Peer Community In Archaeology

Using insights from psychology and primatology to reconsider function in lithic typologies

Sébastien Plutniak, ***Felix Riede*** *and* ***Shumon Tobias Hussain*** *based on peer reviews by* ***Vincent Delvigne*** *and 1 anonymous reviewer*

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The paper "A return to function as the basis of lithic classification" by Radu Iovita (2024) is a contribution to an upcoming volume on the role of typology and type-thinking in current archaeological theory and praxis edited by the PCI recommenders. In this context, the paper offers an in-depth discussion of several crucial dimensions of typological thinking in past and current lithic studies, namely:

- "common sense" in archaeology, discussed based on earlier proposals by influential anthropologist Clifford Geertz (**1975**),
- "function", argued by the author to be the "fundamental property of tools",
- "cognitive" aspects, said to be reflected in the "property we naturally use to classify" stone tools and then argued to be grounded in function,
- "traceology" as an archaeological bundle of methods and practices to determine (tool) function, discussing the current status of this research perspective in archaeology and its future.

Discussing and importantly re-articulating these concepts, Iovita ultimately aims at "establishing unified guiding principles for studying a technology that spans several million years and several different species whose brain capacities range from ca. 300–1400 cm^3".

The notion that tool function should dictate classification is not new (e.g. **Gebauer 1987**). It is particularly noteworthy, however, that the paper engages carefully with various relevant contributions on the topic

from non-Anglophone research traditions. First, its considering works on lithic typologies published in other languages, such as Russian (Sergei Semenov), French (Georges Laplace), and German (Joachim Hahn). Second, it takes up the ideas of two French techno-anthropologists, in particular:

- Anthropologist of technics François Sigaut's (1940-2012) distinction of form, function, and "fonctionnement" (**Sigaut 1991**). Iovita proposes to draw and recast this tripartition, splitting the notion of function into "structural function" (a concept encompassing biological function as well as the "interface between the tool and its environment"), "operation" (which "relates to learning the function of artifacts from others and representing them through their motor associations"), and "designer-intended function" (DIF). Iovita shows how these distinctions can be used to clarify the ways and the grounds on which we build lithic typologies.

- Structural anthropologist Claude Lévi-Strauss' (1908-2009) concept of "*bricolage*", influentially proposed and developed in his *La pensée sauvage* (**Lévi-Strauss 1962**); this concept was also much discussed by North American anthropologist Clifford Geertz and more recently critically re-considered in the English-speaking literature thanks to a new translation of Lévi-Strauss' original text (**Lévi-Strauss 2021**).

Interestingly, Iovita grounds his argumentation on insights from primatology, psychology and the cognitive sciences, to the extent that they fuel discussion on archaeological concepts and methods. Results regarding the so-called "design stance" for example play a crucial role: coined by philosopher and cognitive scientist and philosopher Daniel Dennett (1942-2024), this notion encompasses the possible discrepancies between the designer's intended purpose and the object's current functions. DIF, as discussed by Iovita, directly relates to this idea, illustrating how concepts from other sciences can fruitfully be injected into archaeological thinking.

Lastly, readers should note the intellectual contents generated on PCI as part of the reviewing process of the paper itself: both the reviewers and the author have engaged in in-depth discussions on the idea of (tool) "function" and its contested relationship with form or typology, delineating and mapping different views on these key issues in lithic study which are worth reading on their own.

References:

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Reviews

Evaluation round #1

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Authors' reply, 18 March 2024

Response to Reviewers

First of all, I wish to thank both reviewers for spending time with my paper and entering a dialogue about these ideas with me. Before delving into the nitty-gritty of responding to critiques, I shall endeavor to summarize the nature of the arguments levelled against my main thesis. First of all, both reviewers accepted the review of tool concepts. However, they disagreed about 1) the need for prioritizing function in lithic typology, 2) the ability of the field to effectively switch to a function-based typological practice.

