# Towards a collaborative meta-analysis of the Final Palaeolithic/earliest Mesolithic in Europe. Report on the 2nd CLIOARCH Workshop, 26th-27th November 2020

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# Towards a collaborative meta-analysis of the Final Palaeolithic/earliest Mesolithic in Europe. Report on the 2nd CLIOARCH Workshop, 26th-27th November 2020

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**Abstract** – We report on a virtual workshop aimed at advancing a new synthesis of techno-cultural patterns at the Pleistocene-Holocene boundary in Europe. We respond to the growing need of developing meta-analytical frameworks for comparing and eventually integrating disparate regional datasets and stress the opportunities of collaborative approaches. We propose that expert-sourced lithic data is a promising means of conducting systematic archaeological meta-analyses, and that the compilation and examination of similar continental-scale datasets may be an important research goal in the future.

**Key words** – archaeology; synthesis; comparison; data integration; Pleistocene-Holocene transition; typology; technology; cultural taxonomy; complexity

**Titel** – Auf dem Weg zu einer gemeinschaftlichen Meta-Analyse des Endpaläolithikums/frühesten Mesolithikums in Europa. Bericht über den 2. CLIOARCH-Workshop, 26.-27. November 2020

**Zusammenfassung** – Wir berichten über den 2. Workshop im Rahmen des CLIOARCH-Projekts, der darauf abzielte, auf eine neue Synthese technokultureller Langzeitentwicklungen an der Pleistozän/Holozän-Grenze in Europa hinzuarbeiten. Wir reagieren damit auf den wachsenden Bedarf nach einem metaanalytischen Fundament für den Vergleich und die eventuelle Integration von heterogenen regionalen Datensätzen in der Archäologie des Spätpaläolithikums und frühesten Mesolithikums und betonen insbesondere die reichhaltigen Möglichkeiten, die kooperative Ansätze hierbei bieten. Wir schlagen vor, dass das Expert-Sourcing von vorgefilterten lithischen Informationen eine vielversprechende Grundlage zur Durchführung systematischer archäologischer MetaAnalysen ist und dass die Zusammenstellung, Untersuchung und Konservierung ähnlicher großräumiger Datensammlungen ein wichtiges Forschungsziel für die Zukunft sein könnte.

**Schlüsselwörter** - Archäologie; Synthese; Vergleich; Datenintegration; Pleistozän/Holozän-Grenze; Typologie; Technologie; kulturelle Taxonomie; Komplexität

## Introduction

Like many other fields across the sciences-humanities spectrum, archaeology is increasingly recognizing the need to develop diverse forms of scholarly cooperation and a collaborative working ethos in order to respond to the emerging knowledge ecologies of the 21st century (cf. Smith, 2015). Although this turn towards team-based inquiry and forms of joint scholarly production should not be constructed in opposition to 'lone wolf' scholarship, collaborative research opens novel avenues of investigation, fosters innovative and efficient modes of data collation and might thus pave the way towards new ways of planning and conducting research projects in archaeology. In the context of the ERC-funded CLIOARCH project (Riede et al., 2020), and building on critical interrogations of traditional cultural taxonomies in the Palaeolithic at the project's initial workshop (Hussain & Riede, 2019; Riede et al., 2020), this second workshop held from 26th to 27th November, 2020 in the virtual Gather.town environment (https://gather.town/ [29.1.2021]) was designed to explore the possibilities of collaborative archaeological investigations at a transregional scale. The workshop was an experiment in data-driven cooperative research, with the goal of drawing together, systematically compare and contrast regional archaeological trajectories of lithic evolution at the Final Palaeolithic-earliest Mesolithic juncture, and so to jointly work towards a renewed synthesis of continental-wide cultural evolutionary dynamics in this timeframe.

