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**Title:** Levallois Tradition epigones in the Middle Nile Valley: survey in the Affad Basin

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**Abstract:** The paper presents the results of an archaeological ground survey aimed to record prehistoric settlement landscape in chosen parts of the Southern Dongola Reach (Tergis, Affad and El-Nafab districts). The project fills in the gaps in earlier research on the right bank of the Nile. Numerous new sites were recorded, all reflecting a frequently occupied level of silts and sands originating in the former river valley aggradations. Prospection of locations recorded in 2003 and later demonstrated also the progressing destruction of archaeological sites on the fringes of modern settlement and the new road from Karima to Nawa.

**Keywords:** Sudan, Southern Dongola Reach, Late Pleistocene occupation, survey

تقليد رجال الصف الثاني في وادي النيل الأوسط في حوض العفاط .

Marta Osypińska, Piotr Osypiński

**الملخص:** هذا البحث يقدم نتائج مسح الأراضي الأثري ويهدف إلى تسجيل مستوطنة من عصر ما قبل التاريخ في أجزاء مختارة من جنوب دنقلا العجوز تصل إلى (Tergis, Affad and El-Nafab districts) . إن هذا المشروع يسد الثغرات في بحث سابق على الضفة اليمنى لنهر النيل. سجلت العديد من المواقع الجديدة ، وكلها تعبر بشكل متكرر عن المستوى المحتل من الغرين والرمال التي يكون منشؤها في الإطماء وادي النهر السابق. إن أعمال التنقيب في المواقع قد تم تسجيله بالفعل في عام 2003 وقد برهن لاحقا علي التدمير المستمر للمواقع الأثرية من حدود مستوطنة حديثة والطريق الجديد من كريمة الى ناوا.

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RESEARCH



## ABBREVIATIONS

<i>AA</i>	<i>Archäologischer Anzeiger; Jahrbuch des Deutschen Archäologischen Instituts</i> (Berlin)
<i>ANM</i>	<i>Archéologie du Nil Moyen</i> (Lille)
<i>ASAE</i>	<i>Annales du Service des Antiquités de l'Égypte</i> (Cairo)
<i>AV</i>	<i>Archäologische Veröffentlichungen, Deutsches Archäologisches Institut, Abteilung Kairo</i> (Berlin–Mainz am Rhein)
<i>BAAL</i>	<i>Bulletin d'archéologie et d'architecture libanaises</i> (Beirut)
<i>BAH</i>	<i>Bibliothèque archéologique et historique</i> (Paris)
<i>BAR IS</i>	<i>British Archaeology Reports International Series</i> (Oxford)
<i>BASOR</i>	<i>Bulletin of the American Schools of Oriental Research</i> (Ann Arbor, MI)
<i>BCH</i>	<i>Bulletin de correspondance hellénique</i> (Paris)
<i>BdE</i>	<i>Bibliothèque d'étude</i> (Cairo)
<i>BIFAO</i>	<i>Bulletin de l'Institut français d'archéologie orientale</i> (Cairo)
<i>BSAA</i>	<i>Bulletin de la Société d'archéologie d'Alexandrie</i> (Cairo)
<i>BSFE</i>	<i>Bulletin de la Société française d'égyptologie</i> (Paris)
<i>CCE</i>	<i>Cahiers de la céramique égyptienne</i> (Cairo)
<i>EtTrav</i>	<i>Études et travaux. Travaux du Centre d'archéologie méditerranéenne de l'Académie des sciences polonaise</i> (Warsaw)
<i>FIFAO</i>	<i>Fouilles de l'Institut français d'archéologie orientale</i> (Cairo)
<i>GAMAR</i>	<i>Gdańsk Archaeological Museum African Reports</i> (Gdańsk)
<i>GM</i>	<i>Göttinger Miszellen</i> (Göttingen)
<i>IAMS</i>	<i>Institute of Archaeo-Metallurgical Studies</i> (London)
<i>JARCE</i>	<i>Journal of the American Research Center in Egypt</i> (Boston–Princeton–New York–Cairo)
<i>JEA</i>	<i>Journal of Egyptian Archaeology</i> (London)
<i>JGS</i>	<i>Journal of Glass Studies</i> (Corning, NY)
<i>JJP</i>	<i>Journal of Juristic Papyrology</i> (Warsaw)
<i>JRS</i>	<i>Journal of Roman Studies</i> (London)
<i>MDAIK</i>	<i>Mitteilungen des Deutschen Archäologischen Instituts, Abteilung Kairo</i> (Wiesbaden)
<i>OIP</i>	<i>Oriental Institute Publications</i> (Chicago)
<i>OLA</i>	<i>Orientalia lovaniensia analecta</i> (Louvain)
<i>PAM</i>	<i>Polish Archaeology in the Mediterranean</i> (Warsaw)
<i>PSAS</i>	<i>Proceedings of the Seminar for Arabian Studies</i> (London)
<i>SAAC</i>	<i>Studies in Ancient Art and Civilisation</i> (Kraków)
<i>SAK</i>	<i>Studien zur altägyptischen Kultur</i> (Hamburg)
<i>SAOC</i>	<i>Studies in Ancient Oriental Civilization</i> (Chicago)
<i>WVDOG</i>	<i>Wissenschaftliche Veröffentlichungen der deutschen Orient-Gesellschaft</i> (Berlin–Leipzig)

# LEVALLOIS TRADITION EPIGONES IN THE MIDDLE NILE VALLEY: SURVEY IN THE AFFAD BASIN

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**Abstract:** The paper presents the results of an archaeological ground survey aimed to record prehistoric settlement landscape in chosen parts of the Southern Dongola Reach (Tergis, Affad and El-Nafab districts). The project fills in the gaps in earlier research on the right bank of the Nile. Numerous new sites were recorded, all reflecting a frequently occupied level of silts and sands originating in the former river valley aggradations. Prospection of locations recorded in 2003 and later demonstrated also the progressing destruction of archaeological sites on the fringes of modern settlement and the new road from Karima to Nawa.

**Keywords:** Sudan, Southern Dongola Reach, Late Pleistocene occupation, survey

The right bank of the Nile between Old Dongola and Karima has been studied by several Polish archaeological missions pursuing fieldwork under the auspices of the Polish Centre of Mediterranean Archaeology of the University of Warsaw. The results of a ground survey project headed by Bogdan T. Żurawski, in which the authors of this paper participated, were published in 2003 (Żurawski 2003). The survey yielded data on a cluster of sites reflecting occupation of the area around Affad (al-Affat), a village in the Southern Dongola Reach, which had been inhabited by groups using Levallois knapping methods to produce stone tools. Beside lithic scatters common throughout Sudan, the authors also recorded the preserved spatial relation of Palaeolithic

deposits containing also mineralized animal bones (Osypiński, Osypińska, and Gautier 2011). The currently collected data provide basic evidence for a study of settlement aspects hitherto unrecognized in this part of the Nile Valley, that is, internal camp organization, seasonality of camp sites, hunting and consumer preferences, environmental adaptation etc. Launched in 2011, the research project “Levallois Tradition Epigones in the Middle Nile Valley. The latest Middle Palaeolithic settlement in the Affad Basin”, funded by the National Science Center (DEC-2011/01/D/HS3/04125), is a direct extension of the results of the Southern Dongola Reach Survey (SDRS) and fills substantial gaps in the study of the prehistory of the Middle Nile Valley.

## RESEARCH METHODS

This paper presents the first stage of a research project aimed at carrying out a ground survey and test excavations in the Affad region. Site descriptions refer to and complement the earlier work (Żurawski 2003); the records of the Southern Dongola Reach Survey are cited as SDRS; the present work as 2012. Whenever site function could not be ascertained due to the state of preservation of the remains, Palaeolithic artifacts mapped by the present project were classified as traces of occupation, their presence reflecting only the extent of the area occupied by human groups in the late Pleistocene (without indicating a more specific date). The present contribution also uses Marine Isotope Stages (MIS) as a chronological marker addressing global climate changes in the past. The most important periods for the present studies are the last glacial maxima: MIS2 embracing 29–12 ka (thousands of years ago), MIS3 (starting in 57 ka), MIS4 (starting in 71 ka) and MIS5 (starting in 123 ka, after Lisiecki and Raymo 2005).

Raw material identification of lithic artifacts was based on macroscopic observations with reference to previous studies (Osypiński 2010). Simplified size criteria based on already recognized techno-morphological divisions of Nubian industries were applied in describing Palaeolithic artifacts (Van Peer 1998:128). “Large” referred to industries with predestined flakes more than 6.50 cm, dated to MIS5 or earlier (older than 71 ka); “small” addressed to industries with final products no more than 3 cm long, typical of the latest flake industries of Nubia (in the MIS2 period). Consequently,

middle-sized artifacts (most common in Affad) corresponded to a tradition of producing tools ranging between the large and small values. However, lithic technology alone is not a very precise tool for estimating the age of specific assemblages, especially in the Middle Nile Valley. Most of the finds produced with Levallois methods are generally identified with the Middle Palaeolithic (or Middle Stone Age) (for earlier efforts to resolve this methodological problem, see a discussion of morpho-technological categories in Osypiński 2003). In a broad view, both the Middle Palaeolithic and the latest Levallois-related industries existed unquestionably in the late Pleistocene, hence the term will be used here to describe less diagnostic finds.

Animal remains were identified to species and anatomical part by Marta Osypińska, who used for the purpose comparative collections in Ghent and Brussels, gratefully acknowledging the assistance of colleagues from Belgium. The remains were a source of ideas and hypothesis on specialized hunting and butchery-related behavior.

OSL age estimates were undertaken in the Academic Laboratory Centre of the Institute of Geography, Jan Kochanowski University, Kielce, Poland under the direction of Prof. Tomasz Kalicki and Dr. Ireneusz Olszak.

The results are presented as a site gazetteer being the most effective and basic tool for multiple research concerning studies of landscape exploitation in the past, palaeoenvironment shifts and archaeological heritage management.

## PRELIMINARY RESULTS

Comprehensive investigations of the geomorphology of the analyzed area [Fig. 1] are still in progress, but it is already evident that late and terminal Pleistocene sediments are exposed only in the central part of the study area (Affad region). A time-homogeneous cluster of sites is found there, connected with

settlement of small groups of people in an environment very closely related to the riparian forests and the floodland of the river. Heavily eroded assemblages occurred on the fringes of the research area, secondarily deposited on the surface of younger sandy sediments or within the gravels.

