td>Shawikhatian/Idfuan</td>
<td>BMEPP/CPE</td>
<td>(Vermeersch, Paulissen, and Van Peer 2000; F. Wendorf and Schild 1976)</td>
<td>Middle &amp; Upper Egypt</td>
<td>Ca. 25 ka BP</td>
</tr>
<tr>
<td>Menchian</td>
<td>Toronto</td>
<td>(Vignard 1954; Smith 1966b)</td>
<td>Korn Ombo</td>
<td>undated</td>
</tr>
<tr>
<td>Sebekian</td>
<td>Toronto</td>
<td>(Smith 1966a)</td>
<td>Korn Ombo</td>
<td>16.5-20 ka cal BP</td>
</tr>
<tr>
<td>Levallois Idfuan</td>
<td>CPE</td>
<td>(F. Wendorf and Schild 1976)</td>
<td>Edfu, Esna</td>
<td>19.7-22 ka cal BP</td>
</tr>
<tr>
<td>Fakhurian</td>
<td>CPE</td>
<td>(Lubell 1974)</td>
<td>Esna, Wadi Kubbaniya</td>
<td>23-25.6 ka cal BP</td>
</tr>
<tr>
<td>Gemaian</td>
<td>CPE</td>
<td>(Shiner 1968)</td>
<td>Wadi Halfa</td>
<td>Undated</td>
</tr>
<tr>
<td>Halfan</td>
<td>CPE</td>
<td>(Marks 1968a)</td>
<td>Wadi Halfa, Upper Egypt</td>
<td>19-24 ka cal BP</td>
</tr>
</tbody>
</table>

 Deleted: ¶
 Despite the remaining questions on the meaning and significance of the typological variability within the Late Palaeolithic of the Nile Valley,
 Deleted: ¶
 Deleted: ¶
 Deleted: ¶
 Deleted: ¶
 Deleted: ¶
 Deleted: ¶
 Deleted: ¶
 Deleted: ¶
 Deleted: ¶
 Deleted: ¶
 Deleted: ¶
<table>
<thead>
<tr>
<th>Period</th>
<th>CPE</th>
<th>Location</th>
<th>Age Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qadan</td>
<td>CPE (Shiner 1968; Usai 2020)</td>
<td>Wadi Halfa, Upper Egypt</td>
<td>12–20.2 ka cal BP</td>
</tr>
<tr>
<td>Sebilian</td>
<td>Vignard / redefined by CPE (Hassan 1978; Marks 1968b; Vignard 1923; 1955b)</td>
<td>Kom Ombo, Dishna</td>
<td>12.6–16.9 ka cal BP</td>
</tr>
<tr>
<td>Isnan</td>
<td>CPE (Hassan 1974; F. Wendorf and Schild 1976)</td>
<td>Middle and Upper Egypt</td>
<td>13.2–16.6 ka cal BP</td>
</tr>
<tr>
<td>Arkinian</td>
<td>CPE (Schild, Chmielewska, and Wieckowska 1968)</td>
<td>Wadi Halfa</td>
<td>11.9–12.8 ka cal BP</td>
</tr>
<tr>
<td>UP/LP industry name</td>
<td>Main core and tool types</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Khaterian</td>
<td>“Upper Palaeolithic-like” blade cores, important diversity in reduction strategies, with dominance of single-platform cores; numerous burins</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shuwikhatian/Idfuan</td>
<td>Blade production using opposed platform cores and created products; denticulates, burins, endscrapers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Menchian</td>
<td>“Aurignacian-like” industry; blade industry; numerous endscrapers and retouched blades; few burins</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sebekian</td>
<td>Blade/let produced from flat, prismatic or cylindrical blade cores; retouched bladelets, some end-scrapers, burins, perforators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Levallois Idfuan</td>
<td>Blade production using opposed platform cores, use of Levallois and Halfa methods; notches, denticulates are dominant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fakhurian</td>
<td>Blade and bladelet production, single and opposed platform cores; backed bladelets largely dominant, retouched pieces and perforators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gemaian</td>
<td>Halfan and Nubian-like cores; denticulates and notches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Halfan</td>
<td>Microlithic aspect; Halfan and Levallois cores; Ouchtata and backed bladelets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kabbaniyan</td>
<td>Flake and bladelet production, use of single and opposed platform cores, occasional use of Levallois and Halfa methods; Ouchtata and backed bladelets, burins</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ballanan-Silsilian / Dabarosan</td>
<td>Short elongated blanks (blade/let) with single and opposed platform cores; backed pieces, truncations, proximally retouched blade(let)s and notched tools, occasional use of the microburin technique</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qadan</td>
<td>Small dimensions of the artefacts; mainly oriented towards flake production with single and opposed platform cores, several cores reminiscent of the Levallois methods for Qadan point production, bladelet production documented in some but not all sites; Qadan points, burins, small scrapers and backed pieces (the latter only at some sites)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Afian</td>
<td>Wide and small elongated products, planimetric conception of debitage with high frequencies of faceted platforms, truncations, backed bladelets and geometrics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sebilian</td>
<td>Discoidal and Levallois cores for the production of flakes, truncated and backed flakes, use of the microburin technique</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isnan</td>
<td>Production of flakes and rare blades from single and opposed platform cores; high percentage of endscrapers, followed by notches and denticulates, rare backed pieces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arkonian</td>
<td>Bladelet and flake production from single and opposed platform cores, presence of bipolar reduction, stone anvils; numerous backed pieces and endscrapers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 4. Map showing location and number of sites attributed to three main periods of the Upper and Late Palaeolithic in the Nile Valley.

