anthro notes

National Museum of Natural History Newsletter for Teachers

vol. 6 no. 2 spring 1984

STUDENTS DIG IT!

Erich von Däniken has nothing on high school students in an introductory course in archeology: When confronted for the first time with such mundane Indian artifacts as potsherds, waste flakes from tool-making, deer bones, and a few broken tools, their imaginations run wild. Throw in a few human bones and their fantasies become feverish. Add an earthen mound to this mix and their explanations become extra-terrestrial!

Perhaps I exaggerate, but not very much. Archeology for most high school students has never been conceived of as a science. Instead it is viewed as a romantic search for, and the discovery of, antiquities such as King Philip's tomb, Agamemnon's golden mask, or the treasures of the Pharoahs.

When archeology begins to be understood as a science, it is not at all clear to students how to proceed. After all, the kinds of science most teenagers have been exposed to are earth science, biology, or chemistry. These subjects tend to be long on description and on the type of laboratory experimentation that seems to have little relevance to trash pits, human burials, and pottery sherds. The application of the scientific method to the material remains of past cultures has to be taught to high school students. In this way enthusiastic imaginations are subjected to the rigorous demands of scientific inquiry. This is a process that takes time but can be richly rewarding to both student and teacher.

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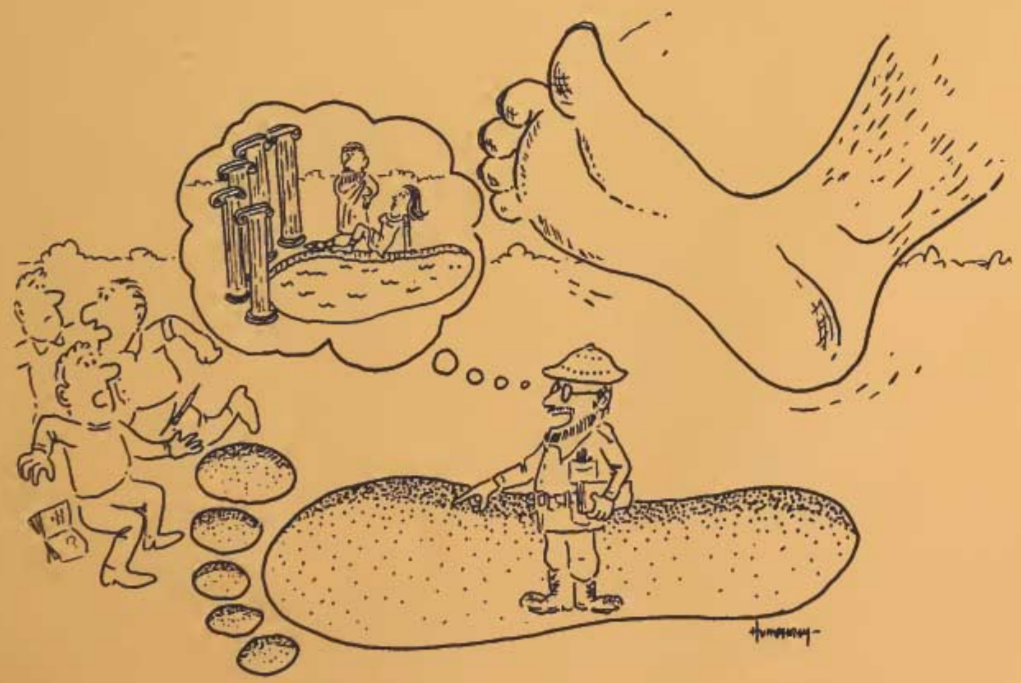

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I teach in a large, upper-middle-class, public high school in the suburbs of Washington, D.C. Most of my students are 11th and 12th graders who have elected to take an 18-week course, half of it physical anthropology and half of it archeology. Invitation to Archaeology, by James Deetz, is the text for the archeology half, but the course is basically built around the use of scientific inquiry and the analysis of archeological data. Since it is not possible to involve all 90 students in a dig nor to arrange a schedule that would permit it, laboratory experiences are provided for all students.

Inference-Making and Testing

Nineteen years ago I participated in the excavation of the Crable site, a prehistoric Indian village site in Illinois, part of a program sponsored by the National Science Foundation for high school teachers. The archeologist in charge allowed the teacher participants to take some samples of the numerous materials found in the plow zone to use for instructional purposes. Using these, as well as slides and drawings, my students are presented with a variety of data about the site and what was found.

During the several weeks of time spent in the study of these materials, the students are expected to develop and test inferences, using the data given, both in artifacts and other materials. Inference-making and testing is done at three distinct levels of analysis and synthesis, each more complex than the preceding one. The first level consists of analyzing each discrete item or bit of data and determining its function, if any. The second level of analysis consists of analyzing and explaining various features (such as trash pits). The third level of analysis as well as synthesis is at the cultural level (such as explaining subsistence patterns). Let me describe each step of this process.

