The Festival of Lithics 2021 Abstract Booklet

Stone Tools Illustrations with Vector Art: The 'STIVA' Method

Jacopo Niccolò Cerasoni [1] *

[1] Pan-African Evolution Research Group, Max Planck Institute for the Science of Human History, Kahlaische Straße 10, 07745, Jena, Germany

*** E-mail: cerasoni@shh.mpg.de**

Associated content

The STIVA Method has been published and is accessible on PLOS ONE (https://doi.org/10.1371/journal.pone.0251466) and on protocols.io (https://dx.doi.org/10.17504/protocols.io.bubqnsmw).

Abstract

Lithic illustrations are often used in scientific publications to efficiently communicate the technological and morphological characteristics of stone tools. They offer invaluable information and insights not only on how stone raw materials were transformed into their final form, but also on the individuals that made them. Here, the "Stone Tools Illustrations with Vector Art" (STIVA) Method is presented, which involves the illustration of lithic artefacts using vectorial graphics software (Adobe® Illustrator®). This protocol follows an optimised step-by-step method, presenting ten major sections that constitute the creation of a lithic illustration: photography, vectorial software configuration, scale, outline, scar borders, ripples, cortex, symbols, composition, and export. This method has been developed to allow researchers, students and educators to create clear and competent illustrations for any application, from scientific publications to public outreach.

Thoughts on advancing the role of statistics in lithic archaeology

Peter Mears [1], Lucy Wilson and Constance L. Browne

[1] University of New Brunswick, Canada

Abstract

The classification of stone tools and their raw materials has always been central to the field of lithic archaeology, but could more be done using statistical techniques to better understand the lives of those who made and used the tools? Our research is focused on building resource selection functions that determine causal influence for the use of stone tool raw material sources across a given landscape. This involves a geological and geographic description of what a source provides in relation to the archaeological site where an artefact was found, in concert with a multivariate statistical model that calculates which, if any, of these factors matters the most and how they interact. We demonstrate the potential and wider application for building complex resource selection functions in an archaeological context, showing how statistical techniques more familiar to wildlife ecology can be adapted and how challenges, such as low sample size and rare-event bias, can be addressed and overcome. Examples are drawn primarily from a dataset of over 15,000 lithic pieces excavated in 11 archaeological layers at a Middle Palaeolithic site in southern France, the Bau de l'Aubesier. In a similar way to how it has impacted modern biological research, we suggest that modern statistical analyses are poised to play an important role in developing modern lithic archaeology, bringing us closer to understanding the past behaviours of our prehistoric ancestors.

Geometric Morphometrics rules! Featuring a recent and promising method for the study of form in formal lithic artefacts from Southeastern Brazil

Renata Araujo*, Dr. Mercedes Okumura, LD Astolfo Araujo*****

***** Ph.D Candidate, Laboratory for Interdisciplinary Research in Evolution, Culture and Environment, Museum of Archaeology and Ethnology at the University of São Paulo, Brazil.

****** Lecturer, PI of the Laboratory for Human Evolutionary Studies, Department of Genetics and Evolutionary Biology, Biosciences Institute, University of São Paulo, Brazil.

******* Full Professor, PI of the Laboratory for Interdisciplinary Research in Evolution, Culture and Environment, Museum of Archaeology and Ethnology at the University of São Paulo, Brazil.

Abstract

Geometric morphometrics is a quantitative method borrowed from Biological Sciences to Archaeology for the analysis of artefact form. The application of a morphometric approach to the analysis of material culture is fairly new – a little more than a decade. Our purpose is to present how geometric morphometrics can be a highly effective and advantageous tool to produce robust and replicable quantitative data regarding size and shape of artefacts, as well as consisting in a complementary method for technological analyses of lithic industries. We will also present results of recent morphometric studies applied to a class of formal lithic artefacts, namely, stemmed lithic points from Holocene sites in Southeastern Brazil, carried out by the second and third authors of this abstract. The Ph.D. project being developed by the first author of this presentation aims to expand the previous analyses run by the other two authors, including, besides lithic points, another class of formal artefact (unifacial, plane-convex tools), both from the State of São Paulo, Brazil. Morphometric studies, in conjunction with data on lithic technology, have been a very promising and effective approach to the production of new evidence allowing the reassessment of lithic industries in Southeastern Brazil, contributing to a greater understanding of the occupation processes of this portion of South America by hunter-gatherer groups during the Holocene.

