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## “Boning Up” on Archaeological Significance

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Every archaeological site in the world is a unique piece of the human story. Ideally, it would be nice to preserve all those pieces, or to at least extract substantial amounts of information related to the story before any site was destroyed. Practically, this simply cannot be done. Depending on where you are on the planet, there is a lot of archaeology out there, and attributing scientific or historical significance to every site, with the consequent legal and management obligations that entail, would shut down too many other activities to be feasible. Road construction would be severely limited, hospitals and airports could not be expanded without extraordinary costs; little new housing could be constructed; logging and farming would be seriously curtailed; and so on. This is the unfortunate reality that makes cultural resource management such a difficult business, for it is archaeologists employed in that field who make decisions about what matters enough to be preserved, in fact or in proxy via data recovery, and what matters so little that it can be destroyed. And once a part of the archaeological record is destroyed, it is gone for good; the material remains we generate today cannot replace materials that were generated by earlier cultures.

Traditionally, the significance of archaeological sites has been determined primarily via consideration of scientific value. In recent decades, more humanistic concerns related to history and cultural heritage have received increased attention. A particular site may be considered significant because it can tell us scientifically useful things we don't know about the past, or because of an association with a person or event of historical note, or because it is a place of spiritual importance to a descendant group. Craftsmanship or physical expression of an ideal “type” of site also can be considered reasons for significance, although these considerations generally have applied to standing architecture. Humanistic values are tricky because they change as culture changes; all humanistic values are contemporary values, always. The same of true of science, sort of, except that there is a demonstrable accumulation of knowledge in science (Darwin is no longer with us, but evolutionary theory is). But there is, of course, disagreement among practitioners about what is scientifically important, and of course those perceptions also change as new information, and new instrumentation and methods for obtaining information, become available. Added to this fact is the conundrum that we cannot see into the future to know what will be considered significant in fifty, or a hundred, or five hundred, or a thousand years from now. Yet, on a daily basis, archaeologists have to make decisions that determine what will even be available to study, or to appreciate from a humanistic perspective, for the remainder of human existence.

Given this extraordinarily weighty responsibility, it behooves professional archaeologists to think hard about different reasons why sites might be considered significant. Recently, I made the argument [1,2] that sites might be considered significant because of the animal remains they contain; not just because such remains inform on past economic activities, human-environment relationships, and other standard anthropological questions, but because they inform on what animal species were where, when, and in what numbers. Such information is useful from an applied perspective, as data on past faunal ranges and population structures can help guide conservation efforts today. Where sites can produce such data, those sites should be considered significant.

The idea that animal remains from archaeological contexts have value for contemporary environmental managers has been around for a while, but only recently has begun to gain real steam, thanks largely to the efforts of zooarchaeologist Lee Lyman and his students and collaborators [3,4]. A number of case studies have been published that show how current knowledge of animal ranges or community characteristics can be badly limited due to changes that took place in modern times before thorough biological surveys were carried out. Conservation biologists are always looking at the “now,” but of course what they are observing are the results of myriad evolutionary factors, one of which is human environmental impact over time. Recognition of the deleterious results of such impact is becoming increasingly common in this day and age, when climate change is rightly viewed as one of the major issues facing humanity. We are the inheritors of a modified planet, which we will modify in turn in ways that future generations will have to deal with. A long-term perspective obviously is of value in such regards, and where animal populations are concerned, the zoo archaeological record can provide that perspective if we can get scientists from different disciplines talking to one another and if we can preserve that record so that its value ultimately can be realized.

The question, then, is how, within the existing regulatory framework, do we argue for the significance of sites from an applied zoo archaeological perspective? Can we say that a site should be preserved, or mitigated, because it has value for practitioners of another discipline or for the good of an endangered species? Probably not, in any way that overworked reviewers in state compliance offices would be willing to routinely countenance. But there is a way that works without overly stretching the current system. In the United States, the significance of archaeological sites is considered via the criteria for eligibility for listing on the National Register of Historic Places, almost always under Criterion d, which states that a site may be considered eligible if it “has yielded, or may be likely to yield, information important in prehistory or history” (36 CFR 60.4). Under this criterion, sites with zoo archaeological remains can be highly relevant to environmental history, as they allow us to chart the drastic alterations Contact brought about in human-nature relationships in North America and the subsequent, unprecedented, rapid transformation of the landscape as the United States became an integral part of a world-system economy. Again, in this era of global climate change, rapidly increasing human populations, and other environmental stressors, such history should be an important part of the conversation about our current actions, and sites that contribute to that conversation can be considered significant

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based on their historical (not to mention scientific) value.

It is important to note that any given site should not be considered significant from an applied zoo archaeological perspective just because bone, shell, or other organic remains are preserved there. The relevance of a faunal assemblage to questions concerning the history of human impacts must be assessed on a case-by-case basis. But there are situations in which the case can be made very easily. For example, freshwater mussels are one of the most endangered faunas on the planet, and our knowledge of pre-contact species ranges and relative abundances is limited by the fact that the animals had been substantially impacted by human activities prior to the initiation of modern biological surveys. Accordingly, any archaeological site from which a large assemblage of mussel shells can be recovered could be considered significant for its potential to contribute to the environmental history of human impact, invoking the "important in history" clause of Criterion d. Unusually for site significance assessments, this is true *regardless of how disturbed the site is*. While some human-induced changes in mussel populations did take place in pre-Contact times [5], such changes were relatively minor, and extirpations or extinctions of species due to Native actions are extremely rare to non-existent. So, a site that might otherwise lack scientific value due to disturbance still may be considered significant if it contains mussel shells sufficient for bio geographical analysis. When enough such sites have been investigated, redundancy in zoo archaeological data can be demonstrated, so that this particular argument for significance becomes inapplicable. For example, mussel assemblages from several sites along the central Tombigbee River in eastern Mississippi and western Alabama have been analyzed, to the point where the pre-Contact fauna from that river segment has been adequately described and published [6].

Comparing zoo archaeological data to modern biological data is not easy, of course, as both kinds of data suffer from various kinds of bias. For archaeological remains, preservation, recovery, and sampling bias are three obvious factors to consider. But archaeologists are pretty good at thinking about such things, so that these complications do not present insurmountable obstacles to deriving data from zoo

archaeological assemblages, data that have relevance for environmental history and applied value from a conservation biology perspective [6]. The suggestions offered here also give zooarchaeologists a clear mission to publish their data in venues where both archaeologists and other scientists can become aware of them, and specifically to note where data redundancy has not yet been achieved. A side benefit of this novel approach to significance is that, if adopted, archaeology would gain a very well-educated, broad-based constituency in the form of biologists, zoologists, ecologists, land managers, and the conservation community in general. Such alliances may be key to continued funding for archaeology in a time when lawmakers seek to downplay the importance of anthropology as a field of scientific endeavor (and indeed, when many within our own ranks consider "science" to be a dirty word). Those old animal bones and shells have import for all kinds of archaeological and anthropological questions, but they also have value for better understanding our on-going relationship with the global environment and in helping guide decisions about where we go from here.

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