A Sherd is Not a Stone

At the first level of inference-making and testing, students are presented with a variety of data. Slides show the site, the surrounding environment, and the excavations undertaken. Maps, drawings, and diagrams of the site are placed on the board and students are given a chance to take notes and ask questions. Then about two dozen sample artifacts and other items are distributed for examination and study. In presenting all of this data, I am careful not to make any inferences or draw any conclusions.

Students work in small groups at tables and are encouraged to work together in making and testing inferences. They are instructed to go through a three-step procedure with each item. First, what are its characteristics? Second, what is it? Third, what was its function? Each item should be described in writing, giving shape, size, color, texture, material, and any other pertinent features. Each item should be sketched. This takes most students at least a week to complete, and for some even longer. They have countless questions and continuously leap over the first two steps to the item's function. I move around the classroom, answering questions mainly by countering with some of my own, such as "What do you observe about the texture of that piece of rock?" "What are the grooves?" "What is the evidence for your inference?"

At first, frustration! Many students can't even distinguish a piece of cord-marked, shell-tempered pottery! "I guess it's a piece of stone," one student concludes after a cursory examination. He needs much help with observation. "Have you looked at it in cross-section?"

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"What is its shape?" "Is it flat?" "Why not?" "What are the white specks?" Students are encouraged to ask these questions of one another.

The cord markings on sherds require the closest observation. How were they made? Only after looking at a short, single section of one cord mark, and only after drawing it, do students finally see the twisted fiber imprint and begin to comprehend how the pot was made.

The Case of the Trash Pits

After completing this first step, the analysis of archeological features begins. At this level students must combine the discrete bits of evidence acquired at the first level into larger complexes. Students are provided with questions to direct their attention: "What were the excavated holes in which were found wood ashes, charcoal, animal and fish bones, sherds, lithic materials, etc.?" "How do you account for the human leg bones?" "Was the mound natural or man-made?" "What was its function?" Here is where fantasy and imagination run riot. However, students are given the following guide for testing their inferences in order to bring them back to the world of reality.

The excavated pits are analyzed first by the whole class. Every imaginable inference concerning their function is recorded on the board. Then each one is tested by the known data. Each bit of data supporting the inference is given a plus mark, while each bit of data that fails to support it or that refutes the inference is given a minus mark. After all of the pertinent supporting or refuting evidence has been weighed in this fashion, that particular inference having the most pluses and fewest minuses is given the highest probability of being correct. Invariably, in the case described, students conclude that the excavated holes were trash pits. Then students are directed to make and test inferences in similar fashion with respect to other features.

Careful attention is given to spatial, temporal and formal aspects. The spatial aspect is stressed with regard to the trash pits. How is it that all of these diverse items are found jumbled up together? The human leg bones found adjoining a trash pit are a mystery that intrigues everyone until the drawing of this find is reexamined and both spatial and temporal possibilities are considered. Most students conclude that an earlier burial was disturbed by later diggers of a trash pit, and the remainder of the skeleton disposed of, leaving the lower leg bones undisturbed. And so another week is spent on this step of inference-making and testing.

"By George, I've Got It!"

The third and most sophisticated part of the process is at the cultural level. Students are given questions such as: "What were the subsistence patterns of these people?" "How large was the village?" "What was the religion and ritual of these people?" Answers to these questions form the basis for a "site report" describing, insofar as possible, the culture of the people who inhabited the Crable site. At this level students must combine data and inferences from both of the previous levels, an intellectual task in synthesis.

By this time, most students have become much more sophisticated in the use of this method of making and testing inferences and are able to assemble a wide variety of data and to test their broad inferences. One of the most frequent comments made by students after completing their site report is, "When we started this study I couldn't imagine how you could tell anything about religion or social organization from just a few artifacts and slides. It's amazing how everything sort of fits together!"

One semester the students retrieved a large collection of artifacts from a dredging of the Chesapeake and Ohio

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Canal in Georgetown, Washington, D.C., We also use these for inference-making and testing with historical materials of the late 19th and early 20th centuries. The predominance of whiskey bottles over milk bottles leads to some interesting speculation about what life was like along the canal. These artifacts provide opportunities for preparing typologies.

Finally, a part of the semester exam given to students contains a sketch of a 30-foot profile of the Koster site in Illinois, much simplified and supplemented, with instructions to students to describe the culture at each of nine living levels, extending back to the PaleoIndian period. This exam is designed to evaluate the skills students have learned in inference-making and testing, as well as their familiarity with the prehistory of eastern North America, the second important segment of the nine-week course.

There are not too many high school archeology courses in the U.S., but those that exist can provide students with excellent opportunities to use scientific inquiry as a bridge between humanistic studies and science. It should not be hard for other teachers to find similar archeological resources that can give their students the thrill of discovery. When students are successful in using these resources to develop and test inferences, in a manner similar to archeologists, both students and teacher derive great satisfaction as well.

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(Paper delivered at the 11th International Congress of Anthropology and Ethnological Sciences, August 1983.)