The first argument can then be further subdivided into two objections: a) there is no need to focus on function in typology because function doesn't make sense as the basis of typology, i.e., because other considerations, such as manufacture, are more important; and b) there is no need to prioritize function because typological practice has already progressed beyond the stage described in the paper (i.e., the paper argues against a straw-man). Additionally, both reviewers felt that I had not engaged sufficiently or particularly fairly with current typological practice. Although an account of current typological practice was not the main point of my paper, in my revised manuscript, I took their recommendations seriously and expanded on this aspect of the paper.

Reviewer 1 (V. Delvigne)
I wish to thank Reviewer 1, Vincent Delvigne, for his long and thoughtful review of this article. Before I go into a more detailed answer, I would like to clarify what seems to be a misunderstanding: at the most general level, I am not arguing for abandoning all typologies built on morphology or manufacture and replacing them with typologies based solely on some functional understanding. I'm only saying that, before one argues about the geometry of a tool is, one should at least know if it was used to shave wood or cut meat. I am arguing for placing what we intuitively want to know about tools at the bottom (or top?) of tool classification. From there on, archaeologists can build the classification as they wish (based on raw material, morphology, or manufacturing mental templates). As such, my paper is really a plea for people to turn their heads in a particular direction; it is not a declaration of war on everything that has been written already.

Seen from this perspective, I have only one, perhaps unsatisfactory answer to most of the critiques leveled: I don't know yet. I don't know if we will ever find out the function of every object we find, but it's still the only thing that makes sense to do, so we should at least try. I don't know how to solve the problem of use equifinality, but I am willing to bet that patterns of use equifinality will tell us more than ignoring function completely.

Concern 1
"The second point we would like to address concerns the use of words from vernacular language (common sense) to designate objects from Prehistory. The author assumes that the name given to the object defines its function. While it is possible that form and function were initially confused in the early days of the discipline, I do not think that this confusion persists today within the prehistorian community. I could be mistaken, not

being familiar with all the ongoing practices worldwide, but it seems to me that nobody now considers, for example, that a scraper is used solely for scraping (see the debate on this topic about carinated scrapers)."

This repositions my critique of implicit functional typologies as a straw-man. The idea is that archaeologists either do not use folk-functional words from the vernacular for stone tool types or, if they do, they don't really mean it. I have added some text to the manuscript to clarify my position. My intention here was to discuss something that I think we archaeologists all do: have a folk theory about what people did with the stone tools we study. Demonstrating beyond any doubt that calling something a grattoir vs. a couteau influences how people interpret an archaeological site, assemblage, or industry is difficult. Let's take the example of hafting: when people started publishing examples of traces of hafting on tools such as handaxes or Keilmesser, there was quite a bit of surprise and perhaps even a bit of disbelief. Even use-wear specialists had not looked for such traces in the first place, because "that's just not how you use a ___". This indicates that, no matter what people call a stone tool, they have some idea in their head about its function. And if that idea is not explicit, it will be implicit. We can get rid of that bias by focusing our attention on it first.

I have added some paragraphs in the paper on typological practice to include references to non-Bordesian typological systems, especially that of Georges Laplace, which are based on the explicit exclusion of common sense. First of all, I would like to point out that Laplace's systems are nowhere as popular in countries other than France (and maybe Italy) as Bordesian or other traditional systems. In most of the world (and, it is true that I am only familiar with the literature published in other European languages, mainly German, Spanish, and Russian), Paleolithic archaeologists use the mixed typology I refer to in the text. Laplace's system, interestingly, as I now wrote in the paper, also relies on a set of primary categories that are defined by naïve guesses at function.

Concern 2

"In this perspective, retouched objects - in the sense of modifying edges (cf. façonnage) - represent an additional step in the production process compared to debitage products (whether used or not). These objects, therefore, hold a special place in the production chain. Because, this production chain aims to classify all objects, it is it that must be considered first and foremost in the classification of lithics, in order to establish set of data by stages of the chaîne opératoire."

