

CURRENT ISSUES IN ARCHAEOLOGICAL
RESOURCE MANAGEMENT

by

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PREFACE

The focus of this paper is on the issues and controversies that have arisen in connection with the management of archaeological resources at both the federal and state levels. Although archaeological resource management can be considered as falling under the broader umbrella of historic preservation, it has succeeded (if that is the proper word) in generating a series of exasperating problems unique unto itself. After a brief introduction to the science of prehistory and the need for management, these problems are discussed within the context of three important management tools: legislation, education, and planning. This division is convenient for pedagogical purposes, however it should not mask the fact that the concerns of archaeological resource management in the real world are highly interrelated. It is hoped that the presentation in this paper sheds some light on their true complexity.

THE SCIENCE OF PREHISTORY

According to the most liberal estimates, the genus "Homo", of which modern man is the most recent species, has existed on this planet for perhaps 1.5 million years. As vast as this time period may seem to us, it still represents only a tiny fraction of the total lifespan of the earth (about three hundredths of one percent). Even so, within this tiny fraction of time the written history of "Homo sapien" is shorter still, ranging from its beginnings about four thousand years ago in parts of the Far East to less than two hundred years ago in extensive areas of Africa and the western hemisphere. Therefore, there is relatively little in terms of the breadth of time covered that studies of written history can tell us about the evolution of Cultural Man. For greater insights into this problem we must turn to the discipline of "prehistory".

Prehistory is the science that seeks to explain changes and stability in patterns of human behavior over time through the systematic study of cultural remains. It is useful to draw a distinction between this study and the body of tools and methods employed by the prehistorian in data collection. This body of techniques we call archaeology, and note that it has applications in the study of written history and other pursuits as well. The terms "prehistory" and "archaeology" are often used interchangeably, however, and this paper will provide no exception to that custom. At the beginning, though, it should be made clear that the two terms are not synonymous,

and that archaeologists are by no means confined to the study of prehistory.

The subject matter of prehistory is human culture, which is itself defined in a wide variety of ways. The definition employed in this paper is undoubtedly one of the simplest ever devised. Culture is everything that people think, have, and do. An archaeological resource, then, is a product of these activities that conveys information about what people in the past thought, had, or did. Any archaeological resource has two essential attributes. The first is modification by man; the second, contextual information. By itself, neither attribute is of much value to the prehistorian. A projectile point of a particular size and shape, for instance, reveals very little about the people who made it. Most of this knowledge is derived from information concerning other artifacts associated with the point in a particular site, and the relationship of that site to other sites in horizontal space or vertical strata. These attributes comprise the context, or provenience, of the point and also include such environmental characteristics as the biotic community and landforms associated with its manufacture and use.

Essentially, it is the site of discrete assemblages of artifacts that forms the basic unit of analysis in the study of prehistory. Prehistory is the analysis of sites as manifestations of social activity, together with their temporal and environmental interrelationships. Thus, in Illinois, archaeologists study Paleo-Indian sites, Archaic sites, Woodland sites,

and Mississippian sites among others. At a more complex level, groups of sites linked by some functional interdependence, such as the so-called Hopewell Interaction Sphere, are also analyzed. The information contained within these sites forms the basis for theories about human development and environmental adaptation. The goal of "archaeological resource management" is to preserve and manage this essential data base in order to provide the optimum long-term benefits to both the science of prehistory and to society as a whole. This strategy often involves issues and trade-offs that are not easily decided. At times the perceived benefits to society and to prehistory are mutually exclusive. A choice must be made between one or the other, and it is rare when both can be maximized in the same decision. This paper examines the more critical issues that must be faced by those involved in archaeological resource management.

THE NEED FOR MANAGEMENT

Three overriding characteristics of archaeological sites must be considered by resource managers in light of the continuing rapid pace of land-use alteration in this country through agricultural growth, industrial development, and residential and commercial expansion.

First, archaeological sites comprise a finite resource; there are not an unlimited number of them.

Second, sites are perishable. They are extremely vulnerable to almost any type of ground-disturbing activity.

Third, archaeological sites are nonrenewable. Once they are destroyed, either through ground-disturbing activities, vandalism, or even professional excavation, they are gone forever; they cannot be replaced.

Although estimates vary, it is thought that within the boundaries of Illinois there were once something over a million archaeological sites (Struever and Farnsworth, 1977). Today, approximately 30,000 have been identified and recorded by the Illinois Archaeological Survey (Hild, 1977). Based upon extrapolations from known site densities, there may be anywhere from 360,000 to 735,000 sites remaining to be discovered. In other words, during the last two hundred years there has been an estimated loss of sites ranging from a quarter of a million to 625,000 in the state of Illinois alone. Needless to say, if this pace were to continue unabated for another two hundred years we would be dealing with an impoverished resource indeed. It is this realization that has led to the increasingly prominent position that cultural resource management programs of all kinds have assumed in federal and state land management agencies, and in the general historic preservation movement as a whole.

