

## COMMENTS

### Archaeology and science: a response to Huffman

This is a brief response to a discussion paper by Thomas N. Huffman, considering the differences between archaeology and science. It presents a pessimistic view of the prospects of archaeology to become a science in the short term.

While Huffman's (2004) discussion of aim and practice in archaeology is to be welcomed, I find it less satisfying than a previous attempt in this journal to address the discipline's epistemology (Lewis-Williams 1994). The underlying theoretical justification for Huffman's position seems to be the belief that archaeology can detect behavioural regularities in human populations and that such regularities are 'caused by reasons'. This, he seems to say, brings archaeology much closer to the natural sciences than Post-Processualists might admit. I would like to attempt an alternative comparison of science and archaeology.

Huffman perceives only one 'fundamental difference' separating the natural sciences from archaeology. He sees the former as successfully applying uniformitarianism to evidence, whereas 'people do things for reasons'. In other words, their behaviour may not be by uniformitarian action and response patterns or similar mechanisms of less intelligent species. That is indeed a very valid point but then Huffman goes on to claim that because human behaviour is not random 'there are good reasons to believe that reasons cause behavioural regularities'. That is, however, hardly the issue, which is that much of human behaviour is culturally determined, and emic access to culture does not exist in archaeology. So, for instance, we might observe identical archaeological 'behaviour traces' that in fact relate to different cultural practices, or ostensibly dissimilar traces might relate to the same cultural practice. There is simply no direct connection

between what the archaeologist might consider to be traces of behaviour and the correct interpretation of any 'regularities' one might perceive in them. Human behaviour is very often irrational, and can only be decoded through understanding its culturally negotiated syntax. To invoke uniformitarian principle is inappropriate in a discipline that lacks emic access to the cultures it believes to study (Cameron 1993; Tangri 1989). Most of these claimed 'cultures' probably did not even exist as real entities. Or do archaeologists seriously believe that there was an ethnically, culturally discrete population corresponding to, say, the Magdalenian? I hope not because the construct of a Magdalenian is a technological and chronological artefact of archaeologists, a conceptual pigeonhole, not a historical reality. Much the same applies throughout archaeology.

Another concern is the circular reasoning implicit in Huffman's belief that these perceived behavioural regularities of populations are diagnostic indices: a 'population' is identified on the basis of archaeological, rather than ethnographic, cultural or genetic, evidence then its definition is confirmed by the same kind of inferred evidence of 'behavioural regularities'.

Huffman also writes of 'archaeological data', a concept that needs considerable qualification before it should even be considered in an epistemological format. For one thing, archaeology typically does not secure random samples but tainted samples of data. A random sample is one that is representative of the whole population being studied. In most circumstances it is difficult to see how that could effectively be acquired in archaeology. Huffman himself observes quite correctly that 'archaeological remains woefully under represent what happened in the past'. This severe limitation is greatly amplified by the effects of taphonomy and by various other metamorphological factors (Bednarik 1995). Moreover, in my experience, most archaeologists do not allow for, or even understand, the effects of taphonomic logic (Bednarik 1994a) on their 'data'. Until they do, their 'data' must be expected to be generally so severely distorted that their interpretations belong in the realm of science fiction or archaeological myths about the past.

To Huffman, the 'other differences supposedly separating science from archaeology are remarkably few and considerably less profound'. He then offers a stereotype definition of scientists, as neutral observers of an independent real world that can be directly observed. Later he contradicts the second part of this parody himself, by mentioning the black holes that cannot be observed.

In citing micro-wear evidence as a form of archaeological data satisfying the requirement of controlled conditions, Huffman unintentionally provides an example of an archaeological method that is mistakenly thought to be scientific. Micro-wear analysis is very useful, but it is not a scientific method. The reasons for this illustrate Huffman's misunderstanding of science. This method does not satisfy the requirement for falsification. The observation that microscopic wear on an

archaeological specimen resembles experimental wear does not prove that two similar processes pertain. On the contrary, the dependency relation is one of supervenience: there could be a difference in one set of properties without there being one in the second. The proposition that the traces on the ancient specimen were made by the same process as those on the replication artefact is clearly not refutable. It may well be true, it quite probably *is* true but that is not the issue. The issue is one of falsifiability, which simply does not apply in archaeology, at least not without importing the methods of a hard science.