Count of sites is based on an arbitrary grid defining square areas of 5*5km. Made using QGIS 3.14. Background: ESRI World Imagery.

4. Cultural taxonomy in the Late Palaeolithic of the Nile Valley:

current problems and elements of discussion

Most of the Late Palaeolithic industries of the Nile Valley were defined in the 1960s and 1970s. Many comprise only a few assemblages, some are not well-dated. For example, only five of these industries are dated using five or more radiocarbon dates that have been considered reliable (see tables 1 and 2); they are the Kubbaniyan (19.3-23.5 ka cal BP), the Halfan (19-24 ka cal BP), the Qadan (12-20.2 ka cal BP), the Afian (14-16.8 ka cal BP) and the Isnan (13.2-16.6 ka cal BP) (see review in A.
Leplongeon 2021, tbl. 3).

Of these five relatively well-dated industries, Close’s stylistic analysis suggested that the Halfan and the Kubbaniyan may be considered as two regional variants of the same industry (Close 1980). In addition, several industries have been subject to discussions related to their definitions. This is the case for example of the Qadan and the Afian.

The Afian was defined shortly after the Nubia Campaign by the CPE during excavations near Esna, as an industry characterised by the production of short elongated blanks from wide and flat opposed-platform cores with prepared striking platforms and a tool-kit where atypical geometric microliths, truncated blades and flakes and backed pieces predominate (F. Wendorf and Schild 1976). Afian assemblages from the Esna area were studied in detail by A. Close (Close, Wendorf, and Schild 1979). However, none of the sites from the Esna area are well-dated, and all chronometric dates for the Afian are coming from assemblages that have been later associated with the Afian. These sites include GS-2B-I in the Kom Ombo area (Phillips and Butzer 1973; Butzer and Hansen 1968; Reed 1965; Reed et al. 1967; Stuiver 1969) and Makhadma 4 near Qena (Vermeersch, Paulissen, and Huyge 2000). Attribution to the Afian for the lithic assemblages of these two sites have however been subject to some debates. At the time of their discoveries, assemblages from GS-2B-I were attributed to the Middle Sebilian (Sebilian II) (Reed et al. 1967; Smith 1966a), but they are later included in the Afian by Schild and Wendorf (Schild and Wendorf 2010). Similarly, attribution of the lithic assemblages of Makhadma 4 was much debated. A first hypothesis was to relate them to the Idfuan or Silsilian (Vermeersch, Paulissen, and Van Neer 1989, 112). However, Wendorf and Schild (1989, 811–12) propose an Afian attribution, and the excavators seem to later agree as they mention it is ‘Afian-related’ in a later publication of the site (Vermeersch, Paulissen, and Huyge 2000, 270). A comparative analysis between one assemblage attributed to the Afian, E71K18-C and published data on the assemblage of Makhadma 4 however shows a number of important differences leading to reconsider the grouping of these two sites under the same industry, results suggesting that Makhadma 4 may be closer to Silsilian sites, as initially suggested by the first publication on Makhadma 4 (A. Leplongeon 2017). Beyond issues related to the attribution of assemblages to one or the other industry, these debates illustrate the need to be cautious when considering the chronological range of industries of the Late Palaeolithic of the Nile Valley, as this example shows that dating of the Afian exclusively relies on dates associated with assemblages, which may or may not be considered Afian, depending on which criteria are taking into account.