Management Tools

Those concerned with the preservation and wise use of archaeological resources have three principle management tools at their disposal: legislation, education, and planning. Each of these is discussed in turn in the following sections of this paper.

LEGISLATION

To a great extent, the history of archaeological resource management in the United States can be traced through the history of its legislation. At the federal level, this history reaches back to the year 1889. In that year, a law was enacted in the U.S. Congress to preserve Casa Grande, the last remaining "big house" of the prehistoric Hohokam culture in southern Arizona. Continued concern with vandalism and "pot hunting" in the ruins of the Southwest led to passage of the American Antiquities Act in 1906. To this day, the Antiquities Act is the only piece of national legislation which provides penalties for the destruction or unauthorized collection of artifacts and other "objects of antiquity" on federal lands. Presently, its constitutionality is in doubt due to the presumed vagueness in the definition of an object of antiquity. This has led recently to a movement to rewrite the law so that convictions under it can be more easily obtained (Collins and Green, 1978).

The Historic Sites Act of 1935 was the only other piece of federal legislation passed prior to World War II that had major significance for the preservation of archaeological resources. Under it the National Historic Landmarks Program was created authorizing the Secretary of the Interior to acquire, or assist in preserving through cooperative agreements, historic sites of national significance. The Cahokia Mounds complex near Collinsville, Illinois, is an example of an archaeological site which has been designated a National Historic Landmark.

Although the Historic Sites Act provided no protection against the destruction of sites accorded Landmark status, it did establish a national policy of preservation which was to be further strengthened in the ensuing decades.

Another important consequence of the Historic Sites Act was the creation within the National Park Service of the Interagency Archaeological Salvage Program. This unit, established following the end of World War II, was given primary responsibility for overseeing the recovery of archaeological resources threatened by a stepped-up national program of dam construction and waterways development. It was under the auspices of this agency, buttressed by the subsequent Reservoir Salvage Act (1960), that the derogatorily labeled pursuit of "salvage archaeology" experienced its greatest boom. Massive amounts of earth were moved as a result of this program in a feverish attempt to identify and recover prehistoric sites threatened by construction and reservoir impoundment. The Federal-Aid Highways Acts of 1956 and 1958 authorized similar salvage efforts during highway construction.

It is generally agreed that the archaeology conducted during the salvage boom of the 1950's and 1960's was, with few exceptions, of low quality (Schiffer and Gumerman, 1977). As the saying goes, sites were "dug like potatoes." Storehouses of artifacts accumulated and basic temporal sequences were established, but the overall record of analysis and publication of results was poor. In part, this was due to a chronic lack of funding for any activity beyond simple site

surveys and excavations, and in part to the dilution of professional talent occasioned by a demand for qualified personnel which outstripped the supply. During this period several archaeologists were hired for administrative positions in federal agencies with nothing more in the way of academic qualifications than a baccalaureate degree and a few weeks of field experience (Interagency Archeological Services Division, 1976).

This situation has improved measurably in the last decade to the extent that many reputable archaeologists no longer look with disdain on "conservation archaeology." Indeed, they can hardly afford to ignore it. Today, federal agencies such as the U. S. Forest Service, and Bureau of Land Management, and the Army Corps of Engineers, in addition to state and local governments and private industry, provide the major sources of funds for archaeological research (Schiffer and Gumerman, 1977). One reason for this state of affairs has been the enactment of several pieces of important legislation at the federal level since 1966.

The National Historic Preservation Act of 1966 was the first of these measures to be passed. It has been important to archaeological resource management in two ways. A provision authorizing federal grants-in-aid to states for historical surveys has resulted in the discovery of thousands of additional archaeological sites. In Illinois, this inventory has been coordinated by the Illinois Archaeological Survey with headquarters at the Urbana-Champaign campus of the

University of Illinois. In addition, the act requires all federal agencies to take into account the effect of their undertakings upon properties listed in an expanded National Register of Historic Places (first created by the 1935 Historic Sites Act). To monitor this process, an Advisory Council on Historic Preservation was established with commenting power on all federal actions which would adversely impact a listed site. The National Historic Preservation Act has created as many bureaucratic headaches as it has benefits, however. These are discussed in later sections of this paper.