Multiple authors have pointed out, both on an ethnographic and archaeological basis, that retouch does not always hold a special place in the production chain. Tindale's Ngadadjara informant pitied him for picking up retouched tula slugs, which look like European endscrapers, because only a man in great need would not search for an unretouched flake (Tindale 1965). Here, retouch is a simple attempt to maintain the edge long enough to be useful, and not something that is part of the tool manufacturing process. It is very unfortunate that the word 'tool' is often used synonymously with 'retouched tool,' because by now we all know plenty of unretouched flakes were used, sometimes exclusively.

Second, what was once believed to be long operational sequences are potentially distinct events representing the intentionality of several people, sometimes separated by hundreds of years. Turq, and, indeed Bordes even, demonstrated that using refittings (Turq et al. 2013). Therefore, I find it difficult to accept that we should base any classification on "stages of the chaîne opératoire," but this has been argued before elsewhere, so I will not rehearse it here.

Concern 4

V. Delvigne then moves on to argue that some important objects appear to be utilitarian, but are actually manufactured with the purpose of serving within some ritual. If I understand correctly, he argues that the

function therefore resides in and/or is subordinate to the manufacture. Therefore, the chaîne opératoire would dictate that manufacture should stand at the basis of the typology. I would argue that the opposite is the case. Such objects only achieve their ceremonial status because they are perceived and understood by a native observer as utilitarian tools of a certain kind (say, knives or axes), whose utilitarian function has been removed from the day-to-day context. Usually, the utilitarian purpose of such tools is an icon (in the Peircean sense) of their purpose in a spirit world or in another supernatural context. Pétrequin (Pétrequin et al. 2012:1354), one of the authors cited by the reviewer, agrees that this is the case for polished stone axes from the Neolithic tombs of Morbihan:

Ainsi, le choix plutôt ubiquiste de la hache comme objet signe n'aurait rien d'arbitraire, mais serait fondé sur une valeur générale de l'outil des agriculteurs en ambiance forestière ; il retranscrirait certains fonctionnements sociaux et politiques dominés par les hommes, la virilité et la violence. De même le choix des jades n'était pas aléatoire, car cette roche fine, remarquablement tenace et lumineuse, semble souvent avoir été associée à l'eau, à la foudre, au serpent ou à l'éternité.

None of the above would work if the utilitarian purpose was not even recognized.

Reviewer 2

I already mentioned above that I welcomed the second reviewer's comments and suggestions to include a discussion of some earlier French literature, including the school of Analytical Typology established by Laplace (and others). This typology is particularly well-suited to microlithic technology, where the number of objects is really large and the morphological variation is huge, almost unlimited. Here the traceological problem is more severe, because without knowing the hafting arrangement it is difficult to reconstruct any of the three levels of function I propose (especially structural function). But, as I wrote above, this should not discourage future archaeologists from trying to understand the function of every microlith! On the contrary, if the problem presents itself this way, we should acknowledge its difficulty and work on the solution, rather than adapting our categories to maintain the same level of comfort.

References

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Decision by Sébastien Plutniak, Felix Riede and Shumon Tobias Hussain, posted 03 August 2023, validated 03 August 2023

Dear Radu,

This is our pleasure to come back to you about your paper with two interesting reviews. As demonstrated by the reviewers' comments, the paper is interesting and thought-provoking. They also highlighted some limits, and proposed interesting suggestions to strengthen your demonstration In particular,

1. you should clarify the point about the scope of your argument, and its consequences for typology in general or for lithic tools in particular;

2. the invitation to take into account less-known –although old– approaches in lithic studies also appears as a valuable way to improve the paper.

We hope these reviews will be helpful and we are looking forward to read the final version, that will be a valuable contribution to our future book!