KEYWORDS: methods, geometric morphometrics, lithic industries, morphology, Brazilian prehistory, Evolutionary Archaeology, Holocene.

Deconstructing the Acheulean: A functional analysis of the High Lodge scrapers

Finn Stileman

Abstract

The MIS 13 site of High Lodge, Suffolk, has been a challenge to Lower Palaeolithic frameworks since its discovery in the 19 th century. Specifically, the divergent lithic assemblage from Bed C2, which is distinguished by elaborately retouched scrapers and a total absence of handaxe technology. While these two deviations from classic Acheulean technology are usually approached separately, controlled and actualistic experiments with scraper reproductions demonstrate their potential versatility, including a surprising appropriacy for butchery. As large, acutely retouched and regenerative tools, these may even represent local alternatives to handaxes, partaking in heavy-duty cutting activities among other tasks. If this theory is tenable, it has huge implications to cultural variance in the Lower Palaeolithic and the disciplinary importance currently placed on handaxes as fossile directeurs. Rather than an

impoverished industry, the non-handaxe assemblage from High Lodge examples the adaptive capacity of Middle Pleistocene hominins.

The Dog that Barks in the Night – a community research initiative to re-appraise the lithics of Rainbow Bar

Abstract

Rainbow Bar is a recognised palaeolithic site of national importance that Wenban-Smith notes has received little attention (see Palaeolithic Archaeology of the Solent River (Wenban-Smith and Hosfield, 2001, LSS Occasional Paper No7, p.4). He goes on to suggest that "the contribution of the Solent region to Palaeolithic research is'very much the dog that didn't bark in the night' and suggests that this was 'a matter for Holmes.'

This project is a community-led response to Wenban-Smith's challenge to help '...put the Solent Basin more firmly on the map' (op.cit., p.5) by developing a methodology congruent with the characteristics and challenges of the site which is an inter-tidal marine feature on an exposed coast, on the edge of a densely populated urban area and on the edge of a very busy international seaway.

The Wider Project

The project is part of a community education and research initiative supported by residents, local associations, and the Hampshire Cultural Trust. The initiative's primary outcome is the gathering together and development of learning and educational materials for the use of local schools, colleges, and the general public. There are several interrelated projects, including ecological and geomorphological, that will support the archaeological work. The intention is that the community and students will be closely involved in the research and the generation of learning materials.

The archaeological research component will model the landscape of Hill Head Beach and Rainbow Bar across the prehistoric periods corresponding to lithic assemblages from the area. The landscape models will be correlated with the finds data to attempt an analysis of hominin activity in making and using flint tools in the locality. This analysis will be developed with the help of local schools into learning materials initially suitable for primary school children. The crucial first stage of the project will consist of determining the most suitable research methodology for a site as complex and challenging as Rainbow Bar that is also congruent with the projects objective of developing learning materials and engaging the community.

The Video as an action research initiative.

The video will showcase the bar as an important palaeolithic archaeological site, with most scenes filmed outside on location when tide and conditions permit. It will outline the key features of the lithic assemblages and their relationship to Rainbow Bar and its current and prehistoric geomorphology and its place in the regional landscape and in Europe.

Its conclusion will be a series of questions for lithic society members asking for advice and guidance on the research methodology. The video can stand alone, but the intention is that the video will combine with papers written for editions of the journal at a later date to form together a piece of action research as outlined below.

- Members consulted on the research methodology using video produced for the 'Festival of Lithics'.

- Short paper to the journal reporting back on the suggestions made by members, the methodology adopted following their suggestions, and the outline implementation plan.

- A further journal paper reporting back on the implementation, its finding and future objectives and plans and inviting critical appraisal from members and proposals for further research.

