

The Quality of the Archaeological Record **by Charles Perreault**

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The Quality of the Archaeological Record tackles a long-standing critique of anthropological archaeology. Presenting a theoretically grounded and mathematically modelled demonstration of the essential futility in reconstructing microscale cultural evolution patterns from the archaeological record, it calls for reorienting the archaeological research program in toto. Objectives are clearly stated at the outset, the argument follows in an organized fashion, and the clarity of exposition is enviable. However, efforts to construct a new vision for archaeology employ interspersed generalised criticisms of archaeologists which impede efficacy of argument while sidestepping broader theoretical issues.

Perreault begins by explaining that archaeology, as a historical science, must seek evidence that can discriminate beyond a reasonable doubt between competing hypotheses (Chapter 1). However, rather than this ‘smoking gun’ approach, much archaeological research relies on tests of consistency, leading to confirmatory bias. Smoking guns are unlikely to ever appear for most questions preoccupying archaeologists today because these are *underdetermined* by the archaeological record (related to the more familiar problem of *equifinality*, see Perreault 2019: 1–2). Four qualities of the archaeological record responsible for the underdetermination problem are elucidated: scope, sampling interval, resolution, and dimensionality (Chapter 2). Next, ways that *mixing* and *loss* of archaeological material and information affect these four qualities are discussed (Chapters 3 and 4). Perreault empirically analyses the

outcome of these largely uncontrollable forces, measuring expected sampling interval and resolution in datasets deriving from archaeological journal articles and regional databases (Chapter 5). It emerges that, despite wide-ranging variability, temporal and spatial intervals increase with age, and are almost always beyond the scale of a human lifetime. This confirms the mismatch between archaeological and ethnographic intervals, supporting the argument of Bailey's (1981, 1987) *time perspectivism*, and of evolutionary archaeologists (Lyman 2007), in a valuable historiographic survey (Chapter 6). Perreault offers reasons why archaeologists have largely ignored the underdetermination problem and how palaeontologists overcame it. Finally, he sets out his vision for a new and improved archaeology purged of individual-level processes underdetermined by the archaeological record but dually focused on cultural histories and macroscale patterns (Chapter 7). Perreault believes that understanding and honesty about the underdetermination problem should lead to such a disciplinary shift. The final chapter summarises the argument and vision for archaeology's future.

On one hand, Perreault's conception of culture history is broad. As "the single most important contribution that archaeology has to offer to the social sciences" (Perreault 2019: 161–2), it includes topics like trade in raw materials, agricultural diffusion, human diets, and even individual-level processes previously critiqued, "but ones that sit at the bottom of Hawkes's pyramid and that are commensurate with the quality of the archaeological record" (Perreault 2019: 164). On the other hand, the questions he considers most promising for macro-scale archaeology are the historical determinist type, namely, how external forces like geography and climate affected cultural evolution. Perreault also lists elements of a strategy for macro-archaeology, focusing on: (i) a narrow set of research questions; (ii) archaeological entities and their distribution in time and space; (iii) general properties of archaeological artefacts; and (iv) large databases with wide spatial and temporal scope.

One discussion question for readers might be, why is Perreault so concerned with answering questions about the human past definitively? Current trends in archaeology favour multiplicity of answers and voices: "The past would be very boring if we all agreed about it. And archaeology would not last very long if we also thought we could work out a final answer to questions such as how we became human" (Gamble 2008: 20). Yet, like others

before him, Perreault wants an exclusively empirical archaeology, essentially the palaeontology of modern humans. He seems driven by a preoccupation with hypothesis testing via confirmation theory—a mark of the neopositivist tradition in North American archaeology—leading him to reject approaches inefficient at achieving this. Although his stated cause is archaeology-wide, Perreault eventually claims his book to be an extension and improvement on time perspectivism (Perreault 2019: 149) for the sake of cultural evolution (Perreault 2019: 136–139). The evolutionary archaeology affiliation is also evident in an expressed desire to acquire seats for archaeologists at the “high table of social sciences” (Perreault 2019: 193; cf. Lyman 2007); not a universally shared goal of archaeologists (Pluciennik 2011). Unfortunately, Perreault’s polemics and generalised criticisms of archaeologists do little to dismantle the stigma of scholars in this tradition as marked by “missionary fervour” in “the conviction that their brand of scientific archaeology is the only true path” (Martinón-Torres and Killick 2015).

