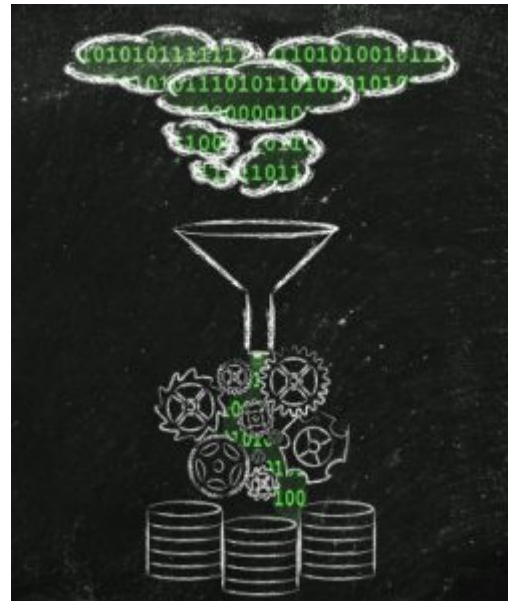


Intrinsic Digitality

One might imagine that a claim that



“The archaeological record is intrinsically digital, not in the sense that it turns digital once the data have been entered and processed, but, more radically, in the sense that it is by its very nature digital, in its genesis and its structure.” (Buccellati 2017, 232)

would pique the interest of any digital archaeologist. But strangely, that seems not to be the case: Giorgio Buccellati’s book appears to be currently unreviewed and largely, it seems, unremarked upon. Two exceptions to this generalisation are Gavin Lucas and Bill Caraher. In his latest book, Gavin Lucas suggests that Buccellati’s characterisation of archaeology as natively digital is problematic (2019, 91), but the critique is limited as the book’s focus lies elsewhere, on textuality. In his response to Sara Perry and James Taylor’s ‘Theorising the Digital’ paper (2018), in which they point to the disconnect between the demonstrable impact of digital archaeology on archaeological method relative to its comparative lack of effect on archaeological theory, Bill Caraher suggests (2018) that Buccellati’s book represents a rare example of the interplay between digital theory and broader archaeological theory. So why does Buccellati argue that archaeology is natively digital? And is his characterisation of digitality useful to digital archaeology, as well as to archaeology more broadly?

Certainly, Buccellati makes it clear that he does not follow the technical approach (he calls it the “implementation aspect”) generally associated with digital archaeology, instead focussing on what archaeology can contribute to digitality rather than the reverse (2017, 4). He considers that the intrinsic digitality of archaeology is predicated upon the idea that – unlike other disciplines – archaeology operates in a bottom-up fashion, building its understanding of the past from fragments of that past rather than starting from the whole and breaking it down:

“There is a primordial atomism, because it is the rule that the fragments are discovered in their disconnection. They are building blocks that occur in a state of nature as deconstructed. They emerge from the soil as disaggregated atoms and are reconstructed through the overall integrity of a proper digital discourse.” (Buccellati 2017, 233).

Of course, the idea of atomistic data is more than a little reminiscent of Nicholas Negroponte’s characterisation of the immateriality of digital data with the shift from atoms to bits (1995, 4-5). And indeed, Buccellati refers to the digital dimension of the data as “bits found in the ground”,

“... as it emerges from the matrix of the soil, a sherd is related only to the contiguous elements of the matrix, and not to the higher (but at this point extraneous) coherence of a typological, functional, or other framework. It is by investing it with a full attribute analysis that the sherd can go beyond its initial autonomy as an atom in the emplacement matrix and be correlated to the ever larger grid of intra- and extra-site connections.” (Buccellati 2017, 236).