## Explicit research designs for collaborative macro-archaeology

The workshop pooled regional expertise from the Iberian Peninsula, Western France, Great Britain, Germany and Switzerland, Austria, North-eastern Italy, Southern Poland, Lithuania, Southern Scandinavia and Central Asia. The ambition was

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to develop and build a continent-wide database encompassing Late Upper Palaeolithic, Final Palaeolithic and earliest Mesolithic archaeological complexes and cultural taxonomic units to enable a quantitative exploration of macro-archaeological patterns, trends and trade-offs in lithic technology, typology and the morphometry of artefacts along and across geographic and chronological gradients. The target timeframe was subdivided into four time-slices, spanning the period between ca. 15 and 11 ka cal. BP and including the Pleistocene-Holocene transition.

With the contribution of individual experts from the included study regions, we compiled information on key archaeological sites anchoring their respective regional records. The experts were selected based on an initial screening of the relevant literature. Some participants were chosen from the CLIOARCH team's personal networks, others because of their regional expertise as inferred from their publications. The goal was to muster a group of scholars from various age groups with a clear emphasis on ECRs (Early Career Researchers).

With reference to the key sites from the different study regions, information on >40 technological properties, subdivided into five analytical domains (laminar reduction strategies and core structure, blade and bladelet production, raw material management, non-blade-oriented production systems and tool management) as well as about 20 tool form categories was compiled as discrete characters in a shared database. This database was further complemented by images of selected formal tools – primarily projectile points and endscrapers – from those same sites. The result of this exercise is a formalized 'datasheet' with technological and toolkit-related entries and a separate image repository. While technological and typological data on laminar reduction systems and lithic tool configurations were collected on the level of archaeological complexes, focusing on emergent tendencies and patterns, the tool shape information was gathered in order to examine morphological changes through time and space, and to trace relationships – synchronicities and asynchronicities – across varying domains of lithic evolution.

The data infrastructure was established well ahead of the workshop and a first round of data collection and validation was completed prior to the virtual event. Each contributor provided a synthesis and breakdown of their regional archaeological sequence, submitted these data beforehand and then presented an overview and contextualization during the workshop. The online workshop then served to discuss the particularities and challenges of each sequence and to pinpoint emergent transcontinental trends, to discuss the preliminary results of the quantitative analysis and to refine and adjust the database.

The rationale of our collaborative venture was macro-archaeological and the motivation was both critical and constructive. From a critical, research-historical and epistemological perspective, we were primarily interested in the relationships between patterns recorded in the expert-sourced data and traditional naming practices as reflected in implicit assertions of affiliation or relatedness of named archaeological complexes or cultural taxonomic units in the Final Palaeolithic and earliest Mesolithic. The goal here was to re-assess whether or not macro-scale data lend support to these conjurations, and to what extent differing archaeological taxonomic practices bias our perception of structured variability and hence large-scale interpretations of the Pleistocene-Holocene transition.

In addition, our objective was to trace the complexity of lithic evolution in the target timeframe and to showcase the utility of examining the interaction of different domains of stone artefact production, design and utilization. Our database intends to balance inter-observer reliability and the generality of the recorded technological and typological observations on a pan-European scale. The purpose is not only to render the available information from different regions comparable, but also to foster new insights on patterns and processes of culture change along the Final Palaeolithic-earliest Mesolithic sequence, and to draw attention to divergent temporalities of evolution. The link between tool form and technological organization, for example, is unlikely to be a constant, and the two domains of lithic technology may have had differential status and significance within regional evolutionary trajectories. Similarly, modes and rates of lithic evolution are likely to have varied over time and space. Reduction technologies, toolkit compositions and tool shapes were most likely also subject to vastly dissimilar rhythms and tempi of change. To uncover and qualify these long-term regime dynamics and shifts was a principal aim of the collaborative research exercise brought to fruition at the workshop.

