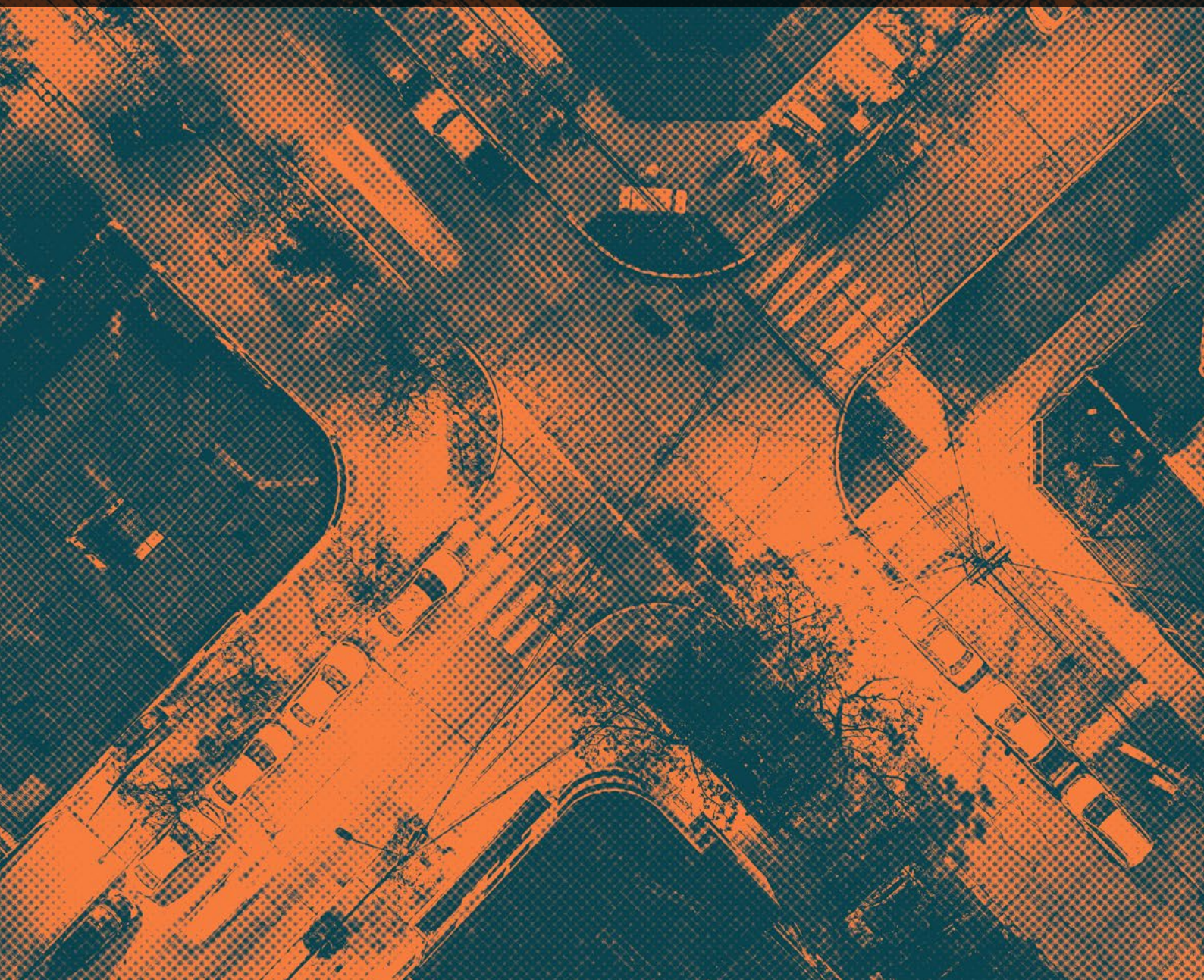
INTER-SECTION

Junior Archaeological Research Journal



INTER-SECTION
DECEMBER 2024
ISSUE V

COLOFON

INTER-SECTION
Junior Archaeological Research Journal

ISSUE V
DECEMBER 2024
ISSN PRINTED VERSION: 2452-266X (MAX. 200 COPIES)
ISSN ONLINE VERSION: 2452-2678

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2333 CC Leiden
the Netherlands

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EDITORIAL STATEMENT:
BRIDGING THE GAP
MAKING ACADEMIC JOURNALS ACCESSIBLE FOR THE NEURODIVERSE

Maia Casna, Sarah Delaney, Rachael Hall, Anouk Mommen, and Foteini Tsigoni

In the past decade, the scientific community has increasingly prioritized diversity and inclusion, recognizing that these values are essential when looking towards innovation and equity in research (Forrester, 2020; Sarju, 2021). Several archaeology journals have responded by emphasizing diversity in editorial boards, promoting inclusive and ethical research practices, as well as highlighting systemic issues with the underrepresentation of specific demographics among their authors (e.g., Bardolph, 2014; Turner, 2022). Although significant progress remains to be made in achieving equality in the field of archaeology and science over the next few decades, these ongoing efforts indicate a promising trend towards a more inclusive and diverse approach to these disciplines.

In this framework, Thorp (2024) recently emphasized the importance of recognizing neurodiversity among scholars and advocated for enhanced efforts to facilitate the inclusion of neurodivergent scientists in the scientific community. A strong example of the inclusion of neurodiversity in archaeology is the Chartered Institute for Archaeologists (CIfA), which actively promotes diversity and inclusion within the profession, further contributing to this positive trend. While neurodiversity is now being addressed in higher education settings thanks to various governmental programs and university initiatives (especially after the online teaching programs adopted during the COVID-19 pandemic), this progress still struggles to translate into scientific outputs (Brinn et al., 2024; Geurts et al., 2020; Levitt, 2022). Creating opportunities for disabled and neurodiverse individuals to feel included within the structured environment of academia is both essential and valuable (e.g., Henning et al., 2022). Such inclusion fosters greater flexibility in how research questions are formulated and methodologies are approached, enriching the diversity of perspectives and enhancing the overall quality of scholarly practice (Bernard et al., 2023).

Scientific publications are the bedrock of research and academic discourse, serving as the primary medium through which new data is disseminated, debated, and built upon. Therefore, ensuring that scientific literature is accessible to neurodivergent scholars is crucial not only for equity but also for maintaining scientific integrity and fostering progress, as it was argued that excluding a significant portion of the academic community from contributing to and benefiting from new knowledge hinders innovation and advancement (Ruzycki & Ahmed, 2022). Additionally, neurodivergent scholars deserve equal opportunity to be involved in the academic research community as those who may face fewer obstacles. Yet, journal layouts are not always accessible to diverse readers, and the scientific publishing industry appears to struggle to accommodate diverse readerships.

To partially bridge this gap—and to experiment with new approaches—this issue of Inter-Section has been designed and formatted to be accessible to a wider audience of readers. Through months of research and discussion that brought together staff members, neurodivergent graphic designers and students, as well as external collaborators, we were able to improve upon current ways of presenting to better visualize archaeology. By listening to and accommodating the diverse cognitive profiles of the individuals involved in our discussion group, we thoroughly reviewed and planned how to enhance Inter-Section's usability, engagement, and reading satisfaction.

As the font can be one of the key issues neurodivergent people may face when trying to read text, we investigated possibilities that offered an improvement. Atkinson Hyperlegible, the main font we selected for this issue, was engineered by the Braille Institute to enhance readability for people with visual impairments and dyslexia, addressing (albeit not in all cases) common challenges such as letter confusion and visual stress. Further, we gave thoughtful consideration to text and column spacing in order to prevent cognitive overload, which is particularly beneficial for readers with ADHD and other attention-related difficulties. A well-organized layout, with ample white space, guides the reader's eye naturally, reducing strain and enhancing comprehension. Color choices were equally important to us. By selecting more subdued color schemes, we aimed to create a reading environment that

minimizes sensory overload. This is particularly important for individuals on the autism spectrum, who may be sensitive to bright colors or busy color schemes. A calm and consistent color palette can make the reading experience more pleasant and less distracting, allowing readers to focus on the content rather than being overwhelmed by the presentation.

While we think this issue represents a significant advancement from previous layouts adopted by Inter-Section, it is crucial that we continue to explore and implement design innovations that foster inclusivity. The use of accessible fonts, thoughtful spacing, and sensory-friendly color palettes are just the beginning: moving forward, enhancing digital accessibility will be a key focus. We aim to develop more flexible reading options, such as adjustable font sizes, text-to-speech features, and interactive content tailored to individual needs. These advancements will further ensure that our publications remain accessible to all readers.

In addition to technological advancements, involving neurodivergent individuals and those with disabilities in the design and review process is crucial, as their insights are invaluable in creating truly inclusive publications. By collaborating with those who directly experience the challenges of accessibility, we can better understand everybody's needs and preferences, leading to more effective solutions.

In conclusion, making scientific publications accessible is essential for encouraging a diverse, inclusive, and innovative research community. Our work on this issue of Inter-Section represents an important initial step towards making the journal more visually welcoming and accessible for neurodivergent readers. In the years to come, we are committed to continuing this path by exploring further enhancements and leveraging technology to provide even more flexible and adaptive reading options. Our goal is to ensure that Inter-Section not only meets the current needs of its diverse readership but also evolves to accommodate the ever-changing requirements of a dynamic and inclusive scientific community.

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COLONIAL GAMIFICATION
MAYA REPRESENTATION IN CIVILIZATION VI

FOTEINI TSIGONI

ABSTRACT:
This paper analyses the inclusion of Maya culture in historical strategy games, specifically *Civilization VI*. We investigate the game through the perspective of the Maya, marking this nation as important as other non-Western and Western civilizations in the game, to understand what is lacking in its representation. We find that the game depicts a limiting view of the Maya by ignoring important archaeological evidence. This is done by emphasizing Eurocentric notions of how a civilization should develop over time and by disregarding works of anthropologists on historical particularism. This paper emphasizes the representation of the 'Other' and how misunderstood this Other is in the media, such as video games; an industry that had been valued at more than 173 billion dollars in 2021. This shows lack of inclusivity of the Maya influences their cultural heritage and the Pan-Maya movement of the modern Maya peoples.

KEYWORDS:
Civilization VI; Maya peoples; Archaeogaming; Lady Wak Chanil Ajaw; Digital colonialism

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INTRODUCTION
The *Civilization* game has been the subject of academic debate over its focus on creating an anti-historical stance and historical alterities by using different 'Nations'. These debates often center around the structure of the game, called 4Xs, which leads to homogenization of nations through genocide and erasure (Chapman, 2013; Ford, 2016; Tharoor, 2016). Adding to that, Western and non-Western civilizations used by the game are seen as distilled versions of themselves and portrayed falsely by the developers (Ghys, 2012; Mol et al., 2017; Mol & Politopoulos, 2021; Politopoulos & Mol, 2021; Rassalle, 2021). This history of misrepresentation was seen recently with the lack of consultation from the Poundmaker Cree nation about the representation of their leader and culture (Carpenter, 2021, 40).

The goal of this paper is to analyze *Civilization VI* from a post-colonial perspective and by looking into the representation of Maya culture and its leader, Lady Six Sky.[1] This representation will be examined in terms of how digital heritage could influence the reception of the culture and heritage of the Maya peoples. This paper was the outcome of several discussions on ancient and contemporary Maya, influenced by the VALUE (Videogames and Archaeology at Leiden University) foundation lectures. It should therefore be viewed as a thought experiment exploring how digital representations of ancient civilizations are now becoming part of their contextual heritage.

SID MEIER'S CIVILIZATION VI GAME
Sid Meier's Civilization VI is a popular strategy video games on most video game streaming platforms. The first launch of the Civilization game was in 1991 by Sid Meier and Bruce Shelley, who created a new game genre known as '4X games'. The four Xs stand for the ability of the player to interact with the world of the game: 'eXploration', 'eXpansion', 'eXploitation' and 'eXtermination' (Mol et al., 2017, 214; Ford, 2016, 4). The goal of the game is to choose a cultural civilization, ancient or modern, out of the 52 available options and to create a strong civilization '*that will stand the test of time*' (https://civilization.com).[2] For each civilization to expand the player needs to unlock

1 "Lady Six Sky" is the Westernised name of the "Lady Wak Chanil Ajaw". As this is piece aims to a post-colonial view of the specific Maya representation in Civilization VI, all references on the main part of the article will henceforth change the Westernised names to the original Classic Maya names.

2 This number is found https://civilization.fandom.com/wiki/Leaders_(Civ6), which is a list of all the leaders in the game, including the expansions 'Gathering Storm', 'Rise and Fall' and 'Frontier Pass'. The original game contains only 28 leaders.

certain features named 'technologies' and 'civics', which will unlock different 'governments'. To unlock new technologies, the player needs to select and unlock civics from the determined 'civic tree' which advances the civilization culturally. Civics unlock political ideologies from the 'government panel'. Technological development and cultural advancement can be performed faster by building specific structures called 'wonders', such as the Pyramids of Giza and the Eifel tower (Mol et al., 2017, 214; Firaxis games 2016, 106-12).[3] The game can be won through religious, technological, cultural or territorial victory (Firaxis games 2016, 146-50).

Each civilization has its own unique characteristics in the way of portrayal and playing, as well as specific perks and an agenda of ruling to be either more technologically or culturally focused.[4] Furthermore, the game gives the ability to mix the 'technologies' and the 'civics', to create new scenarios each time the game is played. In a hypothetical situation within the game, the Egyptian civilization can take on technologies from 18th century England in combination with cultural innovations from the Italian Renaissance period. With these characteristics, any political ideologies of a civilization that are found in historical sources can be ignored to create an imaginary scenario that pushes the boundaries of historical reality.

UNDERSTANDING THE 'DIGITAL' MAYA: MAYA REPRESENTATION IN THE GAME

A new collection of leaders and civilizations was introduced, including the Maya civilization with a new Maya leader introduced in the 'New Frontier Pass' expansion of the *Civilization VI* game, released on May 27th 2020. The choice of the leader, Lady Wak Chanil Ajaw, is different than in previous *Civilization games*, where the Maya were represented by male leaders Pacal II of Palenque (https://civilization.fandom.com/wiki/Pacal_(Civ5); Firaxis 2007, 29) and Chan Imix K'awiil (https://civilization.fandom.com/wiki/Mayan_(Civ3)).[5]

The new leader is portrayed as a woman with an impressive headdress, holding what seems to be a jade spear and wearing elaborate decorations and dress (Figure 1). Jade is prominent on all the pieces of decoration, such as the jade central piece on the belt that depicts a Panthera. However, the rest of the dress seems simplistic, accompanied by extensive body paint on the face and arms. At first glance, the decoration of the leader seems more 'Mayanesque' than Maya, and only vaguely recalls the original depiction of Lady Wak Chanil Ajaw on Naranjo stele 24 (Figure 2).

In the game, the most important feature of Lady Wak Chanil Ajaw is the '*Ix Mutal Ajaw*' which is the name of the queen of Tikal, a former Maya ruler depicted in a stela dating to 761 CE (Pillsbury et al., 2017). In the game, this civilization feature grants extra points to the player if they position secondary cities around the capital city. This creates a defense system for the player, as units receive more attack power within the network of non-capital cities around the capital.

Figure 1: *Screen shot from loading screen to launch game.*

3 The manual does not include any further information about the expansions of the game, 'Gathering Storm', 'Rise and Fall' and 'Frontier Pass'; just the original game with no added features.
4 Each leader has specific perks and subsequently, each civilization has its own 'agenda'. For example, Seondeok of the Korean civilization has the 'Cheomseongdae' where her civilization produces more science points to unlock new technologies faster. Jadwiga of the Polish civilization has the agenda of the 'Saint', where she produces religious points easier to spread her religion faster.
5 During *Civilization II* and *I* games, there was no representation of the Maya civilization and culture.

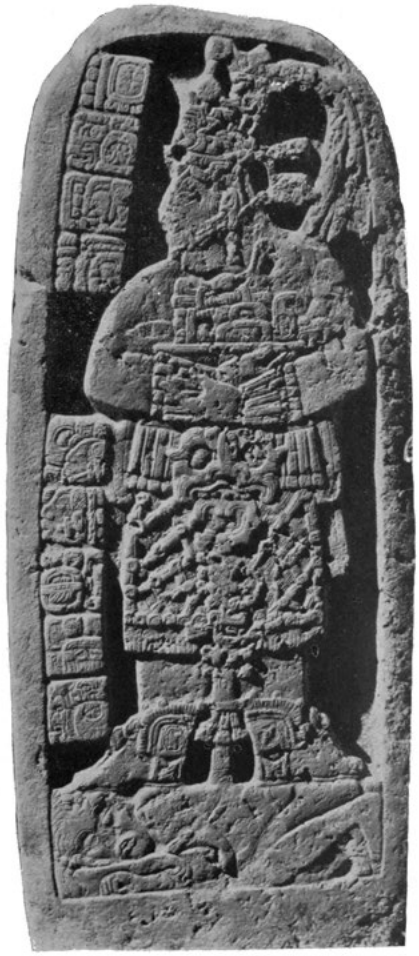

Figure 2: Naranjo stele 24, depiction of Lady Six Sky (marked as public domain by Wikimedia Commons).

I. Socio-Political understanding of the city-state network

It was considered for a long time, from the 18th and mid-20th centuries, that the Maya were a peaceful civilization of the New World. However, after a series of archaeological campaigns from the 1960s, this idea has changed (Webster, 2007). According to Smith and Montiel (2001), among the Mayas military engagement was one of the ways of dominating peripheral territory by larger centers. Through archaeological findings, we can trace a unique city-state network: 1) the main capital city, which was the political center; 2) a surrounding dominated territory, which connected through economic exchange the capital and the provinces; and lastly 3) the overall international context which influence of the capital was projected on (Smith & Montiel, 2001, 247; Flannery, 1998, 18).[6] Societal complexity and craft specialties were characteristics of the main capital cities, which included glorification of the hegemonic leader of the city-state network (Hyslop, 1990). The relation with the provinces provided economic exchange with this political center (Costin & Earle, 1989; Fox et al., 1996). The way of controlling the different provinces was employed mainly through military conquest, taxation, reorganizing settlements, and cooperation with local elites (Costin et al., 1989; Redmond, 1983; Smith & Heath-Smith, 1994; D'Altroy, 1992; Topic & Topic, 1993). Epigraphers and archaeologists may also include a final category used to indicate ties between cities-states that are not currently understood, as seen in figure 3 (Martin, 2020, 309).[7]

This model could be considered as part of the centralization versus decentralization debate for understanding the different Maya polities (Foias, 2013; Schortman & Urban, 2012). The former accounts for one large city-state, such as Tikal and Caracol, were the main powerful economic centers controlling a large territory, that included different sized city states, thus creating a political hierarchy between city-states that were controlled from one center (Foias, 2013, 61). The later can differentiate depending on the cultural political model adopted, however all are similar when accounting a weakly centralized model (Foias, 2013, 60), as seen in the three-party model mentioned in the previous paragraph. One important point mentioned by Foias (2013) when describing this discourse is that post-processual thought extended the discourse as it included variability of change on both models, meaning that proxies such as power or economic control could be lost. With processual thought in mind, he concluded that the dynamic model given by J. Marcus is significant in having a basic understanding of Maya polities.

The dynamic model is defined as a different perspective into the discourse by showing repetitive cycles of growth and decline within this organization/network system of city-states (Marcus, 1992). Thus, it is suggested that the forementioned three party pattern, in the earlier paragraph, actually changed whenever the main capital city declined and/or another city state gained more economic and political power (Marcus, 1998; Iannone, 2002). To provide evidence of this, a recent survey project conducted in Central Mexico proves that the hegemonic character of the Maya city-state network changed dynamics in circular movements because of political fragmentation (Smith et al. 2021, 380).[8] This survey provided proof this through ceramic analysis of different periods in the Yautepec Valley, in Mexico, that the 'dynamic model', or that power structures were not static, were changing depending on

6 It is important to note that a core-periphery approach, as could be suggested in this generic simplification of the city-states' dynamics, has been disputed by later and even more recent studies on this subject (c.f. Schortman & Urban, 2012, 476-478; Smith et al., 2021, 378-382). However, this approach is good to have in mind due to the impact that it had in the conventionalization of network dynamics of Maya city states (c.f. Marcus, 1992, 1998; Iannone, 2002; Smith & Montiel, 2001, among others).

7 The figure was originally provided by Martin and Grube (2000) and in the second version, used in this paper, published in 2008. The schematic map of the Maya networks has been adjusted in the Martin (2020) publication due to newly found evidence.

8 The survey project results as seen in this publication provide an overview of the urbanization processes of the Yautepec Valley of central Mexico. This survey project strived to reconstruct socio-political understanding of the different population centers from the Formative (1100 BCE-100 BCE) until late Colonial period (1650-1820 CE).