It is true that scientists derive much confidence from the confirmation of their predictions but how does one predict the results of experiments in archaeology? Could one create a 'beaker people' and have them move about a continent to see if a predicted result takes place? And even if one did, would it prove the movements of anyone in antiquity? Of course not, because archaeological propositions are not archaeologically testable.

Concerning incommensurability, science has made great efforts in establishing universal standards throughout the 19<sup>th</sup> and 20<sup>th</sup> centuries. True, these can still be improved, and no doubt will be, but even Huffman admits that 'good excavations' do exist, which implies the existence also of poor excavations, and the obvious possibility that much of the 'archaeological record' (and I have before confessed that I have no idea what this phrase denotes [Bednarik 1994b]) is even more tainted than it would be under ideal conditions.

Concerning the choice between two equally plausible rival theories, Huffman thinks that 'there are sufficient other ampliative criteria for a rational judgement between opposing archaeological interpretations'. Unfortunately he then adds: 'Thus theories, and theoretical schools, can be evaluated in terms of their effectiveness in disclosing a real past.' It is not even archaeology's purpose to conjure up a 'real past'. The discipline merely creates constructs of the human past that accord with the expectations of society at the time in question, and its main purpose is to formulate society's current mythologies about the human past. For instance, the Neanderthal 'flower children' of the 1960s become once again primitive brutes in the 'cynical' 1990s. We have not even the ability to determine a 'real present' so an expectation of finding a 'real past' is misguided in more ways than one. We are merely a species of organisms of very modest intelligence; our access to 'objective reality' (should such a state exist) is severely limited by the residues of irrational ideologies, baseless ontologies and metaphysical straightjackets, the baggage of many millennia of cultural development. And that is the case before we even consider the great shortcomings of our still primitive science. Archaeology, like religion, is based on intuitive intellectual processes, designed to confirm a specific ontology, whereas the rather vague account science provides of the world is often very much counterintuitive, and even challenges established reality constructs based on human intuition or 'common sense'.

In contrast to Huffman, who perceives little difference between archaeology and science, I detect many differences. Through its poor epistemology, archaeology as it is practised

is better at clouding the issues it addresses than at clarifying them. Consider, for illustration, Huffman's term 'behaviour': how does it relate to the neurochemistry of the orbito-frontal cerebral cortex in the specimens concerned? This is not a matter of genetic reductionism, it is a valid response to the naive empiricism of traditional archaeology. How does he propose we will translate his ideas about these 'behaviour traces' into falsifiable propositions, so that we can test them scientifically? Remember, we are dealing with the purported behaviour traces of a purported population from a purported time period and of a purported culture. Few of the many variables in this model appear to be scientific tangibles. Moreover, science expects exacting predictions for future observations about phenomena that can be measured. The regularities within these phenomena must be described as consistent patterns, explained by refutable theories cast in terms of causes. How would we do this with Huffman's proposition that he has located certain consistencies in what he calls 'data' that suggest definable 'behaviour patterns', when even most archaeologists reject the idea that their discipline studies behaviour?

Of course behaviour can be studied scientifically by ethology. That discipline deals with the physiological mechanisms controlling behaviour and the stimuli eliciting it. And of course it is possible to study societies of the human primate through sociobiology but that is not what archaeology has in mind, being an anthropocentric field by definition.