The National Environmental Policy Act of 1969 (NEPA) and Executive Order 11593 (1971) have had important impacts upon the development of new directions in archaeological resource management, as well as in the expansion of previously existing programs. The enactment of NEPA reemphasized the commitment of the federal government to the preservation of prehistoric and historic resources. Section 102(c) of this act requires that an assessment of impacts be made for major federal projects significantly affecting the quality of the environment. This means that first of all the baseline state of the environment (including archaeological resources) must be determined, and secondly, that probable changes in this baseline state, together with possible mitigation procedures, must be identified. For major federal projects, at least, archaeologists have suddenly found themselves in the business of impact forecasting, heretofore a totally foreign concern.

Under Executive Order 11593 (Protection and Enhancement

of the Cultural Environment) federal agencies were ordered, somewhat unrealistically, to complete a total inventory of the cultural resources under their jurisdiction by July, 1973, and to nominate all eligible properties to the National Register of Historic Places. In addition, agencies were to refrain from impairing eligible properties under their control whether or not they were listed on the Register. This latter directive established the so-called principle of "interim protection." When combined with the very broad Advisory Council definition of "eligible" archaeological sites, it has, in effect, given the Council the right to comment on the fate of every archaeological site in the country affected by a federally funded or licensed action. As indicated in the following sections on Education and Planning, this situation has created a great deal of resentment toward archaeological preservation among state and local officials. It is one of the major problems that must be solved if a workable program of archaeological resource management is to be developed.

A final piece of national legislation of obvious importance to archaeology is the Archaeological and Historic Preservation Act of 1974. This is an expansion of the 1960 Reservoir Salvage Act and empowers federal agencies to appropriate up to one percent of a total project budget for the recovery or protection of threatened historic and archaeological resources. Although this one percent provision has pumped additional funds into archaeological resource management, it is still inadequate to fully comply with the new responsibilities delegated to the

affected agencies. Some agencies have been forced to divert these funds to the comprehensive inventories required by Executive Order 11593 (Banks, 1977). This is technically illegal, but has been made necessary by the failure of the Order to authorize monies for the inventories. The result is less funding available for actual salvage and protection.

A benefit directly attributable to the Archaeological and Historic Preservation Act has been the broadening of the mission of the old Interagency Archaeological Salvage Program. Previously, this organization had functioned as a coordinating unit for emergency archaeological salvage projects. This mission restricted its activities to such immediate problems as those occasioned by reservoir impoundment, highway construction, and railroad relocations. Significant, but gradual impacts on archaeological sites, such as those caused by the Soil Conservation Service's land leveling projects in the lower Mississippi valley, could not be mitigated by existing salvage policies. In recognition of this problem, the 1974 act broadened the responsibilities of the Secretary of the Interior to include coordination of archaeological mitigation efforts among all federal agencies. The Interagency Archaeological Services Division evolved from the old salvage program as the unit primarily responsible for this effort. It has been active in promoting and coordinating innovative programs at all stages of the archaeological resource management process.

State Laws

No discussion of legislation as an archaeological resource management tool would be complete without at least a brief look at state laws. Federal legislation, of course, has an important impact in every state, since it generally applies not only to federally-owned lands, but to federally funded and licensed projects as well. Therefore, agencies such as the Department of Transportation, the Environmental Protection Agency, and the Soil Conservation Service, who are not empowered to own land, nevertheless fund a great many archaeological resource management activities through various grant and licensing programs. In addition to this, however, several states have enacted their own versions of national laws to cover those situations where the latter do not apply. Three basic types of state laws will be considered here.

State Registers of Historic Places. Under the provisions of the National Historic Preservation Act of 1966 all fifty states were required to adopt their own historic preservation plans in order to qualify for National Park Service grants-in-aid. In many states, including Illinois, this has included the creation of State Registers of Historic Places. The Illinois Register differs from the National Register in two important ways (Sculle, 1977).

First, it does not extend interim protection to sites which are eligible, but not yet listed on the Register. Second, the protection it does afford to listed sites is much more powerful

than that provided by the National Register. For this very reason, however, only a small number of highly significant archaeological sites are likely to be nominated to the State Register. Archaeological excavation is, by its nature, a destructive process. It is possible that some future legitimate excavation of a listed site might be precluded, or at least seriously delayed, by listing on the Illinois Register due to the fact that rather strong safeguards against any type of destruction have been written into the law.

State Environmental Policy Acts. A second class of state law modeled after federal legislation is the State Environmental Policy Act. Illinois does not have such a law, but other states, such as California, do. Generally speaking, these laws require that projects funded or licensed by state agencies be evaluated in terms of their environmental impacts, and that whenever possible adverse or irreversible impacts be mitigated. As in the national law, the term "environment" is often interpreted to include both the cultural and natural surroundings. Thus, archaeological sites clearly come under the purview of many state environmental policy acts.