## SITE GAZETEER

<b>Tergis 52 (Trg52)</b>	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'56.9" E 31°06'26.1" 248 m a.s.l.	<b>SDRS:</b> Small cluster of Levallois flakes (some of elongated proportions), made of pinkish sandstone and chert. <b>2012:</b> Palaeolithic artifacts from the gravel (pebbles up to 3 cm in diameter) and sandy silt with calcareous crests. A few artifacts from the surface, including Levallois flakes made of chert (light in color) and pinkish sandstone, all middle-sized. One much bigger Levallois flake made of ferruginous sandstone.
<b>Tergis 60 (Trg60)</b> = Trg72 after verification in 2012	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'40.8" E 31°06'51.0"	<b>SDRS:</b> Cluster of middle-sized Levallois flakes, made of chert and pinkish sandstone, as well as small discoidal cores. <b>2012:</b> Artifacts from secondary contexts, dispersed over an extended area, covering also other locations.
<b>Tergis 61 (Trg61)</b>	Traces of late Pleistocene and early Holocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'50.1" E 31°06'41.7" 249 m a.s.l.	<b>SDRS:</b> Cluster of middle-sized Levallois flakes, including tools (scraper) made of chert and pinkish sandstone and additionally some blade tradition artifacts. <b>2012:</b> Heavily rounded, single, late Pleistocene and early Holocene artifacts (crescents) recorded on the surface of sandy silts with calcareous crests.
<b>Tergis 70 (Trg 70)</b> = Trg72 after verification in 2012	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'39.3" E 31°06'54.7"	<b>SDRS:</b> Small cluster of middle-sized Levallois flakes made of chert. <b>2012:</b> All artifacts from secondary contexts, dispersed over a large area.
<b>Tergis 71 (Trg71)</b>	Traces of late Pleistocene and early Holocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'44.8" E 31°06'45.4" 248 m a.s.l.	<b>SDRS:</b> Widely dispersed lithics, e.g., single-platform core for blades. <b>2012:</b> Lithic artifacts registered on the surface of sandy silts, partly covered with a sand dune; collected items represented debitage of discoidal cores made of quartzite and pinkish sandstone. Both flakes exhibited denticulate retouch (either intentional or accidental).



<b>Tergis 72 (Trg72)</b>	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'41.1" E 31°06'49.1" 248 m a.s.l.	<b>SDRS:</b> Cluster of flakes and blades made of chert. <b>2012:</b> Strongly colized Palaeolithic artifacts dispersed over a wide area; lithics recorded on a sandy silt surface, partly covered by dunes. Collected items included examples of Levallois points produced applying the Nubian II method, both fragments of middle-sized points made of chert and mudstone [Fig. 4:b,j] and a core made of light chert [Fig. 3:c]. Other artifacts included middle-sized chert and pinkish sandstone flakes.
<b>Tergis 73 (Trg73)</b>	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts) and early Holocene (Mesolithic) settlement.
N 18°01'57.1" E 31°08'57.1" 242 m a.s.l.	<b>SDRS:</b> Limited cluster of flint flakes (some elongated items). <b>2012–2013:</b> Site divided into two parts: gravel sheet including redeposited Palaeolithic and Mesolithic artifacts and sandy hill, estimated 2 m high, covered with remnants of the early Holocene settlement; test excavation in 2013 confirmed a sandy composition of the hill that excluded the presence of early Holocene aggradation silt sediments. Clusters of artifacts from the surface of both parts, including lithics, single pottery fragment representing the Karmakol Tradition (Philips 2003; Gatto 2006) and a molar tooth of Oribi antelope ( <i>Ourebia ourebi</i> ). Palaeolithic finds included middle-sized cores [Fig. 3:f], flakes, also elongated items [Figs 6:b,e; 7:b] and points [Fig. 4:g] made of chert, flint, quartzite and mudstone. Recorded also small discoidal cores [Fig. 5:d].

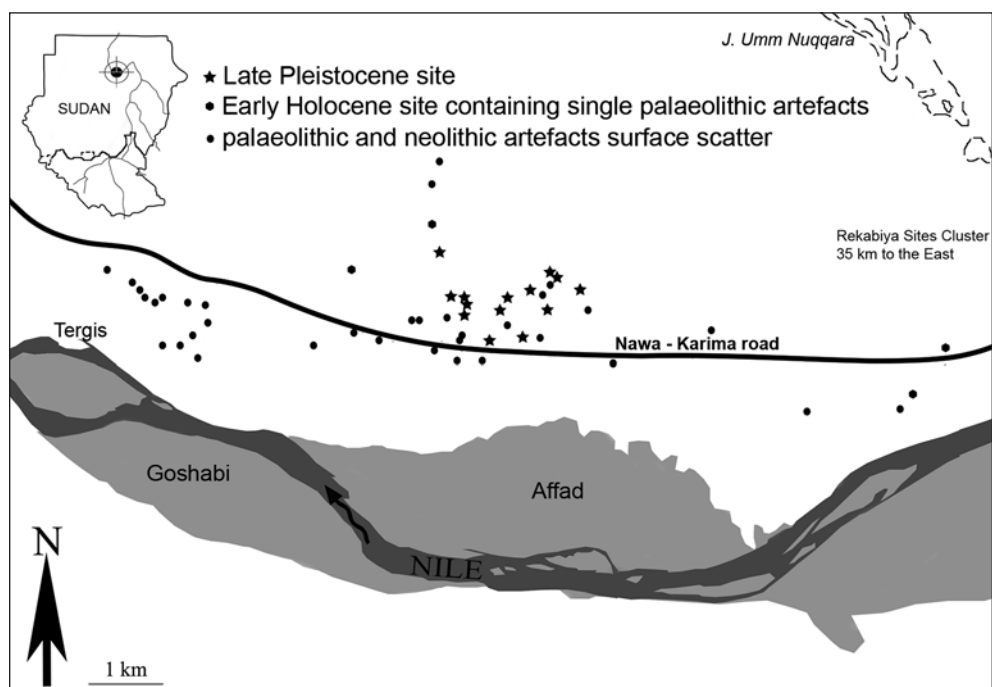


Fig. 1. Paleolithic sites in the Affad region after the 2003 and 2012 surveys  
(All drawings P. Osypiński)

<b>Tergis 74 (Trg74)</b>	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'14.0" E 31°07'01.0" 249 m a.s.l.	<b>SDRS:</b> Limited cluster of elongated flakes and middle-sized discoidal cores, all made of chert. <b>2012:</b> Artifacts on sandy silt, partly covered with a sand dune; samples of chert artifacts, including denticulated flakes [ <i>Figs 2:e; 6:b</i> ] and a scraper made on a middle-sized flake [ <i>Fig. 5:i</i> ].
<b>Tergis 78 (Trg78)</b>	Traces of late Pleistocene and early Holocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'06.4" E 31°07'21.8" 248 m a.s.l.	<b>SDRS:</b> Numerous collection of middle-sized Levallois artifacts, including retouched tools, e.g., denticulates, perforator, retouched point; most lithics made of chert, a few of ferruginous sandstone. <b>2012:</b> Widely dispersed Palaeolithic artifacts on a sandy silt surface; two fractions of sand, gray and yellowish, noted on top of the silt; traces of erosion (rounding edges, patination) on all lithics. Collection of mostly middle-sized flakes made of light chert, translucent flint [ <i>Fig. 5:c</i> ], sandstone and mudstone; biggest flake of petrified wood. Nubian II point core made of sandstone [ <i>Fig. 3:b</i> ] and denticulate tool [ <i>Fig. 2:f</i> ] among the debitage. Early Holocene lithic tradition represented by a microlithic core of chert.
<b>Tergis 79 (Trg79)</b>	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'15.2" E 31°07'11.2" 250 m a.s.l.	<b>SDRS:</b> Limited cluster of artifacts, containing a fragment of tanged point of Aterian type made of pinkish sandstone, and some mineralized bones. <b>2012:</b> Heavily rounded Palaeolithic artifacts, together with thin fragments of bones, over an area approximately 50 m in diameter; recorded on a surface of sandy silt partly covered with a dune. Lithics represented by middle-sized flakes of translucent flint and petrified wood, as well as a final form of a Nubian II point core. Mineralized bones from a middle-sized mammal.
<b>Tergis 80 (Trg80)</b>	Traces of late Pleistocene and early Holocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'17.9" E 31°07'19.9" 250 m a.s.l.	<b>SDRS:</b> Widely dispersed flint and sandstone flakes of Palaeolithic origin. <b>2012:</b> Palaeolithic artifacts widespread on a surface of sandy silt and in overlying gravel; no artifacts from the youngest sediment in the form of windblown sand. Low inselbergs of silt (about 1 m high) in the vicinity of the site, remnants of an ancient terrace; no artifacts registered on top of it. Artifacts included chert flakes and a middle-sized Levallois point [ <i>Fig. 4:b</i> ]; denticulate tool made of pinkish sandstone with thinning of the bulb attesting to relations with the Aterian(?) manufacturing traditions [ <i>Fig. 6:c</i> ]. Two agate flakes suggest later, Holocene occupation. A single mineralized middle-sized mammal bone fragment.
<b>Tergis 81 (Trg81)</b>	Traces of Stone Age occupation (vertical and horizontal redeposition of artifacts).
N 18°01'37.6" E 31°07'27.4" 251 m a.s.l.	<b>SDRS:</b> Limited cluster of elongated chert flakes. <b>2012:</b> Single chunks of chert on the surface of a silty plain between dunes.
<b>Tergis 82 (Trg82)</b>	Traces of Stone Age occupation (vertical and horizontal redeposition of artifacts).
N 18°01'26.5" E 31°07'28.1" 250 m a.s.l.	<b>SDRS:</b> Limited cluster of chert and sandstone flakes. <b>2012:</b> Some heavily eroded lithics recorded from an area approximately 50 m in diameter; collection includes middle-sized flakes made of light chert and more rounded pinkish sandstone flakes with denticulate retouch (either intentional or accidental).

<b>Tergis 83 (Trg83)</b>	Traces of early Holocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'39.1" E 31°07'15.2" 249 m a.s.l.	<b>SDRS:</b> Widely dispersed early Holocene artifacts (single-platform cores and blade tool fragments) on a silty plain with calcareous crusts. <b>2012:</b> Single not distinctive lithics.
<b>Tergis 85 (Trg85)</b>	Traces of late Pleistocene and early Holocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'40.8" E 31°07'00.3" 249 m a.s.l.	<b>SDRS:</b> Collection included blades (single-platform core for blades, truncation on blade) and Levallois points. <b>2012:</b> Palaeolithic artifacts recorded over an area of approximately 50 m in diameter, in white quartz pebble gravel on sandy silt with calcareous crusts marking ancient roots. No artifacts from the youngest dune deposits. Collection included chert flakes and a middle-sized Levallois point [Fig. 4:a]. Flake of pinkish sandstone bore traces of erosion and denticulate negatives of intentional or accidental origin. Early Holocene lithic production represented by a final form of a single-platform flint core for blades.
<b>Affad 12 (Afd12)</b>	Traces of late Pleistocene and early Holocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'14.7" E 31°08'33.4" 244 m a.s.l.	<b>SDRS:</b> Limited cluster of Levallois flakes (some of elongated proportions) on a partly dune-covered plain. <b>2012:</b> No dune at the GPS location. Widely scattered Levallois and single-platform artifacts in gravels on a silt plain. Collection included middle-sized Palaeolithic artifacts: flakes and denticulate tools made of chert (light variant) and pinkish sandstone [Fig. 7:f], as well as small discoidal cores [Fig. 5:e]. Microlithic, early Holocene tradition, represented by blades with notches [Fig. 8:b] and final forms of single-platform cores made of chert, mudstone and quartzite.
<b>Affad 15 (Afd15)</b>	Traces of late Pleistocene and early Holocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'10.8" E 31°09'48.9" 255 m a.s.l.	<b>SDRS:</b> Limited cluster of middle-sized Levallois flakes made of quartzite and chert. <b>2012:</b> Location partly destroyed by the construction of the Karima–Nawa road. Both Palaeolithic and early Holocene artifacts in the southern part. No pottery/bones recorded. Lithics found on the surface of a sand/silt plain with calcareous crusts. Collection included a scraper on a middle-sized Levallois flake from chert [Fig. 8:c], and early Holocene finds, that is, crescents and single-platform cores made of mudstone.
<b>Affad 16 (Afd16)</b>	Traces of late Pleistocene and early Holocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'06.3" E 31°10'02.8" 253 m a.s.l.	<b>SDRS:</b> Limited cluster of Levallois flakes and discoidal cores made of chert. <b>2012:</b> Widely dispersed Palaeolithic and early Holocene artifacts on a sand/silt plain. No pottery/bones. The lithics collection included both Palaeolithic and younger items. Middle-sized retouched flakes [Figs 7:e; 8:b] and small discoidal cores, made of chert (light variant), petrified wood and jasper, represented the older finds; the elongated shape of blanks was distinctive [Figs 6:i; 7:i]. Early Holocene finds included a complete crescent [Fig. 8:j] and a few fragments of blades, resembling in size Palaeolithic blanks, hence such an origin cannot be excluded.
<b>Affad 20 (Afd20 – 2012FRC: MO12, MO17)</b>	Terminal Pleistocene campsite and traces of early Holocene occupation.
N 18°01'18.2" E 31°10'42.9"	<b>SDRS:</b> Both Levallois and microlithic artifacts recorded over a limited area, approximately 50 m in diameter, together with red brick fragments (possibly burned alluvium) and medieval (Dongolan) pottery.