Should the video not engage and elicit a response from members, at a later date we will submit a separate proposal for a paper to the Journal based on our work.

Evolutionary Theory Applied to the Analysis of Late Holocene Stone Tools from the Lund Archaeological Site, Lagoa Santa, Brazil

Enrico Dalmas Baggio Di Gregorio1, 2 & João Carlos Moreno de Sousa3

Abstract

The region of Lagoa Santa, more specifically the Environmental Protection Area of the karst of Lagoa Santa, houses an important context for Brazilian archaeology. In this study we present the Late Holocene lithic industry from the Lund Site, one of the archaeological sites of Lagoa Santa region, Brazil, and which demonstrates an artifact variability not yet described for this region and distinguished from the already known Lagoassantense Paleoamerican Culture. We apply the theoretical approach of evolutionary archaeology and Cultural Transmission Theory (CTT) to study the lithic collection by understanding the process of cultural evolution as analogous to that of biological evolution described by Darwin. Our work focuses on the technological analysis of the lithic artifacts of this site, contributing to the understanding of the dynamics of cultural evolution of prehistoric human groups of Lagoa Santa and their relationship with the environment.

Looking through a lithic lens: Utilising the presence and morphology of lithic tools as a proxy for an understanding of the nature of the Neolithisation of southern England and southern Wales.

Anna-Elyse Young Cardiff University

This paper is a summary of my PhD research plan which focuses on lithics during the British Mesolithic-Neolithic transition. This period is a popular but contentious subject area; it evokes ideas of migration, mobility, change in subsistence, and how contemporaneous peoples viewed the world around them. There are many strands of evidence for this period, such as monuments, faunal and floral remains, aDNA analysis, and pottery. These forms of evidence have been focused on whilst lithic analyses of this period have been largely overlooked or are incidental to any overarching argument on the Neolithisation of Britain. This research intends to put the analysis of lithic technology into the foreground of understanding the Neolithisation in southern England and southern Wales. In other words, viewing the British Mesolithic-Neolithic transition through a 'lithic lens'. This research uses a case-study approach of sites which have associated radiocarbon dates to lithic assemblages dated within the range of ~ 4500-3600 cal BC. This 900-year period incorporates the terminal Mesolithic and the initial Neolithic in Britain. The use of associated radiocarbon dates allows for a more chronologically detailed and critical approach of analysis of the morphology and presence of lithic tools during this paradigm shifting transition, opposed to the general 'Late Mesolithic-Neolithic' date which is so often labelled to assemblages of this nature. As a first year PhD student this paper will present a summary of my research plan, the methods I will employ, some of the sites within my data set and the impact this may have on the ideas of the Neolithisation of Britain. It also provides an opportunity as a 'call for information' on any potential sites that audiences may be able to provide.

New record of bifacial points from the Ribeira Valley and Intervales regions (Southern São Paulo State, Brazil)

MORENO DE SOUSA, J. C. & OKUMURA, M. – Laboratory for Human Evolutionary Studies, Institute Biosciences, University of São Paulo (Brazil)

Outline: In our previous studies (as seen in the last Festival of Lithics edition) on lithic industries associated to hunter-gatherers in Brazil we pointed out that these groups are way more diverse than previously thought, and we begin to identify and classify regional cultural groups. One of these new classifications was defined as the Rioclarense Lithic Industry, at that time, only observed in central and eastern São Paulo state. Recently, we have identified Rioclarense points in the southern part of the state, in the Intervales region. In the Ribeira Valley region, however, a distinct variety of bifacial points was identified. Here we present our new findings regarding the research in the Ribeira Valley, defining new point typologies and adding one more region where the Rioclarense Industry can be observed.

