



## How many lives can a polished axe have? A biographical approach to a Neolithic hoard deposit from Belgium.

**Nelson Almeida**  based on peer reviews by **Joao Marreiros** , **Lars Larsson** and **Juan Gibaja**

Sonja Tomasso, Dries Cnuds, Ferdi Geerts, Bart Vanmontfort, Veerle Rots (2025) From polishing to burning: deciphering a Middle Neolithic hoard from Beringen Brouwershuis (Belgium) through functional analysis. OSF Preprints, ver. 2, peer-reviewed and recommended by Peer Community in Archaeology.

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Votive deposits and hoarding practices are of significance to archaeological research. They can provide insights to the economic and functional aspects but also to less mundane, ritual and symbolic behaviors of past societies. Prehistoric and historic examples are documented in various European regions (e.g., [1, 2]) but Neolithic hoards are generally not among the most frequently found and studied. Attempts to characterize these materials often focus on more traditional archaeology-related discourses, such as raw-material and typotechnological analysis, deposition practices and context-based interpretations. Alternative complementary analytical approaches remain less common in non-metallic hoards despite their informative potential. This scenario is quickly changing due to developments and application of functional studies and the broad field of archaeometry. Combining these approaches with contextual data offers a promising avenue for further research and interpretation.

Tomaso and colleagues [3] present an example of a Middle Neolithic radiocarbon-dated pit from the Beringen Brouweshuis site (Belgium) that was subject to archaeological excavations as part of a developer-funded programme [4]. A sample of flint polished axes, endscrapers and other smaller tool fragments recovered in the mentioned negative feature were selected for an initial residue and use-wear analysis. The materials were subject to a rapid burial and, although unclear if intentional and controlled or incidental, the majority of artifacts were damaged due to exposure to fire. On the one hand, macroscopic and microscopic traces of use-wear and hafting are scarce on the axes - of interest is the identification of an axe used as strike-a-light

and the presence of iron-oxide that could relate to pedogenesis or ochre depositions. On the other hand, the scrapers are better-preserved, less impacted by heat, and show evidence of hide and plant processing, hafting and resharpening.

The case-study is discussed within the scope of a biographical approach [5] to the materials under analysis. Context, methods and interpretation limitations are clearly acknowledged by the authors. In sum, this paper presents interesting results on the first excavated Michelsberg culture axe hoard in Belgium. It contributes to the corpus of information on the relevance of fire (and possibly ochre) specifically in these deposits and more broadly to other past populations ritual and symbolic behaviors (e.g., [6, 7]). At the same time, it is an interesting addition to supra-regional discussions on how prehistoric daily objects can gain new meanings – a resignification – by being included on hoarding practices. The fact that other steps could have been part of this process, namely fire and eventually ochre, showcases the complexity and entanglements that these artifacts and deposits might have had during their lifecycle. **References**

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- [3] Tomasso, J, Cnuts, D, Geerts, F, Vanmontfort, B, Roots, V (2025) From polishing to burning: deciphering a Middle Neolithic hoard from Beringen Brouwershuis (Belgium) through functional analysis. OSF preprints, ver. 2 peer-reviewed and recommended by PCI Archaeology [https://doi.org/10.31219/osf.io/4yqch\\_v2](https://doi.org/10.31219/osf.io/4yqch_v2)
- [4] Geerts, F, Claesen, J, Van Genechten, B, Bouckaert K (2021) De inhoud van een gereedschapskist? Een midden-neolithische depotvondst te Koersel, (Beringen, prov. Limburg, BE). *Notae Praehistoricae* 41: 147-158.
- [5] van Gijn, A (2010) Flint in focus: Lithic biographies in the Neolithic and Bronze Age. Leiden: Sidestone Press.
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## Reviews

### Evaluation round #1

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Version of the preprint: 4

### Authors' reply, 14 February 2025

Dear Dr. Almeida,

We sincerely appreciate your time and effort in reviewing our manuscript submitted to PCI Archaeology. We are grateful for the constructive feedback provided by the reviewers and your thoughtful evaluation. We are pleased to learn that the manuscript is of interest and that the suggested revisions are considered minor. We have carefully addressed all comments and revised the manuscript accordingly (both detailed answer and track changes document attached). Below, we provide a summary of the key revisions made in response to the reviewers' concerns:

#### 1. Archaeological Context

- We have expanded the description of the Beringen Brouwershuis site.

