Robert Chapman and Alison Wylie // Evidential Reasoning in Archaeology

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Evidential Reasoning in Archaeology

Robert Chapman and Alison Wylie

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This volume emerges from years of collaboration between the world-leading philosopher of archaeology, Alison Wylie, and eminent archaeologist Robert Chapman. It analyses the sophisticated ways in which evidence is produced, disseminated, discussed, and interpreted as a defining aspect of archaeological reasoning and practice, and in this sense constitutes a foundational volume for anyone interested in the philosophy of the historical and social sciences. However, the main argument of the book and its significance extend far beyond archaeology and into the very foundations of the philosophy of science.

Building on Wylie's prominent contributions to understanding what it means to 'think about things' ([2002]), the book starts with an overview of the epistemic power of what the authors call 'material evidence', that is, the use of objects as an epistemic resource for understanding past events. Particularly useful and timely is the authors' recognition of an unavoidable tension in the epistemic status of objects used as evidence, which they dub 'the paradox of material evidence' in their introduction. On the one hand, objects have the power to 'correct entrenched dogma' by providing quite literally the hard facts on which hypotheses can build or fall. In that sense, and in line with a long empiricist tradition, they have often been portrayed as bearers of truth, because arguments that accord with concrete findings are generally viewed as harder to counter than arguments built on hypotheses or simulations. On the other hand, extracting knowledge from objects—making them 'speak' their truth—is never trivial nor unaffected by human judgement and expectation. Interpretation filters and shapes what researchers wish objects to say. Many different types of data can be extracted from physical objects—a point that Wylie has illustrated in other parts of her work (for example, Wylie [2017])—and several, often incompatible, methods and approaches can be selected to interpret those data in order to decipher what objects may reveal about the past. There is no obvious way to escape this tension; it needs to be respected and managed as as an unavoidable part of the archaeologists' purview, as the authors consistently and convincingly argue throughout the book.

This sensitivity is no doubt enhanced by Wylie's scholarship in standpoint epistemology, where the recognition of the epistemic power of situated viewpoints is crucial to the evaluation of what constitutes 'objective' and 'reliable' knowledge. And indeed, Chapman and Wylie conclude their analysis with a call to 'reflexivity made concrete', defined as 'a matter of continuously testing and refining the tools in use, keeping their problem-specific contingency firmly in view' (p. 213). Chapman and Wylie's main message concerns the norms that shape research and make its outputs reliable and objective.

These norms include epistemic humility, a respect for ambiguity, methodological opportunism, and the capacity to make the best of working conditions that are neither ideal nor fully under the control of the investigators (as actual research situations never are, even when taking place inside a laboratory). This is where the book connects with fundamental philosophical debates about the nature of scientific knowledge, building heavily on scholars who have also carefully considered the conditions under which beliefs about the world are formed—such as Helen Longino, Peter Galison, and Hasok Chang. This is also where the book succeeds in rescuing scientific methods from the clutches of 'post-truth' propaganda, according to which the failure of science to conform to god-like standards of infallibility and consensus is taken as an indictment of its epistemic power. In Chapman and Wylie's own words: 'the goal of inquiry is not to produce knowledge claims that are true in all contexts of practice and transcendent of local interests, but rather to warrant knowledge claims as credible given available resources, and reliable for specific purposes' (p. 11). When viewed from this perspective, archaeology exemplifies the resourcefulness, historical sensitivity, and attention to the goals and limits of inquiry that make scientific methods so successful in providing reliable knowledge.

The central part of the book brings readers deep into the conceptual, methodological, and interpretative debates animating contemporary archaeology, while also using the authors' extensive knowledge of the history of the field to explain how such controversies emerged in the first place. Chapter 1 sets out the philosophical framework and empirical motivations for the book. It starts with a review of the epistemic pessimism that marked archaeology over the last sixty years, including the 'crisis debates' associated with the scarcity, unreliability, and theory-ladenness imputed to archaeological evidence and the controversial nature of the typological systems used to order and interpret available data. The authors portray the field as stuck between two opposing positions: a positivist belief in confirmation structures and universal standards of inferential adequacy, such as that advocated by the New Archaeology school of the 1960s and 1970s, and a social constructionist stance, such as the 'post-processual' backlash in the 1980s and 1990s. They then build on existing philosophical critiques of unrealistic expectations of deductive certainty—including Stephen Toulmin's ([1958]) construal of critical reason, John Norton's ([2003]) material theory of induction, Chang's ([2004]) work on epistemic iteration, and Bill Wimsatt's ([2014]) conceptualisation of the role of scaffolds for cultural evolution—to argue for the significance of what they call 'inferential scaffolding' in the development of knowledge. In short, inferential scaffolding consists of the set of tools, strategies, and arguments that archaeologists need to develop to make sense of their data, interpret them in ways that are robust to potential challenges, and modify interpretations in the face of new findings.