State Antiquities Acts. Finally, there are those laws, patterned after the 1906 Antiquities Act, designed to protect archaeological sites on state (and sometimes private) lands from unauthorized excavation or collection. These laws vary widely in the penalties they prescribe, with some, such as that enacted in the state of Washington, assessing no penalties at all,

relying instead on voluntary compliance. Illinois has no such law in force. As a matter of interest it should be pointed out that several American Indian groups, including the Navajo and Hopi, do have ordinances which protect archaeological resources on tribal lands.

Preservation law has been dealt with at some length in this section, not only because it is an important management tool, but because it provides a convenient vehicle for presenting an outline of the growth of archaeological resource management in the United States, along with some of its current administrative problems. The following two sections on Education and Planning take a closer look at the scene today, and elaborate on some of the issues already introduced.

EDUCATION

By education is meant not only an attempt to instill an appreciation for the scientific value of archaeological resources in the public at large, but also a similar effort directed at decision-makers and administrators responsible for large-scale projects affecting the ground's surface. In Illinois, public education has been concentrated in such institutions as the Department of Conservation's Division of Historic Sites and in the Illinois State Museum. The education of decision-makers and administrators, however, is properly the responsibility of professional archaeologists. These are the people that archaeologists work with "on the ground" during the day-to-day conduct

of management activities, and it is these people who have the main responsibility for assuring compliance with preservation law. Unfortunately, history has shown the track record of archaeologists to be something less than sterling in this regard. The primary educational thrust has been aimed at the top of the decision-making pyramid, principally at the U. S. Congress. Ironically, the success of this effort, as witnessed by the passage of much significant preservation legislation during the last two decades, has been the major contributor to the growing dissatisfaction with archaeological resource management programs among lower-echelon officials. Referring to the lack of communication between professional archaeologists and agency officials, the Historic Preservation Officer for the state of Iowa has made the following comment (Anderson, 1977:50):

Archaeologists have contributed to the problem of dealing with archaeological sites by not educating the public, the SHPO, and the Federal representative, to convince them that archaeological resources are worth the time and cost of protecting them...There is no denying that there is an increasing level of hostility and resentment among local officials, Federal agency representatives, and State agencies, at the need for, and high cost of, archaeological investigations associated with almost every application for Federal funds. If the Archaeological profession does not act to provide adequate justification for their research, I fear that archaeology will be the first element which will be removed from the protection of preservation law and the Advisory Council process.

In a similar vein, an official of the Environmental Agency notes that:

...such trade associations as the American Concrete Pipe Association...are interested in whether archaeological preservation requirements are slowing down municipal grants ...This is being combined with a general disbelief on the part of municipal officials that Federal agencies are actually requiring them to fund, using 25 percent of their monies in our case, archaeological surveys, and in some cases to stop projects to do archaeological salvage (Olson, 1977:46).

In the states of Idaho and Virginia officials have done more than just complain. Legislation has been proposed in both these states that would restrict nominations to the National Register of Historic Places, and in Georgia there is an agreement between the State Historic Preservation Officer and the state department of transportation which calls for reviewing archaeological preservation for adverse impacts on highway projects, rather than the usual reverse procedure (Crecco, 1977). Finally, an official with the U.S. Army Corps of Engineers, noting that many "insignificant" archaeological sites have been prematurely placed on the National Register, points to the resulting bad publicity as creating, "a loss of credibility for the archaeological community in general, for the Advisory Council, and the National Park Service (Banks, 1977:14).

From the point of view of the individuals cited it is apparent that professional archaeologists have a great deal of educational work yet to do. However, this situation is not entirely the fault of the archaeological community. Archaeological resource management has experienced a rapid period of expansion.

In any such situation, there will inevitably be growing pains as both agencies and archaeologists work to refine their procedures and adjust to new responsibilities. Archaeologists are currently debating among themselves the relative merits of the inductive "old" archaeology and the deductive "new" archaeology, the latter having appeared on the scene only within the last fifteen to twenty years (Dumond, 1977). If there is disagreement within the archaeological profession itself as to the fundamental goals of the discipline, it is not surprising that the face presented to the outside world should be somewhat inconsistent. The archaeological preservation movement differs from the rest of historic preservation in that it has no centralized educational organization equivalent to the National Trust for Historic Preservation. Perhaps it is time to consider such an organization for archaeology, or perhaps the National Trust should expand its scope to more fully embrace the preservation and management of prehistoric resources.

