

Dear editors

Please find attached a revised version of our manuscript. We are including in this letter all the comments made by the reviewers and how we addressed them accordingly (these are the comments preceded by an arrow).

We also would like to acknowledge the suggestions, comments and references given by the reviewers; these greatly improved the original version of the article.

Kind regards

Mercedes and Astolfo

February 2, 2024.

Round #1

by Shumon Tobias Hussain, Felix Riede and Sébastien Plutniak, 15 Mar 2023 11:03

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Invitation to revise your preprint

Dear authors,

many thanks for going along with our PCI-based review and revision process. As you will see from the reviewers' comments, your chapter is considered of potential value for revisiting and steering important foundational debates on classification in archaeology.

As you will see from the reviewers comments' below, both reviewers identify more convincing and less convincing parts of the paper and make a number of important observations and recommendations. Both reviewers have some issues with the overall coherence and structure of the argumentation, however, and this is one of the main aspects that I would recommend carefully addressing in the revisions.

Another central issue is the often selective and one-sided choice of reference literature highlighted by the reviewers, especially with regard to the current state of the debate on classification, typology and systematics in archaeology itself. This may in part have something to do with the fact that given the current outline, the reader is somewhat thrown into the swamp of plentiful concepts and discussion points without clear guidance what to expect and what to follow/pay attention to. In other words, a proper introduction seems currently missing where the overarching goals of the contribution and the core arguments are explicitly introduced, framed and specified. This may also help in defusing the essayistic character of the contribution, which is not in itself a problem but leaves at times the impression of compilatory meandering rather than a focused argument-driven discussion.

→ We have included an introduction which summarizes the aims of the article and the main theoretical approach in Archaeology that we will be using to discuss classification (Evolutionary Archaeology), although other approaches, when relevant will also be addressed. The manuscript also has now an abstract, which hopefully will help to guide the reader.

In addition to the reviewers' perceptive suggestions, I also recommend that key concepts are more explicitly and carefully defined (and not really needed concepts removed from the manuscript altogether). Already the term 'Metaphysics' remains poorly defined and its relationship to concepts such as 'epistemology' and 'ontology' (both used in the text) not well articulated (I suggest to consult Corbey 2005, *The Metaphysics of Apes: Negotiating the Animal-Human Boundary* here). Personally, I regard the possibility of the metaphysical independence of scientific endeavors as a straw-man since nobody really takes, inhabits or defends this position anymore, and both the history and philosophy of science and modern science studies have sufficiently established that there simply can be no 'outside' of metaphysics broadly construed. Also because of this latter point, some distinctions such as 'descriptive' vs. 'prescriptive' metaphysics are minimally confusing to me (as if metaphysics would be a praxis that one could explicitly engage in). Another example is the distinction between 'natural', 'conventional' and 'arbitrary' kinds. The difference between the latter two is not clear at all as one can ask whether arbitrary kinds would not simply defeat themselves and are as such no kinds at all (or is the point here that these are kinds not shared within communities but rather recovered by individuals?). Minimally, and the reviewers have remarked on this as well, these debates invite references to influential conversations in archaeology and anthropology such as the 'emic' vs. 'etic' distinction. I find it generally confusing that some of the aforementioned key concepts are introduced and discussed at length only to be discarded at the end ('pure observation' is another candidate), at least this is how I understand some of the points made. It would thus be good, in the grand to scheme of things, to review all of this and to balance the discussion better in terms of argumentative relevance.

→ We have included some more information regarding metaphysics, ontology, and epistemology, as well as about descriptive and prescriptive metaphysics (see pages 3-4). Eight new references regarding this more detailed discussion were included in the list.

Another definitional note: 'classification' should probably already in the very beginning be contrasted with 'categorization' as both are ordering practices but do not necessarily denote the same – and also because the two concepts may be differentially relevant for the other concepts discussed (including the discussion of 'kinds'). This would help to clarify the text and the points made.

→ Done, see paragraph on page 5.