**A meta-analysis of lithic evolution**

Scientific divisions of labour not only require complementary disciplinary and intra-field specializations but also demand a basic rationale

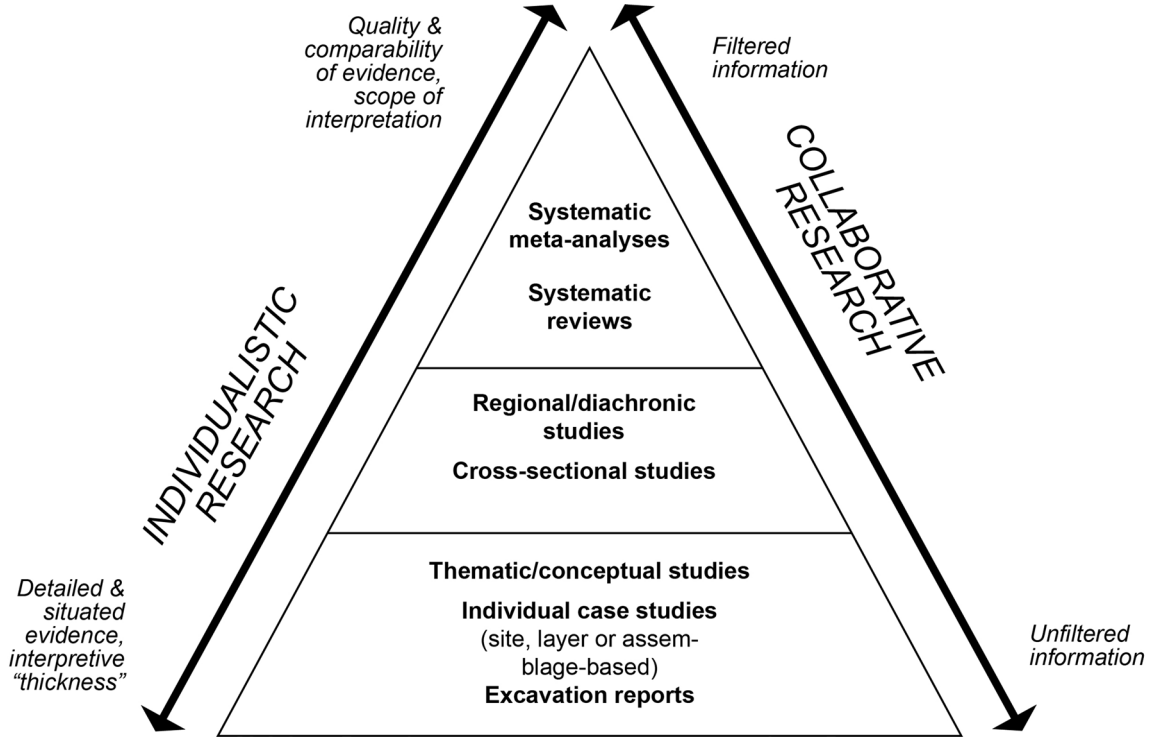


**Fig. 1** Pyramid of evidence in archaeological research.

for how to best exploit different types of studies. However, reflecting on the role of varying research designs as well as the type, quality and resolution of the marshalled data, and the contribution of these studies to our understanding of the past is not commonplace in archaeology. There is a real gap to fill when it comes to the systematization and formalization of the research landscape vis-à-vis the emergent layering, hierarchy and structure of archaeological evidence. Unlike other disciplines (e.g. Sackett, 2012; Voudouris, 2014 for biomedical research), archaeology seems to currently lack a well-defined framework and the theoretical sensitivity for higher-level comparison and knowledge synthesis, including but not restricted to systematic literature reviews and meta-analytical syntheses.

While writing robust literature reviews is often seen as a virtue in the context of doctoral theses, for instance, there are no published discussions or clear guidelines for creating such products – unlike, for example, in the health sciences (Grant & Booth, 2009) or in ecology (Haddaway et al., 2020). This is equally true when it comes to up-scaling from sites or assemblages to higher-level syntheses or meta-analyses featuring hundreds of sites and possibly thousands of data points (but see e.g. Schlummer et al., 2014). While new digital technologies make such endeavours analytically feasible, standard protocols and epistemological framings for how to actually do so are not available.

