



## The nature of Nubian: Developing current global perspectives on Nubian Levallois technology and the Nubian complex

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### ► To cite this version:

Emily Hallinan, Omry Barzilai, Amir Beshkani, João Cascalheira, Yuri E Demidenko, et al.. The nature of Nubian: Developing current global perspectives on Nubian Levallois technology and the Nubian complex. *Evolutionary Anthropology*, 2022, 31 (5), pp.227 - 232. 10.1002/evan.21958 . hal-03833436

**HAL Id: hal-03833436**

**<https://hal.science/hal-03833436>**

Submitted on 28 Oct 2022

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Article in *Evolutionary Anthropology Issues News and Reviews* · September 2022

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## EVOLUTIONARY ANTHROPOLOGY: NEWS

### The Nature of Nubian: developing current global perspectives on Nubian Levallois technology and the Nubian Complex

Submitted: 19 July 2022

Accepted: 28 July 2022

Available online: 5 September 2022

DOI: 10.1002/evan.21958

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## **The Nature of Nubian: developing current global perspectives on Nubian Levallois technology and the Nubian Complex**

### **1. INTRODUCTION**

Nubian Levallois technology has recently risen to the forefront of debates surrounding Late Pleistocene human technological behaviour, cultural traditions and demographic histories. Named after the region where it was first identified, Nubian Levallois describes a specific method of lithic point production that occurs in Middle Palaeolithic (or Middle Stone Age) assemblages across arid North Africa, the Levant and Arabia.<sup>1-9</sup> However, the recent identification of Nubian technology in separate, disconnected regions, such as South Africa<sup>10-12</sup> and possibly India<sup>13,14</sup> suggests there are more diverse scenarios of its emergence and spread than the original model of a broad Nubian technocomplex related to a single, expanding population from its north-east African heartland.<sup>3</sup> While few assemblages containing Nubian technology are directly dated, its proposed MIS 5 timing coincides with early modern human dispersals out of Africa, adding a further dimension of whether certain lithic technologies can be linked to specific geographic populations.

Currently, advancing this debate is hindered by having neither an accepted definition of what constitutes Nubian technology, nor a consensus on its role in modern human cultural evolution and population dynamics.<sup>15-18</sup> To address this, 22 archaeologists (Table 1) met for an international workshop with two aims: (1) refining the definition of the Nubian technological method and how it can be identified in assemblages; and (2) re-evaluating the relationship between Nubian technology as a reduction strategy and the Nubian Complex as a cultural entity in the context of current evidence. The specialist group of lithic analysts brought expertise in relevant assemblages – particularly those where Nubian technology forms a prominent component – from across Africa, the Levant and Arabia (Figure 1), contributing a diverse range of approaches and perspectives to this salient debate.

### **2. WORKSHOP OVERVIEW**

The workshop was held at the Interdisciplinary Center for Archaeology and Human Evolution (ICArEHB), at the University of Algarve in Faro, Portugal, 24-26 February 2022. On the first day, presentations from workshop participants established the landscape of current knowledge about Nubian Levallois technology (Table 1). These were geographically wide-ranging, covering recent work in Israel's Negev Desert (Barzilai, Goder-Goldberger, Oron), extensive surveys in the Egyptian High Desert (Olszewski), the Combined Prehistoric Expedition campaign that originally defined Nubian cores in Sudan (Marks), and assemblages that contain especially high numbers of Nubian cores from the Arabian peninsula (Hilbert, Rose) and South Africa (Hallinan, Shaw). Complementary talks presented lithic studies from Syria (Demidenko), the Zagros (Nymark) and Morocco (Djellal). Additional perspectives tackled epistemological issues driving Nubian debates (Hovers) and encouraged new ways of conceptualising Nubian technology, drawing on geometry (Beshkani) and controlled knapping experiments (Rezek). The format for the second and third days took a discursive approach, with discussions guided by presentations on the following themes: (1) What? Defining Nubian Levallois technology; (2) Where? The origins and distribution of Nubian technology; (3) Why? Reasons behind Nubian technology.

## 2.1 What? A refined definition of Nubian Levallois reduction

Specialists in the field of Nubian Levallois technology have previously identified the need for a clear and unified definition if we are to advance our understanding of the nature of Nubian in technological and taxonomic terms;<sup>17</sup> therefore, this was a major focus of the workshop's first discussion session. The attribute list developed by Usik et al.<sup>19</sup> has been employed in numerous studies to assess whether Nubian Levallois technology in its strictest sense is present in an assemblage.<sup>6,11,12,20</sup> However, disagreement over the identification of certain cores<sup>16,17</sup> and the ambiguous affinities of others<sup>21-24</sup> emphasise the need for a refined definition to serve as a solid foundation for subsequent behavioural interpretations.

