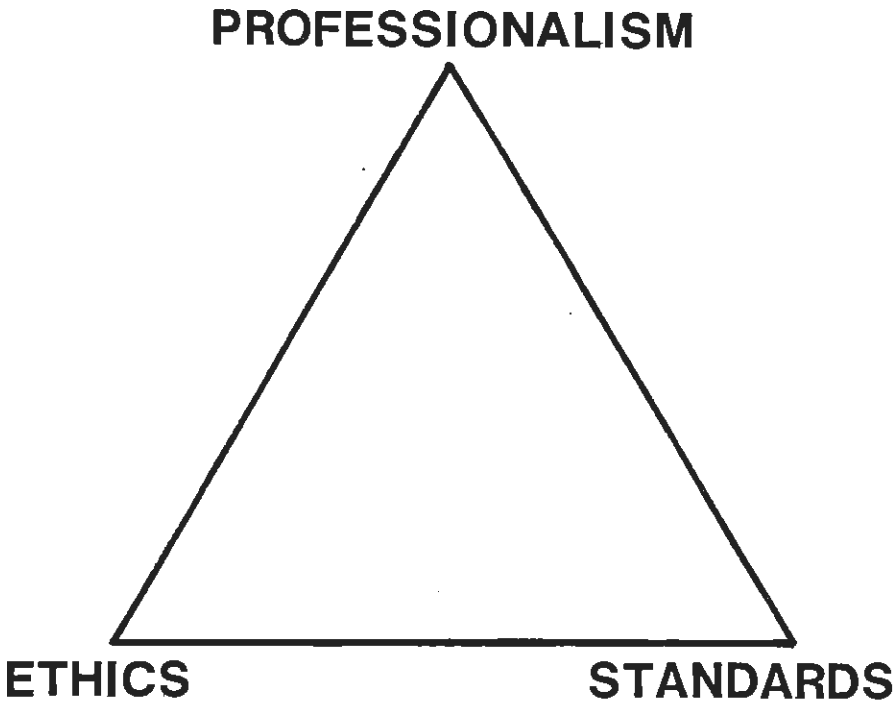
FORMULATING ETHICS AND STANDARDS IN ARCHAEOLOGY



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FORMULATING ETHICS AND STANDARDS IN ARCHAEOLOGY

RESEARCH SERIES 19

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Rightly to be great is not to stir without great argument.

--Shakespeare

ABSTRACT

Issues universal to archaeology, with specific examples derived from archaeological practices in South Carolina, are discussed in eight papers which concentrate on professionalism, ethics, preservation and conservation of archaeological collections and records, and record keeping. That archaeologists must implement measures and practices which are of the highest scientific and professional calibre is a recurrent theme of the papers. Current inadequacies and absences of archaeological professionalism are addressed and specific examples and suggestions which may correct these deficiencies are provided.

Principles and a plan for implementation of professional ethical standards and codes, which would apply to all professional archaeologists, are presented. The inseparability of ethical and scientific standards is stressed, and an examination of compliance level archaeological research reveals that the absence of ethical and scientific standards has resulted in products which are detrimental to the archaeological resource as well as the profession. A primary recommendation for the correction of the resultant problems is the licensing of archaeologists, which may assist archaeology to become a legally recognized profession.

Solutions which may stop or slow the destruction of our constantly dwindling cultural resources include public education, passage and enforcement of stronger preservation laws, and strongly publicized opposition to cultural resource vandalism and destruction such as that caused by the use of metal detectors. Specific recommendations for implementing preservation goals are provided for the archaeologist, historic preservationist, and concerned lay person.

Finally, several papers describe the widespread deficiencies of artifact and field record conservation, curation, and record keeping (especially state site inventories). Specific examples of successfully implemented procedures which have been utilized to establish conservation laboratories, conservation techniques, and systematic record keeping are described. Additionally, specific information is provided regarding types and costs of chemicals and conservation products, such as papers and inks.