Chapters 2 focuses on archaeological fieldwork and the significance of strategies for collecting, recoding, and storing primary data in ways that are reliable through time, whether or not the original site is preserved. Here the storage and dissemination of archaeological data reminds readers of the chains of custody, and related norms of reliability and trust, used to handle forensic evidence. Examples such as the structuring of 'context recording' sheets and the choice of units of analysis in the field illustrate vividly the importance of excavation practices, norms, and skills as ways of 'seeing material traces as archaeological data'. Through careful analysis of the conceptual implications of judgements made during excavation and subsequent data processing, this chapter provides a ground-breaking introduction to the epistemic significance of fieldwork, a crucial phase of research in many disciplines nonetheless largely

disregarded by philosophers thus far. It also echoes Gilbert Ryle's and Michael Polanyi's work on embodied knowledge and the role of training in shaping researchers' perception, abilities, and conceptual commitments.

Chapter 3 turns to the resources employed to calibrate and reinforce these primary data through multiple lines of evidence, so as to enhance the robustness of evidential reasoning and its conclusions vis-à-vis alternative interpretations, and to make it possible to re-interpret old data in new ways where needed. The role of new technologies in the extraction of data from materials, such as the use of geological information systems (GIS), is rightly stressed as a catalyst for interpretive challenges and innovation in archaeological thinking. Chapman and Wylie also consider the role of models and simulations in complementing experimental manipulation, and the ecology of intersecting inferences that ground vast conceptual interpretations of past events and behaviours (such as the social structures and norms governing Iron Age society at Glastonbury in contemporary England). This paves the way for the discussion of trading zones and collaboration in Chapter 4, where the social conditions and mix of expertise required to sustain such an ecology of inferential practices are discussed at length. These inferential practices are also discussed in relation to the controversial status of radiocarbon decay readings, whose evidential weight and reliability vary considerably depending on available calibrating techniques and metadata. The chapter identifies and discusses five conditions for robust evidential reasoning: security, causal anchoring and causal independence, conceptual independence, grounds for calibration, and addressing divergence. This list is one of the gems in the volume, as it brings together long-discussed concerns within philosophical circles in ways that can contribute to science and philosophy alike, and should be considered by practitioners as much as by philosophers.

There is much to admire in a volume that brings insight to both scientists and humanists, as this book certainly does. The price to pay for readers (such as myself) with no background in archaeology is that some of the examples given are not a straightforward read. Yet, making an effort to follow and appreciate the wealth of detail provided here is rewarding, because it provides an immediate and rich taste of the multiple, dynamic, and sophisticated forms of intervention and reasoning at work in this field. My main concern with the book is not with its empirical contents, but with the rather nebulous treatment provided to the notion of 'evidence' itself. This key term is never defined and is often used synonymously with 'traces', 'data', and 'objects'. This works for the purposes of the main argument in the book, which is to call attention to the epistemic role of material objects in the generation of knowledge about the past. It does not, however, help with unravelling the specific role of data within historical sciences such as archaeology; and while the book provides a considerable step forward in the study of the relationship between data and materials, it does not explicitly provide a clear philosophical conceptualization of that relationship. Consider Figures 1 and 2 (below), which Chapman and Wylie use throughout the book to illustrate the intricacies of the network of warrants and backings necessary to the use of objects within evidential reasoning.

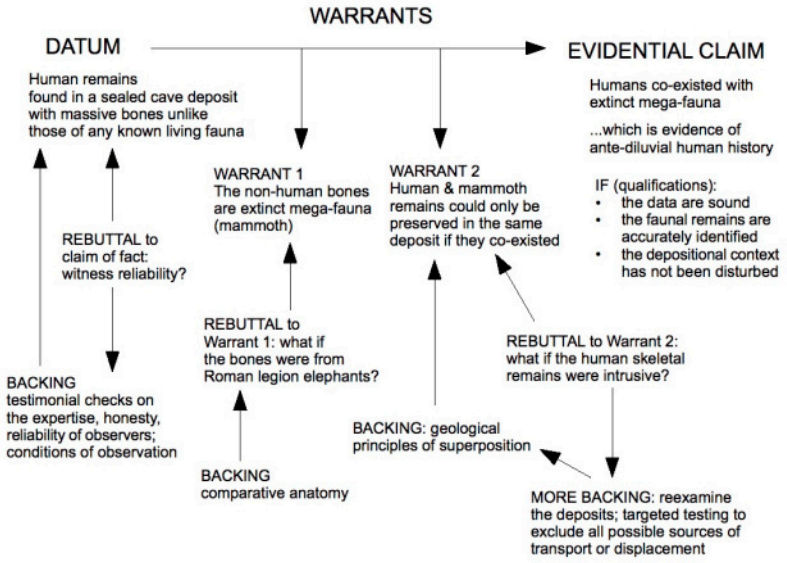

Figure 1. Toulmin's argument schema: components and conditions. (Source: Figure compiled and kindly shared by Alison Wylie, based on Toulmin [1958], pp. 96–8.)