The elephant in the room, of course, is how such debates can inform our selection of observations (properties, qualities, traits, etc.) on which to base classificatory systems. As you remark yourself on p. 21 "Archaeologists under the Evolutionary Archaeology approach would mostly agree that qualitative similarity can indicate causal relations among elements and such relations (which are theory-based) are essential to create explanations about the evolutionary history of artifact

lineages” but I would say the whole question here is ultimately not about theory-ladenness (which is widely accepted) but rather how such background theory informs concrete property/trait choice, and this is well illustrated by phylogenetic approaches, which commonly foreground functional traits.

→ Done. We liked so much your comment that we decided to incorporate them in the manuscript (see page 23).

These discussions are obviously complex (see my comment on lithic stem shapes below) and should be portrayed as such. Jung (2020) for example suggests rather explicitly that a traditional focus on form in archaeological typology should be complemented by newer consideration on function and affordance. This brings me back to an important point touched upon earlier: it is currently somewhat unclear, or is drowned in the breadth of discussion and conceptual debate, what precisely your paper wants to contribute to, and I would recommend to clarify this focus and sharpen it substantially throughout. This would also include a clearer discussion/exposition of the implications of the more philosophical considerations reviewed for archaeological practice and their integration into the relevant archaeological debates, some of which are currently largely ignored. Alternatively, you may want to specify from the onset what specific archaeology you wish to target and focus on in your discussion of classificatory practice.

→ We wrote in a more explicit way that Evolutionary Archaeology will be the focus of the discussion, although, of course, we will address other theoretical approaches whenever they are necessary.

I paste a few specific comments on some statements that I stumbled upon when reading the text below, as these may help in address some of these issues.

In total, I believe this could be a really important and insightful contribution to our planned volume – so thanks again for your trust and submission!

I look forward to seeing your revised version in due time.

Best wishes,

Shumon

p. 11: “The historical approach states that causal relations are fundamental, and that qualitative similarity is important when it can help pointing to causal connections (Ereshefsky 2001: 28).” – I am uncertain what is meant by ‘causal’ here and this needs to be specified; causality can mean many things and may even be misleading in this context. I assume ‘genealogical relationships’ is what is pointed at here. Also note that even the recognition of causal relations does not necessarily solve the problem of identifying the properties that are causally relevant, the elephant in the room (see other comments).

→ Exactly, I have included that in this case, causal is synonymous with genealogical relationships. Thank you.

p. 12: “Such pluralistic approach does not necessarily need to be associated to realist or antirealist views of science (meaning that one can use a pluralistic approach without having to agree whether or not science will provide better theories that explain the world).” The latter is a mischaracterization of scientific realism and pluralism.

→ Given that the author (Ereshefsky) gives no more explanations about this, I decided to delete this part.

p. 14: “Very few authors have discussed the philosophy of classification in Archaeology.” – check out at least the work of Alison Wylie (2002), Philippe Boissinot (2015) and Mathias Jung (2020), as well as Susan Pollock and Reinhard Bernbeck (2005) on categorization.

→ Wylie takes a more historical approach and although her book is very interesting, it does not address with much detail classification or categorization in Archaeology.

→ Boissinot (*Qu'est-ce qu'un fait archéologique?* 2015) refers to an ontology of the aggregate and we included his definition in the manuscript as a footnote. We could only have access to chapter 1 and 2 of the book.

→ Mathias Jung offers some important ideas about classification and typology, we mentioned them briefly in the text.

→ Pollock and Bernbeck are more concerned about the western x non-western categorizations (and the resultant interpretation) of archaeological artifacts.

p. 14 “Even worse has been the lack of discussion regarding a metaphysics of artifacts: an account of what sorts of things they are, and into what ontological category they would fit” – there is whole body of literature in archaeology on things and objects, with key people such as Bjørnar Olsen and sometimes dubbed the ‘material turn’ where the ontological status of things and artefacts are explicitly queried.

→ True. Somehow this important author escaped from the first version of the manuscript.

p. 16 “If we assume that classifications are always and inescapably theory-laden, and this is by itself a metaphysical position,” – why is this? Would the other ‘metaphysical position’ then be that classifications are theory-free? How would this make sense?