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Patricia A. Cridlebaugh
January 11, 1990

PREFACE

Patricia Cridlebaugh

My analysis of the past five years of South Carolina archaeological programs and research indicates that a dangerously high percentage of research is characterized by mediocrity and unscientific (unprofessional) practices. It is increasingly obvious that we must redirect our philosophy to one that is grounded in professional sincerity and the highest of professional standards and ethics. These factors, coupled with the timeliness and significance of the messages and information contained in papers presented in the "Ethics and Standards Session" of the Fifteenth Annual Conference on South Carolina Archaeology (April 1989), provided the impetus for their publication. At the time of the conference, it seemed immensely important that the concerns, ideas, recommendations, and solutions expressed in this session should not be buried and ignored in that immense heap of unpublished "gray" literature.

This monograph insures that these papers are now publicly available. Two papers in this collection, "The Preservation of Archaeological Field Records: Is There a Future for the Past" and "Developing Professionalism in Archaeology," were not presented at the Conference on South Carolina Archaeology. I have included them because of their relevance to the monograph topic and their significant contribution to the preservation of our archaeological records (the former) and the development of archaeological ethics (the later).

The goal of these papers at the time of their presentation, and now in publication, is not to carelessly criticize or engage in finger pointing. The goal is to openly acknowledge that we all have deficiencies which must be addressed if we expect there to be a future for archaeology. Several of these papers demonstrate that specific problems can be corrected, and the authors provide useful suggestions and solutions which may be implemented and/or creatively improved upon. Readers of the monograph have several choices regarding their reaction to the eight essays. As we approach the year A.D. 2000, it is each individual's decision whether to receive these ideas with anger and denial or with initiation/continuation of activities dedicated to high standards and archaeological professionalism.

DEVELOPING PROFESSIONALISM IN ARCHAEOLOGY

Michael Trinkley

Sometimes answers for difficult questions come from very unexpected sources. An example in point was my recent discovery of an article in the September 1954 Journal of the American Institute of Architects. I had been laboring over the issue of archaeological ethics -- attempting to succinctly define professional ethics, searching for some simple statement of ethics, and wondering how they could be made viable. This last point was particularly puzzling since I was convinced that ethics must be inherent in individuals; thinking that one either has ethics or does not.

An entirely new perspective was provided by a South Carolina consulting engineer, Frederick H, McDonald, writing to his colleagues over 25 year ago. He queried his audience,

1. Can the problems of practice in all professions be resolved under common principles?
2. What are the common principles?
3. How can we make them effective?

He goes on to note that while in a few professions there are "principles of good professional practices" labeled "ethics," the engineering disciple was characterized by "a deadening acceptance of these as mere ideals for a super-brand of personal conduct" (McDonald 1954:127-128). He suggested that the error in engineering was to view professional ethics as nothing more than the simple moral ideals of "civilized people," and not "the techniques for safe and profitable practice." Perhaps the similarity and relevance to the archaeological profession is gradually becoming more clear.

McDonald observes that ethics are essentially "the standards of behavior expected of decent men by decent men . . . required of us all in a given level of civilization" (McDonald 1954).

When the simple term "ethics" is used in a professional context, with little or no additional understanding or thought, the result is two fold. First, the discipline implies "either a monopoly of possession [of ethics] . . . or a God-given dispensation of a magic brand of our own." Second, and perhaps more significantly, the profession tends "to rock along on the assumption that the mere possession and practice of this morality is sufficient to equip professional men with the armor, to defend and the weapons to

advance our standards of practice" (McDonald 1954:128).

In 1953 McDonald found that of 66 universities and colleges teaching engineering, only six used any scheduled texts on professional standards. Most of these dealt with law, economics, contracts, and specifications -- not with truly ethical issues. Professors at the various institutions remarked that ethics were discussed informally, leading McDonald to remark that the subjects of ethics and professional standards "seem to be regarded more as the character builders of Boy Scout work than as essential to classwork on practice" (McDonald 1954:128). The result in engineering was that students "are well prepared in basic technology . . . . [but] have little if any preparation in the human problems of applying technology for their own, the profession's or society's good" (McDonald 1954:128-129).