The difference between archaeology and science is considerably greater than the difference between archaeology and religion. The latter two both seem to be belief systems and tools of the state. The state indoctrinates, licenses and, in most cases, employs archaeologists, either directly or indirectly, as consultants who owe their employ to state laws purportedly protecting heritage, when in fact archaeologists often implement the destruction of heritage (Bednarik 2004). Archaeology is not just a 'social science', the only social science that cannot test its propositions, it is primarily a political activity (cf. Trigger 1989, among many others). It provides the 'mind-bending substances on urban streets' that Kohl and Fawcett (1995: 13) write about, referring to archaeology's effects on nationalism and other political issues. Archaeology's curatorial aspirations cause much vexation to the indigenous people of the world, and are also totally unscientific. The endeavours of archaeology to keep out 'unqualified' interlopers impair disciplinary integrity: a discipline that seeks to restrict 'membership' by means other than competence is a 'closed shop' not a science. None of the hard sciences tries to keep out amateurs and, provided they are as competent and productive as their professional peers, their contributions are generally welcomed. In archaeology, amateurs have been persecuted for as long as the discipline has existed and if historically they had the audacity of introducing major improvements or discoveries they were typically treated with great contempt. In this sense and others, archaeology resembles a religious cult more than a science.

Another aspect of this has been identified by Freeman (1994), who examined the amazing similarities between the procedures of authenticating Palaeolithic rock art in southwestern Europe and those employed by ecclesiasts for declaring religious

sanctuaries in much the same region. Although archaeologists succeeded collectively in demonstrating during the 1990s that they are incapable of determining whether some rock art is or is not of the Pleistocene or of a particular period of the Upper Palaeolithic, they still regularly claim Pleistocene antiquity for rock art that is much more likely to be of the Holocene. For instance, there is not a shred of credible evidence that any Pleistocene rock art is known in Portugal and yet many sites in that country are consistently claimed to be Palaeolithic (see *The Digging Stick*, 21[3]).

None of this is particularly important; it is mentioned here only in passing to illustrate the precarious condition of the discipline in its present state. There can be no doubt that archaeology is a client of the hard sciences, but so are religion, industry and other endeavours, without this affecting their status as non-sciences. It is perhaps more constructive to ask: what are the specific attributes of orthodox archaeology that prevent it from becoming a science? Here, the factors I have briefly listed are of some help. For instance, a curatorial archaeology (by which I mean an archaeology seeking control over resources or knowledge) needs to be strictly separated from a scientific one, to which restrictive practices are anathema. But the most fundamental issue is that archaeology needs to acquire an underlying universal theory. Traditionally the discipline operates on the basis of selective uniformitarianism, ethnographic analogy and group consensus. As Huffman observes, uniformitarianism works fine for certain disciplines but not for the study of hominid societies. Ethnographic analogy is often misused in archaeology (Huchet 1991) and is, in any case, not a scientific procedure since its interpreting hypotheses are not falsifiable. And as far as group consensus is concerned, science is certainly a very undemocratic process. In archaeology, especially, we have seen hundreds of examples where a single dissenter, or very small minority, was unambiguously right and the entire discipline was wrong. The most outstanding attribute of archaeology, historically, is that it is the discipline that manages to get it wrong more often than any other. This alone should prompt us to ask why that might be so. For instance, an epistemological investigation of all claims archaeologists have ever made about the Pleistocene human past would probably reveal that at least 90% of them were either false or are likely to be false. To illustrate again with a Neanderthal example: we have currently a whole spectrum of opinions on Neanderthal speech ranging from pongid ability to one similar to contemporary humans. This is all archaeology has produced in that respect since archaeologists indignantly rejected the Kleine Feldhofer Cave remains almost 150 years ago. Obviously, any sane person could have worked out that the language ability of Neanderthals must have been

somewhere between that of apes and that of moderns so the progress made in this respect in 150 years is effectively nil. Now compare this to the progress made in ethology in just the last 50 years and it becomes at once obvious that archaeology and science must be operating very differently.

The perhaps most striking aspect of the relationship between archaeology and science is that archaeology could most certainly be a science. If it applied a universal theorem like taphonomic logic (Bednarik 1994a), and formulated its hypotheses as falsifiable propositions, it could attain scientific status. But I fear that the existing dogma, the antiquated power structures of the discipline and the sheer cognitive laziness of practitioners will see to the deferral of such a development to another century.

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