<p>N 18°01'18.6" E 31°10'45.4" 252 m a.s.l. eastern edge (MO12)</p> <p>N 18°01'14.7" E 31°10'45.1" 251 m a.s.l. southeastern edge (MO17)</p>	<p><b>2012:</b> Relics of a few big hearths (burned alluvium) surrounded by a dense cover of lithics (mostly Palaeolithic) and some mineralized animal bones. Single early Holocene finds (microlithic artifacts, grinders). Surface with artifacts is the topmost part of a silt plain rich in calcareous crusts.</p> <p>Faunal remains included bones of hippopotamus (<i>Hippopotamus amphibius</i>), African buffalo (<i>Syncerus caffer</i>), middle-sized and small antelope (probably <i>Kobus kob</i> and <i>oribi</i>) and fish (mainly <i>Syluriformes</i>).</p> <p>Palaeolithic stone artifacts represented by middle-sized elongated Levallois flakes [Fig. 6:a,g] and pseudo-Levallois points [Fig. 4:k]. Chert (including light variant) and quartzite predominant among the worked raw materials. Small-size production represented by a discoidal flint core for points [Fig. 3:e].</p>
<b>Affad 23 (Afd23)</b>	Terminal Pleistocene campsites and traces of early Holocene occupation.
<p>N 18°01'29.2" E 31°10'26.5" 253 m a.s.l.</p>	<p><b>SDRS:</b> Numerous clusters of Palaeolithic finds (lithics, mineralized animal bones, hearths, postholes) from an area approximately 200 m in diameter.</p> <p><b>2012–2014:</b> Lithics collected from the surface and excavated artifacts included a Levallois point made of chert [Fig. 4:c,e,f,i], a Tayac point of light chert [Fig. 2:d], and also Levallois flakes of quartzite sandstone and chert [Fig. 8:a].</p> <p>Location on the topmost level of a silt plain and sand sediments filling the unevenness of the ground, dated with OSL to <math>15,9 \pm 1,75</math> and <math>15,1 \pm 1,66</math> ka (UJK-OSL-35, 37). Finds recorded mostly within undisturbed deposition levels (Osypiński, Osypińska, and Gautier 2011; Osypiński et al. forthcoming). Silt layer sealing the sediments, related to Palaeolithic settlement, produced similar OSL date <math>15,3 \pm 1,68</math> ka (UJK-OSL-34). Older clayey silt of an origin addressing geomorphological events preceding human occupation produced OSL dates <math>21,1 \pm 2,32</math>; <math>26,8 \pm 3,22</math> and <math>34,1 \pm 4,43</math> ka (UJK-OSL-36, 44 and 45).</p>
<b>Affad 24 (Afd24)</b>	Terminal Pleistocene campsites and traces of early Holocene occupation.
<p>N 18°01'33.7" E 31°10'58.5" 253 m a.s.l.</p>	<p><b>SDRS:</b> Levallois flakes (also retouched), made of chert spread over a limited area.</p> <p><b>2012:</b> An area approximately 50 m in diameter produced numerous Palaeolithic finds and mineralized bones in distinct clusters. Artifacts occurred on the surface of a sand/silt plain rich in thin calcareous crusts.</p> <p>Palaeolithic artifacts were represented by elongated Levallois flakes made of a wide palette of raw materials: chert (also light variant), petrified wood, agate and mudstone [Fig. 8:d,e]. Small-sized flint discoidal cores were also recorded. Early Holocene occupation was evidenced by a single flint crescent. The collected animal remains comprised bones of hippopotamus (<i>Hippopotamus amphibius</i>), medium and small antelopes (<i>Kobus kob</i>, <i>Ourebia ourebi</i>) and fragments of big mammal bones (buffalo or giraffe).</p>
<b>Affad 25 (Afd25)</b>	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts).
<p>N 18°01'20.4" E 31°10'05.0" 253 m a.s.l.</p>	<p><b>SDRS:</b> Limited area, approximately 50 m in diameter, yielded single stone artifacts and heavily rounded mineralized bones.</p> <p><b>2012:</b> Artifacts were found on the surface of a sand/silt plain rich in calcareous crusts. Collected artifacts included middle-sized Levallois flakes made of chert and quartzite. Animal remains belonged to mammals.</p>
<b>Affad 27 (Afd27)</b> =Afd85 after verification in 2012	Traces of Stone Age occupation.
<p>N 18°01'47.6" E 31°11'21.4" 245 m a.s.l.</p>	<p><b>SDRS:</b> Widely scattered elongated Levallois artifacts.</p> <p><b>2012:</b> Location verified as the northeastern edge of Afd85 site (see below).</p>

<b>Affad 29</b> (Afd29 – 2012FRC:MO6)	Traces of Stone Age occupation (vertical and horizontal redeposition of artifacts).
N 18°01'34.5" E 31°11'22.8" 243 m a.s.l.  N 18°01'37.6" E 31°11'18.4" 244 m a.s.l. northwestern edge (MO6)	<b>SDRS:</b> Limited area produced evidence of lithics, mostly blades. <b>2012:</b> Widely dispersed lithics and rounded mineralized bones on the surface of a sand/silt plain rich in small calcareous crusts. Collected bone fragments belonged to large size mammals.
<b>Affad 44</b> (Afd44 – 2012FRC:MO14)	Traces of early Holocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'24.0" E 31°12'39.3" 245 m a.s.l.  N 18°01'17.9" E 31°12'44.0" 244 m a.s.l. southeastern edge (MO14)	<b>SDRS:</b> Limited area produced an assemblage of lithics, mainly blades. <b>2012:</b> Single blade artifacts widely dispersed over an area about 150 m in diameter, found together with heavily rounded mineralized bones, fragments of the scapula of a big mammal, resembling buffalo.
<b>Affad 62</b> (Afd62)	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts), early Holocene settlement.
N 18°00'48.8" E 31°14'42.1" 243 m a.s.l.	<b>SDRS:</b> Single Palaeolithic artifacts, e.g., made of pinkish sandstone as well as numerous Neolithic items. <b>2012:</b> Single Palaeolithic finds among predominant early Holocene remains (e.g., pottery of the Karmakol Tradition) and burnt alluvium attesting to the presence of fire in the past. Mesolithic/Neolithic scatter covered an area of a few hectares. Collected lithics included Palaeolithic small-sized flakes and discoidal cores made of flint and chert, as well as a middle-sized Levallois edge-blade made of light chert.
<b>Affad 63</b> (Afd63)	Traces of early Holocene occupation (vertical and horizontal redeposition of artifacts).
N 18°00'41.3" E 31°14'34.8" 241 m a.s.l.	<b>SDRS:</b> Single Levallois flakes together with some animal bones and medieval pottery. <b>2012:</b> Exclusively microlithic artifacts scattered over an area approximately 100 m in diameter. Silty terrace free of calcareous crusts, partly covered by a sand dune.
<b>Affad 69</b> (Afd69)	Early Holocene settlement with a single grave(?).
N 18°01'14.3" E 31°15'02.0" 248 m a.s.l.	<b>SDRS:</b> Small assemblage of blade artifacts made of agate and flint. <b>2012:</b> Early Holocene artifacts (e.g., grinders) and clusters of exposed human bones (graves?) noted on the surface of a small hill rising from an alluvial plain.
<b>Affad 82</b> (Afd82)	Traces of early Holocene occupation.
N 18°01'22.1" E 31°08'58.7"	<b>SDRS:</b> Widely dispersed lithics, including a single-platform core for blades. <b>2012:</b> Location destroyed in 2009 by the construction of the Karima–Nawa road.
<b>Affad 83</b> (Afd83)	Traces of late Pleistocene and early Holocene occupation.
N 18°01'23.0" E 31°09'04.7" 244 m a.s.l.	<b>SDRS:</b> Widely dispersed single-platform lithics and one scraper made on a big chert flake. <b>2012:</b> Location destroyed in 2009 by the construction of the Karima–Nawa road.

<b>Affad 84 (Afd84)</b>	Killing-scavenging site of terminal Pleistocene origin.
N 18°01'34.9" E 31°10'29.0" 253 a.s.l.	<b>SDRS:</b> Limited cluster of mineralized fish bones and single elongated flakes made of flint and ferruginous sandstone. <b>2012:</b> Location produced numerous fish remains (mostly Clariidae) and single lithics, recorded from an area of approximately 40 m in diameter, surface of a sand/silt plain rich in the calcareous crusts. The location is in the direct neighborhood of Affad 23. Collected lithics included a chert Levallois point and a pseudo-Levallois flint point [Fig. 4:d,l], both middle-sized.
<b>Affad 85 (Afd85 – 2012FRC:MO7)</b>	Killing-scavenging site of late Pleistocene origin.
N 18°01'45.4" E 31°11'19.8" 245 a.s.l.	<b>SDRS:</b> Dispersed middle-sized Levallois flakes made of flint. <b>2012:</b> Clusters of mineralized animal bones and dispersed Palaeolithic artifacts found within an area approximately 50 m in diameter, on a silt plain limited from the north by ferruginous sandstone outcrops.
N 18°01'44.3" E 31°11'18.4" 245 a.s.l. southern edge (MO7)	Animal remains came from the cranial and postcranial parts of a big-size mammal (elephant or hippopotamus). Lithics collected from the surface included elongated denticulate tools made of chert [Fig. 6:j] and much bigger tools of ferruginous sandstone [Fig. 2:a].