All the best,

Sébastien, with Shumon & Felix

PS: in attachment, the file with some additional comments by Sébastien **Download recommender's annotations**

Reviewed by Vincent Delvigne, 21 April 2023

Radu Iovita's article is very well-written and follows a logical structure, but in my opinion, it presents a recurrent fundamental problem (see below). The article seeks to question a key element of our naturalistic ontology: classification. The author draws on references in neuroscience and psychology, including the works of F. Sigaut and those related to the "Design Stance", to determine what is intrinsically a tool for humans. The article also highlights the role of common sense in the history of lithic typology in prehistoric archaeology and rightly demonstrates the bias induced by the social context of researchers (often Western) in the construction of scientific discourse.

However, the title of the article: "Lithic typologies should be functional" (a question mark would have been more appropriate), seems too ambitious considering the development of the article. Upon further review, it indeed appears that the core issue of this article is about tools, rather than typology. Typology represents a classification system, much like taxonomy in biology: they are boxes. "Tools" (in the classic sense of the term) are just one element of this classification. While it is indeed important - even vital and urgent - to clarify what a tool is (in the functional sense of the term), and in this regard I agree with all the author's remarks, it nevertheless appears that typology goes far beyond this question. This is what the *chaîne opératoire* has shown by organizing the broad typology (that of F. Bordes) within a coherent system: the production system. The typological tools (in the sense of F. Bordes) then find their place in a production chain, just like all other objects, each having its own biography.

In this perspective, retouched objects - in the sense of modifying edges (cf. *façonnage*) - represent an additional step in the production process compared to debitage products (whether used or not). These objects, therefore, hold a special place in the production chain. Because, this production chain aims to classify all objects, it is it that must be considered first and foremost in the classification of lithics, in order to establish set of data by stages of the *chaîne opératoire*. This is all the more justified as there are no non-utilitarian objects during a stone-knapping operation: the objects are either products or coproducts (*sensu* Pesesse 2019) which themselves are used for maintenance/preparation of debitage and can even be reused in a production or functional cycle. In this sense, functional information (in the traceological sense of the term) is only important concerning the object's place in the technical process. This is particularly true for shaped objects that are not used. This does not mean that they have no function; they are simply not utilitarian objects, although they represent a more significant technical investment than a "simple flake". This is the case for all so-called prestige objects (see, for example, the works of Petrequin et al.). The opposite is true for many pieces showing repeated use traces but not being tools in the typological sense; however, they can meet predetermined standards (e.g., large Laborian blades) or not (e.g., flakes attached to Caribbean Indian cassava graters or in *tribulums*). In this regard, I do not think that the "utilitarian" typological subdivision governs the technical question; it is established in parallel, at the risk of no longer considering the rest of the production while focusing only on tools (in the true sense of the term). Thus, for me, the question is not so much whether typology should be

functional, but rather to determine what a tool is. Moreover, after the introduction and throughout the rest of the article, the author no longer talks about typology but "stone tool", focusing their attention solely on tools.

The second point we would like to address concerns the use of words from vernacular language (common sense) to designate objects from Prehistory. The author assumes that the name given to the object defines its function. While it is possible that form and function were initially confused in the early days of the discipline, I do not think that this confusion persists today within the prehistorian community. I could be mistaken, not being familiar with all the ongoing practices worldwide, but it seems to me that nobody now considers, for example, that a scraper is used solely for scraping (see the debate on this topic about carinated scrapers). If the vocabulary used in typologies is thus questionable, as the author rightly points out from the second line of the abstract, "a quick look at the lithics literature reveals that, although our natural human tendency is to talk about tools in general primarily in terms of their functions (e.g., hammer, knife, etc.), our stone tool typologies contain a mixture of terms relating to guessed function, manufacturing method, and shape," these must first be refined to ensure that the objects considered are well-defined enough to be compared, which is not always the case today. In this respect, it seems that a 100% functional typology cannot be an end in itself since it cannot organize all objects. Similarly, the new "boxes" of lithic typology now seem to be named based on their shape rather than their presumed usefulness - for example, the case of the *lamelles à dos dextre marginal* (100% descriptive) - or based on an eponymous site (e.g., the *lamelle de la Picardie*). More broadly, when the typological attribution implies a function (e.g., "butcher's knife" of the Flat Blade Technology in Northern and Western Europe), it is only after this has been confirmed by a use wear analysis.