Mindful of the pluralistic nature of archaeological research (Corbey, 2005; Hussain, 2019), we do argue for the development of a more formal framework. **Figure 1** outlines the preliminary proposal developed in the context of our workshop. In our view, developing an epistemologically robust rationale for systematic, large-scale meta-analyses in archaeology is an urgent task (e.g. Altschul et al., 2018; Smith, 2020) and the first step is to explicate the trade-offs between the various layers of the archaeological knowledge pyramid in terms of the challenges and opportunities of insight and the type of research promoted, yet also in terms of the quality and comparability of the so harnessed evidence as well as the kind of knowledge advanced (cf. **Fig. 1**).

Each genre of archaeological study – from individual case studies over thematic, regional or diachronic studies to systemic reviews and meta-analyses – arguably contributes in different yet equally important ways to archaeological knowledge formation. Yet, disciplinary progress at least in part depends on our ability to recognize and exploit this

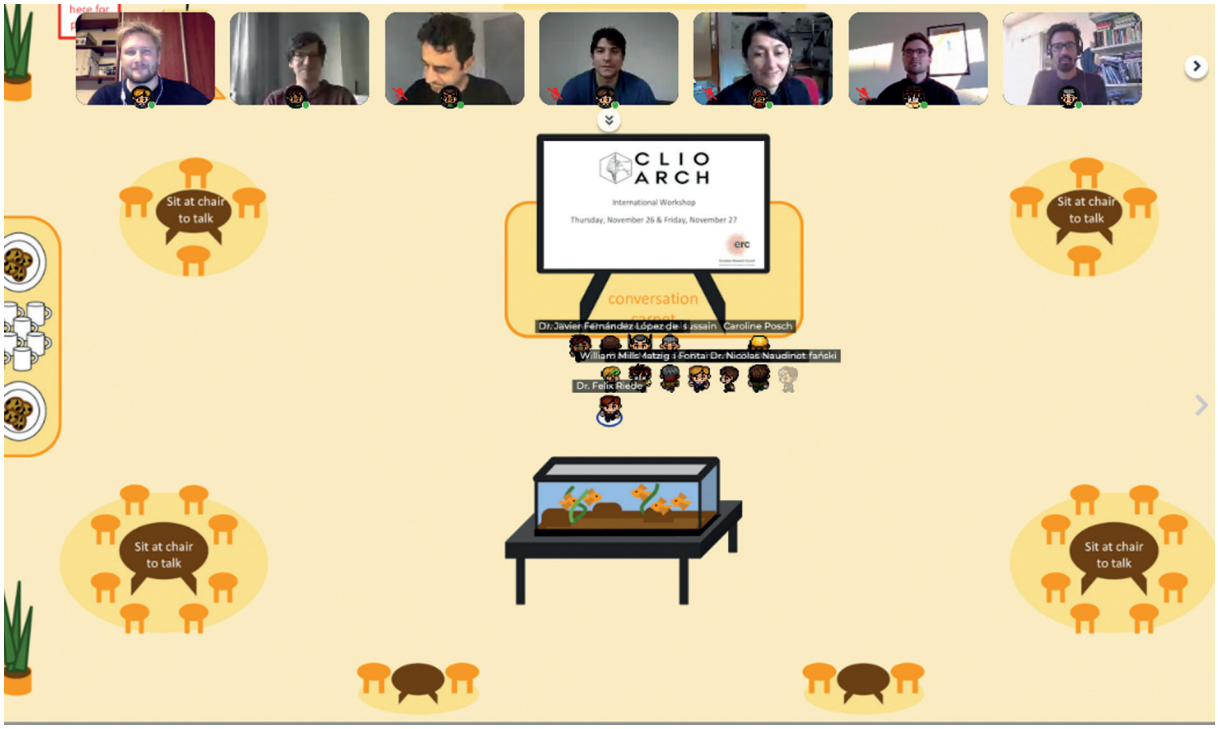


**Fig. 2** Group screenshot in Gather.town from 27th of November 2020.

potential as well as to make evidence gathered on one layer of the knowledge pyramid count for the other layers. Traditionally, archaeological knowledge is perpetuated within research communities and paradigms and in varying formats ranging from single-author monographs over edited volumes to more focused journal papers. This diversity is itself inescapably historical, political and worthy of study (e.g. Skelnář, 1983; Díaz-Andreu, 2007) but at the same time greatly complicates efforts of diachronic and transregional synthesis. Meta-archaeological research proffers new opportunities to foster dialogue here and perhaps enables higher-level integration of these varying knowledge ecologies. The meta-analytical framework tested during our workshop for instance hopes to combine analytical categories from qualitative, *chaîne opératoire* approaches with the object-oriented categories and computational acumen of quantitative and evolutionary archaeologies.

## Conclusion and outlook

In spite of the pressures of this COVID-stained annus horribilis and the fatigue induced by online interaction, discussions were lively and productive during the workshop (**Fig. 2**). Both creating an integrated database for the purpose of higher-level, continental-scale comparison and discussing its design before and during the workshop have underlined that a more systematic and reflective take on synthesis-seeking research in archaeology is required. It is worth noting here that there is no and will never be a 'gold standard' for collaborative meta-analyses in archaeology and finding new productive ways of organizing, recording and examining archaeological evidence on levels above assemblages, sites or regions will always remain a locus of contention and discussion, yet also of innovation and progress. The results and dynamics of the workshop have indeed highlighted the immense – and hitherto largely untapped – potential of collaborative research based on expert-sourced macro-archaeological data. Such research provides the opportunity to create openly available research archives and source data of previously unattainable spatial and temporal coverage and to tackle a whole new set of questions tied to such data.