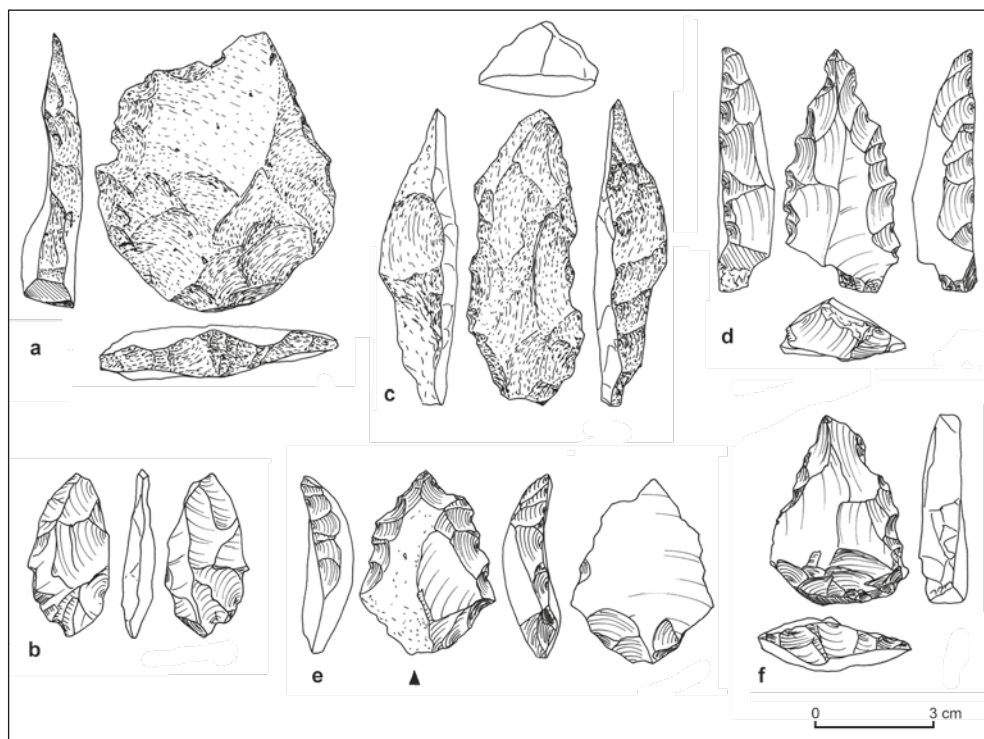


Fig. 2. Chosen lithic artifacts from the 2012 survey: a – Levallois flake with denticulate retouch (site Afd85); b, c – bifacial points (Nfb9, Afd108); d – Tayac point (Afd23); e, f – points with denticulate retouch (Trg74, Trg78)



<b>Affad 87</b> (Afd87 – 2012FRC:MO11, MO15, MO16)	Traces of late Pleistocene and early Holocene occupation.
N 18°01'19.1" E 31°10'54.8" 249 m a.s.l.	<b>SDRS:</b> Collection of lithics (e.g., rejuvenation flake knapped off a single-platform core) made of flint and ferruginous sandstone together with 'red brick fragments', probably fragmented burnt alluvium.
N 18°01'22.1" E 31°10'56.0" 248 m a.s.l., northern edge (MO11)	<b>2012:</b> Remains of huge hearths marked by burnt alluvium, dispersed over an area approximately 250 m by 60 m, in the topmost part of a silty/sandy terrace containing a high number of calcareous crusts marking plant root negatives.
N 18°01'16.8" E 31°11'05.7" 250 m a.s.l. eastern edge (MO15)	A small number of representative lithics collected from the surface included tools made on middle-sized Levallois flakes, e.g., perforator made of chert [Fig. 7:d] and small discoidal flint cores. Eroded animal bone fragments included a single fragment of large mammal bone, comparable to African buffalo in size [Fig. 5:g].
N 18°01'17.7" E 31°11'01.1" 251 m a.s.l. (MO16)	

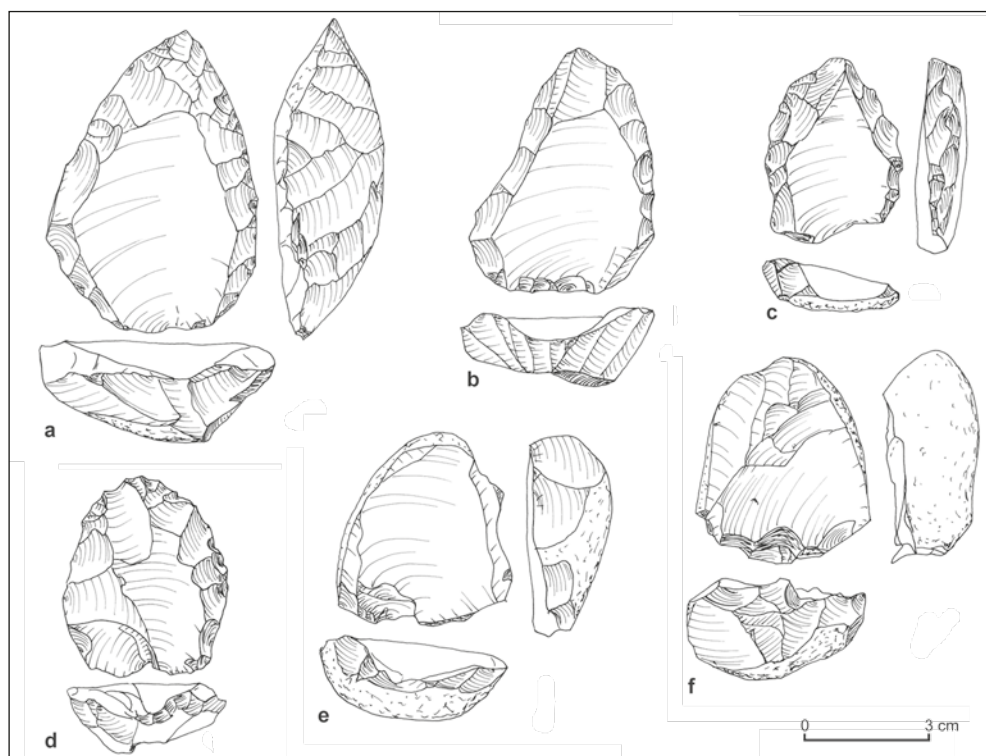


Fig. 3. Levallois cores for points from the 2012 survey: a–d – Nubian II cores (Afd99, Trg78, Trg72, Nfb8); e, f – classic Levallois cores for point (Afd20, Trg73)

<b>Affad 88 (Afd88)</b>	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'04.2" E 31°11'40.2" 242 m a.s.l.	<b>SDRS:</b> Scanty lithics collected from a limited area, including some retouched Levallois flakes made of flint. <b>2012:</b> A few dispersed lithics within an area approximately 50 m in diameter, located to the south of the Karima–Nawa road. The surface contained a high number of calcareous crusts, and its southern part was covered by a sand dune.

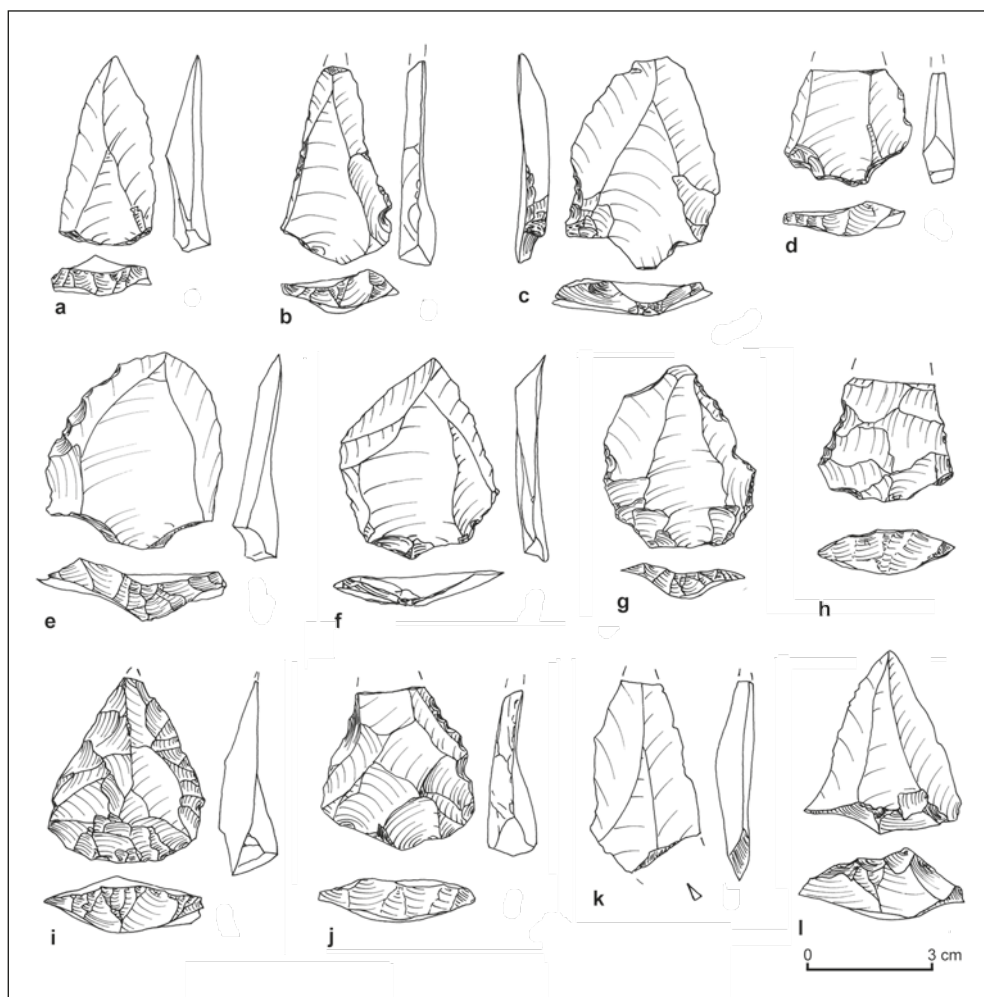


Fig. 4. Levallois points from the 2012 survey: a–g – classic Levallois point (Trg85, Trg80, Afd23, Afd84, Afd23, Afd23, Trg73); h–j – Nubian II points (Trg72, Afd23, Trg72); k, l – pseudo-Levallois points (Afd20, Afd84)



<b>Affad 90 (Afd90)</b>	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts).
N 18°00'38.7" E 31°13'37.6" 241 m a.s.l.	<b>SDRS:</b> Dispersed Palaeolithic flint artifacts and flint blades were recorded. <b>2012:</b> Single Palaeolithic artifacts were found on the surface of fields still cultivated a few years earlier. A representative collection included middle-sized Levallois flakes made of light chert and a heavily exploited discoidal core of chert.
<b>Affad 92 (Afd92)</b>	Traces of Stone Age occupation.
N 18°01'16.5" E 31°09'13.3"	<b>SDRS:</b> Widely dispersed lithics. <b>2012:</b> Location fenced off, a cultivated field which could not be surveyed.
<b>Affad 94 (Afd94)</b>	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'05.5" E 31°10'19.5" 254 m a.s.l.	<b>SDRS:</b> Limited cluster of Levallois flakes and tools (e.g., perforator made of pinkish sandstone), all middle-sized. <b>2012:</b> Single Palaeolithic artifacts and highly rounded bone fragments dispersed over an area approximately 200 m in diameter; topmost part of a silty terrace covered with a thin layer of gray coarse sand, about 0.5 cm thick.

