From the wisdom of old age to a wider debate

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The article by Kuzmin (2019) that opens this section focuses on radiocarbon dating and the reliability of different sampling and preparation procedures. Arguably, however, the debate that he starts reflects a wider challenge within the discipline—and no doubt in other disciplines too. Archaeology has always drawn upon a range of varied skills and methods to achieve its goals. For many of us, it is precisely this expansive and eclectic practice that draws us to the subject. As the discipline has evolved, specialisms have necessarily emerged, and the importance of interdisciplinary work has grown. These developments have facilitated hugely significant advances in understanding, through innovations in scientific methods as well as theories, philosophies and interpretative frameworks. But, as these specialisms emerge and the pace of innovation increases, so our interdependence grows and a communication gap between practitioners may develop. Potential misunderstandings and even ideological dispute may then follow.

The characterisation of archaeology as a theoretical and methodological battle between processualism and post-processualism has long since been put aside. But one need not look far to find signs of a similar-sounding debate playing out daily, most visibly in the context of palaeogenetic research and its reception on social media. Last month, for example, the publication of an aDNA study of Bronze and Iron Age populations from the Levantine port city of Ashkelon (Feldman *et al.* 2019) attracted significant media attention. The results were swiftly critiqued on social media for the framing of the research questions, choice of samples and contextualisation of the results; they were also explicitly politicised through the lens of regional politics (not helped by the emphasis on 'Philistines' in the article title, which poorly reflects the contents). That study and the reactions to it well illustrate some of the 'antagonism' identified by Booth (2019) between archaeologists and palaeogeneticists. In his experience, many archaeologists find aDNA publications problematic because of small or biased samples and insufficient attention to archaeological context. Much of this, he argues, comes down to the misunderstanding of methods and the limits of, and constraints on, palaeogenetic studies; for example, in the use of specialised terminology ('population replacement') and publication practices. In relation to the latter, for instance, he stresses that researchers are limited by career expectations and funding to publish quickly and to direct their work towards journals that do not provide space for the nuance that their critics demand. Booth's attempt to explain and therefore bridge the gap between these groups is welcome, but may not satisfy all. Hakenbeck (2019), for example, critiques the 'unholy Trinity'

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of genetics, archaeology and the far right, and the need for greater awareness of the unpalatable narratives that such data can be made to serve.

Palaeogenetic research has precipitated the most explicit and animated version of a broader issue around working collaboratively across specialisms and disciplinary divides to enhance our understanding of the past. Yet, in practice, the discipline thrives precisely because such diverse approaches cumulatively and collectively advance our knowledge. Neither Kuhnian paradigm shifts, nor C.P. Snow's 'Two Cultures', aptly characterise the reality of archaeological research. Specialisation requires collaboration and the need to rely on the expertise of others—again, hardly a novel situation for archaeology. But as the complexity of the science grows, so the number of specialists involved increases. Ever larger teams working on more and more complex ideas and methods require even greater communication and interdependence.

Whether palaeogenetics or radiocarbon dating, what these examples instantiate is the difficulty of communicating not only with the press and the public (e.g. Brophy 2018), but also among ourselves. If, as Booth suggests, the high-impact journals in which our scientific colleagues are compelled to publish do not provide sufficient space to explore nuance, there is a venue in general archaeology journals—including but not limited to *Antiquity*—for such elaboration. As the demand for communication beyond our immediate specialist circles increases, there is greater need for a common and comprehensible space where we can explain, educate and promote collaboration and understanding. Higham's (2019) response to Kuzmin's article provides a clear exposition of the chemistry supporting the single amino acid method. This may involve, in his words, a "basic chemistry" (2019: 1073) lesson, yet this lesson will be greatly appreciated by those of us who do not have a science background but who nonetheless wish to understand, evaluate and make use of the results of such techniques.

Finding the earliest example of a phenomenon, as Pettitt (2019) notes, is a classic archaeological trope, and one well loved by the media: the earliest pyramid, the first domesticated dog and the initial arrival of a new species, such as *H. sapiens*, in a region, to name some popular examples. The recent publication of new dates and interpretations of fossil bones from the Apidima Cave in Greece provides another example of the central importance of dating (in this case, uranium-series radiometric methods) for the interpretation and significance of archaeological finds (Harvati *et al.* 2019). Here, the interest and controversy lies in the unexpected identification of Apidima 1 as *H. sapiens* at ~210 000 years ago, far earlier than any other example of our species in Europe and earlier than the Neanderthal remains (Apidima 2) from the same site. The subsequent wide publicity around that paper has generated initial responses that raise questions about both the reconstruction of the cranium as *H. sapiens* and the broad chronological range returned by the uranium-series dating (Wade 2019). Notably, one of the authors, Chris Stringer, has elaborated on social media about the peer-review process and the further research undertaken in response to it. Yet despite this scrutiny and the additional work done as a result, in relation to the final article, he still stresses that "As with any challenging new find, the appropriate initial reaction should be healthy scepticism, even when my own name is on the paper" (https://twitter.com/ChrisStringer65/status/1149001290795687939). Just as with the claims for a precocious early human presence in North America based on the Cerruti Mastodon site (Holen *et al.* 2017; Magnani *et al.*

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2019), when any new and unexpected results demand that we rewrite our narratives, extra scrutiny is required: "It is not necessary for extraordinary claims to have extraordinary proofs—they just need to be robust; the more extraordinary the claim, the more robust the proof must be" (McNabb 2019: 802).

All of which brings us back to the radiocarbon dating of the Upper Palaeolithic populations of the Russian steppe. Archaeological knowledge advances through collaboration, testing, questioning, refuting, refining and corroborating. Along the way, misunderstandings are not only possible but probable. Some of this will play out at workshops and conferences, some through peer review and some of it in print. The advantage of the latter—as in the present case—is that such a dialogue can be accessed by a much wider audience. While the contributors to this particular debate do not come to agreement, it is to be hoped that the airing of these different positions provides an example of a wider issue within the discipline and a foundation for further discussion from which we all can benefit.

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