PLANNING

Following legislation and education, the third major tool available to archaeological resource managers is planning. In this regard, archaeology is similar to any other endeavor where planning is an important consideration. The basic questions to be answered are the same, although unique issues surround them. These questions include:

- (i) What do we want?
- (ii) What do we have?
- (iii) What do we keep?
- (iv) How do we do it?

What Do We Want: Politics in Archaeology

Determining what it is we want from archaeology brings us to the crux of the whole issue of archaeology and society. The noted British prehistorian, Grahame Clark, states the problem succinctly (1969:251):

...the question has to be faced whether the study of prehistory has any relevance to modern society, or, more specifically, whether it is sufficiently relevant to warrant the diversion of funds and of potentially productive men, skill, materials, and land. Does prehistory really mean enough to us today to support such large claims on social resources?

A comparison of this passage with the quotation from Anderson on page 18 reveals that little has changed in the decade or so since Clark published his book; and this, despite the increasing amount of legislation and public monies being committed to archaeological resource management. Clark resolves his personal dilemma by pointing out the world-wide integrative potential an expanded knowledge of human history may have. His argument is not unlike that heard when the first photographs of "Spaceship Earth" were published following the Apollo VIII moon mission. Prehistory may bequeath to us a broadened social perspective, transcending petty concerns and enriching our experience so that we may, "live more

abundantly as heirs of all ages and brothers to one another."
(Clark, 1969:264).

Of course, archaeologists generally consider themselves to be social scientists as well as humanitarians, and there is little doubt that the field of prehistory has contributed much to our knowledge of the processes involved in cultural change. Archaeological data are also of use in other disciplines, including climatology, geology, and land-use planning. However, the basic question still remains: when a choice has to be made between preserving an archaeological site or constructing a waste treatment plant, on what basis do we arrive at a decision?

As with all questions of this type, the answer is ultimately a political one. In a democratic society, political solutions to problems usually entail some degree of compromise, and archaeological resource management is no exception to this rule. In answering the questions, "what do we keep?" and, "how do we do it?" the extent of this compromise is delineated. However, even before this can be done, we must first discover what it is we have in terms of archaeological resources. This is accomplished during the inventory stage of the planning process. As we will see in the following discussion, though, even the inventory process is the subject of some yet-to-be-resolved controversies.

What Do We Have: The Archaeological Survey

Executive Order 11593, Section 2(a), ordered that federal

land management agencies should complete a 100 percent inventory of all cultural resources under their jurisdiction by July 1, 1973. This deadline has not been met, nor, in most cases, has the inventory task even approached the 100 percent goal established by the Executive Order. As an example of the adjustments which have had to be made to accomodate reality, the U.S. Forest Service is currently operating under a 1990 service-wide deadline for completed cultural resource inventories (Wildesen, 1977).

Although a 100 percent inventory of cultural resources is certainly a laudable goal, whatever the deadline, the obscured evidence of many archaeological sites makes this objective difficult, if not impossible, to achieve. It can be argued, in fact, that Executive Order 11593 is actually detrimental to sound resource management planning.

Planning is a multi-stage process, involving a gradual weeding out of various alternatives. It is only in the final stages of this process, when a single course of action has been decided upon and funded, that a complete survey should be undertaken for impact assessment and mitigation purposes. Placing the comprehensive survey at this stage of the planning process is entirely consistent with the guidelines of the Council on Environmental Quality for compliance with the National Environmental Policy Act (Scovill, et. al., 1977). However, it conflicts with Executive Order 11593, and also with the guidelines of the Advisory Council on Historic Preservation for implementing the National Historic Preservation

Act. This latter directs that comprehensive surveys should be carried out at, "the earliest stages of planning or consideration of a proposed undertaking" for purposes of determining the eligibility of cultural resources for inclusion upon the National Register (36 CFR 800.4). The problems such a directive creates for land management agencies in terms of archaeological resources are summarized in the following statement by a Bureau of Reclamation archaeologist (Weakly, 1977:17):

When we start out under something called Multiple Objective Planning Procedures, we may, for example, be looking at seven to fifteen alternative locations for a reservoir. Are we required, is it necessary, is it reasonable to do an intensive 100 percent survey of all those alternatives, when you know that only one of them will probably be picked if it is built?... If you have \$150,000 - \$2,000,000 to do an entire environmental impact statement, based on your general investigation, you cannot spend it all on archaeology; that just can't be done.