## 2. Sampling Strategy

- We have clarified why not all artefacts from the pit were analysed, outlining the criteria used for sample selection.

## 3. Argumentation and Comparative Studies

- We have incorporated additional references to relevant studies on heat-induced damage.
- The discussion of use-wear analysis has been strengthened to better highlight its role in characterising the assemblage.
- We have addressed interpretative concerns raised by one of the reviewers, clarifying the rationale behind our interpretations, particularly regarding potential ritual significance.
- We have specified whether the lithic assemblage recovered from the pit is typologically and/or biographically distinct from other contexts at the site.

We believe these revisions have significantly improved the clarity and depth of our manuscript. A revised version of the preprint has been uploaded, with all changes carefully implemented. Additionally, we have prepared a point-by-point response to the reviewers, detailing how each comment was addressed.

We sincerely appreciate the opportunity to improve our work and look forward to your assessment of the revised manuscript. Please let us know if further modifications are required.

Best regards

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## Decision by [Nelson Almeida](#) , posted 26 January 2025, validated 27 January 2025

Dear Authors, I would like to commend you on submitting your preprint to PCI Archaeology. The manuscript follows a biographical and life-cycle approach aiming to characterize a hoard of artifacts deposited in a Neolithic pit from Beringen Brouwershuis (Belgium) based on wear and residue analysis. I have received all the necessary reviews and decided after considering the 3 reviewers' feedback to minor revisions before consideration for a recommendation.

Reviewers agree that your manuscript is of interest although some specific questions should be addressed to strengthen it, mostly concerning contextual and interpretative information. The main aspects raised by the reviewers deal with:

i) Archaeological information, a more descriptive approach regarding the site and the specific context of deposition of the assemblage is needed; ii) Sampling, please develop why not all artifacts present in this pit were analyzed and clarify what were the criteria used for sample selection; iii) Argumentation, there is some lack of reference studies regarding heat-induced damage, and the use of fire and other comparable ritual practices in (roughly) contemporaneous sites. The relevance of use-wear analysis to characterize these assemblages should also be reinforced. One of the reviewers specifically addresses some questions regarding interpretative aspects and I suggest the consideration of these suggestions and clarification of the rationale behind interpretations mentioned. Also, clarify if the lithic assemblage recovered in the infilling of this pit is typologically and/or biographically different from what is seen elsewhere in the site (if existing). All these suggestions can help strengthen this manuscript. Find below the full reviewer's suggestions and comments for your careful consideration. Please address all comments and upload a new version of the preprint. Looking forward to hearing from you. Best wishes,

Nelson J. Almeida

**Reviewed by Joao Marreiros , 13 January 2025**

Dear editor of the PCI Archaeology, dear authors of the manuscript entitled “From polishing to burning: deciphering a middle Neolithic hoard from Beringen Brouweshuis (Belgium) through functional analysis”

I am delighted to review the work by Tomasso and colleagues, which focuses on the microscopic analysis of micro traces on polished stone axes to document their use biography and lifecycle, consequently contributing to the discussion on their significance in Neolithic hoard practices.

In general, I find that the study is well-designed, featuring adequate methodology, documentation, and description of the acquired and analysed data. I recommend that the manuscript be published after minor revisions. Nevertheless, I believe that the manuscript could benefit from some adjustments concerning the scope and research questions that drive the study. I assume the researchers aim to investigate and contribute to the discussion on Neolithic ritual practices through the analysis of use-wear traces on polished axes (the so-called big picture). From my perspective, this discussion encompasses various interrelated aspects; however, this is not clearly articulated in the Abstract and Introduction. References to ritual practices and object biographies are notably absent in these sections.