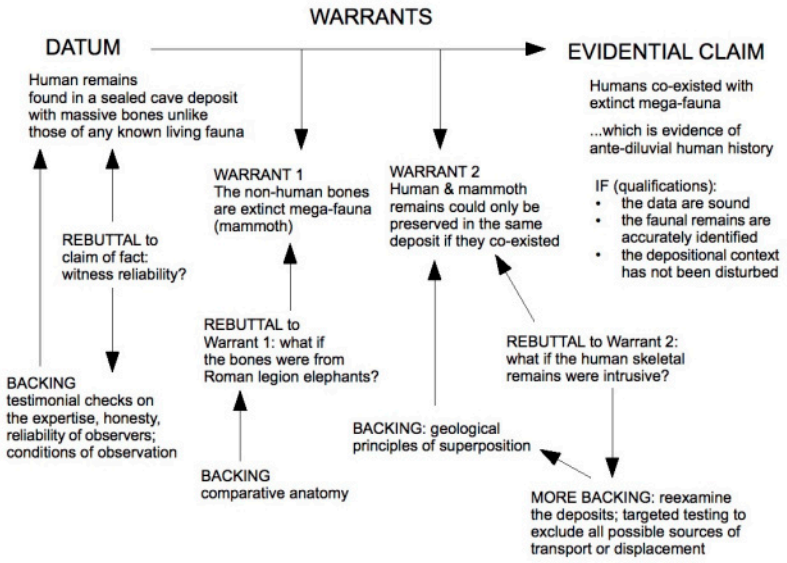

Figure 2. A generic archaeological example of an evidential argument laid out according to Toulmin's argument schema (see Figure 1). Toulmin's schema is expanded to recognize rebuttals that arise questions about the facts (the datum) as well as the warrants, and warrants are understood to include not only domain-specific inference rules (Toulmin [1958], p. 91) but also domain-specific material postulates (Norton [2003], p. 648). (Source: Figure and label developed and kindly shared by Alison Wylie.)

The figures usefully foreground the diverse stages of evidential reasoning, and the variety of arguments and counter-arguments required to convincingly establish an evidential link between a given dataset and a claim about phenomena. To do this, however, the figures provide a crude definition of the category of 'datum' as corresponding to the physical objects that archaeologists study—a definition that does not well serve the authors' sophisticated discussions of the variety of data used in evidential reasoning. In this scheme, all data types that are not actual features of objects are classified as functioning as 'warrants'. But it is not clear from the examples given that it is always the objects themselves that drive evidential reasoning and constitute the foundation on which to establish evidential claims. The discussion of the reconstruction of Iron Age society in Glastonbury, for instance, could be interpreted as a situation where secondary data (originally obtained by measuring objects, but then taking on a life of their own) are what really drives the process of inquiry, and indeed this could be said to happen every time an excavation ends, when all an archaeologist is left with are selected traces, including physical objects but also drawings, measurements, and photographs. In which sense, then, are material traces a 'special' form of data? Should we instead view data as artefacts extracted from physical objects through measurement and analysis, as is often assumed in the case of experiments in physics and biology? And indeed, what is meant by 'datum' in this account, and how does this notion relate to contemporary debates on data as quintessentially computable and numerical, rather than material? Is scientific intervention necessary to the extraction of informational content from research materials? And how precisely do objects, as data, feature as credible and verifiable evidence, particularly in the many situations specific to archaeology where objects are unique and impossible to move around? This book provides a much-needed platform from which to pose in an intelligible manner such questions in relation to the historical sciences, and from which to understand their epistemic significance. However, it does not yet provide a full-blown, systematic account of the role of data in archaeological reasoning, and their relation to material objects. I wonder whether a relational view of the nature of data and of situations of inference, of the kind I have developed in thinking about data practices in the life sciences (Leonelli [2016]), could serve the formulation of such an account.

In closing, I strongly recommend this book as exemplifying 'philosophy of science in practice' at its best. It constitutes an important reference point for those interested in strategies for extracting and analysing evidence within complex field situations—where the data sources available are multiple, conditions are not under the control of researchers, and analysis is grounded on concepts and claims extracted from several disciplines, rather than from a unified theoretical framework. The philosophy of archaeology remains a largely unexplored field, and this volume is all the more significant for reminding us of the reasons why archaeology should be playing a more prominent role as an exemplar of what the authors call 'the strategic wisdom-in-practice that lies between tactical norms and abstract theoretical ideals' (p. 7).

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