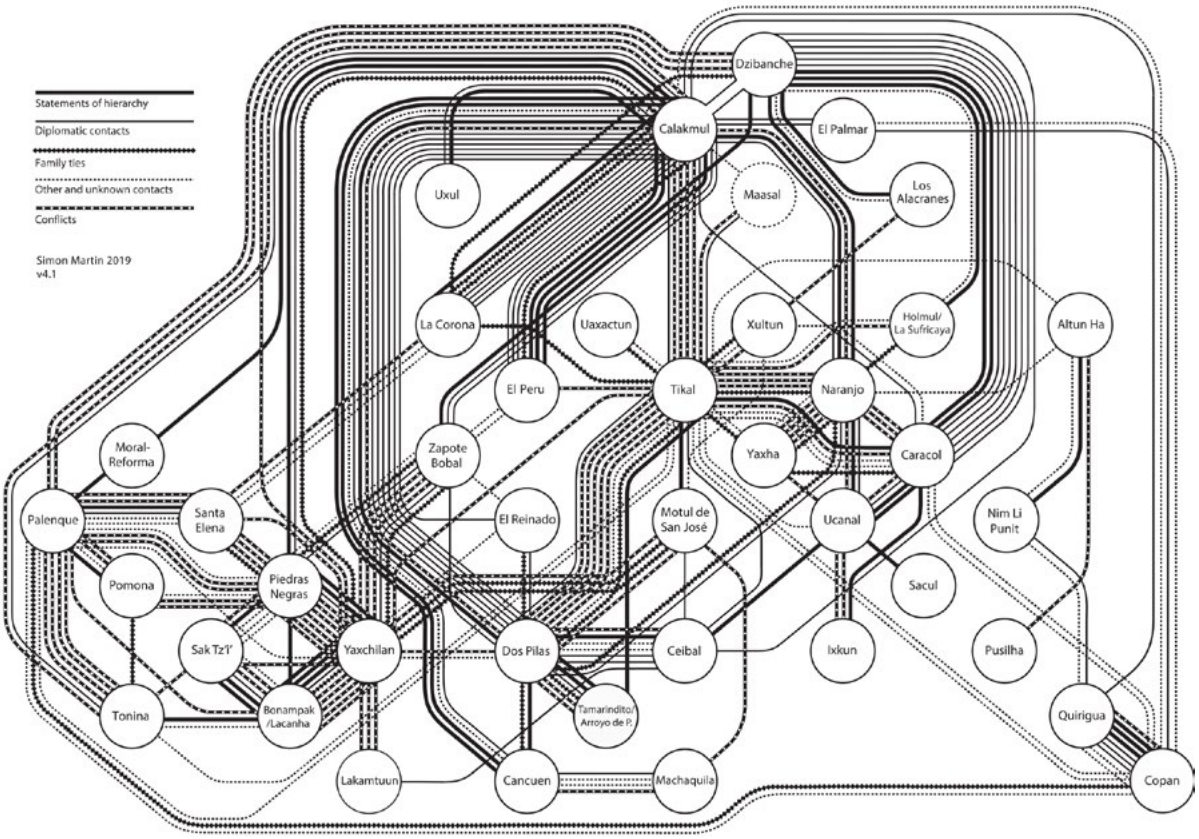

Figure 3: Schematic interpretation of the connections included within a Maya city state network in the Classic period (Martin 2020, 308). Reproduced with permission of Cambridge University Press through PLSclear.

economic and political relations between the city states. Even if these descriptions provide an image into the political and economic system of the classic Maya, it must be noted that the complexity of the Mayan civilization has not been fully explored yet.

II. Lady Wak Chanil Ajaw

King of Tikal, B'alaj Chan K'awiil, the father of Lady Wak Chanil Ajaw, placed her as the founding leader of a new royal family at Naranjo. This decision was taken to create a strong alliance between Caracol and Naranjo in 682 CE, as seen in Naranjo Stela 31 (Sharer, 2006, 383; Closs, 1985, 72; Iwaniszewski, 2018, 191). Thus, Lady Wak Chanil Ajaw became sole ruler; something that happened only rarely in Maya royal culture as it was mostly patrilineal (Sharer, 2006, 387; Martin & Grube, 2008, 14). She was never inaugurated as a formal ruler of the city, but was considered as such. Even though she was not considered a 'holy lady', as seen on Naranjo Stela 24 (Closs, 1985, 74; Proskouriakoff, 1960, 466), she carried out the calendrical rituals and recorded them in different stelae, as any male Maya king would. However, Iwaniszewski (2018) suggests that the epigraphical interpretation of Stela 24 is that Lady Wak Chanil Ajaw could be considered as a 'Lunar Goddess'. It is still not clear whether this title is connected to her royal title (Iwaniszewski, 2018, 194; Helmke, 2017, 83). In 695 CE, she started a series of military campaigns to regain secondary centers for the alliance with Naranjo and reassert authority over the region, as seen on Stela 1 of Naranjo (Sharer, 2006, 390; Martin & Grube, 2008, 75).

CRITICAL REFLECTION

I. How the Maya are represented

The most important aspect of the Maya civilization, which was ignored in its representation, was the politics of the Maya and their city-state networks. It is glaring, once considered the archaeological models presented above, that the game creates an oversimplified perspective of the ancient Maya city-state. For example, even though *Civilization IV* portrays the Mayan civilization as unified, archaeological sources and inscriptions give no indication that the Mayas were ever unified (Martin & Grube, 2008; Foias, 2013). On the contrary, as discussed above, the Mayan civilization followed a dynastic system and each network was often in opposition with the others for ideological, religious or political and economic reasons (Martin & Grube, 2008).

An aspect that could be considered close to the reality of the ancient Maya cities is that *Civ VI* has the function of creating districts with distinct specialities; these districts produce, among other things, various technologies, and serve religious and/or other cultural functions. The big centers of the Maya could be focused on ideological-ritualistic and political and administrative functions (Sanders & Webster, 1988). However, these specialized districts are available for every 'nation' in the game, not just the

cities built by the Maya, therefore suggesting that this is a matter of game structure rather than of historical and social representation.

II. How the game mechanics function and influence the representation

We see that every representation of a nation is influenced by the structure of the game. The game provides specific choices to the player with the technology tree, civic tree, and government panel; drastically reducing the portrayal of civilizations and cultures. By limiting the player with specific technological, cultural, and governmental options, the game oversimplifies the idea of a 'civilization progressing through time'; effectively promoting an anti-historical world (Chapman, 2013). These guided choices about culture and technology could be referred to as 'determinism'. Ghys (2012) argued that technological determinism in games creates a linear way of unlocking and progressing through the game, but at the same time gives us an idea of how people interpret history. He argued that this model is controversial as it represents a history of technology in a linear way, without noting its historic complexity. This deterministic understanding of history has been seen in other historical strategy games, such as *Civilization IV* (2005), *Rise of Nations* (2003), *Empire Earth* (2001) and *Age of Empires* (1997). This determinism could be understood as an oversimplified analysis of history within a Western understanding that serves to 'reduce' the 32 non-Western civilizations.

The 4Xs structure guides nations to have a predatory expansion over the map and encourages colonization over other civilizations. The world of *Civilization VI* is created to give an interactive perspective of storytelling and creates a complex relationship with a hypothetical time and space with protagonists being different civilizations. The game's 4Xs structure leads the player to a clear-cut 'Victorian England' type of colonization over this digital world (Ford, 2016). These last features push the game into a neo-Roman colonization game, as it focuses the player to just do these commands. Thus, diversion from gamification of colonialism is difficult, and the developers intended for the players to play the game in a homogeneous way (Poblocki, 2002; Pötzsch & Hammond, 2012).

On the other hand, we could argue that this 'playground' of history and nations might be appealing. The freedom allowed by the game has created hypothetical historical events. In *Europa Universalis II*, the players could switch the role of nations and "colonize the colonizer", therefore creating anti-historical events; for example, players created a strong enough Oman to take over Zanzibar (Apperley, 2006, 4). This was the original goal of the creator of the game who wanted to create an 'apolitical game', or as he specifically stated in an interview: '*one of our fundamental goals was not to project our own philosophy or politics into things. Playing out somebody else's political philosophy is not fun for the player*' (Tharoor, 2016).

THE HERITAGE OF MODERN MAYA PEOPLES

Keeping the above case study in mind, it is important to notice how ancient heritage of minority peoples, such as the Maya, has been continuously misinterpreted and misused by media for profit. This is sadly a common phenomenon, as the misrepresentation and misappropriation of Maya culture has been long present in large-media products, such as movies, television shows, or clothing lines taking 'inspiration' from Mayan indigenous weavers. Even if in the past decades there has been an effort to reduce this phenomenon, it has not yet stopped (Webster, 2007; Arden, 2004). Maya groups have been battling these colonial frameworks from different countries, both their own and foreign. For example, the Pan-Maya movement (created in the 80s as a response to the marginalization of Maya groups by both politics and modern society) aims to address how the international media mistakenly portray the Maya peoples as a homogeneous group with a uniform identity (Vogt, 2015). It is important to realize, then, that the Maya identity is the dialectic that exists between the formation of modern Maya identity and the historical narratives about the Maya; two intertwined and mutually constitutive elements forming a heterogeneous whole.

The example of the *Civilization* series shows how the games' inclusion of minority peoples' heritage was not necessarily intended for the better promotion of marginalized groups, but rather for the social or economic benefit of providing that space. The game dynamics do not promote Mayan history, nor does the way the leaders are portrayed do justice to the way they have been carved on the stelae that archaeologists are still able to study today. Most importantly, there was no collaboration in *Civ IV* with Maya peoples on the subject of their heritage even though the representation of the Maya in Civ VI (or any other media) could *de facto* be considered as part of the Maya cultural heritage (Balela & Mundy, 2016; Eklund & Sjöblom, 2019). It follows that this flawed media representation of heritage should have been organized differently: its purpose should not have been to provide a partial (and distorted) image of the Mayan heritage, but also to educate people that lack any background information on the complexity of being part of the modern Maya. In this framework, the notion of collaborative (or community-based) archaeology, as recently promoted by several scholars (e.g., Cipolla, 2021), might provide a profitable framework for future endeavors in the region, promoting an approach that focus on partnerships with local communities both in archaeological research and in media portrayal.

CONCLUSION

Historical strategy video games can create an experience of understanding the uniqueness of each civilization. The fact that *Civilization VI* is showing this uniqueness of nations through colonial tactics is interesting to note. These tactics have not changed through the different versions of the game and made it even more popular, thus encouraging the colonial thinking over different nations

and homogenizing them with a neo-Roman approach. We should respect civilizations and their differences and not try to reduce them to imaginations of them, such as in a historical particularism debate. On the contrary, there is significant potential of engaging with different cultures and interacting with them through 'play'. In this way, historical video games, and other media, can show respect to these civilizations' that experience hardships and continuous marginalization.

ACKNOWLEDGMENTS

I would like to express my deepest appreciation to dr Alexander Guerds and the editorial team of Inter-Section for their help throughout the process of editing this article, as well as Dr. Shawn Morton for his helpful review. I am grateful for the help of Alejandro J. Garay Herrera and dr Aris Politopoulos for aiding me. Lastly, I want thank Lennart Kruijer for motivating me to write this piece.

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THE PROBLEM WITH SYMBOLIC BEHAVIOUR

KAREL J. KUIPERS

ABSTRACT:

In recent years there have been multiple high impact publications operating the term 'Symbolic Behaviour', particularly in relation to the Neanderthals. The term is often regarded as one of the hallmarks of cognitive modern behaviour in human evolution. Yet is often unclear why researchers label certain artefacts as 'symbols'. This paper explores the generalised inferential chain that leads from an 'archaeological artefact' to a 'symbol'. An influential paper by d'Errico et al. (2005) will be used as a case study to form the basis of this generalised inferential chain. In many cases there is assumed that ornaments or engravings are symbols. However, symbols as semiotic devices function on the highest level of abstraction; symbols are arbitrary and completely dependent on social context and have no relation to physical reality. Reconstructing social context is impossible for the Palaeolithic, which makes the term 'Symbolic Behaviour' inoperable in human cognitive evolutionary research. Some attention is also paid to the research history out of which the term emerged, laying bare some structural problems in palaeoanthropology.

KEYWORDS:

Behavioural modernity; Human cognitive evolution; Symbolism in the palaeolithic; Semiotics in archaeology; Shell beads

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INTRODUCTION

In 2021, archaeological finds from the Middle Palaeolithic were discussed in two high impact papers (Leder et al., 2021; Pitarch Martí et al., 2021). The finds in question are an engraved bone (Leder et al., 2021) and pigment which is interpreted as a cave painting (Pitarch Martí et al., 2021). Both authors argue that these finds are evidence for Neanderthal's capacity for 'Symbolic Behaviour' (further abbreviated as SB). The concept of SB (i.e., behaviour largely mediated by symbols) has been dominant in the discussion about human cognitive evolution since the late 2000's (e.g., Bar-Yosef Mayer et al., 2009; Bouzouggar et al., 2007; d'Errico et al., 2005, 2009; Henshilwood et al., 2009; Vanhaeren et al., 2006), as one of the core attributes of 'modern' humans. In more recent years, other hominins (particularly the Neanderthals) have also been endowed with SB (Rodriguez-Hidalgo et al., 2019; Rodríguez-Vidal et al., 2014; Romandini et al., 2014; Prévost et al., 2022; Zilhão et al., 2010). However, in describing these alleged 'symbols' many scholars do not provide a solid explanation as to why precisely these artefacts are interpreted as symbols. This is somewhat disconcerting, since these 'symbols' are usually accompanied by very impactful conclusions about human cognitive evolution and hominin behaviour.

This paper explores the validity of the inferential chain that leads from 'archaeological artefact' to 'a symbol' (the symbol being the evidence for SB). An influential paper by d'Errico et al. (2005) will be used as a case study to create a more generalised inferential chain. Close attention is paid to understand what exactly 'a symbol' is, how they function as semiotic devices, and how (and if) archaeologists are able label archaeological artefacts as 'symbols'. In other words; Is the term 'Symbolic Behaviour' operable in an archaeological context? To be clear; this paper does not take a stance in the capacity for symbolic thought and/or behaviour in specific hominin species. It simply addresses some perceived problems in the inferential process that leads from the archaeological artefact to generalised conclusions about a capacity for SB in hominin species.

SYMBOLIC BEHAVIOUR AND MODERN BEHAVIOUR

The term Symbolic Behaviour (SB) should not be discussed without addressing its historic context. The phrase emerged from a long (particularly Anglophone) tradition, which is unfortunately too extensive to discuss here in its entirety. The connection between SB and 'behavioural modernity' will however be shortly touched upon, as it is important to understand why SB became such an influential term.

The term 'Modern Behaviour' (MB) or 'Behavioural Modernity' is a product of the *Human Revolution* model; the idea of a sudden change in the cognitive makeup of 'archaic'

Homo Sapiens (some of the main proponents of which were Binford, 1989; Donald, 1991; Klein, 1995; Lindly & Clark, 1990; Mellars, 1989; Mithen, 1996; Stringer & Gamble, 1993). In most iterations, SB plays a large part in becoming/being a 'modern' human. The *Human Revolution* idea was later dispelled, most notably by McBrearty and Brooks (2000), who convincingly argued that the 'modern package' was more like a mosaic that slowly gathered over time, instead of emerging all at once. Yet, the term 'Modern Behaviour' (and thus the implied dichotomy 'ancient vs. modern') persisted. Roebroeks and Corbey (2001) have explained this as a need for neatly defining 'in-groups' (modern humans, humans 'like us') and 'out-groups' (archaic humans, humans not quite 'like us'). They built on the work of Cartmill (1990); an early critic of the anthropocentrism that according to him seems to dominate palaeoanthropology. With a lack of context, the term eventually started to lack a consensus of what 'modernity' exactly entailed (Chase, 2003; Nowell, 2010). It is in this context that scholars started looking for alternatives (see e.g., Corbey, 2005, 92-120; Garofoli, 2016; Porr & Mathews, 2017 for an overview of the 'Modern Behaviour' discussion specifically).

In the late 2000's the consensus arose that the most defining characteristic of Behavioural Modernity was in fact Symbolic Behaviour. Marean (2007, 367) stated for example; "there is a growing consensus around a definition [of modern behaviour] that has symbolic capacity at its core." (see also Nowell, 2010). In the 2010's the 'in-crowd' was defined by evidence of a capacity for SB; the term MB got distilled into its core and most defining component; SB. It effectively replaced MB in most literature as the marker that defined 'humanness', and attention shifted towards SB. While the term SB arguably has some of the same problems that its predecessor had (mainly, the hard-lining between 'symbolic' and 'not-symbolic', 'like us' and 'not like us'), its main problem lies in properly inferring an 'archaeological artefact' into a 'symbol'.

INFERENCES

As stated earlier; this paper will use the influential d'Errico et al. (2005) publication as a case study to reconstruct the 'artefact-to-symbol' inference. The meticulous inference chain presented by d'Errico et al. (2005) is often cited and repeated many times in similar contexts and is presented as evidence for 'Symbolic Behaviour' in not only early *Homo Sapiens*, but to other hominins as well (e.g., Leder et al., 2021; Rodriguez-Hidalgo et al., 2019; Rodríguez-Vidal et al., 2014; Romandini et al., 2014; Pitarch Martí et al., 2021; Prévost et al., 2022; Zilhão et al., 2010). D'Errico and colleagues (2005) describe a collection of perforated tick shells, found in Blombos Case (South Africa), dating to the MSA. Their inference chain looks like this:

a) Tick shells were collected by MSA *Homo Sapiens*
b) The tick shells were perforated
c) The perforations were manmade and not caused by taphonomic processes
d) The manmade perforations were made close to the lip; they were not made to open the shells
e) Use-wear indicates contact with skin, thread and other shells

Conclusion/interpretation 1: The perforated shells are beads.

f) Traces of ochre was found on the beads
g) The beads are clustered, indicative of 'beadworks'

Conclusion/interpretation 2: The beads were worn as ornaments

h) According to the literature cited (d'Errico et al. 2005; the literature cited by d'Errico et al. is later discussed in this paper) ornaments are unambiguously symbols

Conclusion/interpretation 3: The tick shell beads are indicative of SB and therefore MB

i) Syntactical language is the only means of communicating symbolic codes (ibid. p. 19)

Conclusion/interpretation 4: The Blombos cave inhabitants had fully syntactical language

Conclusion/interpretation 4 has been rigorously analysed by the linguist Rudolf Botha (Botha, 2010). His compound inferential is summarized in Figure 1.

Botha poses that every conclusion in empirical work needs to be supported by a proper bridge theory (Botha, 2010, 348) to warrant the inferential step to the conclusion. Bridge theories should adhere to three basic principles; they are 1) testable 2) supported by empirical evidence and considerations 3) non-ad hoc. Botha (ibid.) points out that "a stipulation or an arbitrary assumption" will not do. As stated early, Botha applies this methodology specifically to the evolution of language (step EFG in his scheme), but the methodology can be applied in a more general context.

Apart from his own study, Botha (2010, 354) also suggests a necessity to "gauche the soundness" of the 'shells-to-beads' inference, and the 'beads-to-symbol' inference. The latter is done here, using a similar methodology as Botha. For the sake of argument, it will be assumed that step ABC ('shells-to-beads') is a valid inference. Figure 2 illustrated how Botha's inferential step 'D' can be further subdivided.

It is important to note (as stated earlier) that the inference presented here is extended by other scholars such as Zilhão et al. (2010). Zilhão et al. argue that archaeologists must include other hominins when similar finds (i.e., artefacts identified as 'personal ornaments') are associated with the hominin in question. For example, Zilhão et al.

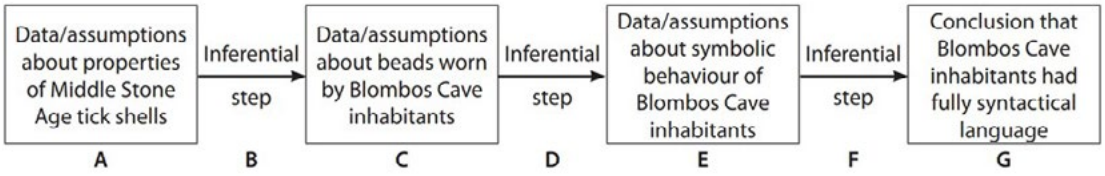

Figure 1: Botha's (2010, 346, fig.2) of the inferential chain presented by d'Errico et al. (2005). Botha refers to the ABC inference as the 'shells-to-beads' inference; CDE as the 'beads to symbols' inference; and finally EFG as the 'symbols-to-syntax' inference.

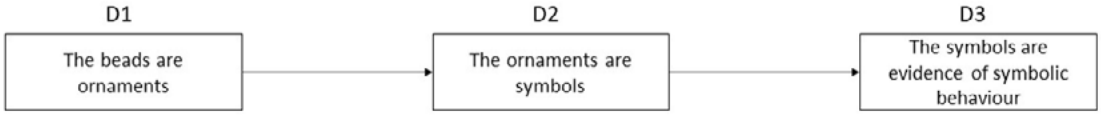

Figure 2: The subdivision of the 'bead-to-symbol' inference.

(2010) argue that the marine shells presented in their paper adhere to the same criteria as finds from a 'modern human' context (ibid., p. 1023), and can therefore also be interpreted as markers for SB. This argument for capacity for SB in other hominins (most notably Neanderthals) is often repeated, either explicitly or implicitly in many other papers. Inferential step D2 can thus be generalised as:

> 'Archaeological artefact X' is a symbol

Which in turn leads to the conclusion:

> 'Species/population Y' which has produced 'archaeological artefact X' is therefore capable of Symbolic Behaviour

While there can be questions as to whether it is warranted to endow an entire species with SB at one point in time on the basis of a single find (see e.g. Stoczkowski 2002, 168-172 on generalisations in (palaeo)anthropology), the interpretation of 'archaeological artefact X' as a symbol might prove to be even more problematic. In many cases, there is simply assumed that 'archaeological artefact x' is a symbol (e.g., Leder et al., 2021; Pitarch Martí et al., 2021 and other authors cited earlier in this paper neither give a definition of what they mean by a 'symbol' nor offer an explanation why the artefact they discuss should be specifically interpreted as such, other than their seemingly non-utilitarian nature and a suggestion of intentionality). However, this is a large inferential step that needs to be properly warranted by a bridge theory. To investigate whether this claim is warranted, the definition of a 'symbol' must be established, and the bridge theory presented by d'Errico et al. (2005) must be thoroughly examined.

THE DEFINITION OF A 'SYMBOL'

To assess the validity of the 'beads-to-symbol' inference, there must first be an understanding as to what archaeologists specifically mean when they use the term 'symbol'. As stated earlier, many archaeologists do not provide a definition. However d'Errico et al. (2005, 4) do; "a key characteristic of all symbols is that their meaning is assigned by arbitrary, socially constructed conventions"; as such defining as symbol in the manner of how it refers to its object. d'Errico et al. (ibid.) primarily cite Wadley (2003) as to how to recognise symbolism in ancient artefacts. Wadley (2003, 248) operates a similar definition of a symbol (using Deacon's (1997) definition); "Deacon points out that symbols are higher-order concepts than icons or indexes and that symbols point arbitrarily to their referents [Wadley here uses the word 'referent' while in semiotics this is mostly denoted as 'the object']".

