



Debate Response

On cultural traditions and innovation: finding common ground

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We appreciate the respondents' comments on our debate article 'Cultural evolution as inheritance, not intentions' (Bentley & O'Brien 2024). We all agree that traditional cultural practices—such as manufacturing Acheulean handaxes—often take considerable amounts of time to learn; as Gladwell (2008) popularly proposed, it takes 10 000 hours of practice to make an expert. We also appear to agree that cultural practices are intergenerational. As Frieman (2024: 1421) notes, ideas and practices persist because they are “valued, recreated, manipulated, instrumentalised and enacted generation after generation”; and as Ingold (2024: 1417) puts it, traditional tasks “are not subject to the free will of the individual but fall upon practitioners as part of their responsibilities” to their communities. Drawing on the practice of Bronze Age metallurgy, Pollard (2024) asks the million-dollar questions: how does innovation occur, and what causes it? As both Prentiss (2024) and Pollard note, for example, the pace of technological change is often punctuated, an observation common across the natural and social sciences, but one that defies easy explanation (e.g. Duran-Nebreda *et al.* 2024; O'Brien *et al.* 2024).

The superficial similarities between practice theory and evolutionary theory, however, obscure the deep differences, including a rejection by practice theorists of an evolutionary approach to the past. Ingold titles his response ‘On the poverty of academic imagination’, calling upon us to abandon our posture “for more expansive intellectual terrains” so that “we can begin to imagine evolution otherwise”. Frieman refers to the evolutionary view of the archaeological record as perpetuating “deeply racist impressions of Indigenous and First Nations peoples” by viewing them as “uncreative and resistant to change”. She also brings up the common critique that reporting a low rate of change in the archaeological record embraces “the image of a conservative, unchanging and uncreative past”, based on “colonial imaginaries”. Ingold (2022: S32) goes further in a recent article, claiming that the sciences have “foundered on a bifurcation between mind and nature”, which can be resolved only by “relinquishing the concept of inheritance”. To Ingold, long a critic of cultural inheritance, the concept is immoral and “mired in a language of appropriation that has defined the colonial era” (Ingold 1990: 51).

Identifying bias in collected evidence is essential scientific practice—from radiocarbon dates to excavation sampling, ethnography and statistical algorithms—but empirically measuring and explaining modes of change of materials in the archaeological record is valuable analysis. The same applies to the study of evolution as a process. Here, Frieman argues that we “over-reach in attempting to apply an approach adapted for the broad scale of millennia to the small scale of human lives and generations”. But evolution applies at *all* scales, and micro- and macroevolutionary processes work together, as revealed in the palaeontological and archaeological records (Prentiss *et al.* 2009; Fogarty *et al.* 2015; Duran-Nebreda *et al.* 2024), including their dual role in the punctuated evolution of humans (O'Brien *et al.* 2024). As Prentiss (2024: 1423) aptly puts it: “Intent underlies our understanding of both micro- and macro-scale processes of cultural evolution. Lamarckian micro-evolutionary process depends on decision-makers choosing whether or not to accept and sometimes alter cultural traits.” We could not have said it better.

A related misunderstanding concerns continuity. Ingold sees behaviours such as a specialised craft as being part of a continuous process that “has no start or end points; it just continues, *as life does*” (emphasis added). Yet, life *does* end. Life beginning and ending is what evolutionary archaeology, like evolutionary biology, is all about: understanding the life histories of related organisms, lineages and clades. Anthropologists and psychologists who study life histories have shown, for example, how physiology, brain size and alloparenting are related to humans needing years of development and parental investment to learn complex skills and expertise (Nettle *et al.* 2013; Gopnik *et al.* 2020). Children of hunter-gatherers, for example, do not peak in terms of foraging production until they are into adulthood, often over 20 years of age (Kraft *et al.* 2021). This is why cultural behaviours and language need to be *learnable* to remain sustainable (Smith *et al.* 2017). Practices that are not learned by the next generation disappear, like the flickering-candle example that Polard describes.

Ingold misunderstands this intergenerational learning process, imagining that novices learn from experts and are then left on their own. This mischaracterisation might apply to early ‘transmission chain’ experiments (passing a message from one person to the next), but research into cumulative cultural evolution—ranging from non-human animals to social-learning experiments in groups of people, to generational studies, to theoretical models—confirms the benefit of group co-operation. The more complex the knowledge, the more it is distributed among wider networks of people working together. The literature on cumulative cultural evolution (e.g. Derex 2022) is filled with insights for archaeologists, such as the effects of population size, specialisation and network integration on the evolution of specialised knowledge.

To conclude, we make three final points. First, we disagree with Frieman’s characterisation of kinship as a free-flowing continuum of relationships and obligations. Kinship systems have rules, which might mandate arranged marriages, matrilineal inheritance, matrilineal residence, bilateral inheritance and so on (e.g. Fortunato 2019; Fowler 2022; Cveček 2024). Even naming systems have an intrinsic logic to them that helps people understand how they are related to others within a kinship system (Jones 2010). As inherited culture, kinship systems persist for very long periods of time (e.g. Surowiec *et al.* 2019). Second, Ingold’s statement that experimental archaeologists have had to figure out how to copy artefacts whereas “prehistoric

learners would have worked within the nurturing milieu of a community of practice” is moot (2024: 1417). We cannot get inside the heads of prehistoric flint-knappers, which is why experimental archaeologists undertake reverse engineering (e.g. Eren *et al.* 2016). Third, Ingold suggests that our evolutionary perspective hides “behind a barricade of bibliographic citations, ‘data’ of dubious relevance and vacuous tautology” and could do with being more “imaginative” (2024: 1419). Reviving this old-school approach (e.g. Hawkes 1968)—where the archaeologist’s imagination is prioritised over data or building on published evidence—would be the ticket to obscurity amid the increasingly global, interdisciplinary and multicultural study of the past.

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