Again, it should be possible to see clear parallels in the archaeological profession. Examination of course catalogs from graduate level archaeology programs seems to suggest that in our profession there is little scheduled emphasis on the ethics or professional standards of archaeological research. The one exception which comes immediately to mind was a recently offered four week course (one credit hour) in archaeological ethics offered during the Fall 1989 semester at the Anthropology Department of the University of South Carolina by Dr. Karl Heider. But, it seems that such offerings are the minority.

McDonald goes on to meet one of my own preconceived notions head-on. He was frequently told by his university colleagues that ethics were a part of one's character and were instilled during early childhood. The problem with this approach, according to McDonald, is that it confuses morality with professional standards of behavior and the former are "but abstractions" compared with the realism "needed to impress and implement professional codes of conduct." He goes on to more bluntly state, "we need to take moral rectitude for granted as the base for admission and staying in a profession" and recognize that the techniques of professional practice must be consistently and aggressively taught to students (McDonald 1954:129). This implies, rather clearly, that one may be a moral individual and still have no concept of ethical standards and professional practice.

To emphasize this point McDonald (1954) turns his attention to distinguishing between the professional man, who deals in the "intangibles of knowledge and judgment" and the non-professional man who deals in the "layman's tangibles of commodities and property." He observes that the tangibles dealt with by most laymen in business usually involve "the ownership, transfer and use of commodities and property [which are] easily identifiable, traceable, and actionable at law." But, he observes,

facts, ideas, solutions and opinions, once expressed,

> lose all power of control as to source of ownership. If the professional man is to benefit from his use and transfer of knowledge, it can only be through the setting up of protective conditions of recognition and compensation (McDonald 1954:129).

He remarks that other professions have been faced with the same problems and have found that "to combat the greed and ignorance of those who harass and prey upon the holders of the precious intangibles of knowledge and judgement" professional codes of conduct have been established. These codes are both dual and reciprocal:

> they guard professional men against the bad and backsliding among their kind, and against abuse by outside traders and cheaters; they guard laymen against exploitation, and against their own misuse of the fruits of professional service (McDonald 1954:130).

Professional ethics then may be defined as "the techniques of attitudes and actions which professional men have agreed upon to bring respect for truthful findings, informed judgement and knowledgeful procedure, and to insure their acceptance and use under professionally set conditions, but their own kind and all other mankind" (McDonald 1954:130). There is no mention of honesty, since again this trait is considered a requisite for all descent men in society and fails to distinguish the non-professional from the professional. Breeches in honesty and its impact on tangibles may be handled through legal action. Breeches in professional conduct, however, are beyond the reach of the law and must be handled within the profession, whether they involve price cutting or pirating of work.

The absence of a clear recognition of professional codes of conduct, according to McDonald (1954), clearly go back to the failure to "indoctrinate our young professionals in the truths and in the protective need of professional standards," and also to a "poorly indoctrinated general profession upon which we depend too much to instruct the young and to enforce the standards of conduct."

Beyond the irony that the problems confronting architects almost 40 years ago are identical to those being faced by the archaeological profession today, Mr. McDonald offers fertile ground for discussion and, hopefully, action.

First, the archaeological profession needs to realize that ethical standards are necessary -- both for the good of its practitioners and also for the good of the public. This involves a recognition that we have willingly accepted, by virtue of our practice, a serious ethical responsibility to <u>preserve</u> and to <u>protect</u> the past. Once it is unambiguously determined that we, as

professionals, have an obligation to the past, we may move forward to develop techniques to ensure that the entire profession meets those obligations.

Second, the archaeological profession must realize that ethical standards are not generalized ideas or concepts, similar to honesty, but involve the development of detailed codes of conduct. As a single example it is insufficient to state merely that a professional archaeologist should maintain detailed field notes during a project. A meaningful standard must be developed, specifying what the field notes must include, how they must be organized, and what is to happen to these notes at the conclusion of the project. Success at this level will require the archaeological profession to refocus its ill-placed sense of individualism and surrender its concept of individual self-righteousness. The place for archaeological individualism is in the development of meaningful and productive research designs, not in maintaining a confusing, illegible, and variable collection of random observations during the progression of a project.