ALONGSIDE AXES: A BRIEF ASSESSMENT OF LITHICS FROM THE EARLY NEOLITHIC FLINT MINES OF SUSSEX

Dr Jon Baczkowski

University of Southampton

I propose to present on the results of new surveys and archival research undertaken at the University of Southampton for my PhD thesis, titled The Early Neolithic Flint Mines of Sussex and their Wider Environs. As part of the project new surveys were carried out on two Sussex mine complexes, Church Hill and Harrow Hill, along with archival research on material recovered from Long Down. Further analysis of newly collected and archival lithics also formed a major part of the project. The presentation will detail elements of the mine assemblages that are not focused on bi-facial axe production, being either associated with mining or domestic activity. Although such lithics only comprise a small percentage of flint mines assemblages, they are significant because they broaden our understanding of flint mining beyond axe production and Early Neolithic technologies in general.

The Upper Paleolithic of the Americas

Thomas J. Williams

Abstract: Concurrent with the increasing evidence of an early human occupation of the Americas is the recognition of a diverse and complex early record. These data indicate multiple patterns and/or adaptive strategies in distinct areas of the western hemisphere. This early period is marked by group expansion out of the Old World and into the New World. To better understand this period, the term The Upper Paleolithic of the Americas has been proposed. This paper examines early lithic technologies present in the New World and what they indicate concerning the proposed entry models and patterning. The paper will also examine some of the key questions that must be explored to provide a greater understanding of this early period.

Early human social transmission during MIS 5: A perspective from the Kalahari Basin.

Precious Chiwara-Maenzanise (Department of Archaeology and Human Evolution Research Institute, University of Cape Town)

Abstract

Many significant early human behavioural innovations first appear in South Africa during Marine Isotope Stage (MIS) 5, between ~130,000 and 74,000 years ago. This includes the earliest known evidence for geometric engravings, the collection of non-utilitarian objects like crystals, the use of ostrich eggshell container technology, and production of microlithic technology. My PhD dissertation focuses on social transmission in the Kalahari Basin of southern Africa during this key period for understanding the emergence and expansion of modern humans. Here, I will present some preliminary results of this work. Mackay et al. (2014, Journal of Human Evolution 72:26-51) have hypothesized that the MIS 5 period in southern Africa is generally characterised by less interaction and reduced intergroup connectedness. However, the Kalahari Basin is an understudied region compared to the more well-known coastal and near-coastal regions of South Africa, and for this reason has not been previously used to test this hypothesis. To further test this hypothesis, I will compare MIS 5 lithic assemblages from multiple archaeological sites within the Kalahari Basin. The samples studied here include the DBSR assemblage from Ga-Mohana Hill North Rockshelter (GHN),

which is dated by OSL to ~105,000 years ago. The lithic technology at GHN includes mainly large flakes, blades and points that are made on tuff, chalcedonic black chert, and banded ironstone formation. Other MIS 5 assemblages in the Kalahari Basin and adjoining regions that can be used for comparison include those at Kathu Pan, 1, 6, 9, Bundu Cave, Erfkroon, and Florisbad in South Africa, and #Gi and White Paintings in Botswana. Using these assemblages from a wide range of sites, I aim to produce a detailed account of the MIS 5 lithic technology in this region, to shed light on the degree and nature of social interaction in the Kalahari, and work toward correcting the geographic bias toward coastal regions in southern Africa.

Revisiting the 'quartz problem' in lithic studies: a review and new, experimental, open-access dataset

Dr Caroline Spry, Dr Rebekah Kurpiel, Dr Elizabeth Foley and Paul Penzo-Kajewski (Department of Archaeology and History, La Trobe University, Bundoora, Victoria, Australia 3086)

Quartz has long been a popular material in many parts of the world for making stone tools. However, the properties and fracture mechanics of quartz complicate the identification and classification of flaked quartz, which can appear similar to quartz fractured by natural and other (non-flaking) cultural processes. While archaeologists have attempted to address this 'quartz problem' largely through experimental studies, the analysis and interpretation of flaked quartz assemblages remain problematic. Here we present a review of literature that investigates the quartz problem, and a case study that examines the physical features of artefacts in an experimentally flaked assemblage—including a suite of 'markers' widely reported to be diagnostic of knapped quartz. The results suggest that freehand knapping of a vein quartz block will produce mostly shatter and small, undiagnostic pieces. Additionally, few artefacts (particularly medial flakes, distal flakes and angular fragments) will exhibit the proposed markers of knapped quartz. Nonetheless, the results suggest that the physical features of individual quartz pieces, as well as assemblage composition, characteristics and context more broadly, are critical as part of an integrated approach to studies of flaked quartz technology. The dataset created for this study is freely available, providing the first example of an open-access dataset to aid the study of flaked quartz assemblages worldwide.