There is little argument that a detailed "pedestrian survey" of an area is necessary for the final stages of a project plan. A U.S. Forest Service rule of thumb concerning the entire inventory process reflects this orientation (Wildesen, 1977): the closer a project is to actual on-the-ground implementation, the more detailed the inventory work required. The pedestrian survey entails an intensive ground-level search for archaeological sites, frequently augmented by test excavations. Its purpose is to approach as closely as possible the goal of a 100 percent inventory of sites. This

information can then be used to assess the impact on archaeological resources of a project proposal, while still providing time for modifications to be made in the project to accommodate threatened cultural resources.

But when the purpose of a survey is to identify the archaeological resources of an entire region, such as the state of Illinois, or when it is meant to provide a general idea of the distribution of archaeological sites during the preliminary stages of planning, this strategy is obviously impractical. Accordingly, archaeological resource managers have been seeking to develop a new inventory technique, the so-called "predictive survey." The objective of this type of survey, as the name suggests, is to predict the distribution of archaeological sites in a region on the basis of a representative sample of just a fraction of the area (King, 1978). Predictive surveys, of course, should always be verified by on-site inspection prior to any ground-disturbing action. However, if a reliable predictive survey for an area can be developed, it would not only save on costs, but would provide an indication, at the earliest stages of the planning process, as to where potentially sensitive areas may be located. The value of such knowledge to land developers and archaeologists alike is undeniable. Much of the hostility and adverse publicity surrounding construction projects delayed by archaeological salvage can be attributed to a lack of site location information during the preliminary planning phase. If this information is available from the beginning, even in a general form, plans can be

adjusted to minimize the impact on archaeological resources, and to reduce the need for salvage operations at a later date.

It must be stressed that predictive surveying is still in the experimental stages of development. The Interagency Archaeological Services Division has encouraged this development by funding such operations for the outer continental shelf of the Gulf of Mexico (Gagliano, 1977), the metropolitan St. Louis area (Benchley, 1976), and east-central New England (Dincauze and Meyer, 1976). At the state level, the Illinois Department of Conservation has divided the state of Illinois up into ten regions and is currently sponsoring an experimental survey in each (Brown, 1978). Although predictive survey techniques are still in the developmental stage, and thus require additional refinement, they show promise of becoming an indispensable planning tool in the field of archaeological resource management.

If the purpose of an archaeological survey is identification, to answer the question, "what have we got?" then for such information to be of optimum use, it must be available during the initial stages of the planning process, when a number of alternative courses of action are still being considered. The predictive survey may prove to be the most efficient and economical technique available for collecting inventory data during this period. But when a single alternative has finally been selected, a comprehensive on-site inspection of the affected area should be undertaken, using as its point of departure information gained during the more general predictive survey.

What do We Keep: The Problem of Archaeological Significance

Evaluating the significance of archaeological resources is one of those necessary evils that all prehistorians involved in cultural resource management must face. And yet it is also an activity that every practicing archaeologist carries out any time a decision is made to excavate "here" rather than "there", or to collect "this" rather than "that."

Executive Order 11593 states that cultural resources should be administered, "in a spirit of stewardship and trusteeship for future generations." (Section 1). At the same time, however, there is a realization that not every prehistoric site can be preserved for the future, or until its excavation is required to test some as yet unformulated research hypothesis. The fact of the matter is that some sites will be sacrificed to the bulldozer, and others will be excavated "before their time" lest they meet the same fate. As distasteful as this situation may seem to some, it is still a marked improvement over the wanton destruction of sites that characterized the first 150 years of this country's history. Therefore, archaeologists will have to come to terms with the reality that some scheme must be devised for ranking archaeological sites in order of their significance. In answer to the question, "what do we keep?" the response is, "we keep those sites which are most significant."

What, then, should be the basis for measuring significance? The currently popular approach to significance evaluation in archaeological resource management involves an assessment of

the extent to which a site will contribute to an understanding of regional research problems in prehistory. This is the criterion of "scientific significance." Its application is being encouraged by the Federal Office of Archaeology and Historic Preservation (Glasgow, 1977) and it is also a principle component of Illinois' embryonic archaeological resource management plan (Downer, 1978). The advantage of such a criterion is that it allows a single site to be considered in terms of its relationship to other sites in a region rather than as an isolated entity. In other words, more of the contextual information of the resource is taken into account in evaluating its importance. The approach also provides a focus for research through the incorporation of at least a general problem orientation.

If the criterion of scientific significance proves workable (and there are those who think it won't), it will not preserve from salvage all significant sites. But it will result in salvage archaeology that produces something more than a simple catalogue of artifacts collected during excavations. Findings will be related to substantive problems in the field of prehistory, at least to the extent that such problems have been adequately defined. In this last respect, some regions have clearly surpassed others, but if archaeological resource management is to make a real contribution to prehistory, comparable to that of scientific archaeology, a major emphasis should be placed on the continual development and testing of research hypotheses, even though construction projects instead

of theory will provide the major dictum as to which sites are to be excavated.

