



# Cultural taxonomies in the Paleolithic—Old questions, novel perspectives

## 1 | INTRODUCTION

Time and time again, the systematics of Paleolithic archeology have been discussed, albeit most often in relation to specific periods or phenomena,<sup>1,2</sup> or in difficult-to-access publications.<sup>3–5</sup> Despite these recurring debates, however, the practice of classification and of building cultural taxonomies has changed little over the last many decades. Today, the cultural taxonomies of the Paleolithic are in crisis.<sup>6</sup> Still, a robust definition of the analytical taxonomic units—cultures, industries, facies, groups—used for charting cultural and behavioral change in space and time is critical. Operational taxonomic units hinge on

1. consistent criteria for their definition and delimitation,
2. a clear taxonomic system into which such archeological entities are placed,
3. agreement on the meaning of the relative ranks within such taxonomic system, and
4. their prehistoric reality vis-à-vis anthropological, ethnic or linguistic notions of culture.

Arguably, these four requirements are essential for conducting comparative and cumulative research at a supra-regional and diachronic scale, and for articulating sequences of culture change in the Paleolithic with paleogenomic, paleoecological or paleoclimatic data. Most commonly, different forms of the typological method have been used to construct such archeological cultures. Taxonomic issues are by no means restricted to the Paleolithic but take on a specific quality there as our temporal scales stretch from the near-paleontological of the Middle Pleistocene to the more intuitively appreciable timescales of the Final Paleolithic.

The recurring debates about Paleolithic systematics together with recent research in many parts of the world and across many of its subperiods—from the Early Stone Age to the Epipaleolithic—have shown, however, that a substantial number of traditional archeological types are no longer doing their diagnostic work and that many formally named archeological units based on such types contribute more to confusion rather than solution in regard to our core questions.<sup>7–11</sup>

These issues are at the core of the European Research Foundation-funded project entitled CLIOdynamic ARCHAeology: Computational approaches to Final Paleolithic/earliest Mesolithic archaeology and climate change (CLIOARCH: <http://cas.au.dk/en/ERC-clioarch/>) and the workshop on which we report here sought to catalyze joint thinking on Paleolithic systematics in a diachronic and global perspective.

## 2 | “ALL THESE FANTASTIC CULTURES” WORKSHOP

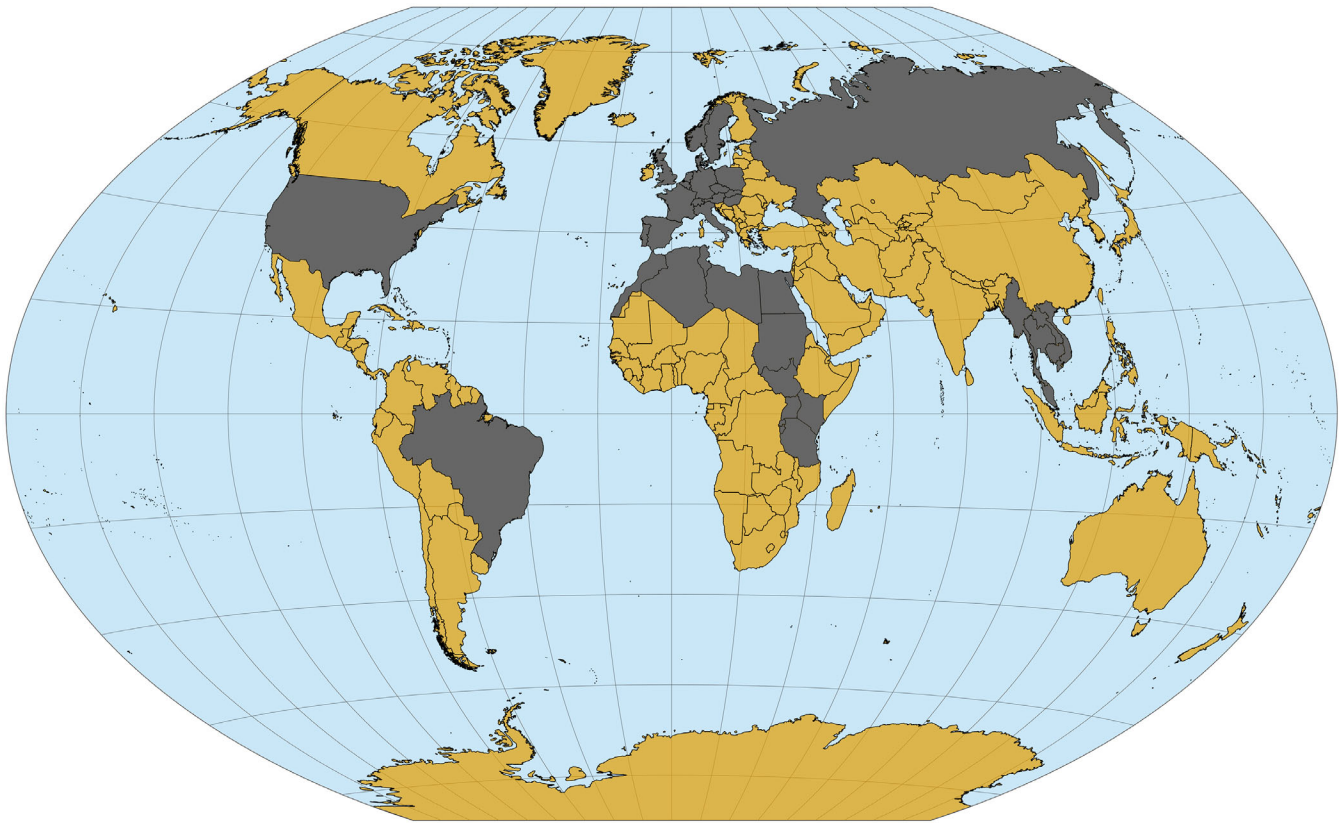
On November 27–29, 2019, the CLIOARCH project organized a workshop titled “All these fantastic cultures? Cultural taxonomies in the Paleolithic—old questions, novel perspectives” at Sandbjerg Manor in Southern Denmark. The conference venue is owned by Aarhus University and allows small groups of researchers to come together without quotidian interruptions to focus in on particular concerns. The meeting was funded jointly by the European Research Council via CLIOARCH and the Aarhus University Research Foundation. Sixteen participants from 10 different countries—reporting on work conducted in a much larger number of countries (Figure 1)—came together over a 3-day period. The composition of participants was carefully designed to bring together workers who would rarely, if ever, meet at their regular conferences and who could, collectively, address the widespread and diachronic nature of the issues at hand.