Third, the archaeological profession must commit itself to teaching ethical codes and standards of conduct on an intensive level in graduate programs. This, as discussed by McDonald (1954), will serve two purposes. It will begin to instill a level of systematic, organized professionalism into archaeology. It will also require the existing professionals to realistically confront the absence of well defined standards. The next generation of archaeological professionals will be trained in professional codes of conduct, reinforcing the professionalism of those already trained.

Fourth, the archaeological profession must develop an attitude which clearly reveals that high levels of professional conduct are not only appropriate, but also <u>expected</u> of those who would practice in the discipline. Those who repeatedly fail to recognize those standards which separate us, as professional men, from others in the non-professional world must be excluded from the profession of archaeology.

These four principles or objectives may be translated into action through a fairly simple, two stage plan. The first stage involves the development of a clear, concise, detailed set of professional standards. It seems appropriate that these standards be developed by the State Historic Preservation Office. This section of the South Carolina Department of Archives and History is responsible for overseeing all compliance archaeology projects conducted in the state. Not only is this type of archaeological investigation predominant in the state, involving more archaeologists and more archaeological sites than any other type of archaeological research, but compliance archaeology has the greatest contact with the lay population. Such standards should involve all phases of archaeological research: the development of

research designs, the implementation of survey projects, the implementation of data recovery projects, the production of reports, the conservation of field records and specimens, and the final curation of archaeological data.

Once the standards are developed by the State Historic Preservation Office they should be disseminated to the professional community for a 30 day review period. All comments received prior to the closing of that review period should be examined, and if appropriate, incorporated into the final document. The final document would then be distributed under the auspices of the State Historic Preservation Office and would form the nucleus of the professional standards of conduct in the State against which all archaeologists would be compared. While such an approach may sound dictatorial to some in the profession, this reaction is another example of the over-emphasis of individualism in archaeology. It is in the common good to ensure professional standards. Since the proposed standards of behavior would be applicable to all archaeologists conducting compliance research in the state, the burden would be even and all-encompassing.

The second stage involves the development of a semester course in professional standards which would be required of all archaeology students in the graduate anthropology program at the University of South Carolina. The core of this course would be the professional standards developed by the State Historic Preservation Office and how these standards should be implemented on a daily basis.

This approach might provide archaeology in South Carolina with sufficient momentum to catch-up with other professions and establish viable, realistic standards of professional conduct.

A VIEW AND VISION OF ARCHAEOLOGICAL PROFESSIONALISM IN SOUTH CAROLINA

Patricia A. Cridlebaugh

In the Southeastern United States a limited number of highly significant archaeological sites were subjected to a flurry of excavations in conjunction with federal activities such as the Works Progress Administration archaeological projects of the 1930s and, subsequent to World War II, the River Basin studies. The more successful of these investigations were conducted by or under the close supervision of archaeologists who trained and/or improved their scientific method during the course of these investigations. While aspects of the research were imperfect by today's standards, many of these archaeologists (Griffin 1952) produced work that has formed the foundation for interpretations and scientific methodology employed in scholastic, research-oriented archaeology. It also was these archaeologists and their students who educated us, and under affiliation with academic institutions, conducted the majority of archaeological projects until the late 1970s and early 1980s.

By the late 1970s the larger proportion of field investigations shifted from academically-affiliated to business-affiliated archaeologists. This change has been a product of the federal legislation of the 1960s. Simply stated, the National Historic Preservation Act of 1966, the National Environmental Policy Act of 1969 and the regulations pursuant to these acts, including Executive Order 11593 (1973), mandated that federal agencies take into consideration the effects of their activities on cultural resources. As agency compliance and review by the State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (ACHP) increased, so did the number of potential survey and data recovery projects.

