Archaeologies of the digital

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I have great sympathy with Aycock's (2021) fundamental proposition that archaeology should be at the forefront of the study of digital artefacts. Our pathways to that shared position, however, diverge from the outset. To begin with, some definitions would be useful to clarify my position.

First, it is perhaps worth characterising the nature of 'digital archaeology' more precisely. For most of the past 60 years, digital archaeology can be seen as primarily concerned with exploring the practical uses of computer techniques and technologies, and the computations that can be applied to different kinds of archaeological data in the pursuit of analysis. It would be a mistake, however, to view digital archaeology solely in terms of a highly technical focus on digital technologies applied to archaeology. Not everybody, for example, needs have the in-depth skills and knowledge required to create advanced software, write scripts or develop packages in order to do archaeology digitally. Furthermore, and most relevant to this debate, digital archaeology includes the study of digital tools and methodologies, and their incorporation into practice. To not include this aspect assumes the neutrality of digital devices, resulting in a digitally uncritical archaeology subject to the fads and trends of technological determinism. Digital archaeology is therefore perhaps best seen as a spectrum, in which archaeologists not only do archaeological research digitally, but also do digital research: creating archaeologies of code, of software, of digital design, of digital environments and of digital practice, for example. Consequently, digital archaeology (including computational archaeology) concerns more than using computers "to understand the old rather than examine the new" (Aycock 2021: ■).

Secondly, a clearer definition of 'digital artefacts' would be useful, as Aycock uses the term in different contexts. Digital artefacts include the physical hardware devices ranging from computers to data loggers, and digital cameras to robotic devices. Digital artefacts may also be the software that runs on these devices, some of it embedded in the hardware itself, some of which—graphics packages or geographical information systems, for example—are loaded on demand and selected by choice, habit or availability.

Digital artefacts also include the products of the hardware and software: the databases, graphics, images and 3D models, for example, which are increasingly born digital, although a proportion are still digitised from analogue sources. These digital devices, software and their outputs are interrelated and interdependent, and frequently entangled in ways that may be unpredictable. While we may seek to examine a piece of digital hardware in isolation, the reality involves considerable complexity, including the software that makes it function and the data outputs it produces, the array of design, implementation and operational factors, and the range of human and increasingly non-human decisions associated with them. Digital artefacts are therefore more than physical devices, software, data and outputs: overarching these are the human practices into which digital devices are integrated and which, in turn, are affected and potentially transformed by those same digital things.

Far from there being a paucity of archaeological work on digital artefacts, or even an aversion to their study, as Aycock (2021) suggests, these characterisations of digital archaeology and digital artefacts reveal a considerable range and depth of work across many years of digital archaeological enterprise. While it is true that a large proportion of this work is committed to the notion of using digital tools as a means of understanding the past, this does not mean that it omits to address the question of digital artefacts. For over 20 years there has been a relatively small but growing body of work that recognises the lack of sustained critiques in the face of this focus on applications and techniques. This work argues that archaeology needs to be more cognisant of the social, cultural, cognitive and behavioural aspects of the digital technologies used and their effects on the archaeological results generated by them (see, for example, the summary in Perry and Taylor (2018)). As Aycock (2021) argues, however, in most cases the emphasis remains on how digital artefacts influence archaeological theory and practice, rather than how we can explicitly address fields beyond archaeology. The introspective approach to digital archaeology that I have espoused (e.g. Huggett 2015), for example, is almost entirely focused on the disciplinary context, and underplays the potential for digital archaeologists to contribute to a broader understanding of

digital technologies, despite arguing that archaeologists—amongst digital humanists—are the best positioned to do so.

So, having arrived at agreement with Aycock's (2021) primary proposition, the question remains as to why digital archaeologists appear reluctant to branch out beyond our own discipline. Aycock (2021) suggests that a lack of interdisciplinary effort may lie behind this, but archaeology has always been strongly interdisciplinary. Indeed, the character of digital archaeology is a form of bricolage, borrowing and adapting tools and theories from, for example, computer science, sociology, politics, media studies and the history and philosophy of technology. Instead, there may be a lack of confidence in branching out beyond the immediate confines of archaeology, as there is a big difference between applying multidisciplinary technical and theoretical borrowings to archaeological practice and making a novel archaeological contribution to those broader fields. The recognition of such contributions within archaeology may also be challenging, as can be the case with archaeogaming (e.g. Champion 2017: 25–26; Politopoulos *et al.* 2019: 163).

Furthermore, the study of digital artefacts is a crowded field. To take a random sample from my bookshelves, there are political and cultural science approaches to the philosophy of software, design and environment perspectives on digital waste, human geographers writing on code and software, an archaeology of algorithmic artefacts by a media archaeologist, an archaeology of machine learning and big data practices by a sociologist, and a media studies analysis of the politics and psychology of the power button. Some authors explicitly describe their approaches and methodologies as 'archaeological', while others might be said to pursue archaeological-style approaches, even if they are not recognised as such. It may seem, therefore, that other disciplines appear to have stolen our digital archaeological clothes. That said, in most instances 'archaeology' is primarily used in a metaphorical sense, whereas in others there is a limited, even simplistic view of archaeology; either of these leaves the field open to a proper archaeological response. The experience of digital archaeology, however, is very similar to that outlined, for example, by González-Ruibal (2013) and Piccini (2015): relatively little attention is paid from outside the discipline, in part because digital archaeologists frequently borrow theories and concepts from other fields, rather than developing specifically archaeological approaches that are of wider interest.

The question then becomes not so much why there is a supposed reluctance to study digital artefacts, but how to lay claim to a digital archaeological perspective, and what does that study bring that is significantly different to what has gone before? On one level, an archaeological approach may consist of treating the digital artefact as a site of archaeological

fieldwork, 'excavating' and recording the object, deconstructing it to understand and appreciate its functioning, characteristics and context of use. But archaeology is more than a discipline of things: "We treat things as making forms of human life, rather than treating those things as if they were merely the products of human actions" (Barrett 2021: 88). In the modern world, the potential of digital artefacts to transform and be transformed by human action, and their capacity for agency and autonomy (e.g. Huggett 2021), make them some of the most complex types of artefacts facing archaeologists. As Aycock (2021) highlights, the challenge is for digital archaeologists to expand their horizons beyond the immediate context of archaeological practices and to contribute confidently to the broader study of human-digital relations.

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