An interesting point is that scientific significance need not be restricted to the discipline of prehistory. The knowledge gained from archaeological sites has made demonstrable contributions to such other endeavors as flood control need assessment, soil genesis and management, climatology, and land-use planning in marginal environments (Dixon, 1977; Schiffer, 1978). These potentialities should also be considered when evaluating the scientific significance of archaeological resources.

Those familiar with historic preservation law may ask why there should be concern for establishing criteria for archaeological significance in the first place. Title 36 of the Code of Federal Regulations (Section 800.10), in reference to the eligibility of properties for the National Register, clearly states that any archaeological site is significant that has, "yielded, or may be likely to yield, information important in prehistory or history." Although at first glance this statement seems compatible with the criterion of scientific significance, it lacks the focus provided by the incorporation of specific research problems. From a planning standpoint, the National Register criterion has not been particularly useful. It has proved to be the case that in applying this definition, there has hardly been an archaeological site in the country that was not ruled eligible for inclusion on the National Register, and thus labelled "significant." There is nothing

intrinsically wrong with this as long as the Register is not used as a planning tool. Unfortunately, the recent tendency has been toward just this application of the Register coming about. The result has been an archaeo-bureaucratic headache of rather large proportions. Federal agencies are required to take into account, and if possible avoid, the impacting of any project they license or fund on properties eligible for the National Register. By this criterion of "legal significance," however, almost every archaeological site is defined as eligible. Those eligible sites which would be adversely impacted must then be salvaged or protected. Again, when the criterion of legal significance is applied, there is scarcely a site known which would not be eligible for protection under these guidelines.

It would seem that such a state of affairs would be an archaeologist's dream. The problem is that it threatens to create an unworkable situation, in which agency representatives would as soon "overlook" a site as burden themselves with the salvage of every one they locate. Under these circumstances the willful destruction of genuinely important resources becomes a very real possibility.

The blanket coverage afforded archaeological sites by the National Register definition of significance has been especially criticized by the director of the Advisory Council's Office of Review and Compliance (McDermott, 1977:58):

We cannot, under present circumstances, protect or salvage every lithic scatter in this country. We do not, for example,

take the posture that every building that is 50 years old has to be considered worthy of preservation. . . We must learn to be selective.

In the attempt to establish a more workable system for ranking archaeological sites, factors other than legal significance must be considered. In addition to scientific significance, others which have been suggested include ethnic significance, public significance, and significance for technical or methodological problems.

Ethnic significance, as defined by Moratto (1975), refers to a site having, "religious, mythological, social or other importance to a discrete population." The increasing awareness and concern among many ethnic groups for their cultural heritage has made this an important consideration in the evaluation of archaeological sites. There have been situations in the recent past where such significance has been an overriding factor in site evaluation. It is ignored only at great peril.

Public significance refers to sites which might contribute to public education through interpretation and exhibition, or which might benefit the local economy as tourist attractions.

Finally, technical-methodological significance becomes important when evaluating those sites which may afford the opportunity to experiment with new archaeological methods and technologies. Examples might include devising ways to identify sites where the ground is obscured by vegetative cover, the testing of remote sensing techniques such as thermal infrared scanning, or the establishment of temporal sequences for nonstratified sites.

In summary, the crucial issue in answering the question, "what do we keep?" revolves around the evaluation of site significance. Scientific, ethnic, public, and technical-methodological significance are all factors which should be considered in ranking the importance of archaeological resources. Once some measure of consensus is achieved as to site value, attention can then be focused on various strategies for assessing the impact of project effects on those archaeological resources which are deemed significant. Issues related to impact assessment are discussed in the final section of this paper.

How Do We Do It: Archaeological Impact Assessment

Prior to the 1970's, the subject of impact assessment was of little concern to archaeologists. The direct effects of a project were assumed to be either inconsequential, or to lead to total site obliteration; no impacts between these two extremes were considered. In addition, there was a marked indifference displayed toward the analysis of any secondary or tertiary impacts resulting from ground-disturbing activities.

This situation has changed during the last decade as a result of the passage of the National Environmental Policy Act. Not only are more detailed forecasts of the extent and types of impacts needed, but when such impacts are most likely to occur should also be known. The former information is necessary to establish management priorities for mitigation procedures (including salvage and/or avoidance of sites) and to satisfy the requirements of Section 102(c) of the National Environmental

Policy Act; the latter is required to schedule efficient mitigation procedures in those cases where adverse impacts seem unavoidable.

