

CONSERVATION AND ARCHAEOLOGY IN GREAT BRITAIN AND THE UNITED STATES: A COMPARISON

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ABSTRACT—Archaeological conservation has received little support or recognition from some archaeologists in the United States. This paper examines the relationship between archaeology and conservation by looking at the historical development of both fields in Great Britain and the United States. British prehistoric archaeology and American classical archaeology have generally supported conservation, while American anthropological archaeology has had little contact with or interest in the conservation field. Understanding the history and theoretical perspective of each of these fields of archaeology could help in developing better professional interaction between archaeology and conservation.

1. INTRODUCTION

Several authors recently have looked at various aspects of the development and history of archaeological conservation (NIC 1984; Caldararo 1987; Gedye 1987; Gilberg 1987; Hodges 1987b; Seeley 1987). However, little attention has been focused on the differences between archaeological conservation in the United States and Great Britain. For example, no training programs are devoted specifically to archaeological conservation in the United States, while Great Britain has three such programs. Also, there has been no examination of how the development of archaeological conservation in the United States has been affected by its differing affiliation with the two main fields of archaeology—classical and anthropological. Looking at the development of archaeological conservation in Britain and

comparing it to the more erratic development of this field in the United States gives a general perspective on the relationship between the professional fields of archaeology and conservation as well as the individual interactions between practicing archaeologists and conservators. W. M. Flinders Petrie, the famous English Egyptologist, wrote in his 1904 text, *Methods and Aims in Archaeology*:

The preservation of the objects that are found is a necessary duty of the finder. To disclose things only to destroy them, when a more skilful or patient worker might have added them to the world's treasures is a hideous fault. . . . Some familiarity with chemistry and physics and properties of materials is one of the first requisites of an excavator (Petrie 1904, 85).

This paper will attempt to show that early in the development of British archaeology from an avocation to an academic discipline, the attitude Petrie expresses helped to support the growth of an allied field, archaeological conservation. In contrast, archaeologists in the United States, especially those who work in the New World, have little knowledge of the developed profession of archaeological conservation. In many textbooks, American authors mention preservation or conservation, but they rarely acknowledge the existence of an international group of

individuals with expertise in examination and stabilization of archaeological material (Ashmore and Sharer 1988; Fagan 1978; Hole and Heizer 1973; Sharer and Ashmore 1987). To these archaeologists, conservation is limited to a set of techniques for the preservation of morphology. This essay will examine these two extremes in understanding of and attitudes toward archaeological conservation that are held by individuals who all nominally do the same thing: archaeology.

It will be shown that prehistoric archaeology supported the development of archaeological conservation in Britain. This situation will be contrasted with a discussion of the different manner in which American archaeologists dealt with similar problems of recovery and preservation. The different theoretical perspectives, methodological concerns, and archaeological materials that engaged each group will also be shown to have affected the development of archaeological conservation in each country. The literature of prehistoric archaeology and conservation will be evaluated to support these ideas.

Understanding the historical development of archaeological conservation and archaeology and examining the different relationships between the two professions in Britain and the United States is one way of identifying areas of mutual interest and antagonism in order to develop a better working relationship. This process in turn could easily lead to research and development and support in many areas of mutual interest.

2. WHAT IS ARCHAEOLOGICAL CONSERVATION?

The term "archaeological conservation" has been variously defined. In the United States,

archaeological and ethnographic conservation have always been closely allied (NIC 1984). This relationship may be seen as an extension of the historical alliance of American prehistoric archaeology with anthropology and reflects the anthropological collections found in the United States. Alternately, in Great Britain the responsibilities of archaeological conservation only recently have sometimes extended to folklife and ethnographic collections (Pye and Cronyn 1987).

In general, archaeologists and conservators view excavated material from two different perspectives. An incomplete understanding of each perspective contributes to the uneasy relationship that exists between conservation and archaeology (Moyer 1988; Thornton 1989). Many authors have discussed this relationship (Hamilton 1976; Borque 1980; Keene 1980; Morris 1980; Tuck and Logan 1987; Logan 1988; Hodges 1987a). The huge range of interests of each group of professionals has sometimes made it difficult for archaeologists and conservators to agree on what should happen to excavated material.

The responsibilities and interests of archaeological conservation have not been clearly defined by the conservation profession. Leaving aside the question of whether conservation should have strictly defined boundaries delimiting its responsibilities, this problem exacerbates communication difficulties between conservation and other disciplines. Within the conservation profession there is a range of opinion on what the responsibilities of archaeological conservators should be (Pye and Cronyn 1987; Johnson and Wallis 1991). Archaeological objects, if they are housed in art museums, are treated by conservators

and others according to a different aesthetic and ethical standard than those housed in anthropology collections. Conservators of archaeological material may work in the field with archaeologists treating freshly excavated finds or in a museum lab on objects that have been in collections for years (fig. 1). Preservation of sites and monuments has also been included under the aegis of archaeological conservation (Franco 1987; Alva and Chiari 1984).