Thus, the demand has been supplied by archaeological consultants whose primary business is to conduct compliance archaeological projects. Compliance archaeology should only be unique in that it usually must be conducted on short notice within a limited amount of time; it is subject to mandatory review by both the SHPO and the ACHP; it should be conducted in accordance with research standards and guidelines developed by the Secretary of Interior (1983) and the ACHP (1980); and the research must be conducted by archaeologists who meet defined, universal professional criteria. Otherwise, compliance and noncompliance

scientific archaeological research both should be characterized by such features as well-developed research designs, pertinent research questions, solid methodology, key project personnel who are skilled research archaeologists, interdisciplinary research, careful preparation and conservation of artifacts and field records for curation, detailed analyses and interpretations, and a well-disseminated final report of investigations conducted under the close supervision of a qualified professional archaeologist.

What then defines the professional archaeologist? It is beyond dispute that for years many archaeologists practicing in the United States have conducted research in a professional and ethical manner with constant regard for the resource and scientific methodology. While departments of anthropology and individual archaeologists may have developed research standards and criteria to define the "professional archaeologist," the first nationally applicable definition of a professional archaeologist was provided in codified federal regulations pursuant to the National Historic Preservation Act. The Secretary of Interior's (1983:44739) Professional Qualifications Standards establish the following criteria:

> The minimum professional qualifications in archaeology are a graduate degree in archaeology, anthropology, or closely related field plus:
>
> 1) At least one year of full-time professional experience or equivalent specialized training in archaeological research, administration, or management;
>
> 2) At least four months of supervised field and analytic experience in general North American archaeology, and;
>
> 3) Demonstrated ability to carry research to completion.
>
> In addition to these minimum qualifications, a professional in prehistoric archaeology shall have at least one year of full-time professional experience at a supervisory level in the study of archaeological resources of the prehistoric period. A professional in historic archaeology shall have at least one year of full-time professional experience at a supervisory level in the study of archaeological resources of the historic period.

Emphasis should be placed on the fact that these criteria include requirements of an advanced degree <u>plus</u> a certain amount of field, laboratory, and supervisory experience. Moreover, these are the <u>minimum</u> requirements -- the absolute lowest acceptable level of education, training, and experience. It is imperative that those of us responsible for archaeological investigations exceed these criteria in reality and not just on paper. As professionals, it is our responsibility, then, to conduct solid scientific research. We, in fact, expect that investigation of archaeological resources should be entrusted to us because we are THE educated, trained, and

skilled experts.

Archaeologists typically cite three major factors which contribute to the damage and destruction of our fragile, rapidly diminishing archaeological resources: landscape-disturbing development projects, farming practices, and vandalism. A sincere concern for the future of archaeological resources and the science of archaeology requires that professional archaeologists examine the impact of their own activities on these resources. This call for introspection transcends the well understood caveat that we destroy a site when we excavate it. Individually and collectively, we must not loose sight of the fact that unexcavated and excavated archaeological resources are not ours to mangle or destroy, but rather, it is our responsibility to expertly document, protect, and preserve them.

A variety of practices by archaeologists indicates that critical problems exist today relative to the caliber of research and the application of scientific procedures and professional ethics. While some compliance and noncompliance projects conducted by academically-affiliated archaeologists are scientifically inadequate, contract and agency archaeologists in the business of compliance archaeology seem to have a higher rate of failure. If we expect (and we do) academically-affiliated projects to be directed and supervised by archaeologists who dramatically exceed the above criteria, should that not be the case with all archaeological projects? Regardless of orientation, all archaeological projects should be research-motivated with the goal of contributing significant scientific information. The primary concern of project personnel, from the principal investigator (PI) to the technician, should be the quality of the data. In addition, to avoid becoming overextended, new projects should not be initiated if personnel and facilities are inadequate.

Many of these factors simply do not characterize a high percentage of nonacademic compliance archaeology. A review of approximately the last four years of South Carolina compliance archaeological projects (see, for example, Bates 1989; Brockington 1987; Brooks et al. 1989; Caballero 1988; Drucker and Jackson 1988; Elliott 1987; Espenshade and Brockington 1989; Johnson 1989; Lepionka 1986, 1988; Manning 1986; Martin et al. 1987; Roberts and Caballero 1988; Trinkley 1987, 1989; Zierden et al. 1986) is informative. Essentially, archaeological research ranges from unacceptable to mediocre to very good. Much of the research is adequate; however, there is considerable room of improvement, a higher level of professionalism, and a more scholarly approach. Many archaeologists have conducted research which, in retrospect, they desperately wish they could revise. The archaeologist who constantly strives to improve his/her science -- to be a good archaeologist -- is not the focus of these concerns.