→ You are right, this sounded confusing and we deleted this part.

p. 16 “In the case of Evolutionary Archaeology, which states that artifacts represent evolutionary lineages created by cultural transmission” – if EA takes this as its starting point, something is wrong; statements like this have to be nuanced and qualified.

→ You are right, we amended this accordingly, including the hypothesis testing of such lineages.

p. 17: “Some archaeologists explicitly reject the idea that classification in Archaeology ought to “discover” these natural kinds (Adams & Adams 1991: 13; Dunnell 1986: 177-182; Dunnell 2009: 47), while others explicitly put the ultimate goal of classification as the discovery of types (Spaulding 1953), or at least a quest for the reconstruction of the mental templates of the artisans (Read 2007).” – the latter two are concepts arguably not equitable to natural kinds and the resp.

authors would also not necessarily subscribe to 'natural kinds'. This is very oddly phrased as I am not aware of anybody in archaeology actually aiming to uncover 'natural kinds'.

→ Read and Spaulding were in search of kinds which “really existed”, and in this sense they were “natural”, not because they were “made by mother nature”, but as an opposition of “artificial” or “arbitrary” (at least this is Dunnell’s use of the term in *Systematics*). For more examples of archaeologists talking about natural types or kinds, see:

-Michlovic, M. G. (1975). *The Implications of Lithic Artifact Styles For Current Archaeological Theory*. University of Illinois at Urbana-Champaign.

“Thus, not only does a denial of natural types preclude any falsifying tests, it also commits the archaeologist to a narrow range of theoretical concern. (...)It seems, at this point, pertinent to offer some more positive justification for the acceptance of real or natural types (which I also refer to as ‘styles’)”

- Wynn, T., & McGrew, W. C. (1989). An ape's view of the Oldowan. *Man*, 383-398.

“Such a search for natural ‘types’ is a perennial problem of archaeological methodology precisely because there is no way to know that the categories which we recognise in archaeological assemblages correspond to the mental categories of the artisans. As a result, many archaeologists avoid the question altogether by using problem-specific analytical types, for which no argument for correspondence is needed. Nevertheless, from the perspective of the evolution of cognition, the nature of natural groupings is important”.

McPherron, S. P. (1994). *A reduction model for variability in Acheulian biface morphology*. University of Pennsylvania.

“These biface types, therefore, do not meet the definition outlined in the previous chapter for natural types. It is inappropriate, therefore, to suggest that these types correspond to various forms that were desired by their makers”

White, G. (2011). Familiar Artifacts in Artificial Stone: The Baked Clay Tradition of Prehistoric Northern California. *Pacific Coast Archaeological Society Quarterly*, 47, 1-2.

“No comprehensive classification has been offered to date, but there are three obvious natural types: Rod-Shaped, Tabular-shaped. And Disk-shaped”.

- Santacreu, D. A., Trias, M. C., & Rosselló, J. G. (2017). Formal analysis and typological classification in the study of ancient pottery. *The Oxford handbook of archaeological ceramic analysis*, 181-205.

- López-García, P., Argote-Espino, D., & Fačevicová, K. (2018). Statistical processing of compositional data. The case of ceramic samples from the archaeological site of Xalasco, Tlaxcala, Mexico. *Journal of Archaeological Science: Reports*, 19, 100-114.:

“A direct link of the compositional groups with the natural ceramic types (originally classified in terms of their surface finish) was not observed. The identification of only two chemical groups could also suggest that the natural types are essentially the same ware (...)”