Drawing on our combined experience of relevant assemblages in nearly all regions where Nubian technology is found, the workshop group identified the following features as key requirements for a Levallois core to be described as 'Nubian'. First, Nubian cores are expected to follow the widely accepted criteria of preferential Levallois reduction schemes more broadly: (1) the volume of the core is formed of two surfaces meeting at a plane of intersection, (2) these are hierarchically related with defined roles as preparation and production surface, and (3) the aim of reduction is to produce a predetermined product, achieved through the management of lateral and distal convexities.<sup>25-26</sup> Second, they show a specific sequence of reduction<sup>19,26</sup> that results in the following technological and morphological characteristics (Figure 2):

- (1) Possession of a steep ridge at the distal end of the core (the distal median ridge), of 90 degrees or less, formed by two or more intersecting scars.
- (2) The presence of a distal platform for preparation removals, serving an alternate role to the proximal platform from which preferential removals are struck.
- (3) The distal portion of the core is the focus of preparation of the distal ridge, with removals from the distal platform and/or steep lateral preparation focused on the distal half to third of the core.
- (4) The overall morphology of the core is pointed, occurring in a variety of convergent shapes.
- (5) Reduction is aimed at producing pointed end-products.

In our discussions, an important distinction was drawn between two analytical goals: identifying whether an artefact is a Nubian core, and characterising variability within an assemblage containing Nubian Levallois technology. Our revised criteria directly address the first issue. The second issue, quantifying intra-assemblage variability of Nubian reduction, is captured in the attributes defined by Usik et al.<sup>19</sup>; for example, exploring the range of distal median ridge steepness, which is expected to be between 60 and 120 degrees. Under our modified approach, this accommodates for reworked or exhausted cores that have a flatter distal ridge (greater than 90 and sometimes exceeding 120 degrees) but otherwise fall within a Nubian reduction system. Other attributes, such as the angle of the distal platform and core morphology, are suited to intra-assemblage analyses but are not diagnostic criteria alone.

A further point of discourse concerned the terms 'Type 1', 'Type 2' and 'Type 1/2' to describe dorsal scar preparation patterns on Nubian cores. The workshop participants agreed that Nubian 'Types' are only useful in so far as they describe preparation methods within an assemblage, representing the extremes of a spectrum of distal (Type 1) and lateral (Type 2) preparation strategies. Therefore,

more clarity in characterising this variability in future work will come from describing cores explicitly in terms of their pattern of distal ridge preparation, thereby removing the blurred boundaries of Types and focusing instead on describing technology.

## **2.2 Where? Re-aligning the ‘Nubian Complex’ debate**

Since the original applications of the term ‘Nubian’,<sup>1,3</sup> our knowledge of the geographic distribution of Nubian technology has widened, particularly in the last 10 years, resulting in more complex implications for how it is understood in cultural terms. However, it is increasingly evident that the quantitative occurrence of Nubian technology is not the same in time and space. It is to be expected that occasional cores that fall within our strict revised definition of Nubian cores may occur in other assemblages with Levallois reduction; however, the significance (or not) of these depend entirely on the assemblage context. Arguments focusing on the existence of the Nubian Complex<sup>15</sup> are doing little to aid our understanding of the nature of Nubian technology as a cultural behaviour in regions where it is a prominent reduction strategy.<sup>4,6,9</sup> The conclusion arising from the workshop supported a move towards restricting the use of “Complex” or equivalent cultural designations until further comparative studies and explicit tests of dispersal, diffusion and convergence scenarios have been carried out. We propose a reorientation in approach towards a ‘bottom up’ understanding of the shared building blocks that may represent common cultural elements in a revised notion of a Nubian cultural entity.

## **2.3 Why Nubian?**

A key – though at this stage in our research, abstract – question is why the Nubian reduction strategy might have been employed. While debates usually centre on the Nubian core since this is the more abundant and recognisable artefact type in most assemblages, fresh perspectives offered by workshop participants working in other Palaeolithic contexts served as a reminder that tool function is an important and often neglected aspect. However, a widespread problem in tackling this is that very few assemblages with Nubian Levallois reduction contain high numbers of end-products (points or pointed flakes). Considerations related to point shape, robusticity and aerodynamics were discussed but further investigation is needed to test these hypotheses.<sup>27</sup> The relationship between Nubian technology and the present-day desert environments in which it occurs might also offer insights into arid behavioural adaptations,<sup>11</sup> or a shared cultural ‘contextual area’.<sup>6,9,20,28</sup>