However, just as Negroponte’s epithet is flawed (bits are themselves made up of atoms, after all), Buccellati’s characterisation seems problematic. It suggests that the fragment – be it a sherd, a context, or any other individual item – is the smallest indivisible component in the archaeological interpretative chain, the so-called atomic element or bit, which then acquires descriptive attributes as it is added to the database. There’s more than a hint of ‘raw data’ here, that data are waiting to be discovered, and Buccellati appears contradictory on this point – on the one hand he does indeed see fragments as ‘givens’ (Buccellati 2017, 234), while on the other,

“... archaeological data proper do not exist as concrete self-standing data. They are essentially ‘invented,’ in the sense of ‘discovered and conceptualized,’ by the excavator or researcher.” (Buccellati 2017, 300),

and he argues that the changeability (“lability”) of the data depends on it not being ‘given’ (2017, 307). But if the data are not concrete, stable givens (and they are not), then can they legitimately be described as digital bits? A bit may be the smallest indivisible element of information, but it can still take on one of two states – in this context it might perhaps represent presence/absence (although we are told that absence of evidence is not evidence of absence), but recognising the presence of a fragment is itself dependent on a number of factors, including the experience of the observer, their research questions, and their understanding of the archaeological phenomena they encounter. Indeed, if we seek a digital analogy, the quantum bit or qubit might be better fit since its state can be 0, 1 or both at the same time, and that state is changed simply by accessing it.

Buccellati also has some interesting observations about databases; for instance:

“On one level, a database may be seen as a static repository of data. It is not, in fact, an argument in the conventional sense of the term, since it does not articulate a sequence aimed at proposing a conclusion. Such a sequence is instead set in motion by the ‘user’ who

engages in sorts, and searches in answer to a given query. It is the query, then, that sets in motion the argument: it is triggered by the 'user'; it is not developed by the database as such." (Buccellati 2017, 184).

On the face of it, the distinctions made here are fair enough (and Buccellati goes on to suggest that a database is not simply a static repository), but there are several issues to unpack. For instance, it isn't simply a matter of the user determining the sequence: the user's actions will be constrained by the data themselves, by the capabilities of the database software, and by their own knowledge and experience. To some degree, Buccellati recognises this; for example:

"The power of a query is correlative to the strength of the structural codification of the data. In this sense, a well-structured database may rightly be considered as in fact proposing an argument. ... A grammatical identification of minimal constituents entails a conceptual effort that goes beyond the list of ad hoc traits. These can be singled out through the empirical and deductive encounter with the data. But to go beyond and "grammaticalize" them, one has to determine how they fit systemically into a coherent whole and how they are derived deductively through generalized logical principles." (Buccellati 2017, 184-5).

So a database is indeed constrained by the structural organisation of the digital data and the schema used in the definition and characterisation of those data. But this is seen as the power and value of the system, not as a limiting factor which ultimately shapes and makes those arguments (im)possible. Hence:

"In a digital database, there is an easily blurred line between data and argument – hence the reluctance at times to view databases as indicative of creative and original research. In this regard, a proper evaluation should rest not only on the philological quality of the data, but also, and perhaps in even greater measure, on the explicitness and coherence of the underlying structure ... what matters is the generative *power* of the system." (Buccellati 2017, 188-9, emphasis in original).

Such power as there is is entirely dependent on the understanding (and documentation) of that structure, since it is the only way to access something like the intentions and processes of those who captured and recorded the data in the first place.

Interestingly, Buccellati also characterises digitality as a mode of thought, and emphasises its effects:

"We are, nowadays, confronted with digitality on every level of our lives. It refers not only to the ease with which we adapt to the electronic dimension, but especially to the transformation in our mental templates as we readily absorb the presuppositions of digital thought, even when we cannot articulate their theoretical import. This is what I call para-digital. Navigating websites, clicking on hyperlinks, responding to game stimuli, are only some of the ways in which our motor habits have adapted to the medium. More importantly,

there are aspects that go beyond motor habits and do impact our mental templates.” (Buccellati 2017, 197).