In the Introduction, I suggest that the first paragraph, which provides details about the site and selected assemblage, be moved to the end of the section. The narrative should begin with a broader context, emphasizing the research questions presented in the second paragraph, followed by the selected case study. Here, the authors could elaborate more on the contribution of use-wear studies to these questions. Specifically, why is use-wear significant, and why should it be considered in this area of research? What data can use-wear provide that other types of artefact analyses do not? The focus should be on the deposition of these objects and the activities they are associated with.

There appear to be two sections titled “Materials and Methods,” which I assume is an error. The third section, currently also called “Materials and Methods,” should be titled “Sampling.” In this section, the authors should clarify the criteria used for the initial sorting of the artefacts when they state, “... most promising for functional analysis.”

In the Results section, while the authors report damage associated with the exposure of the artefacts to heat, they should substantiate their interpretations with key reference studies. In the Discussion, I again highlight the absence of an initial paragraph, or a few sentences dedicated to contextualizing the study, where the broader picture and main research questions are introduced and discussed. For instance, the authors refer to the concept of the “biographic approach” for the first time here. I believe this concept should be introduced much earlier in the manuscript. Following this idea, it is evident to me that the take-home message of this investigation is centred on hoarding practices, rituals, and interpreting the archaeological assemblages; this focus seems to be lacking in the introduction of the manuscript.

**Reviewed by Lars Larsson, 19 December 2024**

[Download the review](#)

**Reviewed by Juan Gibaja, 24 January 2025**

The review of the article From Polishing To Burning: 1 Deciphering A Middle Neolithic 2 Hoard From Beringen 3 Brouwershuis (Belgium) 4 Through Functional Analysis represents an interesting contribution of functional studies to the interpretation of tools documented in certain structures. I would like to make a few comments bellow, which are not so much criticisms as suggestions for improving the text.

Line 73. One of the biggest deficiencies I have noticed is in the contextual information. You give an explication of the location of the site and talk directly about the structure in which the material was found. I think it would be interesting to describe much better the site, its characteristics, what kind of structures have been discovered, if there are other structures similar to the ones studied, what data other disciplines offer (about the economy, for example), etc.

A map of the sit is also included, but a general map of Belgium would be useful for readers unfamiliar with the geography of the area.

Line 96. I think that one of the researchers who has done the most work on polished tools is Alba Masclans. I think her work should be referred to. Moreover, most of her studies are on Neolithic tools from funerary contexts.

Line 107. With regard to the material, the authors do not explain why they only analysed 17 tools. What is the reason for this selection? In this sense, they have not explained whether there are other structures with lithic material that have not been studied.

Line 245. Regarding the modifications, it is surprising that even if they are very modified, as the author says, small modifications are associated with the hafting of these tools. The question is: could these types of modifications not be the result of alterations? Is there no other possibility than this interpretation?

Line 294. The authors are very interested in interpreting material that is fundamentally linked to the symbolic sphere. For example, the fact that a tool is documented as a strike-a-light is not seen as just another use or reuse, but as an element linked to the ritual. What seems strange to them may be part of the ritual, and other activities, such as wood or leather work, which are documented on other instruments, do not seem to them to be related to the symbolic world.

Line 309. "The absence of extreme discoloration or complete fracturing suggests controlled burning". In the photos, the presence of cracks and negatives of potlids from exposure to intense heat show that there was no controlled heating. These changes occur precisely when the heat is very intense. This leads to destruction of the flint or loss of quality when heating is used to cut the cores.

Line 313. It says: "This controlled exposure implies that the tools were purposefully modified before deposition, potentially carrying ritual significance". This is another example of the search for an exclusively symbolic interpretation. I think this kind of interpretation is very risky and without solid evidence. Many of the tools have been badly affected by high heat and little control. In any site with thermally altered flint tools, there are different degrees of alteration due to proximity or lack of proximity to the heat source, exposure, etc. However, this does not imply anything symbolic, but simply changes inherent to the activities carried out in the settlements. It is difficult to make these assessments if other structures on the site have been analysed or similar cases have not been evaluated. In any case, these are proposals by the authors, which the scientific community will evaluate as solid or not on the basis of the data presented.

For all these reasons, I believe that this article should be published with minor modifications, regardless of whether the authors reflect on their interpretations or not.