Finally, despite the author's wish in conclusion part, it seems unlikely to be able to carry out functional diagnoses on all archaeological set for various reasons:

- The issue of time and investment required for the implementation of such studies; in absolute terms, this could be solved by a significant increase in the pool of researchers and massive investment in the field, so it is admittedly a weak argument, but it cannot be neglected;
- The problem of conservation or the possibility of observing polish and traces; this issue goes beyond the scope of the article, but if the traces are not observable, how can one deduce that an object is a tool and, therefore, integrate it into a typology?
- Similarly, the creation of traces on objects requires the repetition of gestures; however, in cases of brief use or materials worked that leave little or no traces, how can we determine that these pieces are indeed tools?
- Conversely, to return to the example of a knife (line 13), an object can be used for multiple activities (cf. the concept of *bricolage* by Levi Strauss). For objects with complex life cycles featuring reuses and successive rejuvenations (see, for example, PhD of J. Jacquier and C. Guéret), the author notes: "The more complex the history of the artifact (including, for instance, re-hafting of the same piece after breakage or resharpening), the more superimposed such traces can be, making a final interpretation and reconstruction uncertain or simply very time-consuming" (lines 471-474). Thus, to return to the example of the net and the hammock (line 156), what traces will be found: those of the net, the hammock, or both, and in this case, how can this object be integrated into a typology? How choose the archaeologist? Each object has its own life and, therefore, cannot serve as an archetype, which is, however, the basis of all typology.

As the author rightly pointed out in the first paragraph of the article, "even if that were not so, we are not Stone Age people," I believe that typology is an etic classification tool, not an emic research tool. However, this - and here I agree with the author - must be acknowledged as such. In this respect, the core development of this article (i.e., the debate on the definition of what is a tool and what is not) seems to run parallel to that of typology; at least it does not place itself at the same level of resolution in the classification of lithic objects (cf. functional versus non-functional). As such, lithic typology cannot be reduced to the question of the functionality of tools.

While I recommend the publication of this article, particularly regarding the reflection on the psychology of the tool, I would encourage the author to temper their argument and refocus it on the concept of the tool rather than that of typology.

Some formatting remarks:
Line 59: ”Ax” instead of ”Axe”?
Line 102: The expression ”more natural” is unnecessary and a bit odd in the context of this article.
Lines 275 & 276: ”(…) being also human, she (…)” add ’he or she’; the same for line 276 ”(…) broken bits of stone, she (…)” add ’he or she’.

In french

L’article de Radu Iovita est très bien écrit, suit une trame logique, mais présente à mon sens un problème de fond récurent (voir *infra*). L’article cherche ainsi à remettre en question un élément clé de notre ontologie naturaliste : la classification. L’auteur s’appuie pour ce faire sur des références en neurosciences et en psychologie, notamment les travaux de F. Sigaut ainsi que ceux ayant trait au ”Design Stance”, pour déterminer ce qu’est intrinsèquement un outil pour l’être humain. L’article souligne également le rôle du sens commun dans l’histoire de la typologie lithique en archéologie préhistorique et montre très justement le biais induit par le contexte social des chercheurs (souvent occidentaux) dans la construction du discours scientifique.

