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Just what is geoarchaeology?

Mention “geoarchaeology” and wait for the response. You might get a precise definition such as “archaeology done by means of geological methods, techniques, or concepts” (K. Butzer, 1980, *Journal of Field Archaeology*, v. 7, p. 417-422). You might hear someone shout “redundant,” because “geoarchaeology is nothing more than good prehistoric archaeology” (R.M. Thorson, February *Geotimes*, p. 32-33). Some see a contradiction in terms because “archaeology is...an earth science” (F.H. West, 1982, *Quarterly Review of Archaeology*, v. 3, p. 9-11), and because both are already interdisciplinary. Some see an “emerging discipline” (G.R. Rapp Jr and J.A. Gifford, 1982, *American Scientist*, v. 70, p. 45-53), whereas others see an academic fad that “would shortly come to be known as archaeology” (West).

Our point here is that geoarchaeology is not one thing, it is many. Is the label worth keeping? Is the subject a discipline? Is the phenomenon simply ambiguous, or truly contentious? What can or should be done?

A label for any enterprise serves no purpose unless it is reasonably well understood by most workers. Last year Thorson solicited the opinions of many individuals working in geoarchaeology, naively expecting to find a general consensus of views. He was wrong! Apparently, nearly as many schools of geoarchaeological thought exist out there as practicing geoarchaeologists. However, this response is not surprising when you consider that at least some members of the following disciplines adopt a hybrid label: stratigraphy, geomorphology, pedology, petrology, physics, geochemistry, geophysics, paleontology, remote sensing, sedimentology, marine geology, climatology, and archaeology.

Instead of writing a “declaration of current general views” for the annual review issue of *Geotimes* last February, Thorson distilled dozens of different viewpoints into an essay defining five geo-archetypes: idealist, cynic, geo-realist, archaeo-realist, and negotiator. When plans for this issue of *Geotimes* were made, each of the original informants was asked to respond to the published essay so that we could forge a broadly inclusive position paper on the status of geoarchaeology. This article is the result.

Who cares about labels or petty

intellectual struggles? We believe that it is important to document scientific controversy, a phenomenon usually indicative of scientific health. We also believe that the controversy stems mainly from misperceptions that can be evaluated best by exposure in print. We hope that our efforts will enhance future rapport between the disciplines, leading to better science in the end. And that is really what we all want.

The controversy is tiring to some. Dina Dincauze (University of Massachusetts, Amherst) feels “benign acceptance” for the February *Geotimes* essay, and Paul Karrow (University of Waterloo) has the “feeling that the only activity in the field of geoarchaeology is perpetual wrangling over philosophy.” Both clearly show that too much discussion can be counterproductive. However, knowing that our report tries to summarize a broad spectrum of the field, rather than the polemics of a few key individuals, we hope that you will read on.

Geoarchaeology or archaeological geology? Geoarchaeology has been defined by many as the application of earth-science techniques to archaeological problems. Almost everyone concedes that workers in this disciplinary overlap attempt to answer archaeological questions, and that meaningful geologic results are frequently obtained in the process. Archaeological geology, meaning the “application of geological techniques to the solution of discrete problems that are archaeological in nature” (Rapp and Gifford) sounds very much like geoarchaeology, but the research goals are basically within geology.

We might dismiss the label problem as a semantic conundrum, but we believe that it addresses “ownership” of site stratigraphy. At the extremes, we hear “archaeology is geology” from an informant unwilling to be quoted, and “geology is just one small part of geoarchaeology, which is really archaeology done right” from others.

Gleaning geological data from archaeological contexts, or perfecting stratigraphy, chronometric or geochemical techniques can sometimes best be done in archaeological settings, but most of us are really going after human history. But maybe we haven’t done a very good job of it, otherwise Paul Goldberg (1988, *Biblical*

Archaeologist, December, p. 197-202) would have no need to write “The role of the archaeologist in geoarchaeological endeavors is practically never considered in [their] works, despite the fact that many are ostensibly written for archaeologists.” Apparently, only geoarchaeologists — not archaeological geologists — need to be concerned about communicating their results to archaeologists.

A second point concerns the exclusiveness of archaeological geology. Is there also such a thing as archaeological geography? How about archaeological pedology, or archaeological climatology? Because all of these are clearly geosciences, geoarchaeology is much more inclusive. Geoarchaeology is not shorthand for geo(logical)archaeology, but for the application of all earth sciences to archaeological problems. Archaeological geology is an important, but small piece of the pie.

Having settled on a label, does geoarchaeology exist? A 1982 review by West of Rapp and Gifford’s 1982 *American Scientist* article remarks that “I just happen to think that [geoarchaeology or archaeological geology] would shortly come to be known as archaeology — albeit probably the better for having come forthrightly to grips with its true nature.” He believes that archaeology is an interdisciplinary earth science “in the execution of its data gathering aspect.” Or, as Jonathan Davis (Desert Research Institute, Reno) says, “it studies physical, not behavioral evidence.” David Meltzer (Southern Methodist University, Dallas) speaks for many when he views “geoarchaeology as just good prehistoric archaeology.” If geoarchaeology is synonymous with archaeology, then the former term shouldn’t exist. But here we are with an issue of *Geotimes* devoted to it. What is geoarchaeology?

Mike Wilson (University of Lethbridge) says it is “a buzz-word.” It is a “specialization,” according to Bill Farrand (University of Michigan). Thorson has called it “A chameleon-like zone of overlap” or “interest group.” Is it an addiction or academic bigamy? Those of us who enjoy the field agree that it is all of these. It is also one of many sets of techniques applied to archaeological questions.