He suggests a number of examples of how digitality affects our mental templates, from a tendency to relate more readily to statistics (an arguable point in itself, speaking personally), the way we expect explanations and documentation to be instantly available, our tendency to graze through data, and our expectations of (and maybe facility with) multilinearity, for instance. These examples present a rather limited view of para-digitality and could be taken much further, not least in terms of the kind of cognitive scaffolding and shaping afforded by the digital tools (e.g. Huggett 2017). Though to be fair, his focus is on digital texts and websites (Buccellati 2017, 206ff) and he explicitly does not consider databases or software more generally (2017, 207).

Finally, Buccellati has a nice characterisation of big data approaches in archaeology, although he doesn't necessarily define it as such:

“In a digital way of reasoning, we accept, more readily than ever before, vast masses of non-contiguous elements, expecting the hidden connectivity to emerge as we tickle the individual pieces. Thus it is that we come to feel instinctively that the dislocation is there to be bridged, that even the most amorphous data-mass is in fact potentially a database, subject to an articulation that reveals the polarities and the resulting unity.” (Buccellati 2017, 175).

I rather like the idea of big data as tickling the individual pieces in the expectation that hidden connectivities will emerge. But 'tickling' the data is an intriguing analogy: as a term, it can define discomfort, sensitivity, unpleasantness, as well as amusement and even pleasure. Perhaps like trout, data can be tickled into a trance which enables its capture, although this would rather underline the significance of human intervention prior to data capture, and emphasises the idea of data as made things, rather than givens, as well as some of the challenges associated with big data approaches.

I've barely scratched the surface of Buccellati's discussion here - it's a thick volume and it's concerned with more than just digitality. But does his claim that archaeology is intrinsically digital hold water? I don't think so - it's an interesting argument, but there's a degree of circularity about it. As he says, the concept of archaeological digitality could only have come about through the application of digital techniques in the first place, and while he sees digitality as inherent, nevertheless he admits our awareness of it could only have followed the implementation of digital techniques; it could not have been derived in a wholly paper-based environment (Buccellati 2017, 233). More importantly, throughout it appears to overlook the importance of what Alison Wylie has called the 'preunderstandings' which scaffold our approach to data in the first place (Wylie 2017, 204). In a way, much of the fragmentation that Buccellati describes is not just a creation of taphonomy, but is also a function of this prior scaffolding, rather than data appearing as a natural, even inevitable outcome of discovery. All that said, I'm perfectly aware I may have misunderstood key elements of his argument - it is not an easy read, as some of the quotations I have used amply demonstrate. What it does show, however, is that there is real scope for a digital theoretical investigation of archaeological data and interpretation, and Buccellati's work is a useful step on that road.

References

Buccellati, Giorgio 2017 *A Critique of Archaeological Reason: Structure, Digital, and Philosophical Aspects of the Excavated Record* (Cambridge: Cambridge University Press).

Caraher, Bill 2018 'Continuity, Practice, and Theory in Digital Archaeology', *The Archaeology of the Mediterranean World* December 17, 2018 (blog post).

Huggett, Jeremy 2017 'The Apparatus of Digital Archaeology', *Internet Archaeology* 44. DOI: 10.11141/ia.44.7

Lucas, Gavin 2019 *Writing the Past: Knowledge and Literary Production in Archaeology* (Abingdon: Routledge).

Negroponte, Nicholas 1995 *Being Digital* (London: Hodder & Stoughton).

Perry, Sara and Taylor, James 2018 'Theorising the Digital: A Call to Action for the Archaeological Community', in Mieko Matsumoto and Espen Uleberg (eds.) *Oceans of Data: Proceedings of the 44th Conference on Computer Applications and Quantitative Methods in Archaeology* (Oxford: Archaeopress), pp. 11-22. Volume available OA via Archaeopress

Wylie, A. 2017 'How Archaeological Evidence Bites Back: Strategies for Putting Old Data to Work in New Ways', *Science, Technology, & Human Values* 42 (2), 203-225. DOI: 10.1177/0162243916671200