Cependant, le titre de l’article : ” Lithic typologies should be functional ” (un point d’interrogation aurait été plus approprié), semble trop ambitieux au vu du développement de l’article. Après relecture, il apparait en effet que la question de fond de cet article est celle de l’outillage et non de la typologie. La typologie représente un système de classement, au même titre que la taxonomie en biologie : ce sont des boites ; et les « outils » (au sens classique du termes) ne sont qu’un élément de cette classification. S’il est effectivement important - voire primordiale et urgent - de préciser ce qu’est un outil (au sens fonctionnel du terme), et en cela je rejoins toutes les remarques de l’auteur, il apparait pour autant que la typologie dépasse largement cette question. C’est ce qu’a montré la chaîne opératoire en organisant la typologie au sens large (c’est-à-dire celle de F. Bordes) dans un système cohérent : le système de production. Les outils typologiques (au sens de F. Bordes) trouvent dès lors leur place dans une chaîne de production au même titre que tous les autres objets, tous ayant une biographie qui leur est propre. Dans cette perspective, les objets retouchés – au sens de la modification des tranchants (cf. façonnage) – présentent une étape supplémentaire dans le processus de production par rapport aux produits débités (qu’ils soient utilisés ou non). Ces objets occupent donc une place particulière dans la chaîne de production. Or, cette chaîne de production a une vocation de classement de tous les objets. C’est donc elle qui doit être prise en compte en premier lieu dans la classification du lithique, afin de constituer des corpus par étapes de la chaîne opératoire. Ceci est d’autant plus justifié qu’il n’y a pas d’objet non utilitaire lors d’une opération de taille de la pierre : les objets sont soit des produits soit des coproduits (sensu Pesesse 2019) qui eux-mêmes servent à l’entretien / préparation du débitage et peuvent même être réutilisés dans un cycle de production ou fonctionnel. En ce sens, l’information fonctionnelle (au sens tracéologique du termes) n’est importante qu’au regard de la place de l’objet dans le processus technique. Ceci est particulièrement vrai pour les objets façonnés non utilisés. Cela ne signifie pas qu’ils n’ont pas de fonction, ils ne sont simplement pas des objets utilitaires bien qu’ils représentent un investissement technique plus important qu’un « simple éclat ». C’est le cas de tous les objets dits de prestige (voir par exemple les travaux de Petrequin et al.). L’inverse est vrai d’ailleurs de nombreuses pièces présentant des traces d’utilisation répétées, mais qui ne sont pas des outils au sens typologiques; ils peuvent toutefois répondre à des standards de prédétermination (e.g. grandes lames du Laborien) ou non (e.g. éclats emmanchés sur les râpes à manioc des indiens caraïbes ou dans les *tribulums*). À cet égard, je ne pense pas que la subdivision typologique ”utilitaire” préside à la question technique elle s’établie en parallèle, au risque d’ailleurs de ne plus considérer le reste de la production en se concentrant sur le seul outillage (au sens vrai du termes). Ainsi, pour moi, la question n’est pas tant de savoir si la typologie doit être fonctionnelle, mais plutôt de déterminer ce qu’est un outil. D’ailleurs, après l’introduction et dans le reste de l’article, l’auteur ne parle plus de typologie mais de ”stone tool”, focalisant son attention sur le seul outillage.

Le second point que nous souhaiterions aborder concerne l’utilisation de mots issus du langage vernaculaire (sens commun) pour désigner les objets de la Préhistoire. L’auteur, par du principe que le nom donné à

l'objet en défini la fonction, or si au début de la discipline il est possible que la forme et la fonction aient été confondues, je ne pense pas aujourd'hui qu'elle le soit encore au sein de la communauté des préhistoriens. Je peux me tromper, ne connaissant pas l'intégralité des pratiques en cours dans le monde, mais il me semble que plus personne ne considère a priori par exemple qu'un grattoir sert à gratter (voir le débat à ce sujet sur les grattoirs carénés). Si le vocabulaire employé dans les typologies pose ainsi question, comme le souligne très justement l'auteur dès la seconde ligne de l'abstract « a quick look at the lithics literature reveals that, although our natural human tendency is to talk about tools in general primarily in terms of their functions (e.g., hammer, knife, etc.), our stone tool typologies contain a mixture of terms relating to guessed function, manufacturing method, and shape", celles-ci doivent avant tout être affiner afin de s'assurer que les objets considérés sont assez bien définis pour qu'ils puissent être comparés, ce qui n'est pas toujours le cas aujourd'hui. A ce titre, il parait qu'une typologie 100% fonctionnelle ne puisse pas être une finalité puisqu'elle-même ne peut organiser l'ensemble des objets. De même, les nouveaux « tiroirs » de la typologie lithique semblent aujourd'hui nommé en fonction de leur forme et non de leur prétendue utilité - c'est par exemple le cas pour la lamelle à dos dextre marginal (100 % descriptif) - ou alors en fonction d'un site éponyme (p. ex. la lamelle de la Picardie).Plus largement, lorsque l'attribution typologique induit une fonction (p. ex. « couteau de boucherie » des ensembles à Flat Blade Technology dans l'ouest de l'Europe), c'est seulement après s'en être assuré par une étude la tracéologique. Or, malgré le souhait de l'auteur dans la conclusion, il parait peu probable de pouvoir faire des diagnoses fonctionnelles sur l'intégralité des corpus et ce pour différentes raisons :