To confuse the role of conservation in archaeology even further, archaeologists in the United States have used the term "conservation archaeology" to refer to preservation of the entire site *in situ* or excavation of a site threatened by development (Lipe 1978; Fowler 1986; Johnson 1988). For these archaeologists, conservation of objects is relegated to a support staff position with responsibility beginning only with the curation of recovered materials after all excavation and primary analysis are finished (McGimsey and Davis 1977).

To elucidate the historical relationship between archaeology and conservation, a narrow definition of archaeological conservation will be used for this paper. Archaeological conservation is the conservation of material produced by systematic field excavation. It includes both field or first-aid treatment as well as more complete examination and treatment in the laboratory, based on an understanding of chemical and physical properties of materials. It also includes research in technology and the development of new treatment techniques. Archaeological material includes the objects and samples recovered during excavation as well as the records produced by the archaeologists at work. Objects that have been buried but have no exact site

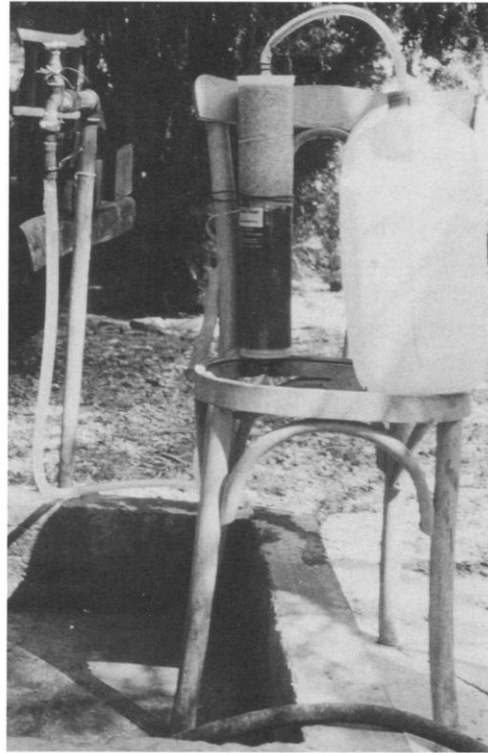


Fig. 1. Archaeological conservators may work in the field with archaeologists. Fieldwork requires imaginative use of equipment for proper treatment of objects. Shown here is a system for producing deionized water.

provenance are not considered archaeological in this definition, though a discussion of the ethics of treating this material is sorely needed. This definition also does not include *in situ* preservation of sites and monuments before or after excavation; this type of preservation requires specialized knowledge of many other techniques, though conservators in the field may be called on to give advice.

3. TYPES OF ARCHAEOLOGY

Archaeology in Britain and the United States is a very broad academic discipline with different theoretical orientations used by

different groups of practitioners. The different subdisciplines can be organized variously but can include classical archaeology, Mesopotamian archaeology, Biblical archaeology, Middle Eastern archaeology, Egyptology, Asian studies, prehistoric Old and New World archaeology, Mesoamerican archaeology, medieval, post-medieval, and historical archaeology, industrial and urban archaeology, underwater, wet-site, and maritime archaeology, and even environmental archaeology. Other categories could be added to this list, and there is much overlap among the categories. Nevertheless, this list shows the long temporal perspective and the geographic range that archaeology studies.

Each group of archaeologists has a wide variation in interest and experience. In some areas of the world (e.g., around the Mediterranean), American and British excavators' acquaintance with conservation may be quite similar. However, it cannot be denied that while archaeological conservation has an established role in British archaeology, U.S. conservators have a much more peripheral responsibility, if any.

3.1 CLASSICAL VERSUS PREHISTORIC ARCHAEOLOGY

The above list of archaeology disciplines can be organized into two broad categories that have developed separately since the late 1800s: classical and prehistoric archaeology. These two groups are distinguished by their basic differences in theoretical perspective. In its broadest sense, classical archaeology studies the early civilizations in the classical world as well as Anatolia and the Middle East. It has a coherent body of interest, founded in classical scholarship since the Renaissance (Renfrew 1980). It developed out of this humanistic tradition and has been

allied to art historical and epigraphic disciplines (Trigger 1986). This humanistic archaeology differs considerably from the more scientifically allied prehistory in often having extant written texts from the civilization being studied as well as emphasizing "high art" objects and the culture of elite groups in ancient society.

According to one classical archaeologist, his discipline is at the bottom of a strict hierarchical structure within classical scholarship. The job of classical archaeology has been "to illustrate the world already known from written sources . . . and to add to the repertoire of beautiful objects in museums" (Dyson 1981, 8). While this is a rather controversial and depressing description for the scope of classical archaeology, it illustrates a concern for each object as a separate entity with intrinsic worth that requires attention to preserve it and restore its former beauty.

In contrast, prehistoric archaeology, which sees itself as having a more scientific perspective, tends to view its finds as data, sources of information about human activity that must be manipulated in various ways before being of any use. According to Glyn Daniel, this type of archaeologist "long ago ceased to be a connoisseur: indeed so much so that it may sometimes be complained justifiably of the prehistoric archaeologist that he has entirely set aside aesthetic judgments" (Daniel 1975, 288). This difference in perspective between classical and prehistoric archaeology may not be generally recognized in the conservation community. However, it can make a great deal of difference to the conservator interacting with archaeologists and deciding on the proper course of treatment for archaeological material.