Deacon (1997) has written about symbolism (particularly in relationship to language) in archaeology extensively in his work the *Symbolic Species*. Deacon relies heavily on the semiotic theory formulated by the influential semiotician Charles Sanders Peirce to develop his own variation (Deacon 1997, 70-73; de Villiers 2006; Eco 1986; See figure 3), the latter being more appropriate for archaeology and human evolution. While there are some differences in the nuances Peirce, Deacon, Wadley and d'Errico et al. all define a symbol as a sign that refers to its subject in an arbitrary manner (Figure 3).

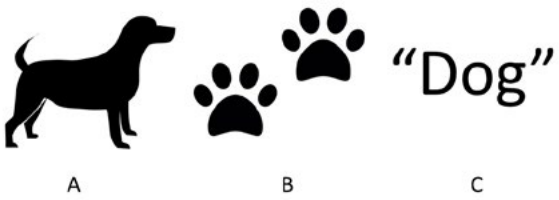

Figure 3: The semiotic signs shortly summarised (Deacon 1997, 70-73; Eco 1986, p, 136). A is an icon; it refers to its object by means of likeliness. B is an index; it refers to its object by means of strong association. C is a symbol; it refers to its object by means of arbitrariness or convention, in this example; a word in the English language.

As such, the system that Peirce, Deacon, Wadley and d'Errico et al. use is a system that is based on reference. To warrant the 'beads-to-symbol' inference this manner of referencing must be properly understood (i.e., How do semiotic signs come into existence?). This will be done in the next section.

BRIDGE THEORIES; SEMIOSIS

In this paper is assumed that Wadley and d'Errico use Deacon's complete definition as it is described in Deacon 1997 (62-64; 70-73). Typically this type of semiotics generally involve three parties (Deacon, 1997, 63-64; de Villiers, 2006, 93, 96; Peirce, 1965, 135-136). The semiotic sign consist of an interplay between *the object, the representamen* (a term Peirce uses in to indicate the signifying element of the sign (Benedict, 1985). The terminology of this part of the sign is a bit problematic (ibid.), but it has little impact on the argument presented here.), and *the interpretant* (a means to interpret a sign, an interpretative response as it were (Deacon 1997, 63); not the same as an *interpreter*, which is the interpreting party). A semiotic sign comes into being when an interpreter recognises a representamen which can identify an object via an interpretant. Without the presence of one of these parties the semiotic sign cannot exist. This triadic relationship is problematic for archaeologists, as it implies that a semiotic sign cannot be contained in an artefact; it is an interpretational process. To warrant the 'beads-to-symbolism' claim it is up to the archaeologist to reconstruct this process. This entails reconstructing the *original* representamen, interpretant, and object. What d'Errico et al. (2005) seemingly claim to find is the representamen of the triadic relationship. The object to which the alleged symbolic beads refer is unknown, as well as the original interpretant. As d'Errico et al. (2005) miss two out of three components to create a semiotic sign, they attempt to reconstruct them; the shell beads were worn as personal ornaments and should be interpreted (according to Wadley 2003, 248), as carriers of the identity of a social group, and are therefore symbolic. While this may seem as a valid reconstruction of the triadic semiotic relationship, d'Errico et al. (2005) have actually created a parallel semiotic sign based on a (possible) common representamen (Figure 4).

This is in line with Deacon (1997, 62-64) who emphasises the importance of the interpretative context of semiotic signs. The reference is an interpretative response to a sign, not an intrinsic given of it.
While this is problematic for iconic and indexical signs as well, the problem is magnified by the arbitrary nature of symbolic signs; symbols have no relationship to reality except for an arbitrarily given meaning and/or a social convention, which is per definition not contained in the archaeological artefact. There is simply no way to tell if something is/was a symbol without a complete reconstruction of the semiotic triadic relationship. As such, the chosen definition (Deacon's definition; 'symbols refer to their object in an arbitrary manner') by Wadley (2003) and d'Errico et al. (2005) results in an unresolvable logical situation, where it is impossible to either verify or falsify the validity of the 'beads-to-symbol' inference.

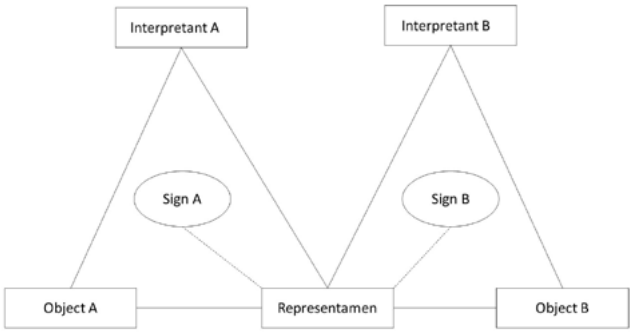

Figure 4: The parallel semiotic signs. Sign A in this case could be the interpretation by d'Errico et al. (2005), d'Errico et al. being the interpreters (and therefore using their own respective interpretant), the shell beads the representamen, and a symbolic signifier for group identity the object. Sign B could be a possible semiotic sign for the original inhabitants of the Blombos Cave; interpretant B being an unknown interpretant used by the social group, object B the possible social identity, and the representamen again the shell beads. However, there is no way to either verify or falsify that these signs are similar and/or overlapping or even if there was a semiotic sign connected to the beads in the original context to begin with.

CONCLUSION/DISCUSSION

In adopting the definition of 'symbols are signs that point to their object by arbitrary reference' d'Errico et al. (2005) have created an unsolvable logic dilemma. As such the term SB seems to be inoperable in the context of human evolution. While this problem is apparent in particularly a human evolution context, the interpretation of semiotic signs in archaeology is universal; only by reconstructing the entirety of a semiotic triadic relationship (if this definition is applied) a semiotic sign can be properly inferred. There should not be denied that making some degree of axiomatic assumptions is inherent to archaeology, but in the case of SB, the conclusions are disproportionate to the data; the inference chain is a logical impossibility, while at the same time it is often highly impactful on the narrative of human evolution.

This paper should also be viewed in the context of the human evolution narrative. The discussion has shifted from Modern Behaviour to Symbolic Behaviour, the latter presumably being one of the defining traits of what ontologically should be viewed as 'humanness'. If the concept of SB will prove as inoperable as its predecessor MB in a human evolutionary context, perhaps it is time for archaeologists to revise the idea of human essential exceptionalism.

ACKNOWLEDGEMENTS

I would like to thank Marie Soressi, Wil Roebroeks and Annabelle Louise Lockey for comments and insights on earlier iterations of this paper, and Marian Bailey for her comments on this version.

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THE ETHICS OF STUDYING HUMAN AND NON-HUMAN REMAINS IN THE CIRCUM-CARIBBEAN

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ABSTRACT:
The study, management, and display of archaeological skeletal remains has become an increasingly debated subject, as one lacking regulations in most parts of the world. Currently, little legal or structured ethical guidance is available for researchers that deal with skeletal remains, who often depend on their own ethic code of practice. In the circum-Caribbean, there are a few institutionalised ways to protect human remains, such as the document of practice guidelines that was established in the summer of 2022 by the International Association for Caribbean Archaeology (IACA). In addition, this document is designed to cover practice in Caribbean archaeology, which in reality is rather difficult, due to the heterogeneity of the region. Moreover, there are little to no legal repercussions for not adhering to these guidelines. Consulting with local researchers and stakeholders from different islands in the Caribbean region, we highlight different aspects of the archaeological process in which these ethical considerations surface. Taking into account Indigenous Caribbean ontologies, we consider the treatment of animal remains in parallel to human remains. We propose a treatment of animal remains that is similar to that of human remains, aiming for a decolonial archaeological practice in Caribbean contexts. We end by suggesting pointers that can act as a reference for researchers in the region concerned with skeletal material.

KEYWORDS:
Caribbean; Bioarchaeology; Ethical research; Decolonisation; Community archaeology

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INTRODUCTION

The study, management and display of biological remains has become an increasingly delicate subject, one that still lacks regulations in most parts of the world. Currently, little legal or structured ethical guidance is available for researchers who handle human and animal remains. In the Americas specifically, there are a few institutionalised ways to protect human remains, from legal frameworks like the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) in the United States, to ethical guidelines like 'Turning the Page' (1992) in Canada, and the new Code of Ethics proposed by the International Association for Caribbean Archaeology (IACA, 2022). This paper will focus on the Caribbean region.

The Caribbean region encompasses the islands and mainland surrounded by the Caribbean Sea (Figure 1). This region was the first to be colonised by Europeans in 1492, with the latter establishing colonies in the entire continent within the following century (Deagan, 2002). Up until today, there are island states that are extended territories of European countries (i.e., Guadeloupe), marking already more than 500 years of colonial presence in the region.[1] This extensive colonial past has naturally affected the way research is conducted in terms of scopes, funding, access of local researchers (Taiwo, 1993). In this regard, many of the ongoing archaeological and anthropological studies are still informed by lingering institutionalised colonialism[2] (Hofman et al., 2018; Keegan & Hofman, 2017).

1 For more information on colonialization and its effects in the Caribbean region see: Beaule & Douglass (2020) and Delle (2014).

Even though the last few decades have brought theoretical and methodological changes to Caribbean archaeology (Keegan & Hofman, 2017, 21), the diversity, language differences, and geopolitical complexity of the area, both in the past and the present, have made it difficult to decolonise practice.[3]

An attempted decolonial perspective on the study of biological remains prioritises two main approaches: 1) the importance of critical community archaeology,[4] through ownership and collaboration,[5] which primarily means prioritising local stakeholder[6] demands (Atalay, 2020; Marek-Martinez, 2021; Tuck & Yang, 2014); and 2) the inclusion and collaboration with Indigenous knowledge systems and non-western ontologies (Todd, 2016; Van Dyke, 2021). This also includes a post-humanist approach, in which, we can attribute personhood to non-human animals in certain contexts (Fowler, 2004, 12-16; Pagán-Jiménez, 2004; Russell, 2012). In this sense, we call for the contextualised trans-species application of the notion of personhood.

On the basis of these theoretical stances, this paper discusses several existing guidelines relevant to the Caribbean case study (mainly from American and/or Caribbean associations) on the issue of excavating, analysing and displaying skeletal remains. With the contribution of several stakeholders with immediate association to the Caribbean region, we attempt a critical review of archaeological practice. Discussions mainly aimed at the stakeholders' personal and professional views on decolonisation of archaeological research.

CURRENT STATE OF AFFAIRS

After reviewing several of the existing guidelines and codes of ethics[7] for the management of skeletal remains in different parts of the world, we noticed that most of them agree on several points. In the next paragraphs we will review them and highlight their applicability in the Caribbean region.

Regarding project formulation

Most of the existing guidelines underline the need to incorporate stakeholders during the entire process of project development, including the formulation of research questions and plans for the management of skeletal material through engagement and collaboration. A special mention is made on addressing their cultural and ethical considerations (SAA, 2021; NAGPRA, 1991; APABE, 2005, 2017, AAPA, 2003). However, the existing guidelines fail to communicate what they refer to as 'collaboration' using this term in a vague manner, without identifying the multiple methodologies in which this can be done.

Regarding excavation

For excavation, most guidelines agree that consideration should be given on whether excavation of skeletal remains is necessary in the first place, some needing the permission of local descendant communities to proceed. While excavating, many guidelines mention that human remains should be 'handled with dignity and respect'. We consider that further explanation of these terms is needed. In the same way, the existing guidelines mention that researchers involved in the excavation should not only be specialised in handling skeletal remains, but also receive training on ethical issues (AAPA, 2003). Nonetheless, the guidelines do not specify how to actively include stakeholders in the excavation. In addition, most of the current guidelines do not address the issue of finding unexpected skeletal remains, as well as how the recording of skeletal remains should be handled.

Regarding scientific analysis

When scientific analyses have been approved (molecular or macroscopic), several guidelines often recommend in their code of conduct handling human remains with 'respect' and 'dignity' (i.e., BABAO, 2019). Again, these guidelines fail to define these terms, leaving them as vague concepts to be interpreted by the researcher. Other accepted practices include ensuring the preservation of the sample and avoiding major destruction of the material when it comes to destructive analysis, considering the cost/benefit implications (BABAO, 2019). Another important aspect focuses on properly trained personnel con-

2 Or else Neocolonialism: the control of certain countries, created through colonialism, by the dominant colonizers through indirect means. The term is used to refer to the continuing dependence of former colonies on foreign countries, and more generally, to places where the power of developed countries was used to produce a colonial-like exploitation (terminology adjusted from Encyclopaedia Britannica).

3 In this paper the term 'decolonise' refers to an archaeological practice that rejects the supremacy of dominant western scientific ontologies and prioritises agency of all (archaeological) Indigenous Caribbean beings.

4 Critical community archaeology focuses on taking into account the perspectives from the different stakeholders for the sake of working with the community. For more information on community archaeology see: Agbe-Davies (2014), Marshall (2002), McDavid (2014); in the Caribbean: Sankatsing Nava & Hofman (2018).

5 In this paper the term 'collaboration' refers to the formulation of partnerships between (non) - local researchers and the local communities, those that are affected by and/or are interested in the archaeological research. This partnership entails the equal involvement of all parties in every step of the project (from formulating the objectives and the broader scope to cover the interests/needs of all stakeholders). This partnership continues with equal terms throughout the duration of the project, as well as after its conclusion, when decisions about long-term curation are to be made.

6 In this paper the term 'stakeholders' refers to Indigenous groups, local communities, as well as local and non-local researchers working in the Caribbean region.

7 The guidelines presented in this manuscript do not cover the entirety of guidelines published. Here, we focused on guidelines and codes of ethics published from either the American and/or Caribbean Archaeological Association or from Associations engaged with the topic of bioarchaeology/osteoarchaeology. Furthermore, our research was limited to guidelines published in an accessible (through the web) manner and those published in the English language.

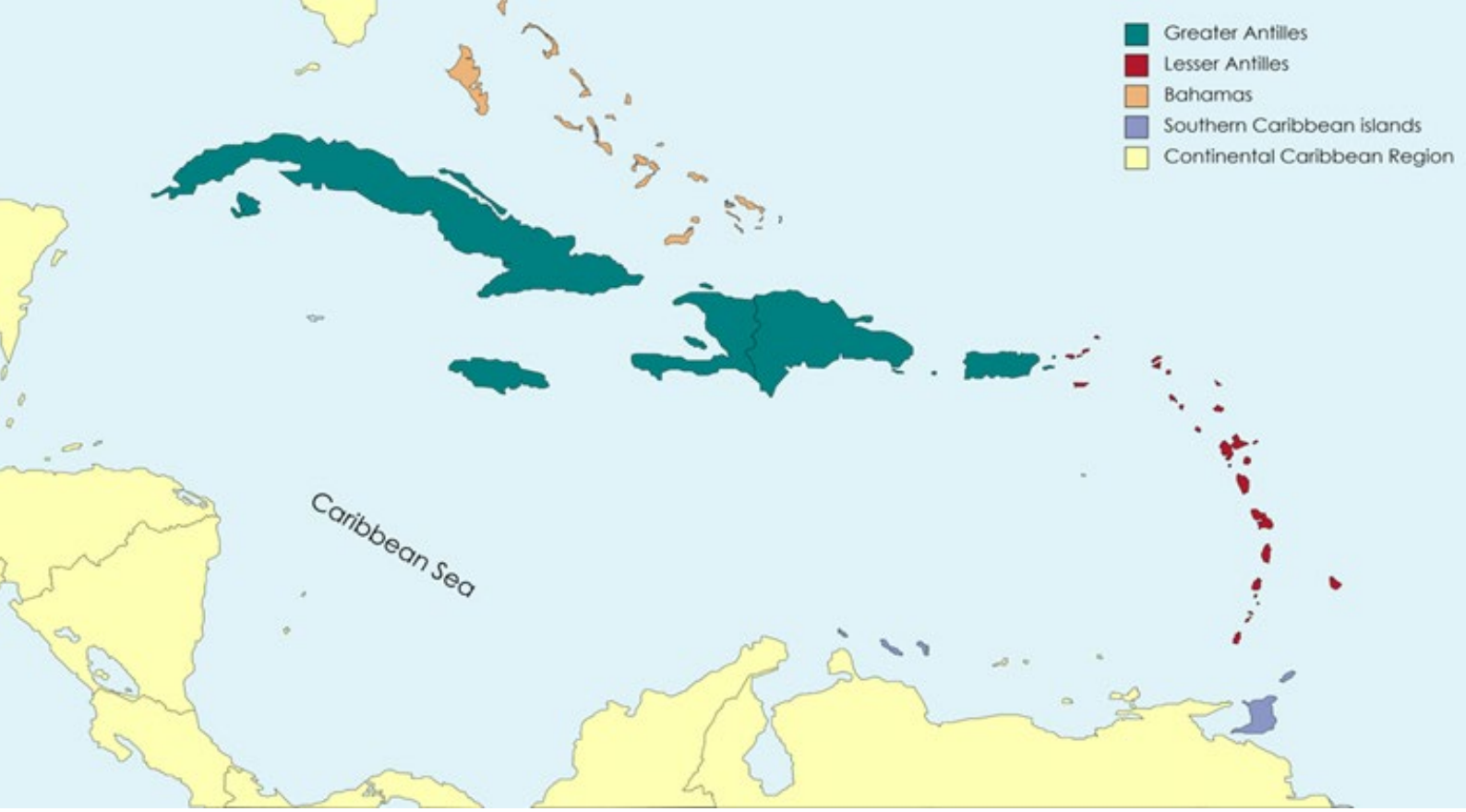

Figure 1: The Caribbean region. Illustration by E. Seferidou. The Caribbean region is located to the southeast of the Gulf of Mexico, to the east of Central America, to the north coast of South America and to the west of the Atlantic Ocean.

ducting the analysis. After the analysis, a frequently mentioned issue is the appropriate reporting and publishing of the produced data, plans for long-term responsibility and stewardship, and repatriation of the tissues used (BABAO, 2019; IACA, 2021; NAGPA, 1990; APPA, 2013; SAA, 2021; Bardil et al., 2018; The Human Tissue Act, 2004). Likewise, the availability of the data is important to avoid further damaging sampling and allows for the 're-examination of scientific findings' (Alpaslan-Roodenberg et al., 2021). The inclusion of ethical statements in publications involving human remains has recently emerged as a point of discussion (Squires et al., 2022).

Regarding public display

When it comes to exhibiting and displaying skeletal remains, few of the existing frameworks include specific guidelines. Instead, they provide generic recommendations regarding respectful and ethical treatment of the remains. More specifically, guidelines revolve around the ownership of the remains (i.e., UNDRIP, 2018). However, many do focus on repatriation and following the stakeholders wishes (NAGPRA, 1990; Australian Government Policy on Indigenous Repatriation; BABAO, 2019; IACA, 2022; SAA, 2021). There is a specific mention of long-term curation in the country of origin of the remains (IACA, 2022). Furthermore, BABAO (2019) underlines the necessity of acquiring the stakeholder's permission for publishing images of human remains.

Regarding museums in the Caribbean region, each has its own set of rules and guidelines on the exhibition of biological remains, although these are mainly focused on human remains. Most local museums do not find the display of biological remains problematic, as long as it is done respectfully, however they fail to explain what falls within respectful treatment. Due to the colonial nature of both the national museums and of the history of archaeological procedures in the area, the physical care of the skeletal remains sometimes is disregarded (Mickleburgh, 2015).

Regarding animal remains

Archaeological animal remains are often treated as passive objects rather than agentic individuals, and are given less agency than for example 'artistic' material culture, particularly within the New Materialism strand of Posthumanism (Malafouris, 2018; Ravenscroft, 2018). Our current understanding of personhood in the ontology of Indigenous Ceramic Age Caribbeans is primarily informed by so-called 'Amerindian Perspectivism' (Viveiros de Castro 1998, 2012; Pané & Arrom, 1999). In Amerindian perspectivism, animals see themselves as persons, with a different morphology. Certain animal individuals have, as perceived by the Indigenous peoples of the Caribbean, the human spirit in them. This embows them with inherent personhood that is covered by their animal form[8] (Fowler, 2004; Fowler 2016, 398). Certain species who hold more cosmological relevance such as the dog and the turtle are often attributed personhood, and are referred to as spirit masters (Viveiros de Castro, 1998). This attributed personhood can be further supported by the presence of different forms of (hybrid) anthropo-zoomorphic material

8 These are sometimes also reffered to as 'animal-masks'.

culture in the Caribbean archaeological record, showing the fluidity of form (Paulsen, 2019; Waldron, 2016, 2019 among many others). Having established that the notion of personhood can in certain cases be attributed to non-human animals, we advocate for extending our argument for the treatment of human remains to that of certain animal remains, if context elicits as such.

Finally, it should be mentioned that, with the exception of NAGPRA, the guidelines have no legal connotations, and they provide merely a framework of conduct, or suggestive practices. Also, the definition of human remains is not clear and therefore instances of use of teeth or hair, without obtaining consent has been reported (Tsosie et al., 2020).

IN PRACTICE

The paragraphs below analyse archaeological practice based on our consultations with various stakeholders (termed personal communication; for more information see Appendix 1).

Project formulation

Regarding this first part of a project, there is variation in local practices in every region. Archaeological research can be preceded by extensive outreach, where each project needs to be discussed between all stakeholders. In these cases, archaeologists should formulate a plan, which is based on tribal or Indigenous law and ideals, and present it to the local communities (*personal communication*, Meulenberg, 2022; *personal communication*, White, 2022). A serious issue in other regions is the unwillingness of archaeologists to change their practices. Due to the highly competitive environment in educational institutes, in terms of funding, distinctions, publications, there is less time dedicated to collaborative projects. Archaeologists who try to incorporate collaboration into their research, especially early career ones, face multiple limitations, in resources and networks. The issue with local communities is more lack of information rather than lack of interest, which can lead to exclusion from heritage projects (*personal communication*, Fricke, 2022). In other islands (i.e., Curaçao), archaeological practice follows the guidelines of the Valetta Treaty (Council of Europe, 1992), and it regards mostly commercial or rescue projects. Generally, there is willingness to increase engagement and outreach. However, setting up such a network and keeping up continuous collaboration, requires time and resources, which are often scarce (*personal communication*, Kraan, 2022).