In order to adequately forecast impacts, one must first realize that while all construction projects generate effects, such as excavation or ground clearance, not all effects result in impacts. Whether or not an effect's potential for impacting archaeological sites is realized depends primarily upon the nature of the resource in the area. In order to carry out an impact assessment, each of the following kinds of information must be taken into account (Schiffer and Gumermen, 1977a):

- (i) The effects of all activities that occur during a project's planning, construction, and operating stages
- (ii) The nature of the archaeological resources in all affected areas, including their adjudged significance
- (iii) The relationship between anticipated effects and the actual impacts on archaeological resources

It should be noted that while items (i) and (ii) are relatively easy to ascertain, item (iii) lies at the very frontier of current archaeological knowledge. Schiffer (1976) conceptualized the relationship between effects and actual impacts with the aid of the dual constructs of c-transforms and n-transforms. C-transforms embody those principles related to the operation of cultural processes upon the archaeological record. Plowing may displace small artifacts both vertically and horizontally and damage larger ones.

Pot hunting by amateur collectors often results in a site being deprived of its finely finished tools, or in the occurrence of predictable strata disturbances occasioned, for example, by tendencies of some collectors to dig in the corners of pueblo rooms where mortuary offerings are usually buried. This interaction between the activities of amateur collectors and the status of archaeological resources is the subject area of the new sub-discipline of ethnoarchaeology.

N-transforms refer to regularities in the operation of natural processes as they affect archaeological sites. A widespread problem for which there is little information available concerns the impact of flooding on site deposits. Beyond the obvious fact that water gets sites wet, there is very little additional knowledge pertaining to this particular effect. Yet, such information could drastically affect mitigation policies. Under certain conditions, it is possible that flooding may actually be an effective preservation tool. Archaeologists are generally in agreement that, whenever feasible, the preservation of sites is to be much preferred over the premature excavation often entailed in salvage operations. With the continued development of underwater archaeological techniques, it is not unreasonable to speculate that the submersion of archaeological sites, in order to preserve them for future generations with different problem orientations, may become a more common practice in the years to come.

The problems of impact assessment caused by inadequate knowledge of the natural and cultural processes operating on

archaeological resources are magnified when one moves beyond a consideration of the direct effects of a project to its secondary and tertiary effects. The direct effects of a flood control project are easily recognized, for example, and include such activities as clearing the land, digging the footings for a dam, and reservoir impoundment. Secondary effects are those supporting activities related to the primary goal, such as access road development, the construction of temporary housing for workers and displaced residents, and the recreational use of the reservoir. Tertiary effects are the most difficult to deal with, but generally include those not directly related to the first two categories, including increased land use below the dam or construction of vacation homes and resorts along the reservoir shoreline. It is easy to imagine that all of these effects may be directly translatable into impacts upon archaeological resources. To regard a flood control project as just that, without taking into account its spin-off effects, is to seriously restrict the value of an impact assessment. Even if all the processes operating upon archaeological resources are perfectly understood, this knowledge is of limited use if secondary and tertiary effects are ignored.

It should be apparent that, independent of any legal requirements, an expanded knowledge of impact processes would provide considerable scientific benefits to the study of prehistory. There is a huge difference between knowing that plowing will damage a site, and being able to relate the kinds of conditions of plowing to specific disturbances in the

archaeological record. Besides allowing for more comprehensive impact assessments, this knowledge provides the archaeologist with a tool for estimating particular biases in site deposits occasioned by ground-disturbing activities. From a research perspective, this is invaluable information.

CONCLUSION

Although official concern with the protection of archaeological resources in this country can be traced back almost a century, the rapid growth of archaeological resource management is a relatively recent phenomenon. It should not be surprising that this rate of growth has been accompanied by a variety of procedural and methodological difficulties that can only be resolved over time in consultation with all concerned parties. In many ways, archaeological preservation must be treated separately from historic preservation. There is an obvious difference in the nature of the resources each activity is designed to protect, and, indeed, in the purposes for which protection is desired. It is encouraging to note, in this regard, that the Heritage, Conservation, and Recreation Service has singled out archaeological resources as one of the priority areas to be considered in developing its 1979 Historic Preservation Policy Plan (Preservation News, April 1979). A similar concern is in evidence within the state of Illinois' Division of Historic Sites. Although it is unrealistic to believe that we can save every archaeological site for posterity,

neither do we have to abandon them to complete impoverishment. Deciding which sites are worthy of protection, and developing the techniques to accomplish this, will continue to require the concerted efforts of all those involved in archaeological resource management.

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