4. EUROPEAN PREHISTORIC ARCHAEOLOGY AND CONSERVATION

Archaeological conservation as a distinct field has not grown out of classical, humanistic archaeology, as might be expected, but out of European prehistoric archaeology. Often termed scientific archaeology, this field allied itself with history, natural sciences, and geology in the late 1800s (Daniel 1975). Daniel traces the development of preservation and excavation techniques in British archaeology to excavation during the mid-19th century of spectacularly preserved tree-coffin sites like Gristhorpe in England and the Swiss lake dwellings. These techniques and others were then developed by British excavators like W. M. Flinders Petrie and Sir Leonard Woolley in western Asia and Egypt. "Archaeology had to develop a technique of excavation and preservation all its own; [it was realized] that careful excavation of specially preserved sites would yield the most detailed knowledge of the way of life of early man" (Daniel 1975, 161).

In Britain, and in Europe more generally, prehistoric archaeology is viewed as an extension of European history back into prehistoric times (Trigger 1978). A major interest of British prehistoric archaeology since the late 1800s has been the development of "systematic archaeological techniques of excavation, field survey, conservation and protection" (Daniel 1975, 152). Preservation and conservation techniques have been considered an important part of archaeological investigations.

British archaeologists were influenced in their techniques by the German excavations of such individuals as E. Curtius at Olympia and Hubert Schmidt of the Berlin Museum

für Volkerkunde at Anau in Turkestan (Daniel 1975, 228–89). Later, other German excavators like G. Bersu, a refugee from Nazi Germany in the 1930s who excavated at Little Woodbury in Wiltshire, continued to actively influence British archaeology (Evans 1989).

In addition to being early innovators in excavation techniques, the Germans were innovators of scientific archaeological conservation in the museum. Friedrich Rathgen, first director of the Chemical Laboratory of the Royal Museums of Berlin, has been called the "father of modern archaeological conservation" (Gilberg 1987). A chemist by training, from 1888 he developed treatments for artifacts based on a scientific approach rather than on traditional, empirical, craft-based skills (Gilberg 1987). Many of his methods form the basis of techniques still used on archaeological materials today.

5. BRITISH PREHISTORY AND CONSERVATION

The development of archaeological conservation in Britain appears to stem from British archaeology's strong interest in method and techniques and the creative input of certain archaeologists, conservation chemists, and conservators at crucial stages during the late 1800s through the mid-20th century. Other individuals then influenced the development of conservation as a specialized discipline, separate from archaeology, as conservation became more organized worldwide. Unlike American archaeologists, British workers realized early the importance of chemical and physical knowledge for successful treatments.

5.1 CONSERVATION IN EARLY SCIENTIFIC ARCHAEOLOGY IN BRITAIN

W. M. Flinders Petrie did much of his work on sites in the Middle East, especially Palestine and Egypt. The huge sites in this geographic area produce masses of material that often exhibit amazingly good preservation. During his excavations he acquired a great interest in the development of techniques to conserve his fragile finds. He developed and published many techniques for preservation of objects as early as 1888. While it is unclear what contact Petrie may have had with those first German conservators, the Germans certainly knew of his techniques (Rathgen 1905). Alfred Lucas, a chemist who worked in the Egyptian Department of Antiquities and the author of another early text (1932), must also have had professional contact with Petrie.

Petrie's skill and expertise continued to grow, as shown by his chapter "Preservation of Objects," in which he discussed deterioration and preservation of material in the field (1904). The materials he devised treatment for include stone, pottery, textiles, wood, ivory, papyri, beadwork, stucco, gold, silver, copper, bronze, lead, and iron. The next chapter in that volume, titled "Packing," describes techniques for packing excavated material so it could be safely transported from the field to the museum. These techniques presage the concerns of later conservators working in the field. This chapter might be considered an early version of the more recent handbooks written by conservators for field archaeologists (Downman 1970; Leigh et al. 1972, 1978; Watkinson 1987; Sease 1992).

Petrie expressed a modern perspective on the requirements for an individual

specializing in conservation. Although he noted the need for "some familiarity with chemistry and physics and properties of materials," (1888, 85), he gave the responsibility of preservation to the excavator, not to a separate expert. His attitudes coincide with the development of the preservation (versus restoration) ethic developing toward many different materials (Caldararo 1987). However, Petrie's great experience made him a very practical field conservator:

In all this we are stating field practice only, and not dealing with museum methods, which differ by having far more command of resources, and by not having to deal with any of the troublesome cases which do not survive to reach a museum (1904, 85-86).

Other archaeologists working at the same time in the same area of the world had very different ideas about the importance of preserving fragile material or lacked the techniques to preserve them. Petrie noted that the excavator Clermont-Ganneau had never heard of using paraffin wax as a consolidant/support (which Petrie commonly used) and so was not able to preserve bead coverings on the sacred rams at Elephantine (n.d., 99). He also raged against the lack of care given to the objects after they had been removed to a museum in the local country or back in Britain: "The perils of discoveries are by no means over when they reach a museum. Thing after thing has been spoilt, lost or thrown away after it seemed safely housed" (n.d., 576).