Excavation

Although local communities can participate in excavation projects, this is heavily restricted by the availability of economic resources, as having local communities work together with the archaeologists in an equitable environment means providing equal financial restitution. Regarding the excavation of biological remains there still is a lot of prejudice (*personal communication*, Kraan, 2022; *personal communication*, White, 2022). Because of the absence of legal frameworks, practice regarding biological remains varies according to the institution handling the excavation and geopolitical conditions in each region.

Scientific analysis

The limited expertise on scientific analysis (both macroscopic and molecular techniques) can be proven a significant obstacle in this process. A very common phenomenon when analysing osteological assemblages is that the context in which the material was acquired is unclear. In these cases, researchers should publish the results in a way that can be accessible, particularly when descendant communities cannot directly be contacted. However, publishing results without consent could potentially also be harmful for specific groups. The best strategy to be followed is to build a collaboration with local institutions/researchers (*personal communication*, Fricke, 2022). Another misconception is that when performing macroscopic or non-destructive analysis, community involvement is not necessary. Nonetheless, permission and participation of the community on the project is required every step of the way regardless of the characteristics of the analysis.

Recently, there are multiple articles published by researchers from the global South on how to build strong scientific collaborations that can promote knowledge production that will benefit both the researchers involved and the local population (Ávila-Arcos et al., 2022; Claw et al., 2018; Tsosie et al., 2020); but also by the local communities themselves (i.e., San Code of Research Ethics).

Storage, Restitution & Reburial

Often, institutions are limited by resources to properly store skeletal materials. Even though there are no official rules regarding repatriation and reburial in most parts of the Caribbean, there are cases where the descendant communities were involved throughout the project and a consensus was reached to repatriate and rebury the remains[9] (*personal communication*, Morris, 2022).

For animal remains, storage is often given little thought, and respectful care is often dependent on the museums' staff personal views, mainly due to budget constraints and to priority given to human remains (*personal communication*, Jacobson, 2022; *personal communication*, Morris, 2022). Some material becomes part of a reference collection, while the rest is stored indefinitely for further analysis, which often occurs in unregulated storage environments (Baker & Worley, 2019, 24). The trans-species approach to personhood is sporadically enacted in archaeological practice but it is very rare in the Caribbean region.[10]

9 The case of the First Peoples' ancestors, who were found under the Red House of Parliament in Trinidad and reburied by their descendants. More information can be found here: https://newsday.co.tt/2019/10/20/60-first-peoples-remains-laid-to-rest-at-red-house/

10 An example of tailoring to context exists in practice under NAGPRA, where Dr. Miyar, state archaeologist of Florida, oversaw a reburial of a dog at the request of an Indigenous group as personhood was attributed to them (After personal communication with Z. C.A.N. van Litsenburg).

Public display

There is little attention given to the display of remains in Caribbean museums. In some places, although there is no formalised legislation, some are advocating against their display in museums (*personal communication*, Jacobson, 2022; *personal communication*, Kraan, 2022). Some museums have found alternatives, for example showing burials without the human remains and adding images or tracing the bones in the sand (Figure 2), or by using replicas of the bones [i.e., the Musée Edgar Clerc in La Moule, Guadeloupe (*personal communication*, Jacobson, 2022)]. Elsewhere, the request extends to not discussing or showing photographs of the remains [i.e., Suriname (*personal communication*, White, 2022)]. On the contrary, on other islands (i.e., Aruba), the local communities request and encourage the museums to display human remains, as they think it would be more engaging and educational (*personal communication*, Kelly, 2022).

Furthermore, many museums fail to provide the proper facilities for storage and preservation during display (*personal communication*, Kraan, 2019; *personal communication*, Meulenberg, 2019). In the few cases where museums decide not to display human remains, animal remains are still displayed as part of material culture (i.e., tools), as food waste, or as part of burials (*personal communication*, Jacobson, 2022). What is interesting, is the disparity between the placement of remains, while Indigenous remains are seen on display in museums, European remains are more often located in forts or historical monuments and African remains are rarely acknowledged or displayed (*personal communication*, Jacobson, 2022).

CONCLUSION

This paper intended to assemble the current state of affairs regarding the ethical treatment of biological remains in the Caribbean region. Through discussions with several stakeholders, we concluded that special attention should be paid on increasing collaborative projects, with funds allocated towards including local communities and stakeholders. To our knowledge, there is not a published study available that describes in detail a community archaeological project from start (project formulation) to finish (display) in the Caribbean. However, there are several examples of case studies that have successfully involved local communities into at least parts of the project (Nieves-Colón et al., 2020, Hofman & Hoogland, 2016; Hofman et al., 2012).

One of the main limitations that we encountered while conducting this research included our western education background. In addition, the stakeholders that we came in contact with, were in their majority researchers working in the area, associated directly or indirectly with Leiden University,[11] with a small representation of local community members. Moreover, due to the general heterogeneity of the region, it seems counterproductive to impose a blanket set of guidelines on the treatment of biological remains for all. Therefore, we believe that we are not in a position to propose practices that could be applied to such a broad and diverse region. Since there is not only one legislative body for the whole Caribbean, it seems more appropriate for individual regions and their representatives to decide on their own approach when handling biological remains. One first step towards this could be the creation of advisory boards, formed by local researchers and stakeholders, that can help transform the way that research is done.

Appendix 1.
1.1 Individuals that contributed to the interviews
1.2 Methodology of interviews
1.3 Interview questions

1.1 Individuals that contributed to the interviews

The individuals that were chosen for the interviews are listed below, together with a short biographical note.

When contacting potential candidates, our primary target-group was local researchers that live and/or work in the Caribbean region or have a very strong connection with the local archaeological practice. On top of that, we focused on researchers who are involved in the treatment of skeletal remains and therefore could provide insight on the bioarchaeological practices on their region/place of work. Another practical parameter for our choice was the ability to communicate in English, Spanish, Dutch or French with the interviewees.

Felicia Fricke is a post-doctoral researcher at the University of Copenhagen. She completed her PhD research on the topic "The Lifeways of Enslaved People in Curaçao, St. Eustatius, and St. Maarten/St. Martin: A Thematic Analysis of Archaeological, Osteological and Oral Historical Data", using qualitative data and a postcolonial theoretical approach. She has conducted research in the Lesser Antilles, primarily the Dutch islands (Saba, St. Eustatius, St. Martin, Curaçao, Bonaire). Currently she is involved in developing ethical guidelines for IACA. She is also the 1st secretary of NVFA and is also working on developing a code of ethics that will cover the Dutch islands as well.

Katarina Jacobson is a Guadeloupean archaeologist. She is the responsible for the collections department in the Édgar Clerc museum in La Moule, Guadeloupe. Graduated from the Sorbonne in Paris, she is known as one of the only Guadeloupean archaeologists focusing on Pre-Columbian archaeology. Jacobson won the Museum

11 This stems from the authors of the current paper being early career researchers and thus having limited access/ knowledge of researchers from other institutions that are interested/involved in the issue of ethical treatment of skeletal remains in the Caribbean region. Adding to the list of stakeholders to include people from different educational backgrounds, (research) interests, coming from multiple different subregions in the Caribbean, is definitely an avenue for future research worth pursuing.

Figure 2: Burial display in the Centro Cultural León Jimenes in the Dominican Republic. Although there is an image of human remains in the background, no real remains were used for this display and instead the placement of the skeletal remains was traced on the sand. Photo by M. Aguasvivas.

Association of the Caribbean's prize for Emerging Caribbean Museum Professional. Currently finishing her PhD at Leiden University focusing on Pre-Columbian ceramics and multi-cultural interactions.

Claudia Kraan is an archaeological researcher stationed in Curaçao. She works at the National Archaeological-Anthropological Memory Management (NAAM). Her position at this institution covers both deputy director and archaeologist. As osteologist, Kraan occasionally works together with the local crime scene investigators on both Curaçao and Bonaire.

Ashleigh Morris is a Trinidadian heritage preservation specialist working for the National Trust of Trinidad and Tobago. He is an affiliate research fellow at the Royal Netherlands Institute of South-East Asian and Caribbean studies, as well as a PhD candidate at Leiden University. His research focuses on cultural interactions in missionized Trinidad.

Cheryl White is a senior professor at the faculty of humanities at the Anton de Kom University. White joined Anton de Kom University as a US Department of State Fulbright-Hayes Teaching/ Research Fellow 2014-2015 for Suriname, South America. Her research focuses on historical archaeology. Beside her function at the university, she also is active as a technical advisor for the Suriname governmental archaeological services.

Irene Meulenberg is a policy officer and archaeologist for the Ministry of Education and Science. She followed a physical anthropology course and continued working with human remains in Suriname.

Harold Kelly is an archaeologist at the National Archaeological Museum Aruba currently working on his PhD for the Royal Netherlands Institute of South-East Asian and Caribbean studies project Island(er)s at the Helm, focusing on sustainability and how islanders use coping mechanisms in face of climatic and environmental changes.

1.2 Methodology of interviews

The majority of the interviews (with the exception of Dr. Felicia Fricke) were conducted online - through zoom platform. This was both due to the circumstances of the COVID-19 pandemic globally, as well as the locations of the authors and interviewees. The interviews were divided equally among the co-authors and were conducted in a one-on-one manner. All participants were given a participation form to sign in advance, agreeing to the interview and the use thereof for the purposes of this article. Even though the authors had agreed on a semi-structured interview, with several questions having been prepared in advance (see Appendix 1.3), we allowed for flexibility during the discussions. In several cases, it was deemed necessary to elaborate or focus more on topics that were

closer to the area of expertise of the participants and deviate from the structure. In addition, in many occasions, the participants were driving the discussion to issues that they considered more important to be discussed.

1.3 Interview questions

1. How are you connected to the subject of treatment of archaeological biological remains? In which area?

2. What is the dominant way in which biological remains are handled as part of archaeological research in your area of research/work? From excavation to display.
   2.1. (*possible follow up question*) Why not display bones?

3. Do you agree with these methods? What would you change/ what would you keep?

4. What do you think are the biggest challenges in handling biological remains in your region of study?

5. What are the perceptions of biological remains by the local communities that claim ancestry of the material?

6. What do you believe to be the difference in the treatment of human remains and non-human animal remains is and why are they different?

7. What strategies have you followed regarding community engagement during your previous work

8. Who do you consider should be the person of contact in how the remains are treated? Why?

Acknowledgements

We would like to first and foremost thank all the researchers (Felicia Fricke, Katarina Jacobson, Claudia Kraan, Ashleigh Morris, Cheryl White, Irene Meulenberg, Harold Kelly) that agreed to participate in our short research project. Their contribution and valuable insight made the compilation of this review possible. We would like to also thank our professor Corinne Hofman, for her guidance throughout the writing process and for the comments she provided in the manuscript. Lastly, we would like to thank the editorial board of InterSection and the two reviewers (Jason Laffoon and Nicoletta Zedda) whose comments and input greatly improved this manuscript.

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TINY TRAVELLERS

STUDY OF WEST ASIAN BEADS FROM MEROVINGIAN BURIALS IN DUTCH LIMBURG IN RELATION TO INTERNATIONAL EXCHANGE NETWORKS.

ANNELY A.A.H. ARENDS

ABSTRACT:
The focus of this article is the international exchange of beads during the early Medieval period, with an emphasis on the relationship between West Asia and the south-eastern Netherlands (Limburg). The bead assemblages of seven sites are examined to provide an insight into the actual numbers and percentages of West Asian beads in the research area. The origin of these beads is determined by their production technique and raw material, which can be traced to regions and sources in West Asia. The distribution patterns of the beads reflect the availability of West Asian beads, and thus the changes and continuity in exchange networks in which they circulated. The results of this study show a higher occurrence of West Asian beads before the seventh century, followed by a decline. This phenomenon has already been attested in North-France and Belgium by C. Pion. The distribution patterns display a higher number of West Asian beads at the studied seven cemeteries near major rivers, especially in the vicinity of Maastricht. These observations suggest a change in the exchange network around the end of the sixth century. At the end of the seventh century, the West Asian beads have disappeared from the Merovingian grave contexts in the Dutch Meuse Valley.

KEYWORDS:
Early Middle Ages; Northern Gaul; Jewellery; Grave goods; Connectivity

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INTRODUCTION: MEROVINGIAN BEAD RESEARCH

Beads are an ancient element of human material culture. They can hold multiple connotations, besides their decorative function. A single string of beads can contain a diversity of materials, production techniques, shapes, origins, generations, values, and meanings (Pion, 2014, 34; Degryse & Shortland, 2019, 2; Mannion, 2015, 90). Beads can be associated with communal and individual ideologies (Mannion, 2015, 91; Sciama, 1998, 17; Bos, 2016, 142). Numbering in the hundreds of thousands, they are a regular occurrence in Merovingian cemeteries (400-750 CE). Therefore, they can give us much information about the social and economic aspects of the Merovingian population (Langbroek, 2021, 278). Specific techniques or raw materials can be traced back to a place of origin, enabling the reconstruction of connections within, and between regions (Arends, 2022, 19-33; Pion & Gratuze 2016, 53-54: Pion et al., 2020, 833). The study of the Merovingian period has proven that artefacts, including beads, from foreign origins are present in the Merovingian assemblage of Northern Gaul, but the exact numbers and distribution in the Netherlands were never documented (Pion, 2014, 34; Degryse & Shortland, 2019, 2). No comparative study of the distribution patterns of West Asian beads in Merovingian graves from different areas in the Netherlands has been made. The study of Merovingian beads in detail is fairly new to the Netherlands. A typochronology for Dutch Medieval beads is forthcoming,[1] based on the typochronology by Pion (2014) on beads from Belgium.

1 Research on a Dutch typochronology was performed under the supervision of Langbroek. Beads from the Merovingian sites of Dommelen-Kerkakkers, Geldrop-Zesgehuchten site C, Uden-Schepersweg, Veldhoven-Huysackers, Veldhoven-Oeienbosdijk, Bergeijk-Fazantlaan, Meerveldhoven, Lent-Lentseveld, Wijchen-Centrum, Elst- 't Woud, Apeldoorn- 't Loo and Echt have been determined and studied by Teunissen-van Manen (2021) and Langbroek (forthcoming). West Asian beads from the Merovingian graves of Alphen-Chaam Molenstraat, Hoogeloon-Broekeneinde, Sittard-Kemperhoul, Posterholt-Achterste Voorst, Obbicht-Oude Molen, Stein-Groote Bongerd, Maastricht-Vrijthof and Maastricht-Pandhof and some from Lent are determined and studied by Arends (2021-2022).

West Asian beads were identified by their colour, decoration, shape, production technique and raw material. This article presents the exact numbers and distribution patterns of beads from West Asia, found in Merovingian graves in current Dutch Limburg. Based on the results, the connections between the research area and West Asia are discussed to answer the question: *What can West Asian Beads recovered from Dutch Merovingian cemeteries convey about early medieval international connections?* The following sub-questions will provide the information necessary to answer the main research question:

1) How many beads of West Asian origin are present in cemeteries within the research area?

2) Do the West Asian beads show change or continuity in their numbers and types throughout the Merovingian period?

3) What is the distribution of West Asian beads in the research area?

4) Are any additional relationships between the West Asian beads visible in the identified types and numbers of beads?

Most West Asian beads can only be assigned to a general area of origin, however, for several bead types the location of bead production is more certain (Neri et al., 2019, 1107; Pion, 2014, 198-199). This study will use the term 'West Asia' to refer to the region of the Syria-Palestine coast, Iran, Iraq, the Armenian highlands, Jordan, the Arabian Peninsula, Anatolia, and the southern Caucasus. For this study Egypt will also be included in this term.

METHODOLOGY

This article is based on a bachelor thesis. The original research studied the West Asian beads in relation to exchange networks, identified from the bead assemblages from twenty funerary sites dating from the Merovingian period located in the southeast of the Netherlands, including the regions of Noord-Brabant, Gelderland, Utrecht, and Limburg (Arends, 2022, 9-10). Only the results of Limburg are free of publication restrictions, and therefore the focus of this article. The study area contains burials from the entire Merovingian period. According to earlymedievaleurope.org, 106 Merovingian sites of which forty-five are cemeteries were excavated in the region of current Dutch Limburg. The study incorporates seven selected burial sites, Sittard-Kemperkoul, Posterholt-Ach-

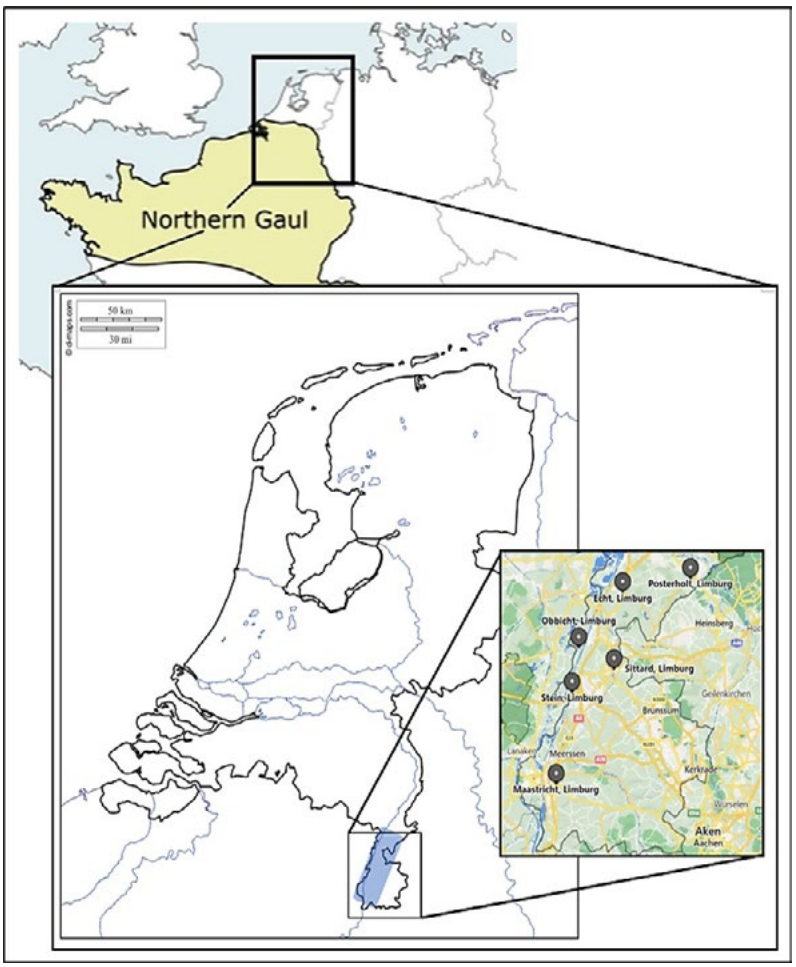

Figure 1: Map of the research area with the selected sites containing Merovingian burials (adapted from: collectingancientcoins.co.uk, d-maps.com, and Microsoft Edge Maps).

terste Voorst, Maastricht-Vrijthof, Maastricht-Pandhof, Echt, Obbicht-Oude Molen, and Stein-Groote Bongerd (Figure 1). These sites were selected because they are well documented and published. This was essential as, due to covid-19 restrictions, physical collections were not available for study. The cemeteries of Maastricht-Vrijthof and -Pandhof, both part of the St. Servaas complex, will be treated as two different sites since they were separately studied, and published. The study material contains 3,829 available glass and non-glass beads derived from 127 graves. The beads were identified as clearly as possible using pictures from publications (De Haas & Theuws, 2013; Theuws & Kars, 2017; Kars, 2011; Kars et al., 2016). Thus, the reference images of several typologies were essential. The identification of glass bead production techniques is primarily based on the typochronology established by Pion (2014), updated in 2018 by Vrielynck, Mathis and Pion. Additional typologies include those of Siegmund (1997) and Koch (1977). However, these typologies categorize beads based on colour and shape, not technique, and are less suitable for present bead studies. Pion's typochronology is suitable for the beads from the sixth century and the early seventh century. Nevertheless, the information on the beads from the second half of the seventh century are less reliable since the typochronology includes only one cemetery from this period. Ongoing studies are striving to close this research gap. Pion categorizes beads based on their production technique and further divides them by colour, shape, decoration, measurements, raw material, chemical composition, age, and place of origin. The West Asian beads discussed in this study are types of beads which are proven, or highly likely, to be produced in West Asia or Egypt (Francis, 2001; Pion, 2014; Gratuze & Pion, 2014; Pion et al., 2020; Pion & Gratuze, 2016; Spaer, 1993). These bead types will be introduced below.

Drawn beads (A1.2, A2, A3, A4)

No traces of production sites of drawn beads have been found in western Europe. The few known workshops are all situated in the Eastern Mediterranean. A key site has been found in Alexandria, Egypt. Here, moulds were recovered that were supposedly used for shaping drawn segmented beads. The knowledge of producing drawn beads has been maintained in Indo-Pacific regions for several centuries. Therefore, the drawn beads found in Dutch Merovingian graves (Figure 2) were produced in West Asia and transferred to the European mainland (Pion, 2014, 198-199). According to Pion, they predominately occur during the late fifth and sixth century CE (Pion, 2014, 135-140). Within the category of drawn beads, there are two types with a specific production location. Pion type A1.1 beads (high alumina soda glass) originate from India (Pion, 2014, 201; Pion & Gratuze, 2016, 55-56). When beads of this type were determined they were left out of the study. Pion type A1.2 beads (high manganese glass) originate from the region of the Euphrates and Tigris (Pion, 2014, 217) and are included in the study. A special category of drawn beads are the so-called metal foil beads (Pion type A4.2, see Figure 2). These three-layered beads consist of two glass layers with a thin layer of gold or silver metal foil in between (Pion, 2014, 47). The production technique remained in use from 300 BCE till the thirteenth century CE (Greiff & Nallbani, 2008, 359). There is evidence that they were produced in Egypt (Greiff & Nallbani, 2008, 372, 374; Pion, 2014, 42, 199; Spaer, 1993, 12). According to Pion, metal foil beads are characteristic for the oldest periods of Merovingian cemeteries in Belgium (Pion, 2014, 135-141). In Europe they disappear from the archaeological record around 600 CE, only to be revived as a larger type after 700 CE. During the Carolingian period the metal foil beads often occur together with mosaic beads, perhaps indicating a common place of origin (Greiff & Nallbani, 2008, 360-361).