- La question du temps et de l'investissement pour la mise en place de telles études ; dans l'absolu cela pourrait être résolu par une augmentation importante du pool de chercheurs et un investissement massif dans le domaine, c'est donc un faux argument certes, mais cela ne peut être négligé ;
- Le problème de la conservation ou de la possibilité d'observation des polis et des traces, cette question dépasse le cadre de l'article, mais si les traces ne sont pas observables alors comment déduire qu'un objet est un outil et donc de l'intégrer dans une typologie
- De la même manière, la mise en place de traces sur les objets nécessite la répétition de gestes, or, en cas d'utilisation fugace ou de matériaux travaillés ne laissant pas ou peu de traces, comment déterminer que ces pièces sont bien des outils ?
- Inversement, pour reprendre l'exemple du couteau (ligne13), un objet peut servir à plusieurs activités (cf. notion de bricolage de Levi Strauss). Or pour les objets aux cycles de vie complexes présentant des réemplois et des ravivages successifs (voir p.ex. thèse de J. Jacquier et de C. Guéret) l'auteur signale : « The more complex the history of the artifact (including, for instance, re-hafting of the same piece after breakage or resharpening), the more superimposed such traces can be, making a final interpretation and reconstruction uncertain or simply very time-consuming" (ligne 471-474). Ainsi, pour reprendre l'exemple du filet et du hammac (ligne 156) quelles traces seront retrouvées : celle du filet, celle du hammac ou les deux et dans ce cas, comment intégrer cet objet dans une typologie ? Chaque objet à une vie qui lui est propre et ne peut donc pas servir d'archétype, ce qui pourtant est la base de toute typologie.

Comme l'a souligné justement l'auteur dès le premier paragraphe de l'article, "even if that were not so, we are not Stone Age people" je pense que la typologie est un outil de classification étique et non un outil de recherche émique. Mais cela - et ici je rejoins l'auteur - doit être assumé comme tel. A ce titre, le coeur du développement de cet article (i.e. le débat sur la définition de ce qui est outil et ce qui ne l'est pas) semble s'établir en parallèle à celui de la typologie ; en tout cas il ne se place pas au même degré de résolution dans le classement des objets lithiques (cf. fonctionnel versus non fonctionnel). A ce titre, la typologie lithique ne peut être réduite à la question de la fonctionnalité des outils.

Si je recommande la publication de cet article, notamment concernant la réflexion sur la psychologie de l'outil, j'encourage toutefois l'auteur à tempérer son propos et recentrer celui-ci sur la notion d'outil plus que sur celle de typologie.

Quelques remarques de forme

Ligne 59 : « Ax » au lieu de « Axe » ?

Ligne 102 : l'expression « more natural » est inutile et un peu étrange dans le contexte de cet article.
Lignes 275 & 276: "(…) being also human, she (…)" add he or she ; the same line 276 "(…) broken bits of stone, she (…)" add he or she.