Petrie also had quite strong opinions about the quality and quantity of restoration work that could be found on material in museums such as the Louvre around the

turn of the century. "One is irritated by the great quantity of restoration; so frequent are they that nearly every label has a long list of them, which one needs to read through before one can begin to consider the statue. Everything, chronology, subject and style, is made subservient to effect and appearance" (n.d., 26).

A variety of opinion about the aesthetics of preservation and restoration of archaeological material still exists. Some museums, considering some antiquities as art objects, go to great lengths in their restoration (Williams 1989). Other conservators, more concerned with the archaeological significance of artifacts, may only clean part of them, also leaving some information (such as clues to the burial environment) encased in the remaining deterioration products (Edwards 1989).

When discussing the future of systematic archaeology, Petrie gave prominence to the importance of developing the role of conservation:

During the last century there has been a gradual growth of archaeological perception; and in place of only caring for beautiful and striking objects there has arisen some interest in whatever can throw light on past civilizations. But unhappily the ideas of conservation have not kept pace with the work of discovery (n.d., 130).

Several British institutions were established to apply scientific techniques to the preservation and analysis of archaeological material. The first, the British Museum Research Laboratory, was founded in 1922 to investigate the rapid deterioration of artifacts during their storage in subway stations during World War I, using Rathgen's work

as the basis for the original research (Oddy 1990). Alexander Scott was appointed as a consultant to the museum by the Department of Scientific and Industrial Research and published three monographs of his work (1921, 1923, 1926). This laboratory, under Harold Plenderleith, was involved in conservation and analysis of material from major excavations of sites like Ur and the tomb of Tutankhamen as well as British sites and material already in the British Museum collection. In 1950, the Ancient Monuments Laboratory was established to deal with conservation of the finds and scientific interpretation of material excavated under the control of the Inspectorate of Ancient Monuments.

British and European conservators developed several texts for archaeologists and museum technicians (IMO 1940; Rathgen 1905; Scott 1921, 1923, 1926; Plenderleith 1934). These texts would have helped to advertise the role and usefulness of early scientific conservation to European archaeologists.

5.2 INSTITUTE OF ARCHAEOLOGY

R.E.M. Wheeler (fig. 2) established the University of London Institute of Archaeology in 1936. He envisioned this new educational institution as "first and foremost an effective medium for the enlargement of technical understanding" (1955, 112). Petrie supported Wheeler's new institute by donating his collection of Palestinian material. One aspect of the training given at the institute was the cleaning and restoration of the archaeological artifacts. Ione Gedye, a student of Petrie's, was one of the original staff members in the technical department at the institute. Students did coursework with these teachers, learning how to restore pottery and clean metals.



Fig. 2. Dr. R.E.M. Wheeler, founder of the University of London Institute of Archaeology. (Courtesy of the Institute of Archaeology, University College London)

Originally, the techniques used in the technical department were the same as those developed by archaeologists on a trial-and-error basis. However, the staff was soon introduced to H. J. Plenderleith at the nearby British Museum Research Laboratory. He helped them begin to develop an understanding of the scientific principles underlying treatments he and others had published (Plenderleith 1934). Ione Gedye also visited the *Musées Royaux d'Art et d'Histoire du Cinquantième* in Brussels to gain more experience in conservation techniques. Henry M. W. Hodges joined the staff of the department in 1957. In the 1958–59 academic year, soon after the institute was moved to its present quarters in Gordon Square, London, the technical department

was renamed the conservation department. The name change signified a shift in the curriculum from training in technical skills to a sounder theoretical understanding of technology, deterioration, and archaeology (Hodges 1987b).

In 1974, Nigel J. Seeley, a chemist by training, succeeded Henry Hodges and then became head of the department in 1976. In 1977, the conservation department was renamed again as the department of archaeological conservation and materials science. The curriculum for conservation students has continued to become more scientifically and analytically based. Postgraduate students began to be accepted in 1975.

The institute training has greatly influenced the development of archaeological conservation in Britain and the United States. The two other British programs in conservation, located in archaeology departments at Cardiff and Durham, were started by institute graduates in 1974 and 1976, respectively. About 10% of those listed as archaeological conservators in the *AIC 1993 Directory* were trained at these institutions.

Rescue archaeology in Britain (known as salvage archaeology in the United States) has supported much of the most recent development in conservation (Foley 1989). Most archaeological conservators have been trained since 1974 (Cameron et al. 1988), coinciding with the rise of rescue archaeology. Archaeological conservation for rescue excavations is carried out by such institutions as the Ancient Monuments Laboratory. Both staff and contract conservators work out of this laboratory and other laboratories around Britain on material excavated by archaeological projects funded by the Historic Buildings and Monuments Commission

(English Heritage). Conservators in local laboratories, such as the Conservation Centre at Salisbury, spend part of their time dealing with material from developer-funded excavations carried out by private companies. These laboratories work actively with the archaeologists in the planning stages of the projects, on-site during the excavations, and back at the laboratory, where they continue conservation as necessary.