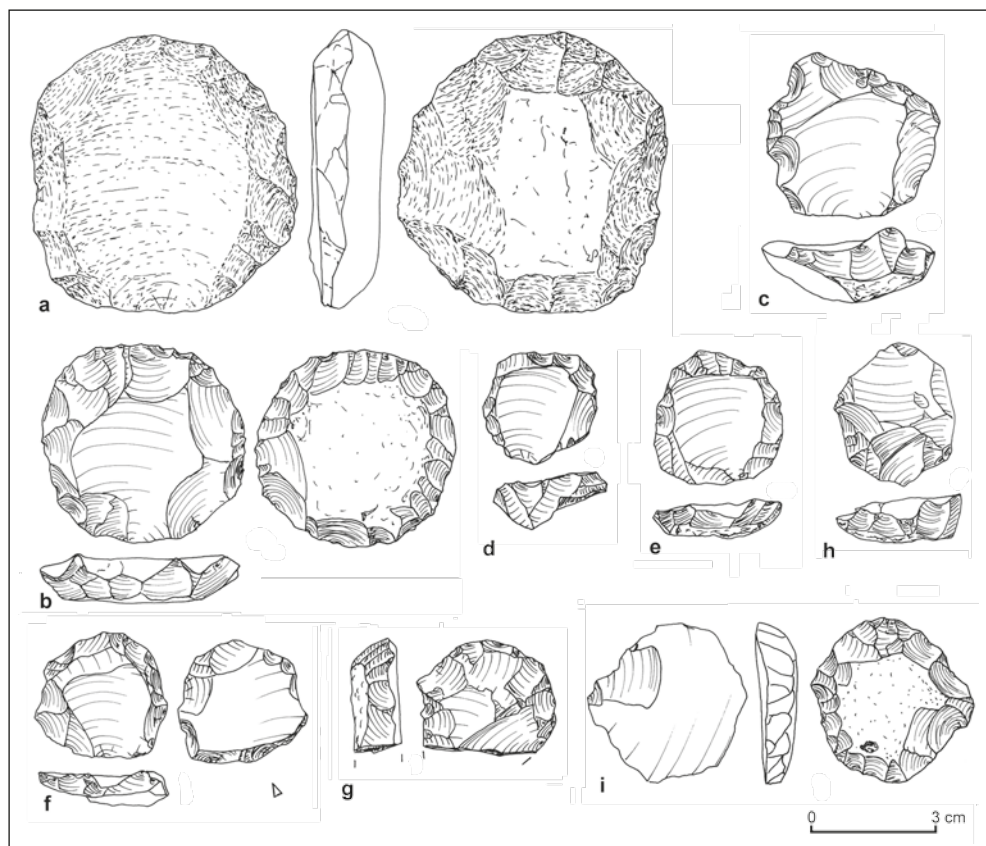


Fig. 5. Discoidal cores from the 2012 survey: a – Nfb8; b – Nfb9; c – Trg78; d – Trg73; e – Afd12; f – Afd99; g – Afd87; h – Nfb10; i – Trg74

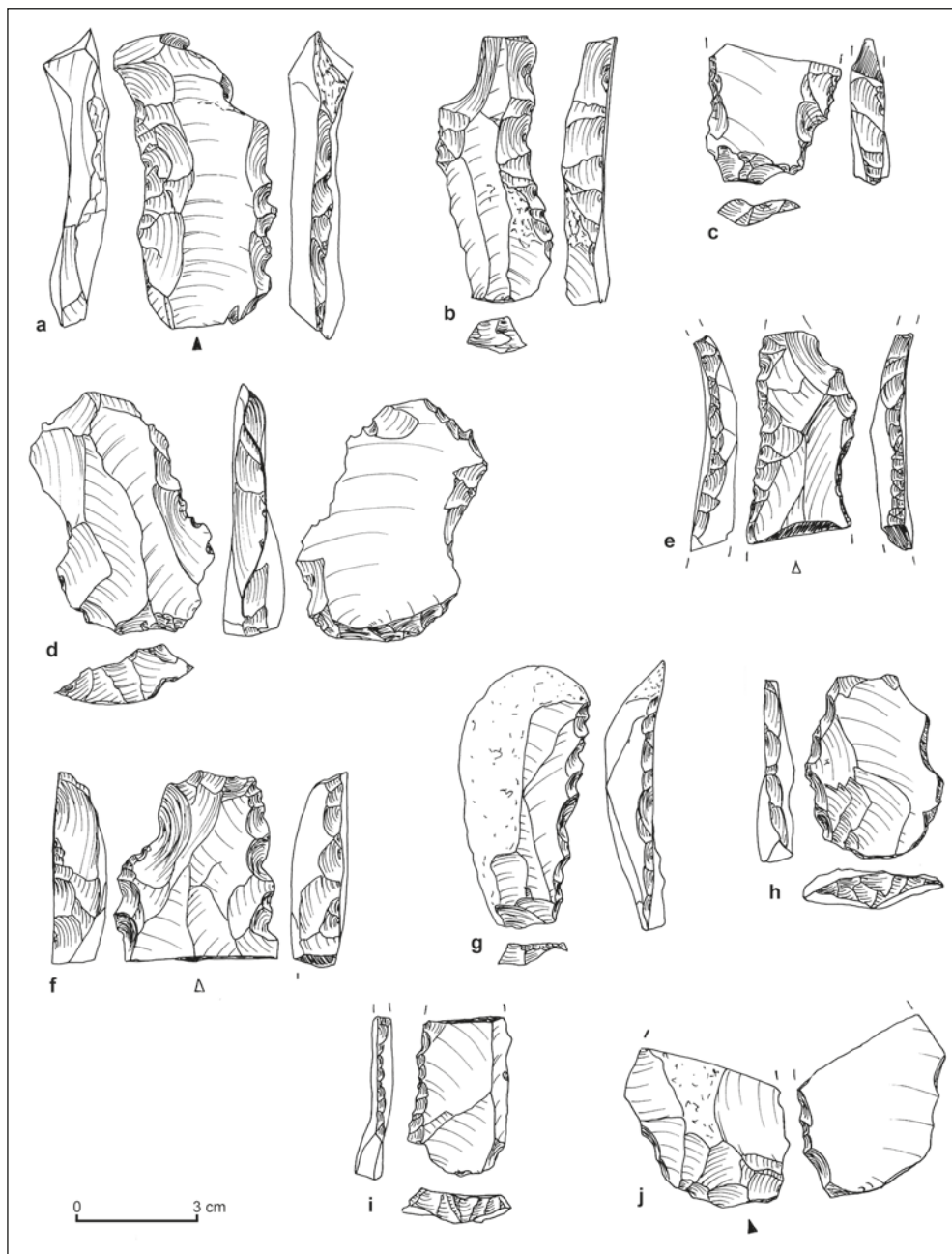


Fig. 6. Denticulates from the 2012 survey: a – Afd20; b – Trg73; c – Trg80; d – Afd105; e – Trg73; f – Rkb10; g – Afd20; h – Trg74; i – Afd16; j – Afd85

<b>Affad 99</b> (Afd99 – 2012FRC: MO1)	Traces of late Pleistocene and early Holocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'29.2" E 31°09'34.1" 245 m a.s.l.	<b>2012:</b> Rounded lithics, both of Palaeolithic and early Holocene origin, together with single mineralized bones, dispersed over an area approximately 100 m in diameter; top of a silty terrace with single mounds of relatively younger silt containing a large number of calcareous crusts. Collection of representative lithics and bone fragments belonging to megafauna (most probably <i>Hippopotamus amphibius</i> ) as well as other animals ( <i>Bovidae</i> ). Palaeolithic items were represented by Levallois flakes made of sandstone (pinkish variant) and middle-sized flint, as well as some small discoidal cores made of light chert [Fig. 5:f] and petrified wood. Among the cores one flint item of small size was intended for the production of a Levallois point representing a Nubian II variant [Fig. 3:a]. An endscraper made on a chert flake can be dated most probably to the Palaeolithic phase [Fig. 7:b], similarly to an elongated cortical flake from discoidal reduction [Fig. 7:g]. Early Holocene items were represented by flake and blade tools: an endscraper [Fig. 7:a], a geometric insertion [Fig. 8:k] and some examples of flint and light chert debitage.

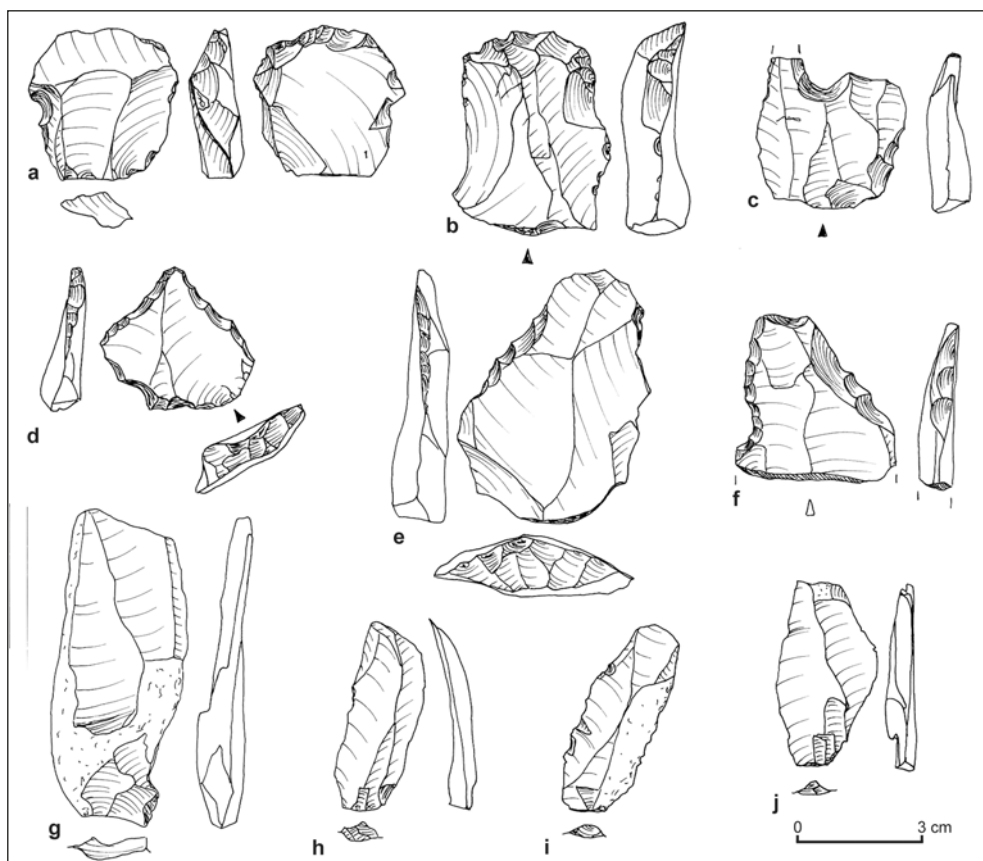


Fig. 7. Other tools and blank from the 2012 survey: a–b – endscrapers (Afd99, Afd99); c, d – perforators (Rkb1, Afd87); e, f – notches (Afd16, Afd12); g–j – elongated flakes (Afd99, Trg73, Afd16)

