Cultural taxonomy for the European Upper Palaeolithic: a wide-ranging problem

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Much of Reynolds and Riede's (2019) call to arms has resonance beyond the European Upper Palaeolithic, and will be familiar to many researchers working with Palaeolithic or Stone Age contexts around the world. My own research on the North African Middle Stone Age, for example, has collated no fewer than 13 different lithic taxonomic units from the literature, each using different bases for classification (Scerri 2017). Quantitative analyses show that the technological variation within these units does not correlate with the range of nomenclatures used to categorise them (Scerri *et al.* 2014). Instead, most of the variation was a function of geographic distance. The remaining variation was explained by the ancient river networks and palaeoecology of a 'Green Sahara'. The problem is therefore wide-ranging, but does this indicate that meaningful cultural units can never be identified, or that stone tools are a poor reflection of culture in any form, as has been suggested by some? Although these assemblages do not organise themselves into discrete groups, together they transmit a regional signature that could be considered a taxonomy of sorts. Furthermore, the geographic distribution of these technologies reflects culturally embedded decisions regarding mobility, landscape use and subsistence. The message here is that looking for a direct relationship between stone tool forms and ethnic/cultural groupings is likely to remain a flawed and ultimately futile pursuit. Reynolds and Riede even suggest that it is a dangerous one. What can we do?

At best, the problematic use of cultural taxonomies means that stone tools—the most abundant source of information on hominins and early members of our own species—are omitted from 'big data' studies of human evolution, involving genetics, climate science and physical anthropology. Such taxonomies are considered too subjective, too categorical and fundamentally lacking in replicability. This has had the very tangible effect of downgrading archaeology as an important source of information in the interdisciplinary pursuit of the human past. At worst, we are at risk of consistently telling 'just-so' stories about the past, which offer a simple and direct link between material culture variation and ethnically defined, autochthonous populations. These stories are being taken at face value when they are naïvely linked to interpretations of, for example, genetic data. In some cases, these archaeological narratives may even influence the interpretation of genetic data through the choice of particular explanatory models over others. Yet as Reynolds and Riede point out, the archaeological and

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genetic data do not always match, and nor would I necessarily expect them to match. Reynolds and Riede are, however, correct in that any correlation between the two sources of information will remain undiscoverable if we persist with problematic and subjective systems of categorisation.

Is it a matter of 'doing taxonomies better'? The study of lithics and the categorisation systems behind them have changed little in the last 60 years of research. We just seem to find increasingly—and often unnecessarily—sophisticated ways of analysing objects that remain conceptually embedded in outdated heuristics and epistemologies. If our starting point is that a taxonomic unit is valid or real, then any analysis will represent a circular confirmation bias, unless otherwise tested. I echo the call that Reynolds and Riede make to colleagues outside of material culture studies: do not accept such taxonomic units at face value; do not use material culture forms as a reflection of ethnicity or of distinct populations leaving lithic 'breadcrumb' trails of their migrations. This is broadly akin to archaeologists viewing genetic trees as population histories, or uncritically accepting the modelled timing of splits in such trees as fact.

How can we move forward? While Reynolds and Riede make a number of suggestions, the elephant in the room is the need for a wholesale structural change in academic culture. Open-data sharing, for example, is desirable, not least because it encourages more scientific rigour. At the same time, however, calls for open data rarely consider the problem of 'data as currency' for untenured academics and students. Open data will only become fully possible when there is a change in the balance between what is perceived as resource and currency in the scientific world. Furthermore, significant variation in data quality and compatibility continues to limit the benefits of open data. One cannot be addressed without the other.

Finally, if academic culture continues to pursue 'big stories' and fetishise virtually risk-free research, it will be difficult to conduct critically needed methods-based validation and blue-skies research (research in domains where 'real-world' applications are not immediately apparent). I would like, for example, to see a move towards more standardisation, coupled with methods for rapid and replicable data collection that are less reliant on expert knowledge. While such knowledge is clearly a requirement for study design and interpretation, we will remain mired in subjective analyses if the data cannot be replicated by non-specialists (Will *et al.* 2019). As a researcher who is actively addressing these problems through experimental and methods-based approaches, the resistance to perceptions of 'risky long-term projects with no rapid results' is alarming.

More positively, the article by Reynolds and Riede reflects a wider step towards tackling this range of issues. The European Upper Palaeolithic has the highest resolution and richest record of all the cultural phases of deep time and is therefore the perfect place to test the heuristics and cultural taxonomies used throughout the study of human evolution. In the meantime, an easier and more achievable step in the right direction is a commitment to being less reliant on the 'shorthand' terms that we all know are problematic. Following Shea's (2014) call to abandon 'NASTIES'—named stone tool industries—we should focus on describing

variation on its own terms. This may take more time, but will probably be more rewarding in the long term.

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