This review is just a brief examination of the development of archaeological conservation in Britain. It would be interesting to investigate how Petrie developed his great support for preservation and to compare his work to that of others, such as Sir Arthur Evans, who employed local restorers. An in-depth look at the origins of individual conservation labs in Britain could suggest how to develop greater conservation support for North American anthropological collections.

6. AMERICAN PREHISTORIC ARCHAEOLOGY AND PRESERVATION

In the New World, prehistorians take as their field of study the archaeology of Native Americans until their contact with European explorers. Since the development of archaeology out of American antiquarianism in the late 1800s, this archaeology has been allied with cultural anthropology, physical anthropology, and linguistics as the discipline of anthropology. The four anthropological disciplines developed as different aspects of a holistic study of the American Indian (Trigger 1978). To quote a well-worn phrase used by these archaeologists, "American archaeology is anthropology or it is nothing" (Willey and Phillips 1958, 4).

Generally, American classical archaeologists and anthropological archaeologists share little in terms of interests and theoretical and methodological principles. They work in separate departments in universities, excavate different sites, and analyze their objects differently. Their research interests are often completely different, sometimes at odds. In general, classical archaeology has supported conservation in the U.S., while anthropological archaeology has little knowledge of conservation.

Willey and Sabloff (1980) have traced the beginnings of professional anthropological archaeology to between 1840 and 1914, the same period when scientific prehistoric archaeology was developing in Britain. Before this time, as in early British archaeology, excavation was done out of simple curiosity and a desire to discover interesting and precious objects. In America, this early archaeology was also accompanied by descriptions of the native peoples encountered by Europeans. Anthropological interaction with Native Americans reflected the more generally held Anglo-European attitude, which viewed Indian cultures as primitive, inherently static, and inferior (Trigger 1980). Remains of complex cultures such as those found in the Midwest were attributed to non-Indian "Mound Builders," a vanished race. This archaeological and ethnographic material was deposited in natural history museums and generally accorded lower status than European-derived historical and art objects (NIC 1984).

During the next period of archaeological development (as defined by Willey and Sabloff 1980), from about 1914 to 1960, researchers began "systematic description of archaeological remains and monuments and the classification of these data in accordance

with formal typologies" (Willey and Sabloff 1980, 7). There were developments in scientific methodology and refinements in field and analytical methods, such as stratigraphic excavation and seriation, which were used to develop a chronological ordering of archaeological material (Willey and Sabloff 1980). "Preservation" techniques were also developed by archaeologists during this time (see below). Typology and classification techniques were used to develop regional chronologies. Generally, these typologies were created using abundant ceramics recovered as sherds. Stone tools (lithics) were also used. Although the import of other materials being excavated should not be minimized, many individuals spent major portions of their time studying sherds and lithics—two relatively stable archaeological materials. This research emphasis may have affected archaeological interest in preservative methods for other materials.

Among American archaeologists, there is perceived to be a much greater variety of material found in Old World sites (Teague 1989). One major material that is not common in the New World, especially in North America, but is frequently recovered in the Old World after the late Neolithic is metal. Native copper, found in the Midwest, and other nonferrous metalwork in South America are major exceptions. Metals (excluding pure gold) can begin to corrode quite quickly and obviously after excavation, sometimes leading to the complete deterioration of the material (fig. 3). Successful stabilization of metals requires a good understanding of the chemical and physical interactions that result in its deterioration. Much of Rathgen and Scott's early research had been concerned with the stabilization of

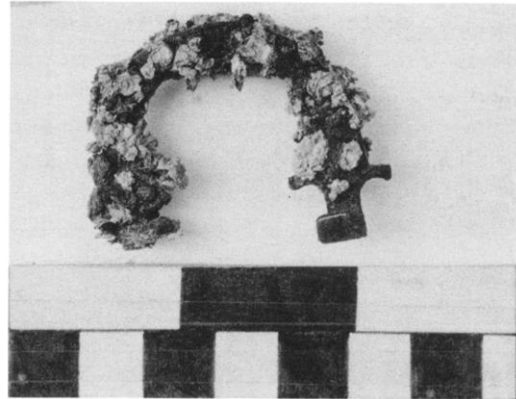


Fig. 3. Metals can begin to corrode quite quickly and obviously after excavation, sometimes leading to the complete deterioration of the material.

metals. The lack of metal artifacts may have been another reason American archaeologists did not look to other experts for help in preservation. Significantly, American historical archaeology, with its wide range of materials, including metals, has been more supportive of conservation than prehistoric archaeology. Hodges (1989) also notes that conservation has been readily accepted by archaeologists working in areas where waterlogged material is recovered (Grattan 1988). Wood is another material that quickly and obviously deteriorates if not protected after excavation.