That Perreault makes no attempt to tackle theoretical critiques of time perspectivism (Lucas 2005: 43–49; Shanks and Tilley 1987a: 120–127; Shanks and Tilley 1987b) might be excused as reliance on Bailey’s (1987, 2007) responses. Yet, in setting archaeology-wide goals, Perreault should have considered insights of postmodernism, feminism, Marxism, and other reflexive approaches acknowledging archaeology’s role in reconstructing the present as much as the past. Such approaches also offer broader frameworks for problematising underdetermination, begetting alternative visions for the future of archaeological research (Gero 2007). Its duality as both science and humanities makes archaeology distinctive and necessarily defiant of the type of programmatic unification Perreault envisions (Preston 2013). Indeed, a growing consensus of theorists considers the 21st century an era of eclectic archaeology that takes advantage of diverse theoretical and analytical options (Bintliff and Pearce 2011).

Perreault’s point is most powerful in that subset of archaeology concerned with cultural evolutionary hypothesis testing, where much research can be justifiably criticised for underdetermined conclusions. Pressure to publish exciting discoveries exacerbates the problem, pushing archaeologists to overshoot their claims. Perreault convincingly calls for more research on context-specific analysis of the quality of the archaeological record, toward

better understanding possibilities and limitations of archaeological data (see Chapter 5). Likewise, Perreault's argument becomes more interesting when understood as a marriage of time perspectivist and cultural evolutionary approaches. It combines time perspectivism's focus on macro-scalar archaeology that goes beyond the temporally limited ethnographic record, with a desire to produce evolutionary models of culture change. This apparently contrasts with an approach combining evolutionary archaeology's emphasis on cultural change with ethnographically constructed reference points in a time perspectivist framework (Arnold 2008). In even greater opposition is a middle-range theory focused on the "household, neighbourhood, settlement, polity, ethnic group, or population" level to solve the same problem of archaeology's relevance and capacity to generate "predictive knowledge of human affairs" (Ortman 2019).

Perreault's advocacy of macro-archaeology comes at a time when the so-called "Third Science Revolution" in archaeology (Kristiansen 2014) is pushing research in that direction, among others. Advances in chronometric dating, paleoclimatic reconstruction, and biomolecular archaeology, integrated with big data on coins, ceramics, shipwrecks, ports, papyri, roads, waterworks, and more, are producing unprecedented scope, detail, and richness in reconstructions of the past. These developments do not change the cultural attributes of archaeological artefacts and the quality of the archaeological record in Perreault's sense but do have important implications for the issues discussed.

First, they extend the type of information attainable from archaeological artefacts, often transforming understandings of cultural evolutionary processes such as the evolution of food preparation, plant and animal domestication, or technological change (Arranz-Otaegui 2018; Radivojević et al. 2019; Tornero et al. 2020). Second, cross-pollination between archaeology and other disciplines is becoming more of a two-way street. For instance, current estimates of bone collagen turnover rate—important in medicine and physiology as well as forensic and archaeological dating—are based on a study led by archaeological scientists interested in isotope analyses (Hedges et al. 2007). Archaeological science is also enriching interpretations and theory (Martín-Torres and Killick 2015). On the effects of modern human genetics studies, but equally relevant to more recent archaeogenomics, Pluciennik (2011: 38) observes: "although often couched by geneticists in terms of simple 'answers', their pri-

mary value for later prehistory onwards has been to force archaeologists to re-engage with the complexities of the *social and cultural processes[...]*” (emphasis mine). Third, advances in technical processing of big data combined with the cumulative growth of archaeological databases, are advancing the type of macro-archaeology Perreault envisions (Stephens et al. 2019; Turchin et al. 2018; cf. Bevan and Crema 2021). Calls for macro-archaeological synthesis and modelling come also from public archaeology and cultural resource management (Heilen 2020), which provide big data for macro-archaeological analysis (Cooper and Green 2017). Fourth, technical-scientific breakthroughs are changing the information that can be extracted from the archaeological record, potentially affecting limitations of scope, sampling interval, resolution, and dimensionality. One result is that archaeological science is making it possible to systematically tackle some of the most distinctly ethnographic questions which Perreault considers to be inexorably underdetermined. Thus, archaeogenetic studies have revealed lineage patterns which, together with field archaeology, enable the reconstruction of ancient kinship structures (Sánchez-Quinto et al. 2019; Schroeder 2019). In short, archaeological science is simultaneously extending the limits on archaeological data Perreault identifies and making his vision of macro-archaeology possible. Although Perreault does not deny this (but see Sørensen 2016), it will be interesting to witness the extent and ways in which archaeological science will push the limits of the archaeological record in coming years.

Polemics aside, this book offers a lucid, organised introduction to the problem of underdetermination in archaeology that will be valuable to students of archaeology. Perreault could have gained by less generalising and greater tolerance toward archaeologists, even if many of his grievances will be familiar to specialists and lay readers. Readers are advised to sieve the polemical from the rigorous arguments while situating the latter within appropriate theoretical and historiographic context, as I have attempted to do in the foregoing.

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