Wound Beads (B6.1-01C/D and B10.1-1/2)

During the early medieval period wound beads were produced in Great Britain and continental Europe, including the Netherlands (Sablerolles et al., 1997, 293-313; Dijkstra et al., 2010, 175-199). Besides the exception of two specific wound types, this category will be left out of the study. The first exception is the confetti bead (Pion type B6.1-01C/D). Earliest attested during the late second century in the Mediterranean, they have a cobalt blue main body with dots in multiple colours. Confetti beads were likely created by rolling the hot bead through small pieces of coloured glass (Pion, 2014, 191-192). They have a strong similarity with 'end of the day' beads known from East-African (including Egypt) and Venetian contexts (Bos, 2016, 134; *metier-magazine.nl*). Confetti beads occur in the Merovingian record around the late fifth century and the beginning of the sixth century. While evident in Noord-Brabant (Theunissen & van Manen, 2021, 73; Arends, 2022, 140) they are not identified in Limburg. The second exception within the category of wound beads are types B10.1-1/2 (Figure 2) within the reticella bead types (Pion type B10.1–B10.4). The exact place of origin of Reticella beads is still debated since no production place is known. Some reticella beads were local, Anglo-Saxon, productions (B10.2–B10.4). The more complex ones are believed to be imported together with mosaic beads (discussed below) from Egypt or the Eastern Mediterranean (Pion, 2014, 227-228; Matthes et al., 2004, 114-116).

Folded beads (Pion bead type C1-3)

Folded beads (Figure 2) are more common in the Eastern Mediterranean than in Europe. In the Eastern Mediterranean, this technique is known since the third century BCE (production centre at Rhodos, Greece) and until the thirteenth century CE (production centre at Fustat, Egypt) (Francis, 2002, 93). The main production consisted of cordiform, fusiform and cylindrical shaped translucent blue beads. Some folded beads have a mosaic inlay (Pion type C2). Folded beads comparable to those found in Gaul during the late sixth century have been found in a cemetery in Khirbat Yajuz, Jordan (Eger & Khalil, 2013, 166-168). The prismatic beads (types C1.1-01/04) date to the second half of the sixth or seventh century (Pion, 2014, 222-223).

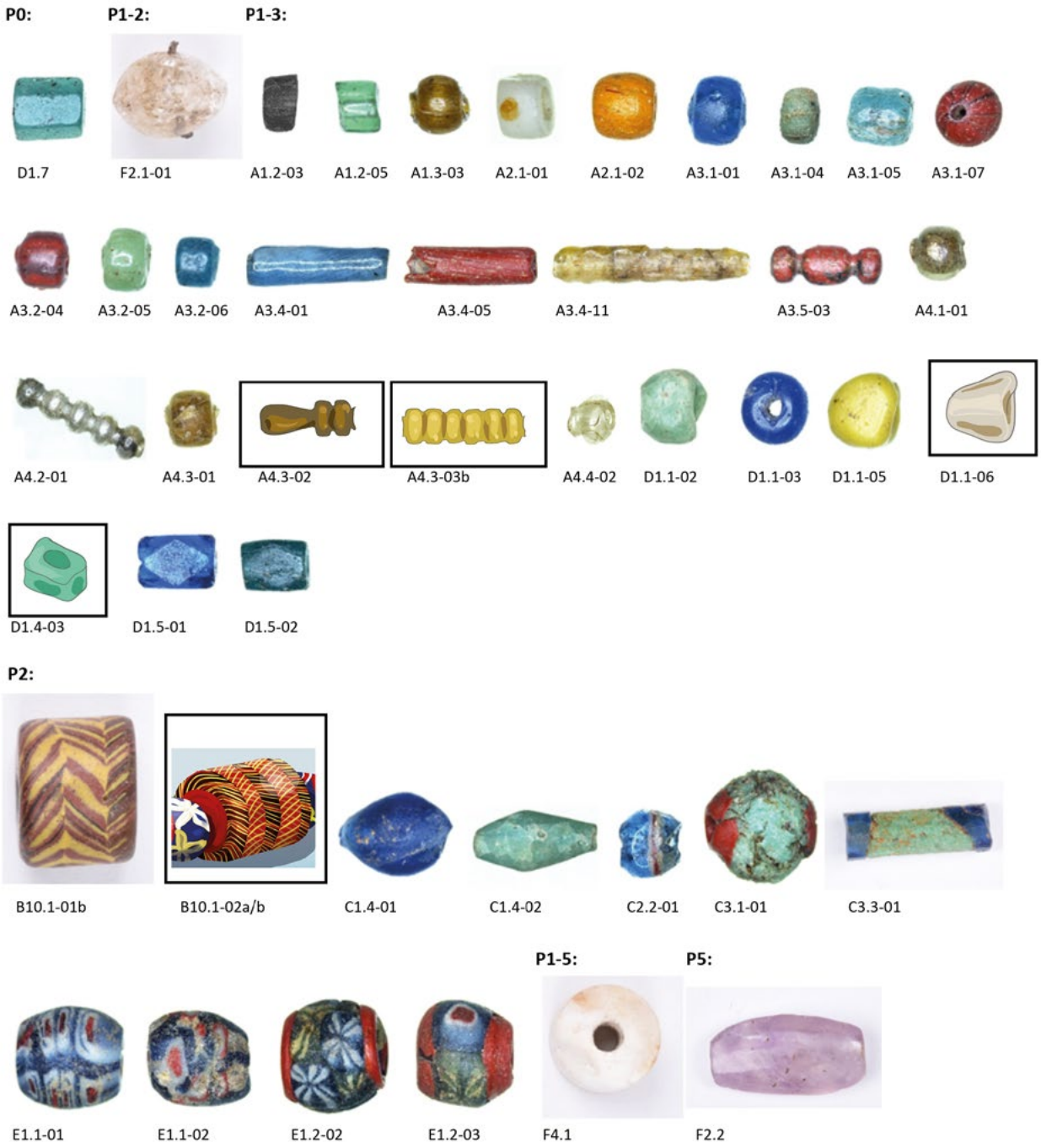

Figure 2: The overview of the common types of West Asian beads in the research area, divided in periods after Vrielynck et al. 2018 (pictures made by Langbroek, drawings in black frame made by Arends; edited by Arends).

Perforated beads (Pion bead type D)

For this technique relatively low temperatures are required (600-800 °C). A piece of glass can be heated and fabricated into a bead by piercing an iron mandrel through the glass (Pion, 2014, 73). Perforated beads (Figure 2) emerged during the second part of the sixth century and disappeared at the end of the century (Pion, 2014, 219). Some perforated beads have a mosaic inlay (Pion type D2). Pion assumes that the perforated beads share a common West Asian origin with the drawn beads with warm cuts. This assumption is based on their shared colour pattern, their brief period of use, and their particular techniques and morphology (Pion, 2014, 219). Folded, perforated, mosaic, and drawn beads have been found together in late Roman and Byzantine graves in Khirbat Yajuz (Eger & Khalil, 2013, 166-168). Archaeometry shows that the perforated beads were made of reused (Roman) glass (Pion, 2014, 219).

Mosaic beads (Pion bead type E)

Merovingian mosaic beads (Figure 2) are fabricated from multiple layers and individual tiny inlays (Volkmann &

Theune, 2001, 525-526). The technique originates likely in Assyria (Volkmann & Theune, 2001, 523). The red glass on the edges of some mosaic beads reveals a chemical composition that differs from wound red beads made in Europe (significantly less iron oxide) and thus suggests a different production location (Matthes et al., 2004, 141, 144). The Merovingian mosaic beads with red edges appear similar to mosaic beads known from Egypt, produced during the second and third centuries CE (Petrie Museum catalogue object 22739 and 22768). Presumably, the mosaic beads found in Merovingian cemeteries were produced in Egypt (Volkmann & Theune, 2001, 528; Pion, 2014, 226).

Non-glass beads (Pion bead type F2.1, F2.2 and F4.1)

Beads made from amethyst, rock crystal, and Meerschaum with a West Asian origin are included in the study (Drauschke, 2010, 52; Drauschke, 2008, 414; Siegmund & Weiss, 1989, 301). There are examples of beads made from other (precious) stones (Langbroek, forthcoming; Pion, 2014, 105) and warmwater oyster shells (Siegmund & Weiss, 1989, 301) in Merovingian graves that originate from the Eastern Mediterranean or farther, however, these were not identified in Limburg and thus not discussed.

The amethyst beads (Pion type F2.2, see Figure 2) were made in the Byzantine Empire. A production location is found in Alexandria. Viable options for the origin of the raw material are the areas of south India and Sri Lanka, Egypt, Ethiopia, or West Asia (Pion, 2014, 229; Drauschke, 2010, 52). According to Willemsen (2014, 150) amethyst beads originate from Egypt. These beads occur in graves in Northern Gaul in the sixth and seventh century. They are rare during the Merovingian period, however their distribution is wide across Europe (Willemsen, 2014, 150; Drauschke, 2010, 55). At the site with amethyst working remains in Alexandria, remains of rock crystal working have been found as well. Hence it can be assumed that these beads (Pion type F2.1; see Figure 2) came from the same location. The raw material occurs at several locations within Europe (the Alps and Ardennes), the Mediterranean and farther away. Rock crystal could be imported from India together with other gemstones (Drauschke, 2010, 52). Meerschaum, or sepiolite, is occasionally found as cylindrical beads in the Merovingian graves of the sixth century (Pion type F4.1; see Figure 2). The suspected origin of the material is the Eastern Mediterranean. A large source exists in Turkey, however no production centres from the sixth century have been found (Drauschke, 2008, 414). It is difficult to differentiate meerschaum and shell from other chalk or limestone materials, and it is possible that they occasionally have been misinterpreted.

Table 1: The results of the sites of Limburg in an overview table.

SITE	TOTAL NUMBER OF GRAVES	NUMBER OF GRAVES WITH BEADS	% GRAVES WITH BEADS OF TOTAL NUMBER OF GRAVES	NUMBER OF BEADS ORIGIONALLY DOCUMENTED	NUMBER OF MEROVIGIAN BEADS AVAILABLE FOR STUDY	NUMBER OF WEST ASIAN BEADS	USAGE PERIOD OF CEMETERY	% WEST ASIAN BEADS OF TOTAL NUMBER OF STUDIED BEADS
SITTARD-KEMPERKOUL	88	20	22,72%	926	875	47	c. 550-700	5,37%
POSTERHOLT-ACHTERSTE VOORST	92	27	29,35%	186	183	5	c. 580-750 AD	2,73%
MAASTRICHT VRIJTHOF	341	37	10,85%	1039	1039	446	c. 510-680	42,93%
MAASTRICHT PANDHOF	1000+	24	??	1393	1393	758	fourth century till end seventh	54,42%
ECHT	??	2	??	67	67	0	First part seventh century	0,00%
OBBICHT-OUDE MOLEN	68	9	13,24%	260	176	23	c. 510-670	13,07%
STEIN-GROOTE BONGERD	72	8	11,11%	118	96	2	c. 510-680	2,08%
TOTAL	**At least 661**	**127**	**19,21%**	**3989**	**3829**	**1281**		**33,46%**

Documentation and data management

The database, consisting of individual tables, images, and graphs for every site and the complete area, is created by the author in an excel format. The study is divided into two stages. First the individual sites were examined, focussing on the number and type of West Asian beads in every grave. Additionally, the dates of the graves and overall cemetery were documented. The graves are divided into three chronological periods to examine the possibility for a chronological change in deposited bead types during the Merovingian period: the period before the seventh century (400/510-590/610 CE), the transition period between the sixth and the seventh century (460/510-650/680 CE), and the seventh century and later (610-680/750 CE). The transition category was created because more than forty graves are dated very broadly by their excavators and could not be assigned to either the sixth or the seventh century. Secondly, the collected information was combined to create an overview of the sites of Limburg to answer the research questions (Table 1). To examine the identified types and numbers of beads of the seven sites, the changes, and continuities, of specific West Asian bead types through time are documented in separate tables (Table 3; 4; 5; 6). This data can display a preference for, or availability of, specific bead types. The beads are not individually dated, but chronologically divided according to the date of the grave as provided in the site publication. The answers of the subquestions will be used to discuss the main research question in the discussion (aided by additional data from Arends, 2022).

Table 2: ***All examined beads from the cemeteries of Limburg.***

TIME PERIOD	SITTARD-KEMPERKOUL	POSTERHOLT-ACHTERSTE VOORST	MAASTRICHT VRIJTHOF	MAASTRICHT PANDHOF	ECHT	OBBICHT-OUDE MOLEN	STEIN-GROOTE BONGERD	TOTAL NUMBER OF BEADS	NUMBER OF WEST ASIAN BEADS	PERCENTAGE OF WEST ASIAN BEAD OF TOTAL
FIFTH AND SIXTH CENTURY	0	0	204	687	0	0	0	891	459	51,52%
TRANSITIONAL PERIOD	812	118	698	669	0	171	52	2520	752	29,84%
SEVENTH CENTURY AND LATER	63	36	88	0	67	4	41	299	42	14,05%
UNDATED	0	29	49	37	0	1	3	119	28	23,53%
TOTAL NUMBER OF BEADS	875	183	446	1393	67	176	96	3829	1281	33,46%

Table 3: ***Total number of dated and undated West Asian beads.***

CATEGORY	UNCERTAIN	DRAWN	WOUND	FOLDED	PERFORATED	MOSAIC	ROCK CRYSTAL	AMETHYST	OTHER	TOTAL
DATED	140	786	3	34	199	29	5	56	1	**1253**
UNDATED	2	16	0	2	6	0	1	1	0	**28**
TOTAL	**142**	**802**	**3**	**36**	**205**	**29**	**6**	**57**	**1**	**1281**

Table 4: ***Attested West Asian bead types in Limburg dated to the fifth and sixth century.***

SITE	DRAWN	WOUND	FOLDED	PERFORATED	MOSAIC	ROCK CRYSTAL	AMETHYST	TOTAL
MAASTRICHT VRIJTHOF	87	1	7	17	6	0	1	**119**
MAASTRICHT PANDHOF	283	1	1	47	0	3	5	**340**
TOTAL	**370**	**2**	**8**	**64**	**6**	**3**	**6**	**459**

Table 5: Attested West Asian bead types in Limburg dated to the transitional period (late fifth till late seventh century).

SITE	UNCERTAIN	DRAWN	WOUND	FOLDED	PERFORATED	MOSAIC	ROCK CRYSTAL	AMETHYST	OTHER	TOTAL
SITTARD-KEMPERHOUL	0	40	0	0	0	0	0	1	0	41
POSTERHOLT-ACHTERSTE VOORST	0	0	0	0	0	2	0	1	0	3
MAASTRICHT VRIJTHOF	4	192	1	0	57	5	1	27	1	288
MAASTRICHT PANDHOF	136	131	0	12	78	16	1	21	0	395
OBBICHT	0	23	0	0	0	0	0	0	0	23
STEIN-GROOTE BONGERD	0	2	0	0	0	0	0	0	0	2
TOTAL	140	388	1	12	135	23	2	50	1	752

Table 6: Attested West Asian bead types in Limburg dated to the seventh and mid-eighth century.

SITE	DRAWN	FOLDED	TOTAL
SITTARD-KEMPERHOUL	6	0	6
MAASTRICHT VRIJTHOF	22	14	36
TOTAL	28	14	42

RESULTS: THE (STUDIED) MEROVINGIAN BEAD ASSEMBLAGE OF WEST ASIAN ORIGIN

The research has revealed a collection of the most common West Asian beads for the region of Limburg (Figure 2). The bead assemblage could contain beads made in India since the small drawn beads from West Asia and India cannot be distinguished based on pictures, but only with a stereomicroscope to identify the production technique, or through chemical analysis. In this research 1,281 beads of West Asian origin are recognized, which relates to 33.46 percent of the total studied bead assemblage (Table 1). Only the seventh century cemetery of Echt contained no West Asian beads. The two cemeteries of Maastricht stand out, not only in the high number of burials and beads, but also because 43 percent and 55 percent of the bead assemblages of the sites consists of West Asian beads (Table 1). This is remarkable as the number of graves which contain beads is comparable with Posterholt and Sittard, yet these bead assemblages contain only 3 percent and 5 percent of West Asian beads. With a West Asian bead percentage of 93.98 for the two cemeteries combined, the cemeteries of Maastricht are an outlier in the results (Table 1). The West Asian beads from Maastricht seem ty-

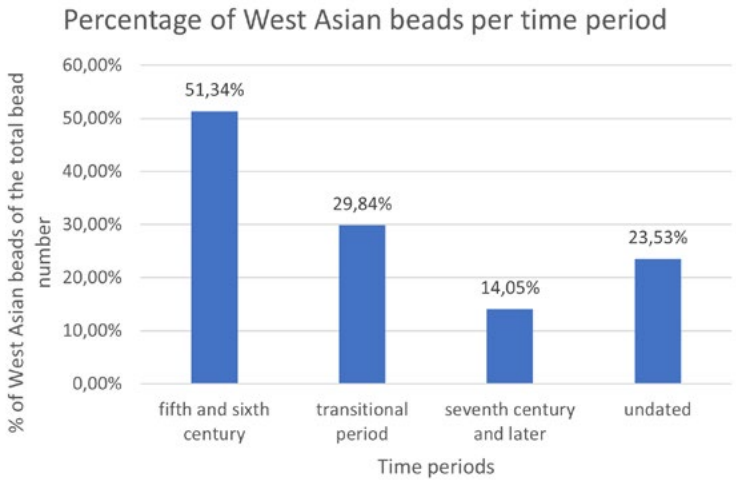

Figure 3: The percentages of West Asian and non-West Asian beads of the total examined bead assemblage of Limburg.

pologically like those of the other cemeteries. Their high number in the transitional period is perhaps caused by graves of the Maastricht-Pandhof site, that could be dated to both the sixth and the seventh century. This creates a bias towards the transitional period, rather than reflecting their actual chronological distribution.

The data displayed a clear correlation between the chronological division of the graves and the attested number of West Asian beads. The West Asian beads from the fifth and sixth century make up 51,52 percent (459 of 891) of the total bead assemblage of the graves, all occurring in graves from Maastricht and not elsewhere (Table 2; Table 4; Figure 3). Of the West Asian beads 29,84 percent (752 of 2520) dates to the transitional period (Table 2; Table 5; Figure 3). The West Asian beads in the graves from the seventh century and later make up 14,05 percent (42 of 299) of the total bead assemblage of this period (Table 2; Table 6; Figure 3). The bead assemblage indicates a peak occurrence of West Asian beads in the fifth and sixth century, and a decline during the seventh century.

All the production techniques that relate to West Asia are present in the studied assemblage (Table 3; 4; 5; 6). Table 3 and Table 5 contain a category labelled 'uncertain', which consists of one possibly shell disk bead, one folded or perforated bead, and 140 tiny drawn green beads that could be from West Asia or the Indian peninsula. These beads are left out of further analysis. The distribution patterns indicate that several bead types are more widespread or more widely available in the research area than others. The diversity of bead production techniques is significantly higher in Maastricht-Vrijthof and Pandhof, compared to the other sites (Table 4; 5; 6). The West Asian bead assemblage predominantly consists of small drawn glass beads, which were identified in every studied cemetery. The second and third largest categories are the perforated beads, followed by the non-glass beads. Translucent green drawn beads and segmented metal foil beads occur very frequently. However, no specific bead type occurred in all six sites (to the extent that could be determined from the published photographs). Amethyst and mosaic beads are mainly concentrated in Maastricht. Moreover, reticella beads are only present in Maastricht. Chronological examination has indicated that the perforated, wound, mosaic, and gemstone beads (Table 4; 5; 6) are well attested in the sixth century. They show a peak occurrence in the transitional period, followed by a sharp decline in the seventh century. An additionally attested pattern in the West Asian bead assemblage is the relatively high occurrence of monochrome drawn and perforated beads, especially in various shades of green and blue (Figure 2).

INTERPRETATION OF THE SEVENTH CENTURY WEST ASIAN BEADS

The few West Asian beads that have been recognized in seventh century graves do not include new types from West Asia but are the same types as the beads of the sixth century. This suggests that several West Asian beads remained in circulation after the sixth century before they were deposited in the graves. This can be illustrated with the folded beads (Pion type C1.4-01/2 and C2.2-01, see fig 2) from the seventh century grave 166 of Maastricht-Vrijthof. These beads are 50 to 100 years too old for the graves they were deposited in. Such chronically misplaced beads are called heirloom beads (Mannion, 2015, 92-93; Volkmann & Theune, 2001, 543-544). Furthermore, it is known that graves were occasionally reopened during the Merovingian period to retrieve beads and wear them again (Aspöck, 2011, 299-300; Van Haperen, 2017, 149; Langbroek, 2016, 81-82). This suggests that these beads were significant for the Merovingian population.