Although American archaeologists may not have understood the importance of a knowledge of the chemistry and physics of deterioration, they did develop and use techniques for "preservation." American anthropological archaeologists often use the term "preservation" to signify maintenance of the morphological structure of an excavated artifact. So, for example, "preservatives" are applied to bone to consolidate the structure. Similarly, "preservative" insect repellants have been sprayed on organic

materials recovered from dry caves. *American Antiquity* and the *SAA-Notebook* contain many references to preservative techniques. Archaeologists were often given verbal advice by conservators, but there was little long-term interaction between the two (Johnson 1994). American archaeology was not unaware of the scientifically based conservation being developed in Europe. Douglas Leechman (1931) published a handbook of techniques for North American artifacts that was influenced by Rathgen and other European practitioners (Caldararo 1987). Many techniques were published in regional journals or as part of more general works (Morris and Burgh 1941; Bird 1951; South 1962; Keel 1963; Dunton 1964). In 1953, Rowe in "Technical aids in anthropology: A historical survey" was quoting Rathgen (1905), Leechman (1931), and Plenderleith (1934) as standard texts on preservation. Tellingly, he noted:

The fact that some technological method has been used successfully once or twice in solving a problem of anthropological interest does not by any means indicate that it is common knowledge even to specialists in that part of anthropology to which it is relevant. . . . I hope there are not many, but I have been much impressed with the amount of interesting and relevant information buried in technical journals which anthropologists would not normally handle (Rowe 1953, 895).

A large amount of technical information is passed throughout the archaeological world by word of mouth, through archaeological field schools and other practical training. In many cases the original development and application of the technique is unknown to

the practitioner. Many of the techniques developed by American archaeologists were practical and useful when they were originally used. However, they have been used without understanding the chemistry and physics of the processes. At times these techniques have created problems that have to be dealt with much later (Odegaard and Jacobs 1988). In many cases, by the time active deterioration occurs the material is no longer the archaeologist's responsibility. The same techniques and materials that have caused damage to materials in the past, and continue to deteriorate or cause damage in artifacts stored in museums now, are still being used by American archaeologists in the field today.

7. THE EFFECTS OF AMERICAN ARCHAEOLOGY'S ANTHROPOLOGICAL PERSPECTIVE

From the late 1960s until very recently, American anthropological archaeology has been dominated by the development of the "New Archaeology." This approach rejected the traditional, descriptive approach of earlier archaeology. Instead, it embraced the general goal of much of social science to "formulate laws that will explain socio-cultural processes and associated human behavior" (Trigger 1978, 20). As part of this approach, archaeologists rejected the quality and usefulness of previously excavated material in collections and called for new excavations to collect new data that could be interpreted through their own, sound, scientifically valid methods (Trigger 1985). There was little support in archaeology for the upkeep and care of collections in museums (Lindsay and Williams-Dean 1980).

Recently, some archaeological researchers have been examining the effects of formation processes, those social and environmental factors that affect the development of the archaeological record. One of the major proponents of the study of formation processes, Michael B. Schiffer, recently published a basic text that included a chapter titled "Environmental Formation Processes: The Artifact" (1987), which discusses deterioration of materials, a traditional area of expertise of conservators. He acknowledges "architectural preservationists and museum conservators" (144) and liberally quotes texts by Plenderleith and Werner (1971) and Dowman (1970) as the most recent texts in conservation. However, the field and museum conservator appears to have no active role to play in Schiffer's identification of formation processes. Elucidation of formation processes would seem to be a major potential area of collaboration between conservation and archaeology. Conservators, who are trained in materials and technical analysis and who closely examine every object during treatment, would appear to have an ideal perspective from which to identify and determine some factors that have influenced the artifacts they are conserving. For example, the careful examination of metal artifacts required before mechanical cleaning can reveal methods of manufacture and repair previously destroyed by more injudicious corrosion removal. Organic material is often recovered during mechanical cleaning of metals and can reveal much information about the depositional environment of the metal and organic material (UKIC 1989).

Most recently, the requirements for repatriation of Native American material culture and human remains have led to the development of an attitude expressed some-

thing like this: "If we are just going to rebury it, why bother with conservation?" Until specific federal guidelines are developed to legislate the repatriation of material housed in collections, there may be little impetus for archaeologists to accept the need for long-term preservation of the objects recovered from future as well as past excavation.

8. THE DEVELOPMENT OF ARCHAEOLOGICAL CONSERVATION IN THE UNITED STATES

Some conservators in the United States have been involved in conservation of archaeological objects or at least materials that were once buried for some time. Important art collections like the Chinese bronzes of the Freer Gallery of Art (Gettens 1969; Pope et al. 1967) and important classical sites such as Sardis in Turkey (Majewski 1973) included conservation as part of a collaborative effort. Until recently, however, these American-trained conservators rarely worked on excavations in the New World (Morris and Seifert 1978). The early collaboration on excavated objects between art historical and classical scholars and conservators may have helped to disguise the lack of contact between many American archaeologists and the conservation field.