<b>Affad 100</b> (Afd100 – 2012FRC: MO2)	Traces of late Pleistocene occupation, killing site(?) (vertical and horizontal redeposition of artifacts).
N 18°01'28.1" E 31°09'37.1" 251 m a.s.l.	<b>2012:</b> Single lithic artifacts together with mineralized big-size animal bone fragments dispersed over an area approximately 50 m in diameter. Eastern slope of a shallow occasional stream incised into a silty terrace with a large number of calcareous crusts. The collected bone samples belonged to a middle-sized antelope.
<b>Affad 101</b> (Afd101 – 2012FRC: MO3)	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'30.5" E 31°09'56.1" 254 m a.s.l.	<b>2012:</b> Single Palaeolithic artifacts and eroded mineralized bone fragments within an area of about 50 m in diameter. Slope of a shallow occasional stream incised into a silty terrace with a large number of calcareous crusts. Collected bones sample belonged to a large mammal, most probably African buffalo.
<b>Affad 102</b> (Afd102 – 2012FRC: MO4)	Killing/scavenging site of late Pleistocene origin.
N 18°01'31.5" E 31°10'07.4" 253 m a.s.l.	<b>2012:</b> Limited cluster of mineralized fish bones, about 20 m in diameter, on the topmost level of a silty/sandy alluvium with a significant number of calcareous crusts. Representative sample of bones belonging to Clariidae. Non-distinctive lithics.
<b>Affad 103</b> (Afd103 – 2012FRC: MO5)	Killing/scavenging site of late Pleistocene origin.
N 18°01'16.8" E 31°10'23.5" 252 m a.s.l.	<b>2012:</b> Relics of a large hearth (burnt alluvium) and some mineralized fish bones within an area about 10 m in diameter. Silty terrace top without calcareous crusts. Bone sample collected ( <i>Synadontis</i> ).
<b>Affad 104</b> (Afd104 – 2012FRC: MO8)	Camp-site(?), late Pleistocene(?).
N 18°01'55.4" E 31°11'00.3" 253 m a.s.l.	<b>2012:</b> Limited cluster of mineralized organic material (bones?), about 1 m in diameter, recorded on the present-day surface but apparently undisturbed by post-depositional factors; seems to be an ancient pit-filling element. Location about 300 m to the south of a sandstone outcrop. No parallel for the state of preservation anywhere in the Southern Dongola Reach. Most probably the bones belonged to a small animal and were partly eroded before the mineralisation process.
<b>Affad 105</b> (Afd105 – 2012FRC: MO9)	Killing/scavenging site of terminal Pleistocene origin.
N 18°01'48.4" E 31°11'00.1" 253 m a.s.l.	<b>2012:</b> A few distinct clusters of large bone fragments and accompanying single lithics on the surface of a silty terrace some 400 m to the south of the sandstone outcrops. All collected bones and teeth fragments belonged to the African elephant ( <i>Loxodonta africana</i> ). Lithics were represented by large Levallois flakes made of ferruginous sandstone, some retouched [Fig. 6:d]. Upper parts of the silt layer containing artifacts dated by OSL to $15,7 \pm 1,73$ ka (UJK-OSL-40), older clayey sediments dated to $26,3 \pm 2,89$ and $25,9 \pm 2,85$ ka (UJK-OSL-41, 42).

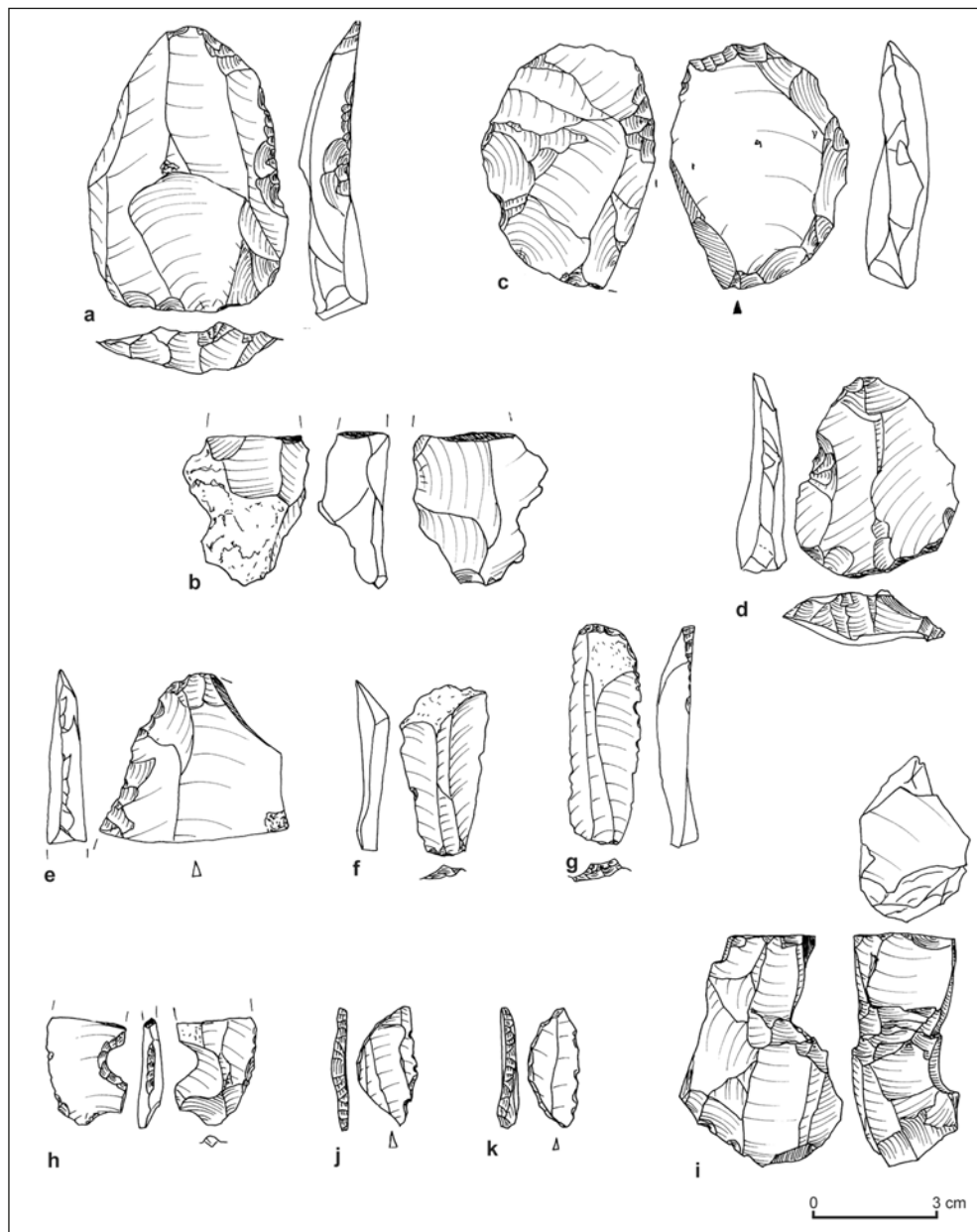


Fig. 8. Retouched flakes and blades from the 2012 survey: a–e – retouched Levallois flakes (*Afd23*, *Afd16*, *Afd15*, *Afd24*, *Afd24*); f – blade (*Nfb10*); g – endscraper (*Nfb10*); h – notched tool (*Afd12*); i – single platform blade core (*Nfb10*); j, k – geometric insertions – lunates (*Afd16*, *Afd99*)



<b>Affad 106</b> (Afd106 – 2012FRC: MO10)	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'42.5" E 31°10'56.0" 253 m a.s.l.	<b>2012:</b> Single find, mineralized animal bone fragment belonging to a small-size ruminant (of oribi size). Surface of a silt/sandy terrace.
<b>Affad 107</b> (Afd107 – 2012FRC: MO13)	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts).
N 18°01'25.9" E 31°10'34.2" 253 a.s.l.	<b>2012:</b> Highly eroded animal bone fragments and single Palaeolithic artifacts spread over a surface approximately 20 m in diameter. Silty terrace free of calcareous crusts. Some animal bones belonging to a small-size ruminant (of oribi size). Representative lithics included a Levallois flake fragment made of petrified wood and a small discoidal core made of chert.
<b>Affad 108</b> (Afd108 – 2012FRC: MO18)	Middle Palaeolithic artifacts redeposited during road construction in 2009.
N 18°01'18.3" E 31°10'03.9" 254 m a.s.l.	<b>2012–2013:</b> Artifacts redeposited together with coarse gravel and occasional 2 cm pebbles from an unknown primary location, most probably a few kilometers away. The abundance of Palaeolithic remains suggests a well preserved late Pleistocene sediment. Teeth and bone fragments represented Hippo ( <i>Hippopotamus amphibius</i> ). Lithics included a heavily reduced discoidal core, triangular in section, made of ferruginous sandstone in the shape of a point [Fig. 2:c]; two cores, one made of a pinkish kind of sandstone, representing the final forms of a discoidal reduction scheme; an almost complete foliate point made of ferruginous sandstone [Fig. 9:a] with a slightly bent profile suggesting a large-sized blank in the form of a thick and elongated flake as found in other parts of the Southern Dongola Reach (Osypiński 2003: Figs MTCII/1:a,b, MTCII/5:b). Invasive retouch completely covered both faces of the tool. Analogous forms occurred in assemblages related to the Nubian late Pleistocene (Nubian Complex) in Khor Abu Anga (Arkell 1949), Sai Island (Van Peer et al. 2003) and down the Wadi Halfa (Chmielewski 1968). The nearest analogy (in a geographical sense) is a foliate from Wadi Muqaddam outlet (location NAMR28), a survey carried out by Section Française de la Direction des Antiquités du Soudan in 2004 prior to the Fourth Cataract resettlement construction [Fig. 9:b].
<b>Affad 109</b> (Afd109 – 2012FRC: tumuli)	Prehistoric cemetery and early Holocene settlement.
N18°02'08.7" E 31°11'04.5" 255 m a.s.l.	<b>2012:</b> Cluster of a dozen small tumuli with stone kerb (type FT02b according to Borcowski and Welsby 2009), set on the ridge of a sandstone outcrop limiting the alluvial plain from the north. Notwithstanding the absence of potsherds, tomb location and construction technique point to the Kerma Horizon. Some of the graves were plundered in the past. A Neolithic settlement stood in an area approximately 100 m by 30 m down the slope from the burials located on higher ground. A representative collection of pottery, lithics and animal bones (domestic cattle) was recorded, including a big granite tool (adze or coultter) [Fig. 11]. Microlithic blades came most probably from the Affad 111 locality approximately 200 m to the southwest.
<b>Affad 110</b> (Afd110)	Killing/butchering site of late (terminal?) Pleistocene origin.
N18°01'42.1" E31°10'00.4" 253 m a.s.l.	<b>2012–2014:</b> Numerous fragments of a large mammal ( <i>Syncerus caffer</i> ) recorded in a cluster 10 m in diameter, most probably a killing site, such as hitherto known from the northern fringes of the Affad Palaeolithic sites. Test excavations in 2014 confirmed the origin of the bones from a single animal, although erosion of the remains enabled precise identification of more than 91% of the recorded finds. Stratigraphy similar to that at the Affad 23 site with analogous clayey silt in the bottom, loam silt above it containing the bones and the latest series of silt covering both earlier units in the ground hollows.