The Qadan was defined by Shiner (1968) based on sites located around the second cataract in Sudan, but none of the sites described by Shiner provided reliable dates. The Qadan has also been described at sites around Wadi Halfa, Tushka, Ballana and
Wadi Kubbaniya in northern Sudan and southern Egypt (see list in A. Leplongeon 2021 Suppl. Info 1b). There has been significant discussion on its definition (primarily based on its microlithic aspect, and the typological composition of assemblages (endscrapers, lunates, burins and backed micro-flakes or micro-blades) (Shiner 1968; F. Wendorf 1968b)), development (increase and decrease of specific core types and proportions of tools), chronological range and whether specific sites are indeed Qadan, in particular site 117, or Jebel Sahaba (for a review of current debates, see Usai 2008; 2020; Crevecoeur et al. 2021 SI). The Qadan received particular attention as it is the industry that was associated with site 117, which is the largest cemetery known for the Late Palaeolithic of the area and is associated with evidence for repeated inter-personal violence (Anderson 1968; F. Wendorf 1968a; Crevecoeur et al. 2021). Because of this particular context, the meaning put behind the use of the taxonomic unit Qadan may be of particular significance. It is often assumed that the different, broadly contemporaneous, industries of the Late Palaeolithic of the Nile Valley reflect distinct human groups (Schild and Wendorf 2010; Crevecoeur et al. 2021). Together with the renewed evidence for repeated episodes of inter-personal violence at the Jebel Sahaba cemetery, probably linked to inter-group (rather than intra-group) violent relationships (Crevecoeur et al. 2021, 8), this leads to the hypothesis (in continuity with hypotheses already formulated by, e.g., Schild and Wendorf 2010; Vermeyensch and Van Neer 2015; Connor and Marks 1986; Butzer 1997) that evidence from site 117 may reflect territorial competition between distinct human groups living in the Nile Valley in the context of important palaeoenvironmental changes at the end of the Pleistocene (Crevecoeur et al. 2021). While the authors remain cautious in their interpretation and refrain from making a direct link for example between the groups producing Qadan assemblages and the attackers of the group who buried their dead at Jebel Sahaba, the research history and debates on cultural taxonomy that have characterised the research on the Late Palaeolithic of the Nile Valley presented above calls for further work focusing on the socio-cultural meaning of taxonomic units defined in the Nile Valley.

Despite some discussion on the attribution of assemblages to specific industries, the current taxonomic framework of the Late Palaeolithic of the Nile Valley has remained more or less fixed until today. The examples of the Afian and Qadan presented above however show that future work should pay attention to the nature of this taxonomic system and its relevance to current questions. Debates have indeed until now focused on whether an industry should be attributed to one or the other taxonomic entity but have not fundamentally questioned the structure of this taxonomic system, which, as seen in the examples above, may be the source of the problems encountered in some cases. Industries are generally considered as representing to some extent different socio-cultural groups inhabiting the Nile Valley at the end of the Pleistocene. While this idea may have received some support, at least for some industries that were defined by the stylistic studies by Close, her studies also suggested that other factors than socio-cultural factors may explain inter-
industry variation. In continuity with her work, present discussions and debates suggest that renewed discussion on the meaning of these taxonomic units should be undertaken, using methodological approaches available nowadays. In the general context of renewed attention on influence of taxonomic systems on current research questions (Riede, Hoggard, and Shennan 2019; Reynolds and Riede 2019), future studies on the Late Palaeolithic of the Nile Valley should consider the current taxonomic system of the LP of the Nile Valley as a useful framework to classify assemblages according to their core and tool typology but remain cautious to their interpretation in terms of numerous socio-cultural groups inhabiting the Nile Valley until further independent evidence may suggest this.