In contrast to the long-standing training support for archaeological conservation in the United Kingdom, in close proximity to archaeological training, in the United States there has been little opportunity for students with this specific interest. George Washington University in Washington, D.C., ran a program in archaeological and ethnographic conservation from the mid-1970s to the early 1980s. The art conserva-

tion programs at the State University College at Buffalo (previously the Cooperstown Graduate Program in Conservation of Historic Works, started in 1970) and the University of Delaware (started in 1974) have traditionally been oriented toward fine and decorative arts. The Conservation Center of New York University Institute of Fine Arts (founded in 1960), which provides primarily art history-based training, has had some opportunities for students to get field experience through its long-standing relationship with the classical excavations at Sardis in Turkey and Samothrace in Greece.

Students in the U.S. programs who have an interest in archaeological materials have gained experience through summer internships with archaeological collections and on excavations, almost always abroad. However, there is some debate about whether this training is extensive enough to allow these students to understand the different approaches, treatments, and ethics required for conservation of archaeological materials as opposed to art objects (NIC 1984; Moyer 1988; Thornton 1989). Conservation training is generally separate from anthropological archaeology. The traditional lack of support for scientifically based conservation from American archaeology has also stymied development of conservation programs in close association with anthropology departments. Realization of this lack has spurred recent development of training. For example, the NYU program has begun specific training in anthropological objects (Conservation Center of the Institute of Fine Arts 1989). The Conservation Analytical Laboratory at the Smithsonian Institution has begun offering third-year and postgraduate internships in archaeological conservation.

9. PUBLICATION OF ARCHAEOLOGICAL CONSERVATION THEORY AND TECHNIQUES

Another way of examining the different relationships that have developed between archaeology and conservation in Britain and the United States is by looking at important journals in each field. The major journals reflect the current attitudes, techniques, theoretical perspectives, and research at a specific time. "They are also both intentionally and unintentionally shapers and trend setters of that discipline" (Dyson 1985, 452). Surveying specific journals for articles relating to preservation and archaeological conservation makes it possible to trace concern with this topic.

9.1 THE CONSERVATION LITERATURE

Examining the journals of the national societies for conservation in Britain and the United States shows how much more prominent archaeological conservation has been in the United Kingdom. The United Kingdom Institute for Conservation, started as the United Kingdom Group of the International Institute for the Conservation of Historic and Artistic Works (IIC), incorporated separately in 1979 and began a formal journal, *The Conservator*, in 1977. The American Institute for the Conservation of Historic and Artistic Works began as the American Group of the International Institute for Conservation and incorporated in 1972. This group had an informal *Bulletin* from 1960 until 1978 that then evolved into the formal *Journal of the American Institute for Conservation (JAIC)*.

Data for this survey were reported in Johnson (1990). The tables of contents of

the two journals were examined to find articles that pertain to archaeological conservation. Tallying the total number of such articles reveals a major difference. *The Conservator* has 21 in 13 years *JAIC* just 8 in 12 years. Four of the *JAIC* articles discuss specific techniques for archaeological material; 19 in *The Conservator* discuss these practical considerations. These totals support the idea that there has been a greater interest in archaeological techniques in conservation in Britain than in the United States. This interest seems to be focused on problems on a national level, dealing with archaeological material recovered in Britain. The United States, in contrast, has had a more general theoretical interest in archaeological/anthropological conservation, but little practical experience of conservators is published in the conservation literature.

9.2 A COMPARISON OF ARCHAEOLOGICAL LITERATURE

Two archaeological journals were also surveyed to trace concern for conservation in archaeology. *Antiquity* has been published in Great Britain since 1927. In the words of the first editor, "*Antiquity* will attempt to summarize and criticize the work of those who are recreating the past" (Crawford 1927, 1). It publishes articles covering all areas of the Old and New World, but it generally contains a high percentage of articles on British and European archaeology.

This journal was compared with *American Antiquity*, the publication of the Society for American Archaeology (SAA), first issued in July 1935. *American Antiquity* has a more limited geographical area of interest, generally American anthropological archaeology, but it has covered other geographic regions. In addition, the SAA published a *Notebook* from 1939 to 1942.

This informal publication was specifically concerned with techniques, including preservation, that could be used in the field and laboratory.

Both journals are a mix of theoretical discussion and descriptions of methods and techniques. They are both popular, well-read journals and have had great influence in the growth of archaeology in each country as well as internationally. An examination of these two journals for articles concerned with preservation and restoration of archaeological material should give a general indication of the type of understanding held by archaeologists in each country.

A review of the table of contents of each issue extracted only those articles and reviews that dealt explicitly with preservation topics. If such topics were addressed generally in an article, the article was not recovered. A few articles were traced through bibliographic reference during other research. Though these two journals have been published for about the same amount of time, they show great differences in their concern with techniques. The most obvious difference is evident in the number of articles on preservation techniques. *Antiquity* has published only 8 articles in 59 years that describe actual practical preservation techniques. Many of these articles have been written by conservators. In contrast, *American Antiquity* has included 14 articles in 55 years giving methods and techniques of preservation; none of these articles were written by people calling themselves conservators. If articles from the *Notebook* are included, the total on published practical techniques rises to 21.