## **3. FUTURE DIRECTIONS**

Several areas were identified as priorities in our future research and plans to implement these were formed. First, the creation of experimentally knapped assemblages will provide a foundation for testing various hypotheses about the Nubian reduction method. While there are some extensively refitted archaeological assemblages (e.g. Makhadma 6,<sup>29</sup> Abydos 4011,<sup>30</sup> TH.383c<sup>19</sup>) these are in the minority and the problem of ‘missing’ Nubian end-products hinders many of the questions surrounding why Nubian reduction was used over other methods of point production. Second, the application of 3D methods to the measurement and analysis of the key attributes that define Nubian cores will aid the quantification and replicability of our data. Preliminary results of 3D geometric morphometric analyses showed the potential of these tools for comparing the shapes of Nubian cores and end-products, and various methods for digital angle measurements were discussed. The value of generating 3D models of artefacts was further demonstrated by the use of 3D printed Nubian cores to aid workshop discussions and compare specimens from different regions side-by-

side. Third, the comparison of relevant assemblages where Nubian reduction is prominent will allow us to develop models that explicitly test the archaeological evidence against the expected signatures of dispersal, diffusion or convergence at an inter-regional scale. Applying Tostevin's<sup>31,32</sup> attribute-based framework for measuring cultural transmission and social intimacy was proposed as one pathway for achieving this.

Given recent published debates on the nature of Nubian, our workshop was a necessary and timely contribution to the study of the 'Nubian' phenomenon. Adopting the revised approach set out in this paper will provide the necessary vocabulary and scientific rigour to advance these discussions. Our definition draws a clear distinction between identifying Nubian cores in an assemblage and interpreting the Nubian Levallois reduction strategy at an intra- and inter-assemblage scale. Building on the need for archaeological interpretations of lithic assemblages to be rooted in quantitative, reproducible data<sup>33</sup>, our workshop has both established a framework to facilitate this, and laid the groundwork for comparative studies. Future research arising from these outcomes promises significant new insights to constructively explore technological, behavioural and cultural dimensions of the Nubian debate.

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## ACKNOWLEDGMENTS

The 'Nature of Nubian' workshop was supported by funding from the FCT (Fundação para a Ciência e Tecnologia, Portugal) awarded to ICAREHB, FLAD (Luso-American Development Foundation) and the Algarve Archaeological Association. The workshop took place in the frame of Emily Hallinan's project TANKwA funded by the European Union Horizon 2020 Framework under the Marie Skłodowska-Curie Grant Agreement No. 891917.

## CONFLICT OF INTEREST

The authors declare no potential conflict of interest.

## DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analysed in this study.

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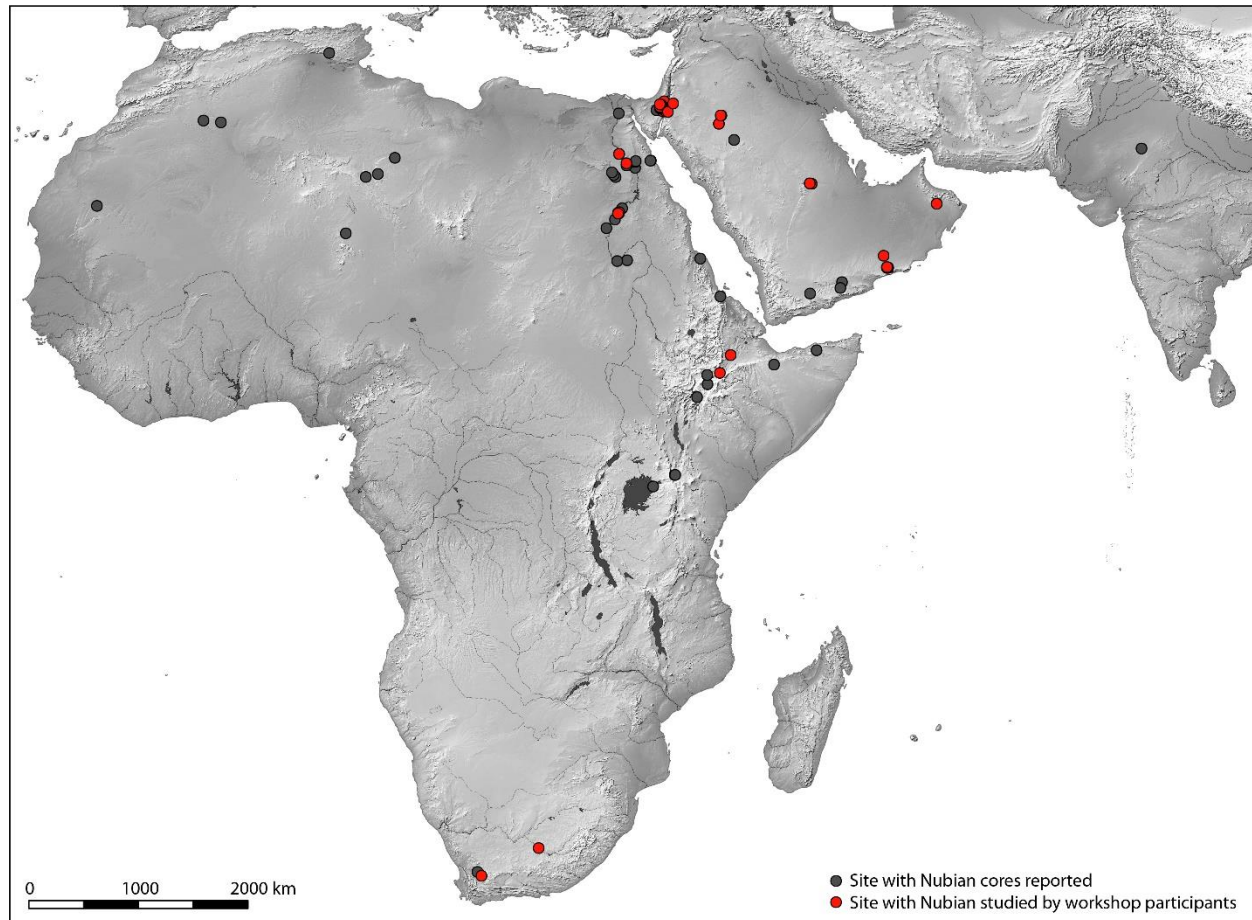
**Table 1.** Overview of workshop presentations

<b>Presenting participants</b>	<b>Presentation title(s)</b>
Omry Barzilai	Contextualizing Nubian cores in the Negev
Amir Beshkani	The Net of Nubian: A tool to understand the reduction sequence
Yuri Demidenko	Sites with Nubian core technology in Central Syria in the context of the Middle to Upper Paleolithic transitional period and IUP Emiran appearance in the Levant*
Youssef Djellal	Early <i>Homo sapiens</i> complex behavior in North Africa: function of the Middle Stone Age lithics in Morocco
Mae Goder-Goldberger	What can we learn about human behavior from the Nubian Levallois technology in the Negev? <i>Discussant (Where?):</i> Diffusion scenarios
Emily Hallinan	South Africa's Nubian in context <i>Discussant (What?):</i> 3D approaches to Nubian Levallois (with João Cascalheira)
Yamandú Hilbert	Nubian technology in Saudi Arabia <i>Discussant (Why?):</i> Variability and raw material
Erella Hovers	What is it about the Nubian?
Anthony Marks	Understanding Nubia's Nubian*
Andreas Nymark	Mousterian misfits? Zagros Mousterian and naughty Nubian
Deborah Olszewski	Nubian aggregates in the high desert near Abydos, Egypt
Maya Oron	Dimona south, a Nubian knapping site in the Negev desert (Israel) <i>Discussant (Why?):</i> Points, variability and cultural traditions
Zeljko Rezek	Is there (and what is?) "Nubian-Levallois" from the etic perspective of fracture and flake formation?
Jeff Rose	Middle Palaeolithic archaeology and landscapes in Dhofar, southern Oman <i>Discussant (Where?):</i> Dispersal scenarios
Matthew Shaw	Nubian technology and the Levallois knapping spectrum at Tweefontein, South Africa <i>Discussant (Where?):</i> Convergence scenarios
<b>Non-presenting participants:</b>	João Cascalheira, Jovan Galfi, Pedro Horta, Candice Koopowitz, Camille Lesage, João Marreiros, Shannon McPherron, Muati al Muati, Alla Yaroshevich

\*Presentation given *in absentia*.

Regrettably, due to global circumstances beyond our control, Yuri Demidenko, Vitaly Usik and Mirosław Masojć were unable to travel to the workshop. Anthony Marks participated over Zoom.

**Figure 1.** Map showing assemblages containing Nubian cores studied by workshop participants (red circles). Sites with Nubian cores reported (grey circles) after Hallinan and Shaw 2020.



**Figure 2.** Schematic illustration of the characteristics of Nubian Levallois technology