Following the statutes of the European Research Council, we intend to make our collated data freely available via Zenodo and/or GitHub, following recommendations for Open Science in archaeology (cf. Marwick et al., 2017). Curation of such data beyond the lifetime of individual research projects – even longer-term projects such as CLIOARCH – is

a thorny issue but should be discussed more openly and proactively in the future. There are hardly any financial provisions for long-term data curation, but by archiving the dataset in standard formats such as .csv and in stable and open repositories, we hope to ensure its accessibility, interoperability, replicability and longevity. Our goal is not only to work towards a baseline archive of lithic evidence from the Pleistocene-Holocene transition, but also to create source material that can be used and expanded upon in a variety of ways downstream.

This being said, re-imagining archaeology as a collaborative journey is not only important because of the disclosed possibilities of knowledge production, but also because it provides a practical context of cultivating the 'multivocality' required to embark on and navigate larger cooperative research projects. Part of this collaborative ethos is the recognition of unescapable informational disparity and heterogeneity – including the lack of certain types of information in particular working areas – and the filtering and at times biasing effects of different researchers with varying backgrounds, knowledge interests and interpretive preoccupations. But rather than conceiving of this complexity with all of its consequences as impeding, we can appreciate the many opportunities collaborative, meta-analytical research in archaeology creates, not only for learning from each other's perspectives and observations, but also in terms of finding new ways of synchronizing, formalizing and systematizing archaeological data acquisition, preparation, alignment and analysis. Although the challenge is to develop a common language and to avoid talking past each other, there is much leeway for creative ways of re-describing archaeological variability, especially on the macro-level, and in that way integrating – or at least combining – seemingly incompatible research categories, concepts and observations. This naturally requires striking a balance between a pragmatic stance and caring for the details of the record.

Because different kinds of studies necessarily come with varying sets of advantages and disadvantages but also with different requirements with regard to data, methodology and interpretation, it is vital to reflect on the possibilities and emerging opportunities of collating, comparing and integrating archaeological evidence above the level of regional, diachronic or cross-sectional studies. With new tools available for interaction without travel, for data capture, storage, sharing and analysis (cf. Marwick et al., 2017), it is time to develop and test a formal meta-analytical framework for archaeology.

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