The meeting's title refers to an obscure but to-the-point contribution<sup>12</sup> with the same tagline that reviewed the many prehistoric “cultures” of Eastern Europe—and found them wanting. Similarly critical concerns have been voiced for many if not all subperiods of the Paleolithic, albeit often in difficult-to-obtain journals or difficult-to-read languages. The aims and scope of the workshop were therefore to

1. critically **review the history** of Paleolithic cultural taxonomies;
2. point out their **strengths, weaknesses, and shortcomings**;

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**FIGURE 1** A map of regions covered during the workshop [Color figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

3. reflect on the **different properties of archeological taxonomies for different periods**;
4. suggest better **methods for building taxonomic units**; and
5. **compare approaches** so as to arrive at a **best practice across cases**.

Grounded in reviews of research history, the epistemologies and practice of Paleolithic classification and taxonomy were discussed. Together, we examined how such practices differed between different research traditions and regions (e.g., North American, South American, French, Eastern European), across spatiotemporal scales of analysis from multimillennial to centennial and from continental to micro-regional, and in relation to a bewildering array of well-known and more obscure “cultures”: the Nubian Complex; the Nasera and Mumba Industries; the Uluzzian and Protoaurignacian; the Sonvian; the Gravettian, Spitsynian, Aurignacian, Streltskian, Gorodtsovian; the Magdalenian and Final Upper Magdalenian; the Azilian, Azurian and Epipaleolithic, the Epimagdalenian and Sauveterrian; the Itaparica, Lagoa Santa, and Umbu Traditions; the Swiderian, the Federmesser groups and all its fantastic subgroups; the Long Blade Industry, Epi-Ahrensburgian, Belloisian, and Laborian; the Dwelling site culture, the Slate culture, as well as the Funnel beaker culture. Two days of presentations were followed by half-a-day of discussion, which drew out both agreements and disagreements. At the end of the meeting, most of us were more hopeful with regard to Paleolithic cultural taxonomies than ever before (Figure 2).

### 3 | CONSENSUS AND CONTENTION—A BRIGHT FUTURE FOR PALEOLITHIC SYSTEMATICS

Robust classification and cultural taxonomy, we all agreed, are essential for creating analytical units that stand the test of epistemological scrutiny. While published almost half a century ago, the landmark book *Systematics in Prehistory*<sup>13</sup> was mentioned frequently during the workshop. While we distance ourselves from the author, we do note that this book not only laid out a clear-sighted protocol for object classification, it also laid the foundation for later evolutionary approaches that have since matured into a most productive intellectual endeavor (recently summarized in Prentiss.<sup>14</sup> In line with these evolutionary perspectives, the workshop concluded also with emphasizing the need to link notions of cultural transmission to classification, making them theory-driven and epistemologically defensible. By the same token, we all agreed that quantitative methods offer the most transparent and robust means of integrating the vast number of observations made at the level of the artifact into nested, higher-order taxonomies that group artifacts into assemblages, assemblages into clusters, and so on. Multivariate statistics and in particular network and clustering algorithms were identified as particularly useful tools for visualizing the hypothesized relations between our operational units. It is here where the history of archeology, as became evident throughout the workshop, also intersects in salient ways with the



**FIGURE 2** Participants of the Paleolithic taxonomies workshop—In high spirits even after two intense, rainy and dark days of debate [Color figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

history of computation. While early researchers such as Robert Dunnell or David Clarke<sup>15</sup> proposed useful conceptual tools, they were strongly constrained in their application by the limited availability of computers and the then only nascent data handling tools available. In biological taxonomy, the introduction of computers is well known to have not only invigorated but also revolutionized the field<sup>16</sup>—and the same we argue is set to happen in Paleolithic archeology.

At what spatial and temporal scale and on the basis of which material matters of cultural taxonomy are best resolved and precisely which methods constitute an analytical gold standard remains to be resolved. Nonetheless, when an epistemological and computational invigoration is coupled to the more widespread adoption of Open Science and Team Science principles,<sup>17</sup> we may be able to rapidly move on from creating more and more mutually incompatible cultural taxonomies to the arguably more exciting business of using our taxonomies to understand the past patterns and processes of convergent and divergent cultural evolution, resilience, migration, and adaptation.<sup>18,19</sup> Epistemologically robust, empirically grounded, and operational taxonomies are the building blocks of good Paleolithic archeology. If the goals of constructing such taxonomies can be achieved, we concluded, practitioners can engage more confidently in interdisciplinary collaborations with other paleoscientists and we may also be able to accelerate the pace of cumulative analytical discoveries.

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## 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 analyzed in this study.

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