THE SIXTH AND SEVENTH CENTURIES COMPARED: CHANGES IN INTERNATIONAL EARLY MEDIEVAL EXCHANGE NETWORKS

The sixth century cemeteries are situated near the major Meuse River. The amount and typological diversity of West Asian beads are higher at sites in the vicinity of Maastricht. The centre is well connected to international and long-distance exchange networks during the Merovingian period, as it was in the Roman period (Tys, 2020, 771; Theuws, 2020, 897, 906). The attested West Asian beads of this study are comparable with beads found in Merovingian graves in the current Netherlands, Belgium, France, Germany, and England (Arends, 2022, 138; Langbroek, 2021, 278; Pion, 2014, 13-14). The high quantity, and diversity of beads of West Asian origin in the graves indicates a continuous demand and supply of beads from West Asia during the late fifth and sixth century. The West Asian beads from the oldest (late fifth/early sixth centuries) graves bear a resemblance to those found in the tombs of the Late Roman Empire. The number of beads and types of adornment increases in the second half of the fifth century. The majority are monochrome drawn glass beads (Pion, 2014, 135-138). The frequent occurrence of West Asian beads in rural cemeteries supports the theory that in the sixth century, the rural population of Northern Gaul was connected with not only a road-based, but also a river-based exchange network. This suggests that the active elite control in the research area on exchange networks and objects from West Asia was presumably limited (Theuws, 2020, 889-890, 897, 906; Tys, 2020, 771). Towards the seventh century, life-stage rituals, including burial practices, became more associated with the church instead of families (Theuws, 2020, 887; Theuws & Van Haperen, 2012, 163-165; Knippenberg & Theuws, 2019, 10; Effros, 2003, 117-118). As population numbers increased, local craft production, including bead-making, developed (Pion, 2014, 180-181). These developments were combined with the expansion of structured elite control over rural dwellers, their properties, and local exchange connections (Theuws, 2020, 899; Theuws & Van Haperen, 2012, 164, Hodges, 2012, 122). This could be the result of the increasing influence of Christianity, or another undetermined factor. European beads could have become more accessible than those transferred over a considerable distance by fluvial and maritime connections from

West Asia (Volkmann & Theune, 2001, 538-40; Pion et al., 2020, 849-50). The Byzantine Empire was a powerful Mediterranean force during the sixth century and presumably played a leading role in the exchange between West Asia and western Europe (Lailou & Morrisson 2007, 35). Thus, when the economic and political position of the Byzantine Empire weakened from the second half of the sixth century, its exchange networks declined (Burbank & Cooper, 2010, 68-69; Lailou & Morrisson, 2007, 23-24). The regions of Egypt and the Levant are considered the main production areas of the attested West Asian beads in this research (Pion et al., 2020, 833). After these areas were no longer under Byzantine rule in the seventh century, but annexed by the Sassanian Empire, and later the Rashidun Caliphate (Lailou & Morrisson, 2007, 24), their connections with Europe seemed to decline. Chronologically, this corresponds with the decline of West Asian beads in studied cemeteries in Limburg. It is generally assumed that during the early medieval period long distance networks slowly disappeared, but the reasons remain speculative (Langbroek, 2016, 138; Pion & Gratuze, 2016, 62). A shortage in natron available for glass production from the seventh century onwards could be a possible reason (Shortland et al., 2006, 527-528). An observation, similar to the one made in this study, was made by Pion in his research on Merovingian beads in Belgium and France. He suggests that West Asian beads are a sixth century phenomenon (Pion, 2014, 135-143). In this study, most types of West Asian beads occur in every studied chronological period, though in different numbers. The bead variation from the late fifth till the late sixth centuries is higher compared to the data from during the seventh and mid-eighth centuries (Table 4; 5; 6) (Arends, 2022, 130-131). It should be noted that the decrease of West Asian beads in Merovingian graves could have been a deliberate choice by the population. However, it seems plausible that the availability of West Asian beads is affected by political and economic developments in West Asia from the late sixth century onwards.

CONCLUSION

This research has attested that detailed examination of Merovingian beads from Limburg and of production techniques can give an insight into early medieval exchange connections with West Asia. The results indicate an exchange network among the sites near the Meuse River in which the rural population is active, with a higher percentage and diversity of West Asian beads around the centre of Maastricht. The types of West Asian beads are diverse with a clear main category of monochrome drawn glass beads. Chronological classification has indicated a decline of West Asian beads in grave contexts during the seventh century. A combination of local and international developments from the late sixth and seventh century onwards reduced the transfer of beads from West Asia to Merovingian Gaul. Hypothetically, the reduced availability of West Asian beads in western Europe is associated with the weakened position of the Byzantine Empire and the loss of direct contact with the main production areas in Egypt, and the Syria-Palestine coastal area. The results of this research can serve as a stepping stone to examine West Asian beads throughout other areas in the Netherlands, and the region of Northern Gaul. The bead assemblages of the sites of Limburg need a physical, and microscopic examination and identification to contribute to a more thorough study, which is now based on published photographs. For instance, a study on the potential Indian beads would create a more comprehensive picture. Further research on the appearance and disappearance of certain West Asian bead types is recommended, to provide a more accurate image of the connections with different regions in West Asia during the early medieval period.

ACKNOWLEDGEMENTS AND COPYRIGHT

This research was made possible by the published works of the ANASTASIS project on the sites of Maastricht-Vrijthof, Posterholt-Achterste Voorst, Sittard-Kemperkoul, Obbicht-Oude Molen and Stein-Groote Bongerd. The site of Echt was made available by the database and research of Mette Langbroek. She also provided the pictures of the beads in figure 2. Maastricht-Pandhof was added with a different publication, the published Ph.D. thesis of Mirjam Kars. I thank my supervisors Mette Langbroek and Dr. Marike van Aerde, who provided insights and expertise that aided this thesis study.

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NEANDERTHAL ART
AND THE PROBLEM OF ETHNOCENTRISM

Tullio Abruzzese

ABSTRACT:
The recognition of artistic expressions coming from the Palaeolithic has always been skewed towards the acknowledgement of our species as the sole superior maker. This is due to the double standard applied to the Palaeolithic archaeological research, for which similar material evidence from Modern Human and Neanderthal contexts are interpreted differently because different levels of cognitive abilities are attached to different human species. This biased understanding of the deep past comes from a mindset derived from the 'colonial thought' that steered (and regrettably often still steers) Western political, social, and scientific agendas. Colonialism implies the owning and the refusal of knowledge and culture of the Other by the superior Western knowledge system. Colonialism is here understood as the product of a universal Ethnocentrism, proper of the human mind. In this paper, a review of the state of knowledge and debates around Neanderthal modernity is presented by using Middle and Upper Palaeolithic artistic expressions as a case study. Ultimately, a more relativistic theoretical framework is proposed to move beyond futile discussions around hominins' complexity of thoughts and behaviours. Understanding that our species stands not alone on a higher evolutive step can help archaeology (and also other sciences involved in the study of the deep past) move forward and beyond its boundaries, by re-evaluating and questioning old interpretations and hypotheses, products of an ethnocentric mindset.

KEYWORDS:
Middle Palaeolithic; Otherness; Decolonization; Art; Ethnocentrism

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INTRODUCTION:

Archaeology is a product of Western colonialism. This statement might sound outrageous, but nevertheless true. Archaeology has been used as a tool for controlling and owning other cultures' past and situating it into a Western system of cultural and ideological values (Moro-Abadía, 2006; Porr & Matthews, 2017; Smith & Wobst, 2005b). As Nicholas and Hollowell (2007) illustrate, archaeology is often still perceived by Indigenous groups or more generally descendant communities as "just another tool of oppression that objectifies the past and disenfranchises them from their own histories" (Nicholas & Hollowell, 2007, 60). The recognition of this problem led to a generally diffused post-colonial approach towards the discipline of archaeology (e.g., Porr & Matthews, 2020a; Smith & Wobst, 2005a). However, still a lot needs to be done to fully decolonize archaeology (for an overview of this critique see e.g., Hamilakis, 2012), especially in the part of the discipline that studies the deep past of humanity, broadly known as Palaeolithic archaeology. This branch often falls into the traps created by the colonial discourse, for example by interpreting deep past behaviours and cultures using modern parallels and Western ideals, or by creating temporal divisions and disparities among species solely based on the problematic assumption of *Homo Sapiens*' exceptionalism.

An example of an archaeological endeavour which easily falls victim to the 'colonial mindset' (the reasoning underlying the phenomenon of colonialism, def. by the author) is the quest for archaeological traces of the beginning of our complexity of thoughts and behaviours. In fact, the question of the origin of 'modern' behaviours and cognitive sophistication, led to the theorization of the so-called Human Revolution Model (Klein, 1995; Mellars & Stringer, 1989; Noble & Davidson, 1991) in which *Homo Sapiens* (HS) is seen as the modern, complex species par excellence (McBrearty & Brooks, 2000; McBrearty, 2013). The model postulates that ours is the only species of the genus *Homo* to be worthy of the title of 'human' because of the development of a more complex and modern set of behaviours such as the use of language, new technologies, and the manipulation of symbols (Deacon, 1997; Henshilwood & Marean, 2003; Nowell, 2010; McBrearty & Brooks, 2000; McBrearty, 2013). According to this definition (i.e., 'behavioural' humanity as opposed to 'anatom-

ical' humanity), HS became finally 'human' around 70ka when it started displaying complex behaviours such as the processing of pigments or the ability to exploit marine resources. However, this raises the question of inter-*Homo* 'humanity': are modern behaviours and cognitive complexity unique traits of our species? Are they an overall characteristics of the genus *Homo*?

To answer these questions a sort of 'shopping list' for the archaeological recognition of complexity has been created (Wadley, 2003, p. 247). This list of complex traits encompasses many characteristics shown archaeologically by HS. These include for example the creation of microlithic implements, evidence for long-distance exchanges, or the creation of tools made of perishable materials, other than the two traits mentioned in the previous paragraph and many more (McBrearty & Brooks, 2000, p. 503). Leaving aside the limitations and the dangers derived from the use of such a checklist (for an overview of the main problems see e.g., Henshilwood & Marean, 2003; Nowell, 2010; Wadley, 2003), the search for archaeologically recognisable complex behaviours led to the awareness that our species is not as unique as previously thought. In particular, one of our evolutionary cousins stands out: the Neanderthals (*H. neanderthalensis*, HN). Our relatives seem to possess many of the complex characteristics displayed archaeologically by HS (for an overview see e.g., Roebroeks & Soressi, 2016; Villa & Roebroeks, 2014), with the exception, arguably, of symbolic behaviours (i.e., the ability to communicate through symbols). Important to note is that the ability to communicate symbolically has been considered the key characteristic of 'humanness' (Deacon, 1997; McBrearty, 2013), also because, during the European Upper Palaeolithic, symbolism took a whole new, spectacular form: art expressed through non-perishable media.

Today, 'art' is a word charged with implications, connotations, and ideas. Therefore, a definition of this culturally specific, but nevertheless universal, category is needed. Following the definitions of Wadley (2003, p. 248) and Mithen (1996, p. 154-155) the word 'art' is here used to refer to any form of material symbolic expression intentionally created with the potential to communicate concepts, ideas, identities, and/or worldviews. Shell beads, decorated ostrich eggshells, or images drawn on a rock wall coming from Middle Palaeolithic (MP) or Upper Palaeolithic (UP) contexts, are all considered here as art. Artistic expressions have the potential to transmit messages that need to be interpreted (Deacon, 1997; Wadley, 2003; Mithen, 1996). Therefore, art and symbolism are here treated as mainly interpretative processes.

Palaeolithic artistic expressions in the form of jewellery and body ornaments, or paintings and engravings (hereafter called figurative expressions), are widely accepted as such when coming from HS contexts but are heavily debated when attributed to Neanderthals. An example of this duality is the summarization of Neanderthals' behavioural traits by Marean (2015) where complex behaviours such as pigments use or symbolic artefacts dubbed "advanced cognition" (Marean, 2015, p. 537) of HS are represented by continuous thick lines starting as far back as 200ka, while Neanderthals' "advanced cognition" is represented by a meaningful empty space with a few sparse dots clustered around 50ka (curiously, the probable date of the contact between the two species in Europe). Another example is offered by the way early figurative depictions are interpreted with a neuroscientific approach excluding the possibility of symbolic representation in Hodgson (2019) who stated that early "nonfunctional marks" (Hodgson, 2019, p. 588) may not have been symbolic or representational but just linked to the way the visual cortex of hominins processed visual information, not considering that the need of drawing such patterns might be in its own right a marker for complex cognition. Why does the idea of inter-species cognitive complexity encounter harsh opposition? Why does it seem that a double standard is applied when interpreting and recognizing HS and HN artistic expressions? In this paper, I aim to answer these questions by using MP figurative expressions as a case study. I will argue that the double standards often applied in Palaeolithic archaeology are a legacy of colonialism rooted in the whole archaeological discipline, ultimately derived from a universal ethnocentric mindset entrenched in our minds. Finally, I will plea for the decolonization of the deep past, echoing a growing number of scholars embracing a critical approach towards the Western theoretical mindset employed for the study of the deep past (e.g., Back Danielsson et al., 2012; Gosden, 2012; Hamilakis, 2012; Porr & Matthews, 2017, 2020a; Porr, 2019; Smith & Wobst, 2005a).

FROM DOUBLE STANDARDS TO ETHNOCENTRISM

Famous sites such as the caves of Lascaux and Chauvet in France, or the rock painting of the Aboriginal *Dreamtime* in Western Australia, are often cited when talking about cave art. These examples have in common the hand of the maker: HS. In fact, it is generally assumed that our species is the maker of these ancient artistic expressions, and historically little doubts were raised about whether these representations were among the first examples of intentional art in the history of mankind (e.g., Bednarik, 1995; White, 1992). The same applies to the oldest parietal arts in Sulawesi (Indonesia), for example, or to the earliest UP cave art in the Iberian peninsula. Over the decades, ancient caves such as Lascaux and Chauvet, have generated several theories around their meanings, ranging from shamanistic or animistic interpretations to didactical purposes (Sauvet et al., 2009). Indeed, it seems like no limit to the speculation about the cognitive capacities of our ancestors exists (the recent proto-language hypothesis proposed by Bacon et al., 2023, or the old 'hunting magic' interpretation summarized in Mithen, 1991, are good examples of this). On the other hand, art coming from the Neanderthal world has been heavily debated and questioned, and often classified as "accidental" (Medina-Alcaide et al., 2018, p. 72) or as a natural occurrence,

applying an interpretative double standard for which similar evidence is treated differently solely based on the context (e.g., age or periodisation). In this regard, it is worthwhile mentioning a few examples such as the discussion on the natural formation of red stains in speleothems by Aubert and colleagues (2018) or the argument for non-intentional (accidental) smearing of red ochre into stalactites by Medina-Alcaide et al. (2018), both trying to explain the red colouring shown in Figure 1, or the recent discrediting of the MP dating for the alleged intentional Neanderthal art (Figure 2-A) by White and colleagues (2020). In this context, it is fair to cite the corpus of research with opposing views on HN artistic capacities. For example, the new dating evidence for the red motifs in Spanish caves by Hoffmann et al. (2018) which seems to point to HN as the maker, or the approach to the understanding of Neanderthals' use of space by Jaubert et al. (2016), or the recent publication of engravings made by pressing the fingers into soft tuff walls creating elaborate motifs of certain Neanderthal origin at La Roche-Cotard (Loire Valley, France) described by Marquet and colleagues (2023). These are just a few among many other examples, roughly summarizing the entity of the debates around MP artistic expressions (Nowell, 2023 offers a more complete and thorough summarization of the state-of-the-art around HN research and debates therein). However, on a theoretical level, not everyone accepts the idea that also the Neanderthals were able to express something other than simple biological needs (Marean, 2015; Savage-Rumbaugh & Fields, 2011).

I would argue that this bias derives from ideological double standards applied to the study of the deep Palaeolithic past (Roebroeks & Corbey, 2001). The examples provided above, show the double standards at work (Figure 2): since it is assumed the HN are on a different level of cultural complexity when compared to HS, evidence for higher cognitive processes needs to be reviewed. This creates a bias in the research that might even be considered unintentional. In fact, I would argue that this 'epistemological double standard' is enabled by the underlying colonialist thought that dominated, and in a certain sense created, the archaeology of the deep past. Indeed, historically, archaeology was born as a product of the Western cultural system, and past people have been studied through the eyes of our modern society, to own the past and the people whose past is at stake (Moro-Abadía, 2006; Porr, 2020; Porr & Matthews, 2017; Smith & Wobst, 2005b). This is especially problematic for the Palaeolithic since the comparisons between modern and past cultures create the illusion of a clear-cut past whose cultural entities are only the primitive and 'pristine' state of the modern

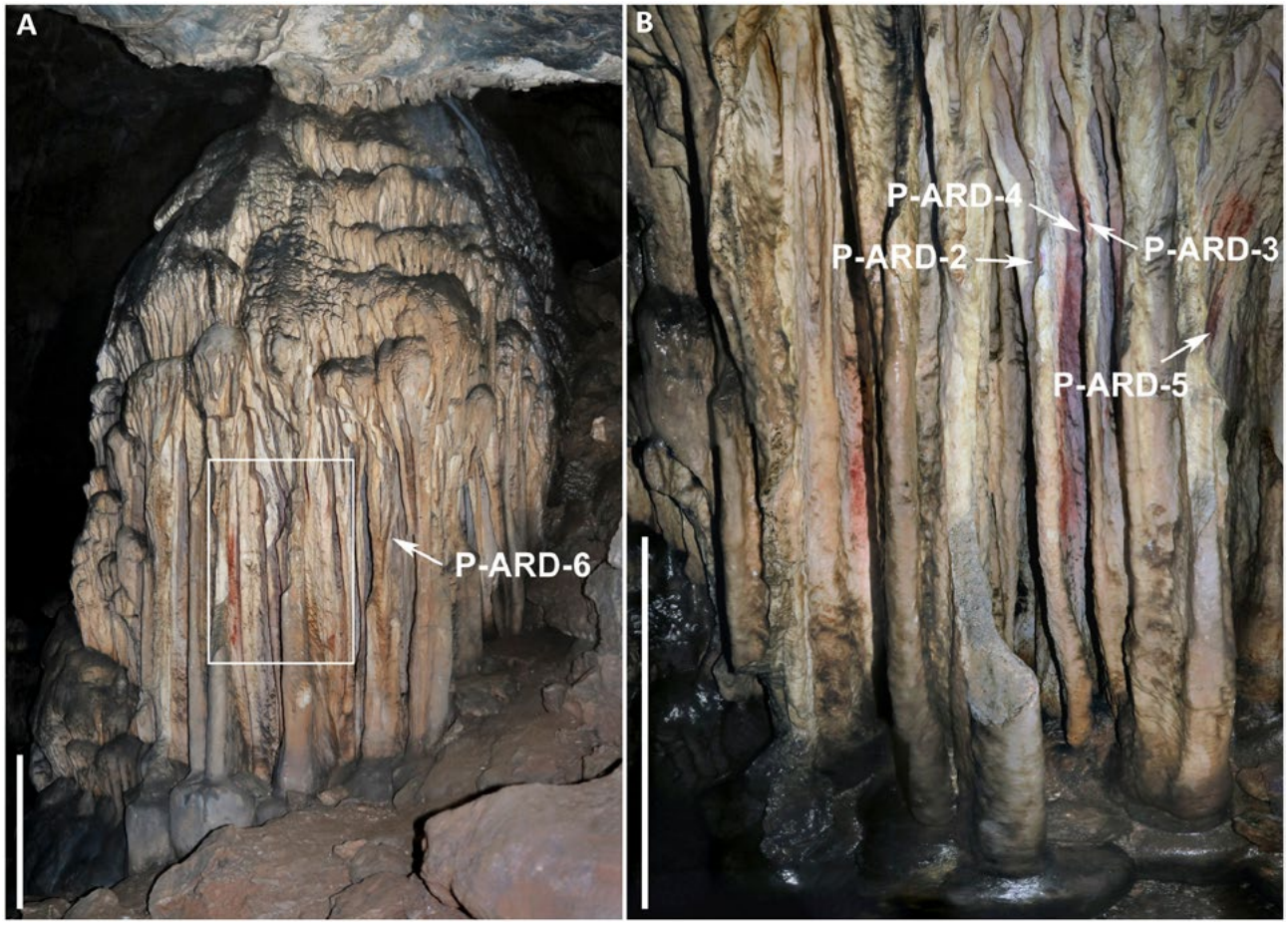

Figure 1: Speleothem "curtains" (Panel II.A.3) decorated with red ochre in the "Sala de las Estrellas", De Ardales Cave, Spain (after Pitarch Martí et al., 2021). Licensed for use by CC BY-NC/CC BY 4.0.

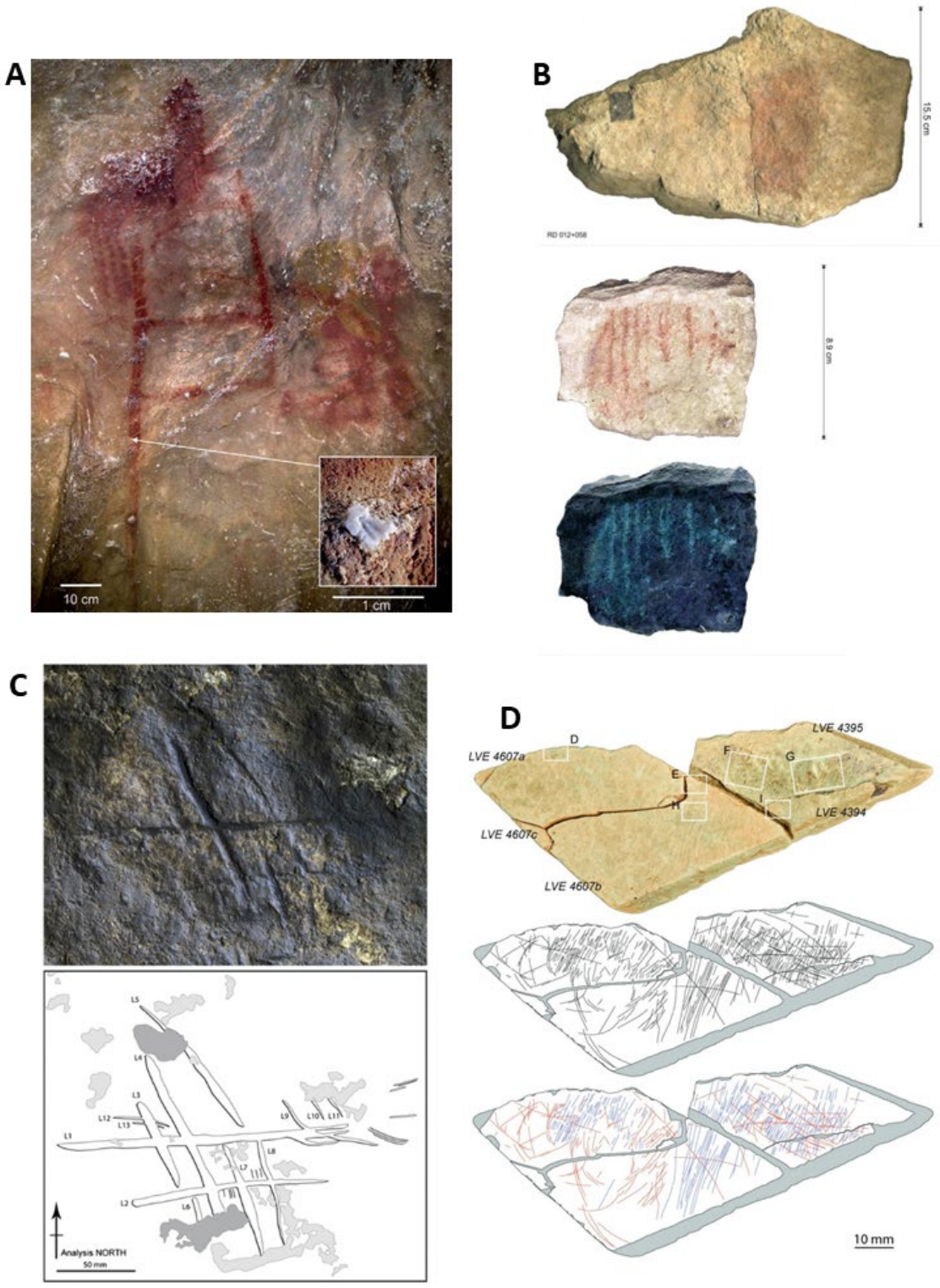

Figure 2: Comparisons between artistic/symbolic representations coming from MP (A and C) and UP (B and D) contexts: A) Panel 78 in hall XI of La Pasiega cave (Cantabria, Spain) (after Hoffmann et al., 2018).This panel features the La Trampa pictorial group which yielded a minimum age of 64.8 ka and attributed to H. neanderthalensis (Hoffmann et al., 2018). However, the attribution and the dating have encountered fierce debate (see e.g., White et al., 2020); B) Two examples of pebbles with ochre stains from the Dalmeri rock shelter (Trento, Italy) attributed to the UP Epigravettian culture (after Dalmeri et al., 2011). Even though the depictions show nothing more than example A, these cobbles have been attributed to the symbolic realm of Epigravettian people, in fact the area yielding the cobbles has been even called "ritual area" (Dalmeri et al., 2011); C) Engraving of MP age in Gorham's Cave, Gibraltar (after Rodríguez-Vidal et al., 2014). Although the intentionality of the engravings cannot be questioned, the panel has been associated with marks left by bear claws rather than sentient hominins (Camarós et al., 2017); D) Plaquette 1 from Les Varines (Jersey, Channel Islands) attributed to the UP Magdalenian culture (after Bello et al., 2020). Although the scratches bear few remarkable similarities with example C, the willingness of the maker to convey some artistic expression is not questioned directly from the title of the manuscript (Bello et al., 2020). Licensed for use by CC BY-NC/CC BY 4.0.