Since all instances of the quest for “natural types” were based on some sort of mathematical classification, and since all this literature (especially after Clarke) was rooted in Biology (Sneath, Sokal etc), and since the idea of “natural taxonomic groups” comes from that discipline, it seems warranted that archaeologists were indeed looking after natural kinds, even if in fact they were after *conventional kinds*, and not natural ones, and we already made this distinction clear in the text.

p. 17: “In this realm, Archaeology departs from Biology because the latter is occupied with the classification of natural things, and the question of natural kinds can be legitimate, while Archaeology is tackling with the fact that artifacts are created by humans.” – This reintroduces the nature-culture dichotomy on the metaphysical level. So artifacts are not part of the natural world and they do not partake in the ‘natural order’? I would say this rendering misses the point of the ‘natural kind’ debate. It would indeed be good if the authors provide some more rationale why this debate even matters, especially given that they reject it themselves at the end for archaeology (but this whole argument arguably needs to be revisited).

➔ You are right. I amended this part accordingly.

p. 21: “The problem is that when performing a typology, the researcher is skipping the analytic step, since a type is already a synthetic unit (Araujo and Okumura 2021).” – be aware that archaeologists (and other scholars) have in the past routinely distinguished between ‘monothetic’ and ‘synthetic’ type concepts (e.g. Hahn, McPherron)

➔ We are not addressing the difference between monothetic and polythetic types (the distinction made by Clarke, McPherron, Whallon, Sokal and Sneath and many others), but the fact that “types” are synthetic units, not very suitable to analysis (in spite of Clarke’s 1968 attempts). Anyway, we agree that the monothetic versus polythetic distinction is important and added it to the text.

p. 23: “In the case of a classification of arrowheads, under an Evolutionary Archaeology approach, the stem shape can be considered as related to stylistic choices that are considered as very little associated to the actual performance of the point (meaning that a point presenting a concave stem base might be as good as a point that has a bifurcated stem shape” – in many cases the configuration of the stem may actually be more importance for the overall functionality/operationality of the

weapon system, in the sense of its 'performance qualities', as the stem connects the point with the haft and is therefore a key design element in integrating the whole system. See Steven Kuhn's (2020) useful discussion of different hafting solutions in relation to different proximal artefact designs and its relevance in long-term technological evolution. This qualification, in other words, relies on a restricted definition of performance.

→ Thank you for the suggestions, this book is really good. We have included some remarks in the manuscript, to make sure that we know the importance of the stem and that the idea proposed by some authors is a hypothesis that needs to be tested (see page 25, including footnote).

Also, I think we should not prematurely transition here from the debate on 'natural' and 'conventional' kinds to the old (archaeological) debate on 'function' vs. 'style', not least because the latter has not necessarily clarified things and the relation between the two debates is not obvious and everything else than intuitively given.

→ We barely touch the style and function discussion, but I believe that the few examples regarding the selection of traits and the theoretical expectations are important (even if they can be problematic). A good way of thinking about this is to consider style x function of a given trait as a hypothesis to be tested.

Reviewed by anonymous reviewer, 14 Mar 2023 12:23

I paginated the pdf to make it easier to comment. I highly recommend doing this, and numbering the lines in the whole document. I should mention that I am a paleoanthropologist and an archaeologist, not a philosopher or an historian of science.

The manuscript consists of 3 parts: (1) a discussion of metaphysics and classification in philosophy of science (pp. 1-7), (2) how these terms and concepts are used in biology (pp. 8-13), and (3) how (2) can be applied to archaeology (pp. 14-25).

(1) is quite sophisticated but replete with terms and concepts unfamiliar to most archaeologists or defined differently from archaeological usage. The authors note that epistemology is largely ignored by archaeologists, which is true (and also true of biologists). The text reads much longer and more complex than it has to be, assuming that the target audiences are biologists and archaeologists. It could benefit from stringent copy editing. It needs more headings to break it up into manageable chunks, and some figures summarizing the main points made in the text. It appears to have been written for philosophers or historians of science. It is the strongest part of the essay.

→ Done: more headings and figures. However, other reviewer pointed that the chapter needed more definitions, so instead of editing it, we ended up adding more things (including a short discussion regarding, for example, metaphysics x ontology, etc). Given the general lack of knowledge of archaeologists on the subject, we believe that such information will not hurt.