From the evidence contained in these two journals, it appears that 20th-century British archaeologists have been less concerned with

devising and publishing their own techniques for stabilizing finds because other "experts," called conservators or chemists, were working on these problems. In the United States, on the other hand, prehistoric archaeologists were devising and sometimes publishing their own ways of preserving excavated material.

The American techniques reported in *American Antiquity* and the *Notebook* generally use well-known, commercially available products and often show great practical experience in their use. However, the amount of technical expertise and manual dexterity required to use them properly is often not made clear. Because there is little knowledge of conservation and little interaction between American prehistorians and conservators, archaeologists today continue to use these traditional archaeological preservative treatments, sometimes to the detriment of the artifacts.

Of course, there were many other outlets for the description of treatments used on archaeological material. British conservators often published in the *Museum Journal*. *Museum Work*, *Curator*, and *Museum News* are American journals that also published preservative techniques. These publications, however, were not mainstream archaeological works and were probably not seen by the majority of archaeologists. More recently, some archaeological conservators are beginning to publish in the archaeological literature, creating a higher profile for the conservation field (Storch 1987; Neely and Storch 1981; Strahan 1989).

10. CONCLUSIONS

In Britain, because of the early awareness of the importance of scientific understanding in conservation and the efforts of several key

individuals and institutions, archaeological conservation developed a separate identity with close ties to archaeology. To quote a British archaeologist, "As an indication of the importance attached to it [conservation of objects] by archaeologists, it is enough to say that the Gold Medal of the Society of Antiquaries, the most cherished award in English archaeology, was this year [1964] given to Dr. Plenderleith, formerly Keeper of the Research Laboratory of the British Museum" (Gilyard-Beer 1964, 161).

In the United States, while conservation has been involved in projects with humanities-based classical archaeology, it has had little contact with anthropological archaeology. American archaeological conservation is generally less established and more disorganized in its goals and methods than British conservation. For instance, the Archaeology Section of the UKIC is the oldest and largest specialized group within the society. In the United States, however, archaeological conservation is just beginning to develop an identity separate from objects conservation. For example, a new journal, the *Archaeological Conservation Newsletter*, only began publication in 1988. The British and American literature compared here supports the idea that there are basic differences in the role and responsibilities of archaeological conservation in these two countries.

One observation that has been made repeatedly during research for this essay is that archaeologists (and other professionals concerned with archaeological materials, such as curators and museum directors) become aware and supportive of the need for conservation when faced with objects that have deteriorated noticeably in a short period of time. Where deterioration is slow or caused by inappropriate past treatments,

archaeologists have been less willing to take responsibility for the preservation of their excavated materials. This problem is especially apparent in the United States. Preservation problems have been left for later generations (Lindsay and Williams-Dean 1980). While few archaeologists would publicly admit to not caring for the objects they recover, they continue to use treatments known by conservators to cause immediate or eventual damage.

American conservators also share the responsibility for the continued use of improper treatments. Art historians and the museum community generally have been more educated about the importance of scientific conservation and how it can contribute to their research and professional concerns. In the same way, archaeologists must be taught the importance of proper care of excavated artifacts using safe, stable materials and techniques and planning for conservation from the beginning of a project. They also need to understand that interaction with conservators can gain them additional information about materials and techniques as well as deterioration and formation processes. Conservators must begin to publish their information and ideas in the archaeological literature and continue to push for conservation education of archaeologists from the undergraduate level at field schools and in the classroom. Additional funding for conservation could become available if prehistoric archaeologists come to understand the reasoning behind conservation requirements. Instead of being at the end of the archaeological process, spending time fixing mistakes, conservators must become more a part of the archaeological profession, with its greater academic and monetary resources.

Research in archaeological conservation has been identified as a priority by both American and British conservators (NIC 1984; UKIC 1989). However, it is noteworthy that only in Britain has funding been specifically set aside for archaeological conservation. Significantly, this support comes from the Science-Based Archaeology Committee (SBAC), which also funds development of analytical methods. New World archaeologists have had little trouble accepting techniques that help to answer their specific questions, such as dating (carbon-14, dendrochronology), materials sourcing (petrography), and diet (trace element analysis). However, they have rarely critically examined the techniques concerned with the preservation of data contained within artifacts, seeing preservation as a battery of well-developed, known techniques for saving morphology (Hester et al. 1975).

While many American and British archaeologists have been concerned with the development of a stronger theoretical foundation for archaeology in recent decades, it has also become apparent that this theory must be based on strong data recovered using highly developed methodologies. According to Meltzer et al. (1986, 16):

The primary problem facing the [archaeological] field today is a methodological one; our ways and means of knowing the past are weak. Scientific explanation is a product of a dialectical interchange between the observational/empirical and the rational/theoretical realms. Our methods (the means of obtaining knowledge about the past) provide the critical linkage across the abyss separating the observational and rational realms. Until the unsolved

methodological problems are squarely faced and resolved, the construction of archaeological theory will remain a dream.

Conservators in Britain and the United States, trained specifically in careful observation and empirical methods for archaeological materials, can play a major role in developing and identifying methods for investigating the archaeological record while preserving it for the future.

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