Download the review

Reviewed by anonymous reviewer 1, 19 July 2023

The reviewed paper by Iovita, entitled *Lithic typologies should be functional*, is an interesting reflection on the human (and non-human primates) function-based concept of tools. In this sense, the author shows, based on psychological evidence and research on learning and tool use behaviour in humans and non-human primates, that function is the key aspect for our understanding, conceptualization and classification of tools. As a consequence, it is argued that the analysis of archaeological lithic assemblages should pivot on the study of use-wear traces, which must be accompanied by a methodological and technical improvement of this field of study. Indeed, the generalization of use-wear traces analysis would represent, in combination with data on techno-typology, a clear step forward in our comprehension of the patterns of technological management of lithic resources, especially regarding tool manufacturing and consumption. I consider of special interest the proposed concepts and nomenclature for functional analysis (Structural Function, Operation and Designer Intended Function), which enriches the notion of function of prehistoric lithic artefacts. As a layman on the topic, I also found very interesting and instructive the sections dedicated to the concept of tools and their functional understanding (section "Deconstructing tool concepts").

All this said, in the opinion of this reviewer the parts dedicated to Typology and typological practice, solely focused on the Bordesian system, are too generic and don't take into consideration the actual diversity, complexity and foundations of the analysis of the (techno)typology of prehistoric lithic industries. One example is the idea that "*our stone tool typologies contain a mixture of terms relating to guessed function, manufacturing method, and shape*" or that "*typologies end up mixing tools with obvious functional attributions (scrapers, burins, etc.) with those determined by the method of their manufacture (bifaces, Levallois flakes, Krukowski micro-burins, backed 'pieces,' etc.), and those that are simply shape descriptions ('limaces,' 'trapezes') and, finally, those that are shape descriptions with implied functions ('points')*". Although this is unquestionable for the most known empirical typologies (such as the mentioned Bordes type list), it is also true that other long-tradition typological systems overcame this issue a long time ago. One example is G. Laplace's Analytical Typology. In this, the different tool types are not defined by any of those variables, but by the convergence of several morphotechnical features of the retouch (namely: mode, amplitude, delineation, direction, form, etc.). Focusing on function-related terms, it is also undeniable that most of the typological systems (including the Analytical Typology) still hold some of those terms (such as endscrapers, burins, borers, etc.); however, for this reviewer, it is clear that most of these denominations have, effectively, lost that functional meaning or interpretive load (of course, thanks to the development of use-wear traces analysis). On the contrary, other methodologies such as, for example, the "*Sistema Lógico Analítico*" by Carbonell, Guilbaud and Mora overcame that terminological paradigm by proposing a new and aseptic (in functional terms) terminology. In any case, in the opinion of this reviewer, those function-related terminologies are a practical inheritance that does not have a real impact on the current functional apprehension of lithic remains. Because nowadays, which lithic specialist, now that we know the functional diversity of a typological group such as, for example, that of the burins, considers that such an artefact was used for what common sense tells us it has to have been used for? A possible exception, as already highlighted by the author, are some specific types that show a very strong form-function relation, such as "points" and, especially, borers. In these cases, indeed it can be argued that those categories still retain some "functional load", from which, as the author rightly proposes in the paper, we should get rid of.

Another evidence of this generalization can be observed in the section "*Understanding the archaeologist: from the design stance to manufacturing technique*". In this, the mental and methodological process exposed by the author seems somehow speculative and not totally in accordance with the process of analysis of lithic assemblages through the different typological systems, especially the analytical ones. In these, the procedure

of studying (classifying) lithic remains is based on the analysis of the morphotechnical features of the artefacts, and not on the deliberate search of “familiar shapes” that can be related, based on common sense, to specific functionalities.

For all these reasons, I suggest the author qualify and broaden those parts dedicated to Typology and typological practice by taking into consideration other typological systems than the Bordes type list and, by extension, by envisaging other theoretical and methodological approaches to the classification and analysis of lithic industries. I think this would benefit the overall of the paper and would not affect its main aforementioned contributions, which are solid and interesting on their own.

Finally, references in the text need to be standardised, since they follow different (and in some cases, erroneous) formats.