<b>Affad 111 (Afd111)</b>	Workshop of ferruginous sandstone and camp-site, terminal Pleistocene.
N18°01'54.2" E31°11'05.6" 253 m a.s.l.	<b>2012–2014:</b> Numerous flakes of ferruginous sandstone in the vicinity of the Affad 105 site (killing site with elephant bones), in a 15-m-wide cluster on the present day surface (alluvium covered with a thin layer of sand). All artifacts were knapped using a discoidal, flake-oriented method. Animal species identified during surface collection and sondage excavations included small Cercopithecoid ( <i>Cercopithecus</i> sp.), warthog ( <i>Phacochoerus aetiopicus</i> ), hippopotamus ( <i>Hippopotamus amphibius</i> ), African buffalo ( <i>Syncerus caffer</i> ), unspecified antelopes and Nile crocodile ( <i>Crocodylus niloticus</i> ). Lithics and mineralized animal bones were found in silt dated by OSL to $16,0 \pm 1,92$ ka (UJK-OSL-38), as well as in the top of the sand unit (river bar or beach) below, dated by OSL to $23,2 \pm 3,95$ ka (UJK-OSL-39).
<b>Affad 112</b>	Killing/scavenging site of late Pleistocene origin.
N 18°01'41.3" E 31°10'16.2" 253 m a.s.l.	<b>2012:</b> Cluster of animal bones (pelvis), probably one of the killing sites surrounding the camp at Affad 23. A single Levallois flake found nearby, similar to tools from another killing site, Affad 105. It was made of ferruginous sandstone and was relatively big.
<b>Affad 113</b>	Killing/scavenging site of late Pleistocene origin.
N 18°01'38.6" E 31°10'07.5" 253 m a.s.l.	<b>2012:</b> Cluster of fish bones (mostly Clariidae), approximately 20 m in diameter. Similar to sites known earlier, e.g., Affad 84, Affad 102, demonstrating a late Pleistocene technique of gathering fish from drying shallow waterholes. No distinctive lithic tools.
<b>Affad 114</b>	Killing/scavenging site of a late (terminal?) Pleistocene origin.
N 18°01'35.9" E 31°10'07.6" 253 m a.s.l.	<b>2012:</b> Cluster of mineralized animal bones ( <i>Kobus kob</i> and <i>Giraffa camelopardalis</i> ), single lithics (denticulated Levallois point) and relics of fires. The stratigraphic position of the site as well as collection of eco- and artifacts point to a site character similar to Affad 23 or Affad 24, although much smaller in size.
<b>Affad 115</b>	Hunting/gathering site from the early stages of the late Pleistocene(?), lower or early middle Palaeolithic period.
N 18°03'03.1" E 31°11'36.4"	<b>2012:</b> Cluster of eight handaxes, amygdaloid in shape and made of ferruginous sandstone [Fig. 12 top left], showing heavy wear. Isolated find at the bottom of a discrete wadi, approximately 1.5 km to the north of a range of silty sediments. It is speculated that the handaxes were used to dig tubers or process meat. Tool morphology suggests using a soft hammer in the last modelling phase.
<b>Affad 116</b>	Traces of late Pleistocene occupation.
N 18°03'53.10" E 31°10'52.1"	<b>2012:</b> Levallois classic point made of chert found on the surface of low sandstone hills far to the north of the silt range (approximately 3 km). Undulating surface suggest heavy erosion of the area during the late Pleistocene or Holocene. Single artifacts made of chert as well as chert unworked pebbles suggest the presence of soft sediments (silts?) in the past.
<b>Affad 117</b>	Traces of Holocene occupation.
N 18°03'29.2" E 31°10'47.7"	<b>2012:</b> Endscraper made of chert found on the surface of another sandstone hill, 800 m to the south of Affad 116. Tool morphology suggests a Neolithic origin, pointing to original sediment erosion in the Holocene (after 10 ka).
<b>Affad 118</b>	Hunting/gathering site of the early late Pleistocene; traces of a late Pleistocene/Holocene occupation.
N 18°02'49.3" E 31°10'27.9"	<b>2012:</b> Site recorded in an area strongly affected in 2009 by the construction of the Karima–Nawa road (a workers' base camp was built at the Affad 118 location). Cluster of five handaxes [Fig. 12 bottom left] on the surface and dense cover of late

	Pleistocene and Holocene stone artifacts. The handaxes resembled those collected at Affad 115 (probably of the same age); apart from them, retouched Levallois points as well as a blade core made of petrified wood.
<b>Affad 119</b>	Late Neolithic tumuli spread over a large area (approximately 1 km <sup>2</sup> ).
N 18°02'36.5" E 31°10'22.2"	2012: Cluster of pebbles, approximately 5 m in diameter, with no signs of plunder. Similar features excavated on the opposite bank of the river in Multaga in 2003 were dated by the grave goods to the late Neolithic period (Geus and Lecoine 20003). Another pebble cluster of the same diameter located 700 m to the south of the first one. Several similar tumuli between them. Remains of two handmade thin-walled vessels (bowls) and ostrich egg shells from the surface of one of them. One of the vessels was matt-impressed on the outer surface, both had ornamented rims with diagonal cuts.
N 18°02'15.2" E 31°10'12.7"	

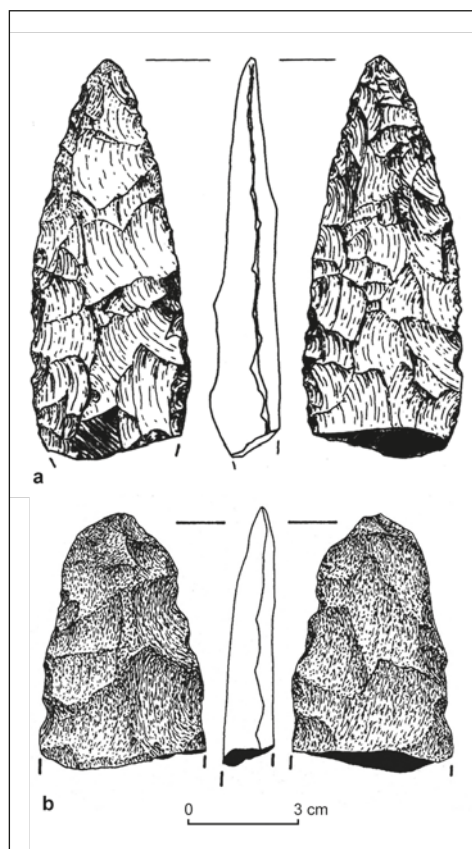


Fig. 9. Bifacial foliates from the Southern Dongola Reach, ferruginous sandstone: a – foliate fragment from Affad 108, found in 2013; b – foliate fragment from NAMR28 (Wadi Muqaddam outlet), found in 2004

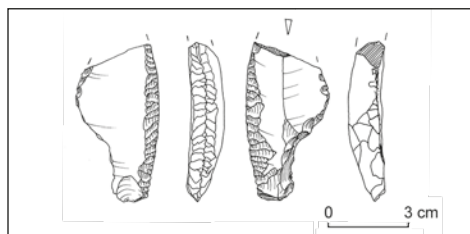


Fig. 10. Fragment of flint tool retouched in the pressure technique from the 2014 season: site Affad 120

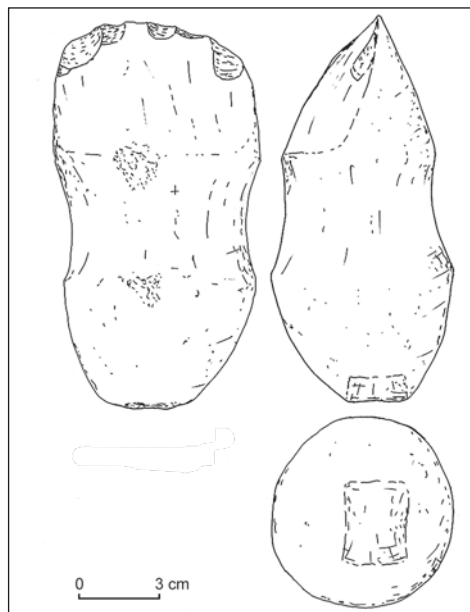


Fig. 11. Granite tool (adze/coulter) from the 2014 season: site Affad 109



<b>Affad 120</b>	Late Pleistocene settlement (camps?).
N 18°02,22.1" E 31°09'54.1"	2012: Numerous petrified animal bones and stone artifacts (mostly of ferruginous sandstone and chert), from a large area, approximately 200 m in diameter, resembling the Affad 23 camp. Found on the surface but also within a silt ground. Provisional



Fig. 12. Handaxes from the Affad Basin, found in 2014: top left, group of eight amygdaloid handaxes from Affad 115; bottom left, group of five amygdaloid handaxes from Affad 118; right, Micoquian-type handaxe from Affad 121 (Photos M. Osypińska)

	identification of bones of both mammals and fishes (Clariidae, <i>Synodontis</i> ). Fragment of flint tool (knife?) retouched in the pressure technique with a metal (copper?) device [Fig. 10] resembling predynastic Egyptian items (Holmes 1989); possibly traded and deposited in one of the graves nearby (e.g., one of the Affad 119 tumuli).
<b>Affad 121</b>	Traces of late Pleistocene and early Holocene occupation.
N 18°02'22.6" E 31°10'15.1"	<b>2012–2014:</b> Top part of gravelly hills some 5 m above silts of terminal Pleistocene alluvium. Place of gravel extraction for road construction in 2009. Most probably the original placement of Affad 108 finds. Single petrified animal bones (megafauna) and a sandstone handaxe of Micoquian type recorded on the surface [Fig. 12 right]. Also clusters of early Neolithic pottery with dotted wavy line decoration along with fragments of domestic cattle bones indicating remains of a Holocene settlement.
<b>Affad 122</b>	Traces of late Pleistocene and Holocene settlement.
N 18°01'57.20" E 31°09'55.8"	<b>2012:</b> Large area (approximately 800 m wide) covered with a dense cover of Neolithic and some Palaeolithic artifacts. No clear clusters, hence the speculation that it was originally an early Neolithic settlement that was washed out in later periods.
<b>Affad 123</b>	Killing/scavenging site of late Pleistocene origin.
N 18°01'42.8" E 31°10'44.7"	<b>2012:</b> Cluster of mineralized bones of a large mammal ( <i>Syncerus caffer</i> ) and single stone tools. The stratigraphy and content of the site resembles killing site Affad 110.
<b>El-Nafab 8</b> (Nfb8 – 2012FRC: MO20)	Traces of late Pleistocene and Holocene occupation (vertical and horizontal redeposition of artifacts).
N 18°06'39.8" E 31°30'49.5" 247 m a.s.l.  New coordinates: N 18°06'45.6" E 31°29'44.4" 244 m a.s.l.	<b>SDRS:</b> Rich collection of Neolithic artifacts together with some small discoidal cores and mineralized animal bones. <b>2012:</b> The location did not produce any artifacts, but a site at some distance, on an old alluvial plain occasionally covered by dunes, corresponded to the earlier records. Representative lithics and animal bones. Bones belonged to medium- and small-sized ruminants, a large ruminant (Bovidae) and Hippo ( <i>Hippopotamus amphibius</i> ). Artifacts were dispersed and did not form any clusters. The lithics included a small Levallois core for a Nubian II-variant point made of chert [Fig. 3:d] and a final form of Levallois middle-sized core made of sandstone [Fig. 5:a].
<b>El-Nafab 9</b> (Nfb9 – 2012FRC: MO19)	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts).
N 18°06'54.9" E 31°30'55.8" 247 m a.s.l.	<b>2012:</b> Single Palaeolithic artifacts spread over an area approximately 100 m in diameter. Sandy terrace with thin calcareous crusts. Lithics represented both discoidal cores made of light chert [Fig. 5:b] and small bifacial laurel points made of chert [Fig. 2:b]. Mineralized bones belonged to large- and middle-sized mammals.
<b>El-Nafab 10</b> (Nfb10 – 2012FRC: MO21)	Traces of late Palaeolithic(?) occupation (vertical and horizontal redeposition of artifacts).
N 18°06'47.8" E 31°30'19.8" 250 m a.s.l.	<b>2012:</b> Numerous lithic artifacts and small fragments of mineralized animal bones deposited within gray sand of an old dune or a bar deposited on alluvium (silt). Lithic artifacts included both elements of flake-oriented production: small discoidal