(2) is more comprehensible to someone like me, an archaeologist with a background in human paleontology. This means the logic of inference is more readily understood, as are the concepts and terms (although “The species-as-sets approach can be tentatively compared to species as mereological sums – the grouping of objects under the parthood relation – which are also defined by their extensions, in the same way that sets are” (pg. 10) must be amongst the most jargon-ridden sentences in the English language!) I’ve read some of the authors cited (e.g., Richards, Ghiselin, Boyd, Gould, Ereshefsky) because I taught a graduate seminar on evolutionary epistemology. Based on that, (2) basically made sense. It however relies rather too heavily on Richards and ignores Hahlweg, Hooker, Casti, Hull, etc.

→ We chose to follow Richards’ approach in this manuscript because the questions he raised are more akin to the topics we are dealing. Hahlweg and Hooker believe in “biological progress”, a stance we strongly disagree with. Casti is an important author, but his work is more directed towards the limits of scientific knowledge, mathematical modelling, and the concept of cooperation in neodarwinian theory, what seems a bit off topic.

(3) is the weakest of the three sections. It offers only a very dated and selective construal of anglophone archaeology, and fails to even mention the francophone research tradition that dominated Stone Age archaeology world-wide for more than a century. It was only in the 1970s that anglophone archaeology shed culture history, now seen as strictly empiricist (. . . “the facts speak for themselves”), limited in its ability to explain anything of interest and shot through with

all kinds of simplistic, essentialist, variety-minimizing assumptions about ‘culture’, the nature of change, and hunter-gatherer adaptations. This shift in the conceptual foundation of the discipline took place when I was in graduate school. It was wrought by Binford, Flannery and their intellectual progeny (Longacre, Hill, Dibble, Schiffer, Freeman, etc.). Dunnell was important, as they note, but his impact on the field was limited by his book, *Systematics in Prehistory* (1971), quite possibly the most boring text ever written. After that he was largely ignored. This part of the manuscript should be thoroughly updated and revised. There are few citations and most of them date in the 1940s-1960s. Anglophone archaeology has changed radically in the past 20 years, although little of this is evident in this part of the manuscript. Archaeology has no universal metalanguage (i.e., mathematics) like physical science does, nor is it very introspective. Consequently, confusion in concepts and terms is inevitable both within, and between, intellectual traditions.

In sum, the manuscript does not cohere very well. (1) is complicated and abstruse to biologists and archaeologists, but probably relatively clear to historians of science. (2) looks pretty good to me because I have some control over systematics in biology. An archaeologist without a background in neo-Darwinian evolution would have trouble with it. (3) is a dated, selective view of archaeology that bears little resemblance to modern practice in the anglophone research tradition. Francophone researchers have also begun to contemplate the logic of inference underlying the culture historical approach. These changes directly affect how we explain pattern in the past.

→ We thank the reviewer for pointing to the fact that we did not address the francophone contributions, and the revised version now addresses it. On the other hand, it seems we have a problem of communication; it is not the scope of this paper to address “anglophone” archaeology at all. We hope this was made clear in the new abstract. In this specific manuscript we are not interested in anglophone archaeology (or its history), we are interested in the theoretical aspects of classification, and by chance a lot of ink has been spilled by anglophone archaeologists. So, if the whole discipline of archaeology (not only anglophone) changed a lot in the last 20 years, what did not change was the confusion reigning in classification matters, be it anglophone, francophone or else. In this regard, it does not make sense to cite the francophone research tradition more deeply than mentioning that they proposed hierarchical “typologies” (what we already did on the manuscript), because there was not much theoretical discussion behind it. When it comes to classification, the modern practice is simply mute, as **if** all the problems were solved, when in reality we are still stuck in mid-20th century classification problems that were never solved. We also beg to differ that “since archaeology has no universal metalanguage, then confusion is inevitable”. On the contrary, we think it is absolutely evitable if some effort goes in this direction. For instance, Laplace’s system provides a metalanguage, and is used by a considerable number of researchers who understand each other. About Dunnell, his contribution to the specific theoretical field of classification is so important that the concepts written in his 1971 book (and in later papers on the subject) are still valid and sound; we cannot say the same about Binford’s, Longacre’s et al. contributions, that in spite of all success they enjoyed in the 1970’s and 1980’s, are pretty much dated.