Acknowledgements

I thank Clément Ménard for numerous discussions on the paper. I thank Shumon Hussain, Sébastien Plutniak and Felix Riede for organizing the session “Between Variability and Singularity: Crossing Theoretical, Qualitative and Computer-based Approaches to Types and Typologies in Archaeology” at the EAA 2021 congress. Many thanks to Giuseppina Mutri and one anonymous reviewer for their useful comments on an earlier version of this manuscript.

Funding

This research has received funding from the Research Foundation – Flanders (FWO) in the frame of a postdoctoral fellowship (FWO file # 12U9220N).

Conflict of interest disclosure

The author declares that she complies with the PCI rule of having no financial conflicts of interest in relation to the content of the article. The author declares the following non-financial conflict of interest: Alice Leplongeon is a recommender of PCI Archaeology.

References


Amer, Mustafa. 1936. “The Excavations of the Egyptian University in the Prehistoric Site at Maadi, Near Cairo.” The Journal of the Royal


———. 2009. “The Evolutions and Revolutions of the Late Middle Stone Age and Lower Later Stone Age in North-West Africa.” In *The Mediterranean from 50 000 to 25 000 BP: Turning Points and New Directions*, edited by M.


Menghin, Oswald, and Mustafa Amer. 1936. The Excavations of the Egyptian University in the Neolithic Site at Maadi: Second Preliminary Report


https://gallica.bnf.fr/ark:/12148/bpt6k57813890.


https://doi.org/10.3390/geosciences11070267.


https://doi.org/10.3406/bspf.1931.5576.


impressions gouvernementales.


3569
3570
Vermeersch, P. M., ed. 2000. *Palaeolithic living sites in Upper and Middle Egypt.*
3571
Egyptian prehistory monographs 2. Leuven: Leuven University Press.
3572
———. 2020. “Human Occupation Density in the Lower Nile Valley (75,000-
15,000 Years Ago).” In *Not Just a Corridor. Human Occupation of the Nile
Valley and Neighbouring Regions between 75,000 and 15,000 Years Ago,*
edited by Alice Leplongeon, Mae Goder-Goldberger, and D. Pleurdeau,
3573
Vermeersch, P. M., M. Otte, E. Gilot, E. Paulissen, G. Giselings, and D. Drappier.
3574
https://doi.org/10.1126/science.216.4546.626.
3575
Vermeersch, P. M., E. Paulissen, and D. Huyge. 2000. “Makhadma 4, a Late
Palaeolithic Fishing Site.” In *Palaeolithic Living Sites in Upper and Middle
Egypt*, edited by P.M. Vermeersch, 227–70. Egyptian Prehistory
3576
Vermeersch, P. M., E. Paulissen, and P. Van Peer. 2000. “Shuwikhat 1, an Upper
Palaeolithic Site.” In *Palaeolithic Living Sites in Upper and Middle Egypt,*
3577
Upper Palaeolithic Underground Chert Mine.” In *Palaeolithic Quarrying
Sites in Upper and Middle Egypt*, edited by P.M. Vermeersch, 211–72.
3578
Leuven: Leuven University Press.
3579
Palaeolithic Makhadma Sites (Egypt): Environment and Subsistence.” In
*Late Prehistory of the Nile Basin and the Sahara,* edited by L. Krzyzaniak
and M. Kobusiewicz, 87–114. Studies in African Archaeology 2. Poznan:
Poznan Archaeological Museum.
3580
https://doi.org/10.11588/propylaeum.194.259.
3581
Vermeersch, P. M., and Wim Van Neer. 2015. “Nile Behaviour and Late
Palaeolithic Humans in Upper Egypt during the Late Pleistocene.”
*Quaternary Science Reviews*, The Quaternary History of the River Nile,
3582
Vermeersch, P.M. 2001. “‘Out of Africa’ from an Egyptian Point of View.”
*Quaternary International* 75 (1): 103–12. https://doi.org/10.1016/S1040-
6182(00)00082-3.
3583
3584
———. 2009. “Egypt from 50 to 25ka BP: A Scarcely Inhabited Region?” In *The
Mediterranean from 50,000 to 25,000 BP: Turning Points and New
Books.


Wendorf, F., R. Schild, and Angela E. Close, eds. 1989. The Prehistory of Wadi