	cores made of light chert [Fig. 5:b] and mudstone as well as blade-oriented elements, e.g., a single-platform core made of chert [Fig. 8:i], an endscraper made on blade [Fig. 8:g] and an analogous blank [Fig. 8:f]. No pottery. Animal bones belonged to a large ruminant, most probably African buffalo.
<b>Rekabiya 1</b> (Rkb1)	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts).
N 18°06'04.7" E 31°28'58.3"	<b>SDRS:</b> A few Levallois cores and flakes made of ferruginous sandstone and chert. <b>2012:</b> Most of the site surface covered by dunes; artifacts deposited on top of an old alluvium rich in calcareous crusts marking the placement of old tree roots. A sample of lithics included a middle-sized notch tool, a broken perforator(?) [Fig. 7:c] and a denticulate tool, all made on light chert Levallois flakes.
<b>Rekabiya 10</b> (Rkb10)	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts) — killing site(?).
N 18°06'52.9" E 31°29'02.8" 252 m a.s.l.	<b>SDRS:</b> A few Palaeolithic artifacts and mineralized bones. <b>2012:</b> Single mineralized bones and lithics dispersed along an occasional stream incised into older alluvium (originally containing Palaeolithic artifacts). Representative collection: denticulate sidescraper made on an elongated Levallois flake of petrified wood [Fig. 6:f] and a fragment of megafauna bone (elephant, rhinoceros or hippo).
<b>Rekabiya 11</b> (Rkb11)	Traces of late Pleistocene occupation (vertical and horizontal redeposition of artifacts) — killing site(?).
N 18°07'02.7" E 31°29'17.5" 254 m a.s.l.	<b>SDRS:</b> Rich collection of Palaeolithic finds and mineralized animal bones spread over an area approximately 100 m in diameter. <b>2012:</b> Mineralized bone fragments along occasional streams incised into older alluvium (silt), originally containing Palaeolithic remains. Representative collection of lithics and bones belonging to hippo, large-, medium- and small-sized ruminants, equidae ( <i>Equus quagga</i> or <i>Equus africanus</i> ) and Giraffe ( <i>Giraffa camelopardalis</i> ). Stone implements included large Levallois flakes made of ferruginous sandstone and a fragment of a wide Levallois elongated flake of light chert. Also a small discoidal core made of mudstone.
<b>Rekabiya 14</b> (Rkb14)	Traces of Stone Age occupation.
N 18°06'50.6" E 31°29'41.6" 256 m a.s.l.	<b>SDRS:</b> Rich collection of Palaeolithic artifacts. <b>2012:</b> No artifacts to be found at the location.
<b>Rekabiya 15</b> (2012FRC: tumuli)	Prehistoric cemetery.
N 18°07'10.6" E 31°29'07.9" 262 m a.s.l.	<b>2012:</b> A cemetery containing a dozen tumuli with stone kerb approximately 3 m in diameter each, set on a ferruginous sandstone outcrop and partly covered by dunes. One tumuli superstructure constructed of a large fragment of mineralized hippopotamus scapula, most probably of Pleistocene origin. Notwithstanding the lack of pottery on the surface, the tumuli were assigned to the Kerma Horizon based on construction and location (Borowski and Welsby 2012).

## CONCLUSIONS

The first stage of the research project “Levallois Tradition Epigones in the Middle Nile Valley” confirmed the high research potential of the studied area. The condition of sites recorded in the region in the course of the Southern Dongola Reach Survey in 2003 was verified and new information collected on the topography of settlement [Table 1]. The list of animal species in the area was supplemented with new zoological data, clarifying the available picture of the palaeoenvironment and ecosystem forms exploited by human groups in the terminal Pleistocene.

The surveyed region consisted of three distinctive zones: Tergis, Affad and El-Nafab/Karafab, differing with regard to the state of preservation of terminal Pleistocene settlement remains. Tergis in the western part of the Affad Basin is a plain area limited by the Nubian Sandstone plateau, with inselbergs like Jebel Abkor that approach the present-day Nile bank. It yielded deflated collections of lithics and trace quantities of mineralized bones. The true Affad sites represented locations

in most cases preserved *in situ* within original terminal Pleistocene sediments, excluding the case of Afd108, which was most probably a set of artifacts redeposited together with gravel used as building material during road construction in 2009. The age of terminal Pleistocene alluvium and associated sands was estimated based on a suite of OSL measurements, sampled in three distinct locations: Afd23, Afd105 and Afd111. Finally, the set of sites from the El-Nafab/Rekabiya area represented another zone of late/terminal Pleistocene occupation, which however could not be put into a temporal relation with the Affad Basin sites due to the small number of locations and the lack of absolute datings. Notwithstanding, the technological traits of the stone tool industry and the preservation of animal remains were similar in both zones. The most distinctive for some of the El-Nafab sites was the presence of blade-oriented lithic production correlates, absent in the Affad area. It should be emphasized, however, that the preliminary dating of these sites to

Table 1. Summary of the surface survey around Affad. EMP – early middle Palaeolithic (until the end of MIS5: about 65 ka), LMP – late middle Palaeolithic (MIS4-2: 65–12 ka), EH – early Holocene (about 12–7 ka).

	Occupation trace			Camp site		Killing/ gathering site		Cemetery	Secondary context
	Stone Age	LMP	EH	LMP	EH	EMP/ LMP	LMP	Late Prehistory	
Tergis area	2	12	6	–	1	–	–	–	–
Affad area	2	18	15	7	3	2	10	3	1
Nafab/ Karafab area	–	4	1	–	–	–	2	1	–
<b>Total</b>	<b>4</b>	<b>34</b>	<b>22</b>	<b>7</b>	<b>4</b>	<b>2</b>	<b>12</b>	<b>4</b>	<b>1</b>

the pre-Holocene period was based on the sole premise of an absence of pottery from the locations.

Middle Palaeolithic artifacts (including bifacial products), noted in surface collections from gravel sheets beyond the terminal Pleistocene alluvium, could represent much older settlement relics. Estimating the age of these geomorphological units is a crucial step in further research, but it is highly likely that they can be related to the evidence collected by the Combined Prehistoric Expedition for gravel sheets on the opposite bank of the river, older than 45 ka (de Heinzelin 1967–1968; Williams et al. 2010).

Relics of early Holocene occupation of the Affad Basin were also confirmed. Dense concentrations of artifacts and features (fireplaces) were observed on elevated ground, mostly sand and gravel units. But single examples of this lithic tradition (including the most characteristic backed lunates) occurred over the entire explored area, indicating an advanced erosion of original early Holocene sediments.

The latest prehistoric occupation of the Affad Basin area related in general to late Neolithic and Kerma horizons (7–3.5 ka) left modest remains in the form of almost completely eroded cemeteries on the margins of the Nubian Sandstone plateau, an area not explored during the

SDRS survey. Numerous clusters of burnt alluvium found on the surface throughout the former alluvial plain correspond most probably to extensive pasturing of this late-prehistoric landscape.

Lithic assemblages from Affad share most characteristics with Nubian inventories (from below the Second Cataract), dating to the late MIS5–MIS2 (about 75–12 ka BP, after Garcea 2010). Typical of the Nubian industries was an extremely long duration of production traditions based on Levallois methods. Groups inhabiting the Affad region in the terminal Pleistocene might have also been responsible for cyclical inflow of flake industries into Lower Nubia (e.g., Gemaian, Sebilian, after Schild and Wendorf 2010). Investigations into this issue are crucial for a study of the end of the Middle Palaeolithic/Middle Stone Age understood as the first stage of the Anatomically Modern Humans history in northeastern Africa. Characteristic traits of the Affad inventories include the dominance of working chert and other fine-crystalline raw materials. Levallois points were commonly produced using the Nubian II method, while no single example of the application of the Nubian I method has been registered (as defined by Guichard and Guichard 1968; Usik et al. 2013).

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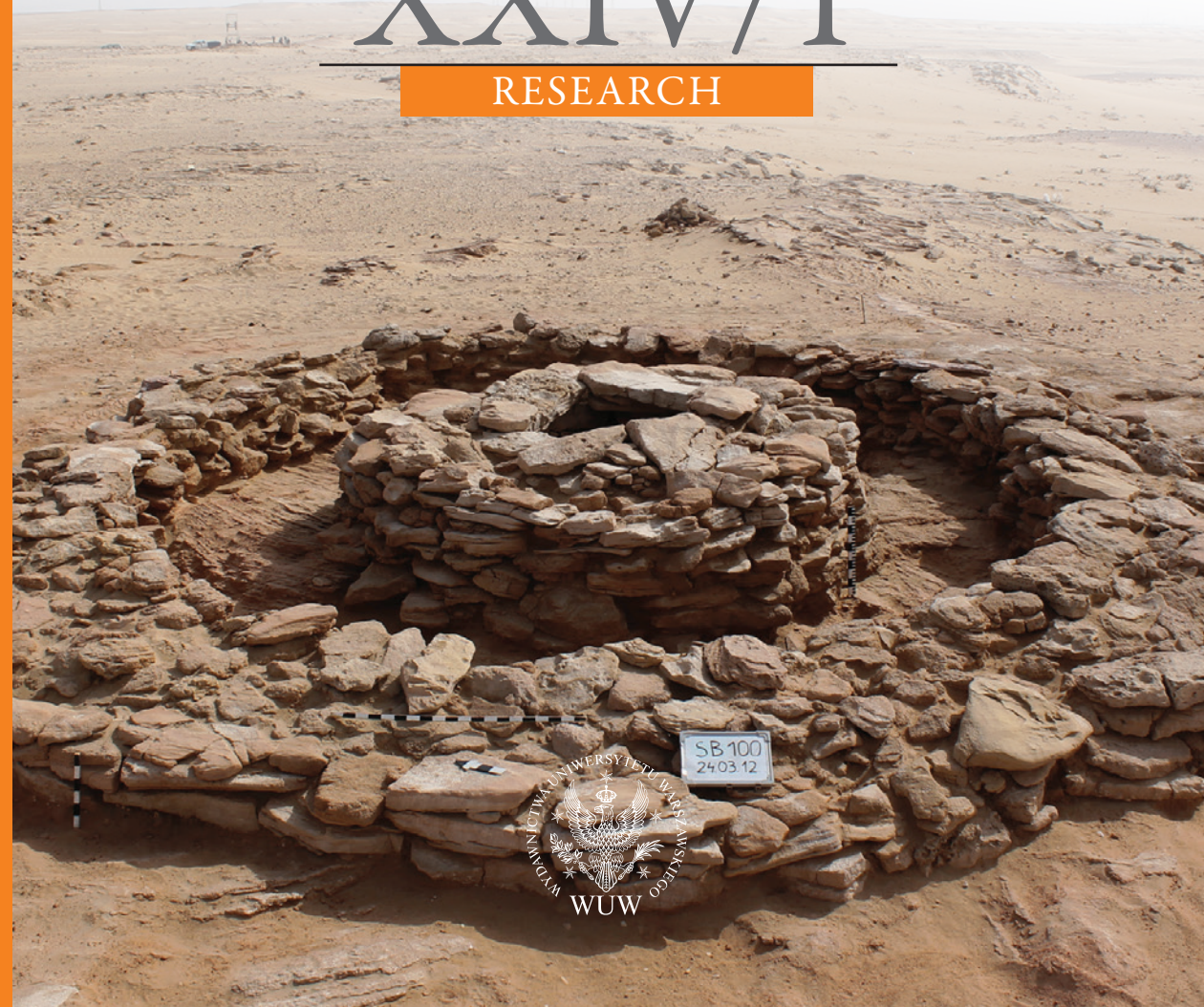
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