(Western) society, and also reinforces the dangerous primitivistic assumption that contemporaneous groups used as background comparison (e.g., indigenous groups such as the Hadza tribe in Tanzania, or the Alaskan Nunamiut groups) are just relics from the past (Athreya & Rogers Ackermann, 2020). Moreover, specifically when our species, rather than our society, is used as the benchmark to interpret, study, and ultimately evaluate other hominins or other members of our genus (*Homo*), the underlying assumption is that of linearity in the cognitive evolution of our lineage, in which we are at the top end of the line, and the 'others' are along the line but below us. We are the intelligent species. These ideas have strong parallels with the universal concept of Ethnocentrism: only the cultural system to which one belongs is superior enough, or 'human' enough to measure, evaluate, and ultimately truly judge all the other systems (Viveiros De Castro, 1998). Indeed, I would argue that ours is a profoundly ethnocentric mind, no matter our background, formation, culture, and personal beliefs. In my reading, Ethnocentrism is a universal condition of mankind.

I would argue that this was the mindset driving the Imperial expansion of many European countries in the past centuries. The encounter of different cultures creates the illusion of superiority, and the opposite side is recognised as frightening different and inferior. The cultural differences are transformed into 'Otherness', and the 'Other' is considered to lack important characteristics of humanness. Through the ethnocentric lens, the term 'Other' is always used discriminatorily, and the 'Other' is always *different* in the negative connotation of the term (Hussain, 2020). This narrative is used to devalue and marginalize the 'others' because the system that judges is the sole holder of the dogmatic truth (Athreya & Rogers Ackermann, 2020). In my opinion, this has been the mindset steering the study of the MP record (but also human evolution in general) for most of the last century. Our species (*Sapiens*) has been seen as the superior mind while all the other hominin species were the 'cavemen'.

Villa and Roebroeks (2014) coined the expression "Modern Human Superiority Complex" to describe how we are seen and perceived as the only species able to produce the complex thoughts behind art. These complex thoughts are ultimately translated into meaning. In fact, any symbolic manifestation needs to transmit a message of some sort. Being a symbolic species (Deacon, 1997), we need to find the meaning behind any form of symbolic expression, be it figurative, gestural, or auditory. When confronted with imagery such as the ones from Lascaux or Chauvet, our mind looks for (and finds) interpretable, familiar patterns. But when we look at something like the stains of red ochre in Figure 1 or the engraved lines in Figure 2-C, we cannot find any known pattern and we cannot attach meaning to it. Because of our experience, we can recognize, relate and imbue with meaning the lions from Chauvet, but we might struggle to describe the unfamiliar red stains or engravings found on a rock deep in a cave coming from contexts that are not attributed to HS. An example of this comes from the Epigravettian site of the Dalmeri rockshelter (Trento, Northern Italy). The site yielded a series of cobbles and broken stones that show depictions in red ochre representing anthropomorphic and zoomorphic figures (Dalmeri et al., 2011). Among these depictions also many cobbles display just red stains of ochre across the surface (Figure 2-B) that have been attributed with certainty to the symbolic realm (Dalmeri et al., 2011). Such biased judgement has been accepted because the context from which these depictions come is HS. Therefore, any depiction must have had something to do with a higher cognitive sphere, and the meaning those red stains convey is just assumed. An ease of interpretation that is seldom granted to Neanderthals or any other hominins (Figure 2). This is an example of the double standards applied to prehistoric research. However, without assuming the existence of meaning, the judgement of HS' stained cobbles might have been different. This is mainly because something without any meaning can be considered empty, and uninterpretable (Goodrich, 1994). Therefore, unfamiliar imagery cannot be labelled as 'art' or 'symbol' (Deacon, 1997; Goodrich, 1994; Mithen, 1996).

Figure 3 tries to summarize my argument from biases and double standards to Ethnocentrism. The universal ethnocentric mind enabled the Western colonialism in which archaeology is rooted. Colonialism, or what I referred to as 'colonial mindset', enabled (and often still enables) the double standards used in the research of the deep Palaeolithic past, creating biased judgement and interpretative fallacies. For example, the search for 'meaning' might be considered as such a fallacy, which does not add anything to the general interpretation of art, and has the sole purpose of 'cutting away' artistic figurative expression from contexts in which meaning cannot be reconstructed, or even imagined.

DECOLONIZING MIDDLE PALAEOLITHIC ART

It is to be noted at this point that meaning is relative and dependent on historical and cultural contexts (Kuhn, 2021; Viveiros De Castro, 1998). Without knowing the context, it is virtually impossible to purposely identify the meaning (Kuipers, 2022). Even when the context is known, reconstructing the meaning is a difficult exercise. Understanding that symbols and their meanings are subjective and culturally specific is the key to escaping the Western colonial thought still applied (often unintentionally) to the study of the deep past of complex behaviours. It is necessary to stop the urge to recognise (here intended as imbuing with meaning) and interpret the images that past humans left behind. It is a futile exercise, whose sole purpose is to celebrate the accomplishments of our species and to fuel discussions at times pointless. Images without a clear meaning for our perception are not 'meaningless', rather they offer a different window onto past cultures, which are not to be labelled inferior, or 'Other'. By using a more relativist approach (i.e., there is no absolute truth but rather different truths that are bound to particular cul-

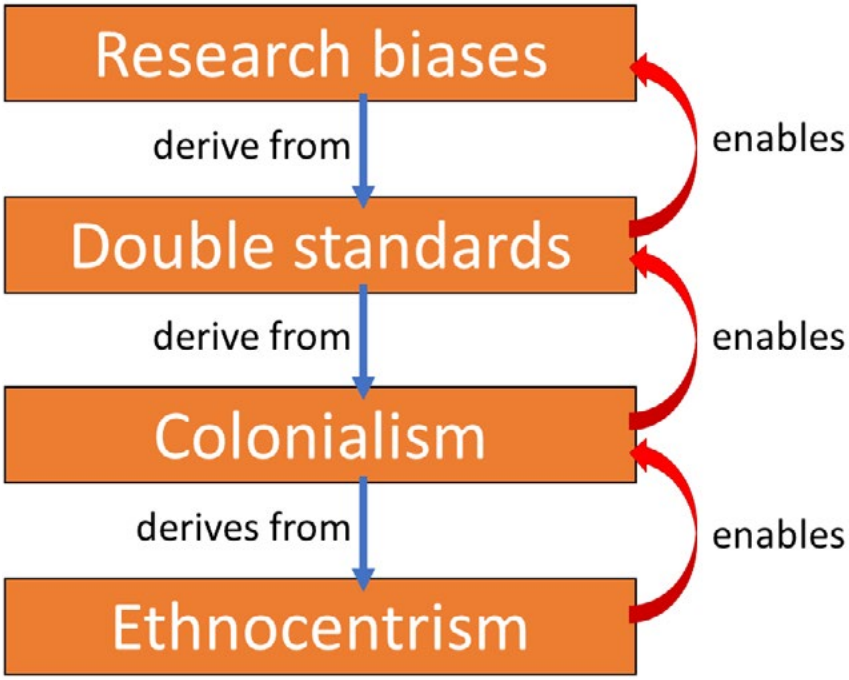

Figure 3: Summarisation of the four main epistemological steps argued for in the article. Research biases in the Palaeolithic are derived from the double standards applied in the archaeological research, which derive from the colonial mindset, which in turn derives from an underlying universal Ethnocentrism. The image shows that the flow can work also the other way by starting from the ethnocentric mind (image by the author).

tural, environmental, or social realities), it is possible to escape the ethnocentric mind applied to the deep past. Hussain (2020, p. 486) remarks that the decolonization of a mindset requires foremostly the recognition of the plural and ephemeral nature of knowledge. I would add that the decolonizing efforts should stem from the negation of the existence of the dogmatic truth, and the acknowledgement of multiple perspectives that might be diametrically opposed to the one of our (Western) society. This is the essence of the relativistic thought.

It is essential to keep in mind that art due to its inherent symbolic nature, communicates (and even manifests itself) often in unexpected ways. For this reason, it is important to consider more perspectives coming from other contexts, and in this sense, the too often suppressed Indigenous knowledge can be a precious help. By applying a relativist framework, it is possible to understand that a single object or representation can have different levels of interpretation relative to the system used for their study. In relativist terms, none of the possible interpretative levels are true by themselves, however, I would argue that different perspectives together can be used to approach what might be called a better approximation. Hussain (2020, p. 486) reminds us that "working together with, rather than against" Indigenous knowledge can produce unexpected, better results. Thus, through the relativist framework, an Indigenous perspective might force us to think about radically alternative scenarios and perspectives related to the emergence, creation, manifestation, and ultimately interpretation of deep past artistic expressions (Hussain, *personal communication*, January 9, 2024). Once it is possible to accept the existence of several, different interpretative levels, it is not necessary to find meaning to recognize the existence of a higher cognitive sphere.

CONCLUSION

Decolonizing the deep past is not only a way of acknowledging that there were other 'humans' walking alongside us but also a way of questioning that part of the Western knowledge system rooted in colonialism and based on the refusal of other systems. For many years since the discovery of the first Neanderthal remains, our evolutionary relatives were seen as cavemen capable only of surviving. Luckily, a growing number of archaeologists are starting to see beyond the "Modern Human Superiority Complex" and questioning the old interpretations produced by what I referred to as 'colonial mindset'. I have argued that a universal ethnocentric mind is at the base of colonialism in which archaeology as a discipline is rooted, which in turn enabled and still enables double standards applied to the study of the deep past, creating biased interpretations of other cultures and also other species such as HN. A more relativistic framework can be used to escape the ethnocentric trap into which the Western knowledge system too often falls. Nowadays, Neanderthals are increasingly recognized as worthy of the coveted title of 'humans'. The framework here proposed not only allows revaluating hominin species from our common past but provides also the opportunity to rediscover sup-

pressed Indigenous perspectives and offers another way of giving voice to neglected and overlooked realities.
By decolonizing the deep past of humanity, it is possible to acknowledge the incredible achievements of other hominin species and to change the perception we have of ourselves. We are not more *sapiens* or 'exceptional' than other past hominin species, and what is seen as our natural right of disposing freely of our environment needs to be revisited. In the end, as Finlayson (2010) stated, we stand alone on this planet not because we are the smartest species, but maybe because we are the luckiest one.

Acknowledgements

The background idea for this work has been elaborated following some of the concepts discussed in the RMA course *Advanced Themes in Archaeology*. I would like to express my gratitude to Dr. Alexander Verpoorte for his precious comments and insights on earlier versions of this paper, and to Karel Kuipers for providing useful feedback and nice, always funny discussions. I would like to thank the editors of Inter-Section and the two reviewers (Dr. Shumon Hussain and Dr. Davide Delpiano) whose fair criticisms made this a way better (and very different!) work. Finally, I would like to thank Dr. Francesca Di Cicco for convincing me to write this paper and providing precious feedback.

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NATURE AS KIN

RECONSIDERING EVIDENCE OF AGRICULTURE IN SOUTHWEST AMAZONIA IN THE EARLY HOLOCENE

ROSA MASON

ABSTRACT:
Palaeoecological evidence for southwest Amazonia reveals subtle but complex botanic management stretching back 10,000 years. In situ cultivation of root crops in managed tree groves comprised a pattern of polyculture agroforestry that left a marked footprint on modern floral biodiversity. This evidence rejects traditional archaeological definitions of 'agricultural societies' and indicates the need to rethink how we approach archaeobotanical remains in tropical forest environments. This forms the basis of a proposed new paradigm for approaching the archaeobotanical record: familiarisation. Familiarisation draws on Amazonian anthropological theory and ethnography to conceptualise human-nonhuman relationships as fluid, reciprocal, and laden with ontological significance. Applied here to the early and middle Holocene in Amazonia (c. 10,000-4,000 calBP), it is a productive milieu for examining horticulture systems in the deep past.

KEYWORDS:
Archaeobotany; Anthropology; Landscape archaeology; Domestication; Tropical archaeology

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INTRODUCTION:

Domestication has long been perceived as the foremost indicator of agriculture (Ford, 1985; Rindos, 1984; Smith, 2001; Zvelebil, 1986), with archaeobotanical evidence of domestication used to determine when past societies 'crossed the threshold' into farming (Smith, 2001, p. 14). This assumption, based on evolutionary schemas developed for the Neolithic Near East (e.g., Childe, 1936), associates agriculture with cereal farming in temperate ecozones. Methodologies for detecting agriculture are often biased towards this ecological context, relying on morphogenetic change in plants to establish whether cultivation occurred.[1]

Relying on morphogenetic change as a marker of domestication (and therefore agriculture) is flawed. Domestication traits develop slowly and inconsistently, only becoming observable once a species moves outside its natural range (Pearsall, 1995, p. 159). Further, factors including genetic disposition, reproductive strategy, environment, and manner of exploitation affect if and how a given species will exhibit adaptations to domestication (Denham et al., 2010, pp. 2-4, 39; Piperno, 2011). Throughout time, complex patterns of plant selection, management, and translocation have given rise to new varieties or hybrids, with convoluted effects on the genetic architecture of plant families and the species composition of landscapes (Barton & Denham, 2011, pp. 21-22; Clement et al., 2010; Kantar et al., 2017, p. 975; Larson et al., 2014, pp. 6142-3). Consequently, relying on identifiable morphogenetic signals for domestication can result in an incomplete reconstruction of past societies' botanic management practices.

This issue is compounded in understudied environments in archaeologies of agriculture, such as tropical forests. Tropical forest cultivation practices are often subtle, diverse, and difficult to trace in the archaeological record (Denham et al., 2007; Neves & Heckenberger, 2019; Piperno, 2011). This article considers evidence from archaeobotany, ecology, anthropology, and ethnography to

1 Morphogenetic change is change in a plant's form and/or structure according to environmental conditions and genetic predisposition.

reconsider traces of early Holocene horticulture in southwest Amazonia.[2] The resulting transdisciplinary synthesis probes the way human-landscape relationships are traditionally (mis)represented in archaeology.

STUDY AREA

The interfluvial hinterland of southwest Amazonia (Fig. 1) has often been portrayed as 'untouched' by human activity prior to European colonisation (e.g., Bush et al., 2015; Lathrap, 1968; McMichael et al., 2012; Meggers, 1954, 1991; Steward, 1948). Since the 1980s, palaeoenvironmental and ethnographic research has increasingly challenged this claim, suggesting local communities shaped this landscape for 10,000 years pre-colonisation – albeit without domesticated field-crops (e.g., Balée, 2002; Denevan, 1992; Erickson, 2006; Heckenberger et al., 2003; Iriarte et al., 2020). Important sites of archaeobotanical analyses include the habitation site Teotonio (archaeological contexts beginning c. 9,000calBP), the anthropogenic 'forest-islands' of Llanos de Moxos (archaeological contexts beginning c. 10,850calBP), and geoglyph sites in Acre (archaeological contexts beginning c. 4,400calBP).[3] Southwest Amazonia has also been the subject of region-wide analyses into forest composition and plant phylogenetics (e.g., Levis et al., 2017; Schaal et al., 2006). This combination of evidence reveals southwest Amazonia as one of the earliest centers for horticultural experimentation globally (Watling et al., 2018).

METHODOLOGY

This article adopts a multidisciplinary approach to summarise evidence of anthropogenic land-management in southwest Amazonia from c. 10,000-4,000calBP.[4] It integrates archaeobotanical and ecological data with anthropological frameworks, namely *multispecies perspectivism* (Viveiros de Castro, 1998) and *interspecies consubstantiality* (Vilaça, 2002). Discussed ethnographic data is not intended to be projected onto early and mid-Holocene communities; rather, it demonstrates that Euro-American definitions of agriculture, landscape, and personhood are not universal. This multidisciplinary approach elucidates the potential of considering alternative ways of thinking when interpreting evidence of past horticultural activity.

POLYCULTURE AGROFORESTRY IN SOUTHWEST AMAZONIA IN THE EARLY TO MID-HOLOCENE: (PALAEO)ECOLOGICAL AND ARCHAEOBOTANICAL EVIDENCE

Archaeobotany and (palaeo)ecology offer useful contributions towards reconstructing past landscape management in southwest Amazonia. Table 1 summarises plant micro- and macrofossil evidence for three key archaeological site complexes (Teotonio, Llanos de Moxos, and Acre), alongside forest composition analyses and phylogenetic investigations from the broader region. Synthesising these lines of evidence suggests early to mid-Holocene

Figure 1: Map of study area, circled in orange: southwest Amazonia (SW). Major rivers and sites mentioned in this paper are marked (map data from OpenStreetMap).

2 Horticulture is defined here as the subdivision of agriculture related to the cultivation of plants.
3 For dating of sites, see Watling et al. (2018) for Teotonio, Lombardo et al. (2020) for Llanos de Moxos, and Watling et al. (2017) for Acre.
4 These dates represent the early and middle Holocene in this region as defined in Capriles et al. (2019) and Lombardo et al. (2020).

communities in southwest Amazonia practiced cultivation systems centered on small-scale polyculture and agroforestry.

Various arboreal and herbaceous resources are attested in the archaeobotanical record of the early Holocene (c. 10,000-6,000calBP), including palms, tree nuts and fruits (e.g., Brazil nut, guava), cucurbits (e.g., gourd), and roots and tubers (e.g., leren, manioc). Pollen and phytoliths found in the Llanos de Moxos indicate that after c. 6,000calBP more cultigens were integrated into food procurement systems, including maize and a variety of rice (Brugger et al., 2016; Hilbert et al., 2017; Lombardo et al., 2020).[5] At Teotonio, this time period is marked by the appearance of an exotic bean (likely *Phaseolus* sp.), implying the translocation of this cultigen into southwest Amazonia prior to c. 6,000calBP (Watling et al., 2018). Bean plants are phosphorus-demanding, suggesting soil enrichment would likely have been necessary to grow them at Teotonio (Watling et al., 2018, p. 21). Alongside other macrofossil and phytolith evidence (Table 1), this evidence suggests communities in southwest Amazonia were practicing low-intensity polyculture incorporating root crops, cereals, and/or legumes by the mid-Holocene. Supporting this interpretation, phylogenetic investigations indicate plants like manioc (*Manihot esculenta*) and peach palm (*Bactris gasipaes*) were being actively manipulated in southwest Amazonia from c. 9,000-8,000calBP (see Table 1).

Archaeobotanical remains in this region are often accompanied by palaeoecological traces of soil preparation. In the Llanos de Moxos, the deposition of organic waste including shell, animal bone, burnt earth, and charcoal increased soil fertility and created up to 4700 'islands' of anthropogenic soils (raised patches above the wet-season water level) (Lombardo et al., 2020, pp. 192-4). These sediments contain phytoliths from squash, manioc, jackbean, chilli pepper, and peach palm dating as early as c. 10,350calBP (Table 1). The *Cucurbita* rind phytoliths are larger than phytoliths from wild varieties, indicating the possibility of consistent low-intensity cultivation in these early Holocene 'gardens' (Lombardo et al., 2020, pp. 190-1).[6] This data is corroborated by pedological findings elsewhere in Amazonia indicating that anthropogenic soils are closely associated with cultivation activity including scraping or turning soils, burning, and localised forest disturbance (Arroyo-Kalin, 2010; Iriarte et al., 2020; Robinson et al., 2021). Such practices create an environment conducive to small-scale growing of cultigens like manioc, squash, and maize (Watling et al., 2018, pp. 21-22).