Understanding Lithic variability in the Siwalik Hills region

Anubhav Preet Kaur

Affiliation: Indian Institute of Science Education and Research, Mohali, India

Position: PhD Research Scholar

Abstract:

Palaeolithic artefacts have been known from the Siwalik Hills region of the Indian Subcontinent since the 19th century. However, it was only in 1936, as a result of the Yale-Cambridge Expedition, that a systematic understanding concerning the lithic typology and associated geological context came to be developed. The entire cultural sequence was defined under the nomenclature of Soanian and categorised into phases on the basis of state of wear, surface condition and associated geology. As a result of subsequent research during the later centuries, technological variability has been highlighted time and again in Soanian assemblages. Nevertheless, the redundant terminology continues to be used to describe lithic assemblages from the Siwalik Hills made on fluvially rolled clast, without paying much heed to the technological variability. This presentation will focus on providing an overview to the Soanian lithic complex across Pakistan, India and Nepal, thereby, moving towards highlighting the technological variability and its implications on the relative chronology.

Flint as Raw Material: An Introduction to Flint Formation, Mineralogy, and Geochemistry

Josie Mills

Geological raw materials have been used by hominins to make artefacts for millions of years and are found at prehistoric sites across the world. This talk focuses on the rock ‘Flint’ a term used by archaeologists to describe silica-rich stone found in the Upper Cretaceous deposits of Northern Europe. Flint will be discussed from a geological perspective exploring how it formed, what it is made from and how it behaves as a raw material. These features help archaeologists to explore raw material acquisition in the past and to understand choices made by prehistoric communities.

Use-Wear and Residue Analysis: A brief history

Michael Hitchcock

Residues are the inorganic or organic remains left behind on a lithic following its use. This can include blood or hair from butchered animals; or plant matter including phytoliths, starch grains or pollen. Use-wear analysis refers to the study of wear traces along the edges of a lithic. Wear traces are specific fractures and striations which form as a result of using the tool, and these differ according to the material worked on, the material the tool is made from and according to the action taking place.

Studies of wear traces and residues along a tool's edge began in earnest in the early 20th century, with publications mostly focusing on ethnographic work. The work of Semenov in the 1950s served as a catalyst in applying use-wear and residue analysis to prehistoric tools. Following the work of individuals such as Semenov and others such as Keeley the analysis of stone tools edges became more common in archaeological publications with use-wear and residue analysis was becoming more and more popular. The Association for Archaeological Wear and Residue Analysts (AWRANA) was formed in 2012 with the aim of standardising methods and calling for wider interest in the subject.

This talk will provide a brief history of Use-wear and residue analysis, from the origins of the methods to the modern day, outlining the evolution of concepts, key figures, and discussing the future potential of these analyses.

Music from Old Stone: Can Experimental Archaeology Reveal Insights into Early Music?

Kiefer Duffy

University of York

Music is an enigmatic component of our evolutionary history, despite its ubiquity in the modern world. Even more enigmatic is the story of how we came to create music through specifically curated objects: Instruments. These appear suddenly in the record with little precedent. How then can we begin to unravel the processes that led to these objects being created. I propose that stone tools offer an ideal medium through which to explore hominin relationships with acoustically active tools and raw materials. This talk describes the first experiment in a series

of explorations of the acoustic properties of knapping and their relationships to success in stone toolmaking. This first experiment being an attempt to quantify the “sound of success” in knapping, looking the acoustic properties of strikes on various raw materials and their flaking outcomes. It will further explore people’s perception and preference in relation to the sound of knapping. Do people prefer the sounds of good flakes being struck from good materials? The experiment is ongoing, and all comments/questions are welcome.