Here are some in-text notes that I made while reading the manuscript (only up to page 5), for your possible interest:

pg. 2 – there are 7-8 definitions of ‘species’ in human paleontology [HP] (see Kimbel & Martin, 2013), point being that ‘species’ depends on how they are defined and whether or not there is a consensus in the discipline.

➔ Done. We have included a footnote saying that it is not our goal to include a lengthy discussion about the different concepts of species. The article by Hey (2006) makes a good discussion about the monist and pluralist approach.

pg. 2 – essentialism no longer a part of HP research, although it figured prominently in the 19th and early 20th centuries. However, cladistic methodologies, common in HP after the early 1990s, do tend to minimize variation. This is because of the conviction that speciation only, or mainly, occurs because of genetic isolation (i.e., cladogenesis); anagenesis no longer taken seriously by many card-carrying cladists.

pg. 2 – the French archaeological research tradition dominated the field from the 19th century until the early 1960s. It relied upon archaeological index fossils (e.g., Aurignacian blades, lamelle Dufour, etc.) to identify what they thought were prehistoric ‘cultures’ analogous to the bands, tribes, linguistic groups known to us from ethnography – a viewpoint that’s absurd from an anglophone perspective (see Binford & Sabloff 1983, Clark 1993, Barton & Clark 2022). Between c. 1900 and the early 1960s, the French approach also dominated US archaeology (called ‘culture history’ in the anglophone world). CH depended on variety-minimizing essentialist perspectives. After 1960 and continuing to the present, essentialism no longer part of anglophone archaeology, having been replaced by various processual conceptual frameworks.

➔ ISSO NAO CABE NO ARTIGO, NAO FIZ NADA SOBRE ESTE COMENTARIO.

pg. 3 – There are many definitions of science. My favorite is “a collection of methods for evaluating the empirical sufficiency of knowledge claims about the world of sense experience” (Clark 2007: 60).

pg. 3 – I doubt any classification can be ‘free from theory’ (bias), whether it be explicit or not, and ‘pure observation’ is impossible.

➔ We have included a foot note about observation being theory-free or theory-neutral (Rothschaefer 1976).

pg. 4 – any generalization arrived at strictly by induction can be refuted, but if a deductive element is ‘built into’ it, it is amenable to testing – so Dupré is correct.

➔ Ok.

pg. 4 – as to Wittgenstein, in physical science there is a universal metalanguage (mathematics) but biology, although it has a powerful, overarching metaphysical paradigm (neo-Darwinian

evolution), and archaeology (which doesn't) both lack a metalanguage that would allow for universal communication, hypothesis formation and testing.

→ Well put, we took the liberty to include your comment as a footnote.

pg. 5 – re Richards, the conceptual framework of biology is evolution. Any explanation that runs counter to the basic tenets of NDE would be rejected by all biologists.

→ Well put, we have replaced “many classifications in Biology” for “classifications in Biology”.

pg. 5 – numerical taxonomy (Dupré) has fallen out of favor in HP and in archaeology, although I've never understood why. Methodological fads permeate both fields.

pg. 5 – see Rose (1998) for excellent discussion of reductionism in biology.

→ Very interesting book, I mention part of the author's ideas on page 8 (I could only get the first two chapters of the book, though).

pp. 5,6 – many life scientists define a species as a polythetic set of genetic or biochemical polymorphisms.

→ Good point, we took the liberty to add this comment on page 11.

pg. 5 – strictly speaking, taxonomy is the study of classification, a distinction usually ignored by archaeologists.

→ We agree, see the following part (page 10): Simpson (1961: 7) proposes the following definitions in Biological Sciences: “Taxonomy is the theoretical study of classification, including its bases, principles, procedures, and rules.”