This 'gardening' likely took place in tandem with agroforestry: the management and manipulation of tree groves to encourage useful species, increase yields, and attract fauna for hunting (Latinis, 2000; Terrell et al., 2003, p. 335). Agroforestry practices – including seed dispersal, weeding, localised disturbance, and systematic harvesting[7] – rarely result in morphological change to tree macrofossils (seeds, nuts, and fruit parenchyma) (Fuller et al., 2023, p. 643). Yet tree resources were central to early Holocene communities in southwest Amazonia; combining archaeobotanical evidence with ecological data suggests these communities shaped the structure and composition of the forest landscape. Brazil nut, for example, is consistently attested in archaeobotanical assemblages from at least 9,500calBP and appears to have been anthropogenically dispersed throughout Amazonia from the southwest during the early Holocene (see Table 1).

Combining microfossil and forest composition data indicates intentional forest disturbance was a central component of past subsistence strategies. Localized burning and clearance help stimulate the growth of useful species like Brazil nut and guava: key arboreal resources attested in the archaeobotanical record (Levis et al., 2012; Watling et al., 2017, 2018). Such practices likely contributed to modern forest composition, creating patches dominated by useful species including peach palm, Brazil nut, bamboo, and fruit trees (Levis et al., 2012, p. 1; Stahl, 2015, p. 1600).[8] Across the Amazon, these useful species are '*five times more likely [...] to be hyperdominant*' than tree species with no history of anthropogenic management (Levis et al., 2017, p. 925). Statistical analyses indicate their abundance and richness in southwest Amazonia is most influenced by anthropogenic factors (see Levis et al., 2017, p. 925), and their distributions correlate strongly with the location of archaeological 'anthrosols' (anthropogenically-fertilised soils associated with habitation sites) (Thomas et al., 2015). Similarly, phytolith assemblages from the Acre site complex show a positive correlation between increased human-driven burning events and an increase in useful palm species (Table 1). Further, nine of the ten most abundant tree species in the forests around these sites today are useful species.

A comparison of modern and archaeological phytolith samples suggests this forest composition has remained broadly similar since the mid-Holocene, raising the possibility of a palm-dominated agroforestry system in the region by this time (Watling et al., 2017).

5 Also see Iriarte et al. (2020) for contemporaneous evidence of maize cultivation at other Amazonian sites.
6 The *Cucurbita* rind phytoliths described here, likely representing a type of squash, fall within the range of some domesticated *Cucurbita* species; however, similar phytoliths found in later layers do not show evidence of change in size, suggesting a lack of domestication pressure (Lombardo et al., 2020). Consequently, it is still unclear if these microfossils represent a domesticated species.
7 For discussion of palaeoecological evidence for agroforestry practices in southwest Amazonia, see: Clement (1999, pp. 189-92), Clement et al. (2015), Kern et al. (2015), Levis et al. (2017), Lombardo et al. (2020), Miller and Nair (2006), Oliver (2008, pp. 202- 203), Stahl (2015, p. 1600), and Watling et al. (2018, pp. 18, 23).
8 Modern ethnobotanical research has observed higher species diversity and richness in anthropogenic soil sites (both current and historical) than in adjacent areas of primary forest, including a higher proportion of useful species (Balée, 1993; Erickson & Balée, 2006; Junqueira et al., 2010, 2011).

Table 1: Data on early and mid-Holocene cultivation practices in southwest Amazonia, grouped by discipline (archaeobotanical lines of evidence in pink; ecological lines of evidence in green). Focal sites discussed in this article are marked in bold.

	Category of evidence	Chronology	Evidence of cultivation
Archaeobotany	*Microfossil record (pollen, starch, phytoliths[1])*	c. 10,400-8,000calBP	**Llanos de Moxos:** Phytolith evidence for regular and consistent co-exploitation of a range of useful species including: arrowroots (Marantaceae sp.), sedge tubers (Cyperaceae sp.) and Heliconia sp. rhizomes from c. 10,400calBP; manioc (*Manihot* sp.) by c. 10,350calBP; squash (Cucurbita sp.) by c. 10,250calBP; leren (*Calathea* sp.) by c. 8000calBP (Lombardo et al., 2020).
		c. 9,500-6,500calBP	**Teotonio**: Phytoliths evidence for the cultigen leren (*Calathea* cf. *allouia*) (Watling et al., 2018).
		c. 6,800-4,000calBP	**Llanos de Moxos**: Phytolith evidence for regular and consistent co-exploitation of cereals: maize from c. 6850calBP; and wild rice by c. 5300calBP, with evidence of selection pressure for larger grains by c. 4000calBP (Hilbert et al., 2017; Lombardo et al., 2020).
		c. 6,495–6,400calBP	**Teotonio:** Phytolith evidence for extensive exploitation and processing of manioc (*Manihot esculenta*) (Watling et al., 2018).
		c. 6,000calBP	**Llanos de Moxos:** Palynological profiles indicates maize cultivation, and possibly that of edible species in the Annonaceae and Cucurbitae families (Brugger et al., 2016; Burbridge et al., 2004).
		c. 6,500-5,500calBP	**Teotonio:** Residue analysis of lithic artefacts has yielded starch grains of a useful local palm species (*Attalea maripa)* and an exotic bean species (*Phaseolus* sp.) (Watling et al., 2018).
	Macrofossil record	c. 9,500-6,000calBP	**Teotonio:** Carbonised parenchyma tissue of tubers and/or roots, alongside charred remains of Brazil nut (*Bertholletia excelsa*) and fruit including *pequiá* (*Caryocar* sp.), guava (*Psidium* sp.), and fruits from palm species, found in an early to mid-Holocene context. A single fragment of bean, possibly belonging to a *Phaseolus* sp., was also recovered in this context (Watling et al., 2018).
		c. 1,600-600calBP	**Llanos de Moxos:** Evidence of well-established and systematic reliance on a range of cultivated plants including palms, fruit trees, and Brazil nut trees, cereals such as maize, and parenchymous storage organs including manioc (Bruno, 2010). Though macrofossils have not been recovered from earlier contexts, these finds correlate with the early and mid-Holocene microfossil record (see Lombardo et al., 2020).
	Charcoal record	c. 6,000calBP	**Llanos de Moxos:** Macroscopic charcoal peak suggests local biomass burning in association with palynological evidence of maize cultivation (Brugger et al., 2016; Burbridge et al., 2004; Iriarte et al., 2020).
		c. 4,400-3,600calBP	**Acre:** Charcoal peaks indicative of anthropogenic burning events, succeeded immediately by a 20-30% increase in phytolith count for useful palm species (in spite of wet climatic conditions non-conducive to palm colonisation) (Watling et al., 2017).

[1]*Phytoliths: fossilised silica-based features in plant tissues.*

	Category of evidence	Chronology	Evidence of cultivation
Ecology	*Forest composition analyses*	c. 4,400-3,600calBP	**Acre:** Useful tree species including Brazil nut and several fruit trees dominate the forest surrounding archaeological sites today. Modern phytolith sampling in these forests is comparable to the archaeological phytolith samples, suggesting a broadly similar forest composition in the mid-Holocene (Watling et al., 2017).
		Early Holocene	**Region-wide:** There is a statistical correlation between the distribution of Brazil nut stands and the presence of anthropogenic sites, as well as consistently greater density and trunk diameter of trees in stands within 30km of sites (Shepard & Ramirez, 2011; Thomas et al., 2015). Combining these results with ecological data on Brazil nut growth and dispersal and palaeoenvironmental reconstructions of Late Pleistocene habitats (Thomas et al., 2014), alongside studies of Brazil nut genetic diversity (Sujii et al., 2015), suggest a high likelihood of human influence in the dispersal of Brazil nut from southwest Amazonia into central and eastern parts of the Basin (i.e. through trade or incidental translocation).
		Present day	**Region-wide:** Greater distribution, abundance, and richness of tree species with a history of human management and/or cultivation. Such species (including Brazil nut, cacao, and tree grape) are five times more likely to be hyperdominant across Amazonian forests than species with no history of human cultivation, and their spatial distribution in southwest Amazonia particularly appears to be strongly correlated with the presence of human occupation sites (Levis et al., 2017).[2]
	Plant phylo-genetics	c. 9,000-7,000calBP	**Region-wide**: Genetic domestication of the cultigen *Manihot esculenta* (manioc) before c. 7,000 years ago based on archaeobotanical evidence from Peru (Elias et al., 2004; Léotard et al., 2009; Olsen & Schaal, 1999; Rival & McKey, 2008; Schaal et al., 2006) and of *Bactris gasipaes* (peach palm), likely also in the early Holocene (Clement, 1988; Clement et al., 2010; de Cristo-Araújo et al., 2013; Galluzzi et al. 2015; Hernández-Ugalde et al., 2010).[3]
		c. 6,000calBP	**Madeira basin**: Genetic domestication of chilli pepper (both *Capsicum baccatum* and *C. pubescens*), peanut (*Arachis hypogaea)*, guaraná (*Paullinia cupana sorbilis*), and coca (*Erythroxylum coca),* likely by the mid-Holocene based on archaeobotanical evidence for these cultigens (Clement et al., 2010, 2016; Grabiele et al., 2012; Scaldaferro et al., 2018; White et al., 2020).
		Present day	**Region-wide:** High genetic diversity in staple cultigens in the region, such as manioc, suggestive of deep-time cultivation and selection strategies that incorporated both sexual and asexual reproduction to maintain diverse species varietals (Clement et al., 2010; Rival & McKey, 2008).

[2]The tree species studied in Levis et al. (2017) include species with genetic, ecological, geographic, and/or historical evidence for anthropogenic influence on their phenotypic or genetic traits. This list includes 85 species, of which 20 have been shown to be hyperdominant. This research builds on that by Levis et al. (2012) in the upper Madeira basin, which showed that useful tree species such as Brazil nut and cacao appear in anomalously high concentrations and high-diversity clustering than ecological conditions imply they should (Levis et al., 2012).

[3]The earliest archaeobotanical evidence of M. esculenta to date is the c. 7,000-year-old sample from coastal Peru, implying the domestication of this species took place prior to this date (with enough time to then be translocated from southwest Amazonia to the Peruvian coast) (Piperno & Pearsall, 1998, pp. 207-2). Timing for peach palm domestication is speculative, based on observed intensification in palm use starting from c. 9,000 years ago (Morcote-Ríos & Bernal, 2001) as well as the high degree of morphological modification seen in domesticated populations vs. wild populations in the area today (Clement, 1988).

Overall, combined archaeobotanical, (palaeo)ecological, and phylogenetic evidence suggests agroforestry and small-scale polyculture were well-developed food procurement strategies in southwest Amazonia by the mid-Holocene. This form of lower-intensity cultivation can be challenging to interpret from the archaeobotanical record due to the lack of morphologically-distinct macrofossils of domesticated crops. Uniting archaeobotanical, palaeoenvironmental, and ecological evidence can elucidate early land-management practices. This interpretation is strengthened by considering anthropological theory and ethnographic data. The next section discusses anthropological perspectives on human-nature interaction in Amazonia with the aim to integrate them into archaeobotanical interpretations of early cultivation systems.

INTRODUCING ANTHROPOLOGICAL PERSPECTIVES: INTERSPECIES MUTUALISM AND KINSHIP

Across the Amazon, 'personhood' is a flexible and dynamic identity category applied to animals, plants, objects, spirits, and natural features (Fausto & Rodgers, 1999; Vilaça, 2002; Viveiros de Castro, 1993, 1998). All beings share a common spirit ('culture') that manifests in different corporeal forms ('natures'); this worldview, termed *multinatural perspectivism* by Viveiros de Castro (1998), governs all human-nonhuman relationships and stimulates complex inter-species dynamics. The concept of *consubstantiality*, meanwhile, describes how all beings in the fluid universe of multinaturalism can be 'incorporated' as kin (Vilaça, 2002). A well documented example is 'pet-keeping', where young wild animals are captured and adopted into a community as kin (see Costa, 2017). Pet-keeping demonstrates the ontological 'universal affinity' that allows all beings to be(come) consanguine (Vilaça, 2002, pp. 349-50). Across different Amazonian languages, the term for 'pets' has a reciprocal term meaning 'owner' or 'master'; yet the same terminological pair is also used to refer to chiefs/followers, adoptive parents/children, and shamans/guiding spirits (Fausto, 2008, pp. 330-4). This suggests human-nonhuman relationships can be comprised of a complex blend of mastery and familial care.

The same terminological pair is used to describe the relationship between plants and (human) gardeners. Across Amazonian communities, plants are often associated with family, fertility, and regeneration (Fausto & Neves, 2018, pp. 1606-7). Ethnographies frequently report a perception of plants not only as persons, but as *children* of human cultivators (Heckler, 2004; Miller, 2011; Nimuendajú, 1939; Rival, 2001; Seeger, 1981; Taylor, 2001). This parental bond is observed across diverse communities for a range of cultivars, including manioc (Hugh-Jones, 1980, pp. 123-33), maize (Miller, 2011, p. 76), peanuts (Silva, 2009), and sweet potato (Fausto & Neves, 2018, p. 1612). The bond often manifests in practices such as giving plants human names, singing songs to them, and other forms of ceremonial respect such as abstaining from sex after planting (Lagrou, 2007 in Miller, 2011, p. 82; Nimuendajú, 1939, p. 90).

Celibacy in these instances is motivated by the idea that human cultivators are co-producing plants with nature spirits (Fausto & Neves, 2018, p. 1612). The harvest and consumption of 'co-parented' cultigens has diverse ritualistic associations. For the Cashinahua, maize becomes male semen after ingestion and thus plays a role in conceiving future human children (Lagrou, 2007 in Miller, 2011, p. 82). Among the Araweté, where maize is largely consumed as beer, the fermentation process is led by women and discussed as a form of incubation or pregnancy (Viveiros de Castro, 1992, p. 129). In Barasana worldviews, meanwhile, manioc plots are 'the site of human conception and birth' (Hugh-Jones, 1980, p. 115).[9] These examples illustrate that, just as humans parent plants, plants parent humans.

FAMILIARISATION: A PROPOSED NEW FRAMEWORK FOR UNDERSTANDING THE ARCHAEOBOTANICAL RECORD OF SOUTHWEST AMAZONIA

Anthropological theories illuminate how horticulture systems can be enmeshed in other dimensions of meaning, with important implications for approaching the archaeobotanical record. A model for detecting early agriculture founded on ideas of ownership and domination of nature – i.e., a *domestication* model – is ill-fitting to contexts where horticultural practice is integrated into the broader landscape. Indigenous Amazonian worldviews today describe a landscape that cannot be divided, practically nor ontologically, into areas 'in' *vs.* 'outside' the human domain. Early and mid-Holocene forest-gardens encompassed diverse resources and practices in subtle, spatially-diffuse systems of ecological management. Considering anthropological perspectives, we can envisage forest-gardens also as spaces where inter-species kinship was enacted and (re)affirmed. These spaces challenge the assumption that efficiency and homogeneity are always guiding principles of cultivation practice, suggesting that environmental manipulation strategies can be modulated by factors such as familial care, social regeneration, and cultural responsibility.

Shifting what we consider the purpose of cultivation requires us to shift how we seek evidence of it. I propose 'familiarisation' as an alternative paradigm to 'domestication' for interpreting the eco-archaeological record (Table 2).[10]

9 For further examples of beliefs and practices related to the regenerative power of plants in Amazonia, see: da Matta (1973, pp. 284-7), Miller (2011), Nimuendajú (1939, pp. 89-90, 134), and Posey and Plenderleith (2002).
10 'Familiarisation' refers to bringing something into the human sphere on levels beyond the pursuit of immediate functional return; it is a term laden with connotations of reciprocal care and multi-directional effects (Fausto & Rodgers, 1999).

Table 2: A summary of two alternative theoretical approaches to studying agriculture in archaeology: Domestication (traditional paradigm) and Familiarisation (proposed paradigm). Inspired by Fausto & Neves (2018).

	DOMESTICATION	FAMILIARISATION
Scope	Focuses on single species or species families. Prioritises the study of these species' physical and genetic changes.	Shifts the focus to landscape-wide analysis. Prioritises the study of human ecological practices and collaborative interactions with nature.
Conceptualisation of human-nature relationship	Sees humans as dominating nature, and therefore as the (sole) creators of 'civilization'. Neglects the agency of nonhuman beings.	Recognises the multidirectional complexity of human-plant interactions. Decentres humans within the landscape, recognising the important roles of nonhuman beings in co-creating environments.
Philosophy of history	Teleological: agriculture is portrayed as a unilinear development towards increasing human domination over nature. Focuses on agricultural origins and human 'progress' in evolutionary schemas designed to distance modern (Euro-American) civilizations from the 'savagery' of prehistoric and non-European societies.	Acknowledges the variable rate of change and patterns of flux characterising the historical development of human societies. Actively combats the legacy of evolutionary schemas of development, as part of the broader mission of decolonising academia and empowering non-Eurocentric epistemologies.
Perception of human agency	Prioritises the functional, economic motivations behind past peoples' practices and habits.	Recognises the multilayered and entangled patterns of knowledge, belief, and behaviour that constitute past lifeways.
Underlying epistemology	Reflects Euro-American perspectives on nature and on human behaviours.	Integrates 'alternative' understandings of nature and the drivers of human action/thought.

The familiarisation framework requires archaeobotanists to recognise certain important principles (drawn from Fausto & Neves, 2018; Neves & Heckenberger, 2019; Terrell et al., 2003):

1. Human impact on environment is not limited to morphogenetic alterations; it also involves changing the species composition of landscapes through practices like translocation, regenerative burning, and weeding.
2. There is no guaranteed correlation between the extent of morphogenetic evolution observable in any given species and that species' significance in past livelihoods.
3. Contemporary archaeologists/palaeoecologists are likely to value a species differently to the past peoples who exploited it.
4. Genetic homogeneity was not a universal desire across communities who cultivated plant resources.
5. We must consider the whole "species pool" in which specific domesticates were manipulated (Terrell et al., 2003, p. 325).

The dynamic, mixed-resource cultivation practiced in southwest Amazonia in the early and mid-Holocene appears to have prioritised low-impact ecological interfer-

ence, in the pursuit of biodiverse local environments replete with useful trees, cereals, and tubers. These 'mixed and diversified cultivation systems' (Neves & Heckenberger, 2019, p. 383) represent polycultural 'agroecosystems' shaped by a mix of intentional and uncontrolled factors (Altieri, 2001, p. 109; Fausto & Neves, 2018, p. 1608). Managed tree groves are one example: the cumulative effect of low-intensity activities like pruning undergrowth, controlled burning, and ad hoc seed dispersal (i.e., along walking trails) likely shaped the patches of 'anthropogenic forests' seen today (Franco-Moraes et al., 2019; Levis et al., 2018; Ribeiro et al., 2014). From an ontological perspective, these managed patches represent an ecological space that is both forest and garden, 'wild' and 'domestic' (Fausto & Neves, 2018, p. 1614).

A similar duality exists in the selection and cultivation of herbaceous plants in forest-garden plots. Many Amazonian communities today do not rigidly control the sexual reproduction of staple cultivars within these plots, but rather allow cross-species pollination (Elias et al., 2000; Silva, 2009; Smith & Fausto, 2016, p. 101; Terrell et al., 2003, p. 341-2). Permitting cultivated plants to intermix with 'wild' plants outside the garden system (e.g., through frequent fallows) results in high germplasm diversity and greater intraspecies genetic variety (Carneiro da Cunha & Morim de Lima, 2017, p. 62; Maezumi et al., 2018, p. 543). Data from plant ecology and phylogenetics suggests cultivators in the past also favoured mixed-reproduction strategies: genetic studies of manioc, for example, indicate that early manioc horticulture involved incorporating new seedlings into managed clonal stocks to encourage beneficial traits and maintain varietal diversity (McKey & Rival, 2008). As well as contributing to healthier plant populations (Denham et al., 2020, p. 586; McKey et al., 2012, p. 381), this diversity is likely culturally-significant. Different cultivated species, varieties, and hybrids hosted in forest-gardens each have specific traits suited to different processing or consumption purposes. Further, different varieties often have specific lore attached (including history, songs, and/or rituals), instilling growers with a cultural responsibility to conserve them all (Miller, 2011, p. 73; Terrell et al., 2003, p. 341-2).

Amazonian ontologies revolve around an underlying openness to 'Otherness.' All living beings are 'mutually constitutive,' tied together in patterns of inter-species transformation and kinship (Vilaça, 2002; Viveiros de Castro, 1993, p. 380-382). In this worldview, life arises from 'the incorporation and preservation of small differences' (Fausto & Neves, 2018, p. 1614). Early cultivation systems centred on genetically-diverse polyculture agroforestry can be interpreted as a material enaction of this ontological inclination towards accepting (and encouraging) alterity.

Conclusion

The proposed familiarisation framework incorporates anthropology and ethnography to re-interpret archaeobotanical evidence of early Amazonian cultivation systems. The framework considers how human-plant relationships can form part of broader socio-cultural systems of kinship and reciprocity; it encourages us to consider how prehistoric actions upon landscape may have been guided by a perception of 'plants as people'. In southwest Amazonia, early Holocene forest-gardens were likely both functional and spiritual spaces where floral biodiversity was actively maintained via polyculture and agroforestry strategies. Applying the familiarisation framework to archaeological and (palaeo)ecological datasets from this context suggests that the observed intra- and interspecies diversity was motivated by a complex blend of productivity, sustainability, and cultural responsibility. This case study demonstrates how the familiarisation approach can assist archaeobotanists understand the ways cultural knowledge interweaves with ecological practices and becomes inscribed into landscape.

Acknowledgements

I would like to thank my undergraduate thesis supervisor, dr Alexander Geurds (Leiden University), for supporting me throughout the writing of my initial thesis, and for encouraging me to pursue publication. I also thank my Honours degree supervisor, dr Tim Denham (Australian National University), for helping me refine my ideas. Thank you to the staff at Inter-Section for their feedback, encouragement, and endless patience throughout this process. Finally, I want to thank my parents, David and Rebecca, and my sister Dorothy for the many hours they contributed to reading, editing, and listening to me talk about my work.

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Junior Archaeological Research Journal

ISSUE V
DECEMBER 2024
ISSN PRINTED VERSION: 2452-266X (MAX. 200 COPIES)
ISSN ONLINE VERSION: 2452-2678

Universiteit Leiden
Archaeology