All labels are simultaneously both conveniences and annoyances, because

whole is partly offset by its fragmentation. From this viewpoint, geoarchaeology (the subunit) exists only because prehistoric field archaeology (the whole) is too broad or perhaps too lacking in a "unified methodology" (M.L. Shackley, 1979, *Naturwissenschaften*, v. 66, p. 429-432) to exploit all relevant earth-science techniques. Beyond that, archaeology may need geoarchaeology as a lever to force it to "come to grips with its true nature," as West so aptly put it. By this we mean that the external infusion of earth sciences into the field may help move parts of archaeology away from over-dependence on anthropological paradigms.

Perhaps geoarchaeology thrives because archaeology is really paleontology, purportedly a geologic subdiscipline. Beyond the assumed level of complexity granted to the label "cultural," how do the field and interpretive procedures used to reconstruct a Paleoindian site differ fundamentally from those used to reconstruct a Silurian reef or a dinosaur-bearing alluvial paleosol? Aren't chronology, taphonomy, stratigraphy, paleoecology, paleoclimatology, and typology used equally in all three efforts?

Moving forward in time to an Old World early hominid site brings us squarely into the domain of archaeology, not because any of our operating principles have changed, but simply because the objects being considered are human. Some geologists must surely consider most prehistoric archaeologists as paleontologists who specialize in the trace fossils (lithic remains) of our recent ancestors.

There just might be too much kinship between the disciplines to ever cleave them at their methodological or intellectual roots, yet too much specialization in the modern arena for them to do without each other. The term geoarchaeology connotes both the historic affiliation and mutual dependency between the disciplines.

The barriers to more effective interdisciplinary work are human. Although most of us seem to be journeyman realists, we have met the cynic, the idealist, and the truly incompetent, and have either taken offense or been "burned." We then proceed to generalize our experiences and define each other with restrictive labels. Our minds are quickly and firmly made up.

Probably the best place to begin a discussion of barriers is outside the zone of disciplinary overlap. Geographers are miffed that they are not accorded equal status with geologists. Geochemists and

hard-rock geologists take issue with the peculiar American bias that "archaeology is not all stratigraphy" (Norman Herz, University of Georgia). And of course, the "soul" of archaeology is forever being yanked around in the social sciences.

An equitable way to proceed is to name two other archetypes, one from each camp, that do nothing but polarize archaeologists and geoscientists. These attitudes are the "savior syndrome" among geoscientists and "cigarbox geoarchaeology" among archaeologists. Geoscientists with the "savior syndrome" believe that they are the answer to archaeologists' prayers. They arrive on site ready to save the poor, dumb archaeologists from their own stupidity, condescendingly dispensing jargonistic jewels of geo-wisdom to the lost prehistorians. These pedant/saviors give no thought or consideration to the possibility that the archaeologists have any inkling of what earth science is all about. The result is a group of archaeologists who have been insulted, and who have no inclination to pursue geoscience further.

In contrast, there are the archaeologists who arrive on the doorstep of geoscientists with a cigarbox containing a miscellaneous collection of dirt and rock. They wonder what the earth scientists, out of the kindness of their hearts, can tell them. "Cigarbox geoarchaeology" does not ask real questions. Often the immediate and justifiable reaction of the geoscientists is "why should I spend my time on this, when the archaeologist did not consult me in the planning and execution of the field work?" No one wants to be treated as an afterthought. We have all experienced variations of these situations, but only rarely are they publicized. At times, we are our own worst enemies.

And then there is the substantive and central issue of scale, the subject of the next symposium of the Archaeological Geology Division of the Geological Society of America. Disciplinary boundaries aside, no topic results in more miscommunication in the field; we speak from our own experience. Different perspectives on spatial and temporal scales between "on-site" personnel (not necessarily archaeologists) and "off-site" personnel frequently lead to distorted and parallel, rather than focused and convergent, conversations between co-workers. Similar communication disorders arise from disparate views of scale involving analytic precision, logical certainty, complexity, and relevancy.

According to Tom Hamilton (USGS,

Anchorage), "At the university level, probably nothing would succeed as well [in enhancing archaeo/geo research] as a damn good joint beer party." By this, does he mean that our wariness and inhibitions are the prime obstacles to effective communication, or is he reminding us that deep down we are in this cooperative business for fun? Is academic turf really the issue? Should we let it get in the way? Fortunately, earth scientists and archaeologists (some of whom are spouses) don't hold a premium on miscommunication.

At the heart of the matter is academic training. For each discipline, we refer to the intellectual heritage, the central goals, major unanswered question, the tolerance for ambiguity, and the basis for hypothesis formation, among others. The "geoarchaeological paradigm, namely that some archaeological questions can be answered, at least in part by appropriately framed geological studies" (J.K. Stein and W.R. Farrand, 1985, *Archaeological Sediments in Context*, v. 1, p. 1-3) must be taught to archaeology students. Conversely, earth-science students must be taught to appreciate that geo-investigations of sites are driven by archaeological research questions, which they must learn to comprehend.

Interested undergraduate students should pursue traditional degree programs, taking as many courses in the other field as schedules permit. To foster this, those of us in academic settings must relax credit requirements within departmental boundaries, sponsor joint courses and colloquia, and encourage students to learn how the "other side" operates. And those of us in governmental agencies and the private sector can provide incentives by hiring cross-trained individuals. The recent trend wherein traditional geology departments are doing away with positions historically associated with archaeology (Quaternary stratigraphy and geomorphology) is a bad omen, but one counterbalanced by the availability of excellent graduate-level interdisciplinary programs at many institutions. Perhaps those of us in the business now cannot change our views enough. But the future of our field lies in the hands of our students and our apprentices. And we do have some control over that.

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