Barton, C.M. & Clark, G.A. (2021). From artifacts to cultures: Technology, society, and knowledge in the Upper Paleolithic. *Journal of Paleolithic Archaeology* 4(1): 1-21.

Binford, L., and Sabloff, J. (1982). Paradigms, systematics and archaeology. *Journal of Anthropological Research* 38(1): 137-153.

Clark, G.A. (1993). Paradigms in science and archaeology. *Journal of Archaeological Research* 1(3): 203-234.

Clark, G.A. (2007). The flight from science and reason: evolution and creationism in contemporary American life. In *Proceedings of the International Science Conference 'Science in Archaeology'* (B. Harrison, ed.), pp. 60-80. Portland, OR: Institute for Archaeological Studies.

Kimbel, W.H. & Martin, L.B., eds. (2013). *Species, species concepts and primate evolution*. Springer Science & Business Media, 2013.

Rose, S. (1998). *Lifelines—Biology Beyond Determinism*. Oxford, Oxford University Press.

Reviewed by anonymous reviewer, 21 Feb 2023 10:54

The article 'On the Physics and Metaphysics of Classification in Archaeology' by Mercedes Okumura and Astolfo G.M. Araujo gives a welcome perspective on one main issue that has been faced by archaeologists since the emergence of the field: how to classify the archaeological material.

The article is well structured and well written. It first discusses the theoretical concepts (or absence of) behind classification, before developing in more detail the metaphysics of classification in biology and finally discussing the philosophy of classification in archaeology. The authors depart from the statement that this topic has been little explored in archaeology and call for a raise of awareness of what lies behind any kind of classification in archaeology and for being explicit about their theoretical positions.

In particular, the discussion about classification in archaeology that falls into two different types of kinds, i.e., conventional kinds and arbitrary kinds appears important. I however believe this section should be developed and include references to debates that have marked the history of archaeology. One may think, to cite but a few recent examples, of the extensive discussion on this in Tostevin's 2012 *Seeing Lithics* (Chapter 3 and the discussion of the emic vs. the etic including in the context of the Bordes-Binford debate), or of the discussion on the differences between chaîne opératoire and reduction sequence in Hussain's 2019 *The French-Anglophone Divide in lithic research*. The strong criticism that follows, of classifications based on conventional kinds, following Read's definition of an artefact as an intentionally made object also reads like a simplification of the debate, as I wonder to what extent this restricted definition for artefact is used, even in cases of classifications based on conventional kinds. This section also leaves me a bit confused as whether it means that the authors reject any ontological approach to the past, which does not seem to be the case given the sentence p. 21 "In a way, a pluralistic approach using epistemic kinds might be interesting for Archaeology, especially if conceptualism is applied."

→ We chose to add a discussion about methodological issues (monothetic versus polythetic groups) in this version of the manuscript, since it was less addressed in the literature. The emic x etic debate, or the contrast between chaîne opératoire and reduction sequence on the other hand, were more explored in the literature. We believe the text would be too long if we pursue this path.

→ About Read's definition, it seems to us that he is clear about the subject: artefacts are intentional. If he (and whoever follows this idea) really applies it in practice, is an open question. Anyway, we believe that one should follow the definitions that were proposed until the end. If they do not fit the practice, they should be changed.

→ About the pluralistic approach, as we put on p. 24, it means that "one could group and divide things into categories based on pragmatic interests, using objective features to guide such grouping". This does not mean a "anything goes" approach where types can be either emic or etic depending on the problem at hand. We maintain that the search for conventional types is a dead end.

While the paper does present an interesting discussion of fundamentals in archaeological classification and the fact that the authors do present a convincing case for being explicit in our

theoretical approaches to classifications, the paper could be improved by better integrating the existing literature on classification in archaeology, which, even if it has probably not received enough attention by archaeologists, is still very much present in some works.

As minor points, I have noted a few typos (others might be present) in the text:

- p. 7 "will be find"

- p. 9 "can be used accordingly to the subject"

- p. 14 "can be, in principle, look much simpler"

→ Done (found / according / look simpler).