Evidence of unscientific research approaches and activities

should concern professionals as well as interested lay persons who have donated time, money, and energy to the preservation and protection of the State's archaeological resources. We all must demand that the archaeologists to whom we entrust this fragile record of our heritage are well educated, well trained, skilled, open to constant improvement, and ethical. The following six cases (Cases 1-6) are illustrative of activities which can only have a negative impact upon archaeology and its reputation.

Case 1. The Secretary of Interior's (1983) standards establish that the Principal Investigator (PI) must meet the professional qualifications specified above. A well-worn loop-hole in those standards and guidelines is that used by the PI who is often the only professional archaeologist affiliated with a project. All too often the project/field director is an inexperienced anthropology graduate student or a technician who has never studied anthropology. If the PI fails to spend all or the majority of the time actually in the field and laboratory, have the investigations been conducted by an archaeologist? Before we assign the title, duties, or responsibilities of an archaeologist to an individual who cannot be classified as a professional, we should consider the impact on the resource as well as upon the science.

Case 2. An archaeologist entered into a contract to conduct archaeological data recovery investigations to assist the sponsor in meeting his compliance obligations. Prior to completion of the research, the compliance status of the project changed to noncompliance. The archaeologist failed to complete the artifact preparation, data analyses and interpretation, and report preparation. As agency review of the research was no longer necessary, the archaeologist reasoned that no completion and documentation of the research was necessary.

A variation of this type problem was the archaeologist who prepared a draft report of investigations but failed, due to the consultant's financial difficulties, to complete a final publishable report of investigations. In addition, the artifacts and field records, which were not properly prepared for curation, were delivered to the confused and unappreciative sponsor rather than to an acceptable repository.

Before we commence a project, we must ensure that our budget and contract allow for the timely completion of all aspects (field work through production of a professional quality report of investigations) of the proposed research. Failure by archaeologists to professionally document research is totally unacceptable, ethically and scholastically.

Case 3. Competitive data recovery plans and project bids were reviewed by a sponsor and the contract was awarded primarily on the basis of the bid and data recovery plan. When the archaeological investigations were reviewed, it was evident that the archaeologist

did not conform to several stipulations of the final sponsor-accepted data recovery plan as well as the sponsor's Scope of Work. It was obvious the archaeologist did not obtain prior approval from the sponsor to revise the research plan; scientifically-acceptable explanations for the revisions and omissions were not provided, and several of the omitted or revised procedures resulted in unsystematic, unscientific methodology and research.

Case 4. Field research was conducted at the site of architectural ruins which would be preserved and protected in place. The archaeological field work was characterized by an absence of background and archival research conducted by a qualified historian, daily revisions of the research design and recovery techniques, a field director who had no background in archaeology/anthropology/history/architecture, unexperienced laborers, an absence of adequate equipment such as a transit or theodolite, unsystematic recovery procedures, sloppy unit and feature excavation, an inability to interpret the site, failure to keep daily field records and photographs, failure to use polyethylene sheeting, and a failure to backfill the site once the excavations were "complete."

Visitors to the site observe backdirt piles eroding into the open excavation units, eroding profiles, deteriorating architectural elements, and exposed features and artifacts. Also, at least three years after the field "investigations," no report of investigations has been produced.

Case 5. An archaeological survey to inventory and evaluate the National Register of Historic Places eligibility of sites was conducted. The survey report identified several sites parallel to roads and indicated that adverse environmental conditions such as extremely dense vegetation and swampy terrain contributed to the paucity of identifiable sites in the project area. Subsequently, additional archaeological investigations by a second consultant identified several sites in the "densely vegetated and swampy areas." Beyond the dense roadside vegetation lay open woods and sites which were characterized by surface features.

Case 6. Results of archaeological investigations, documented in final reports, describe and illustrate a site which is cruciform-shaped. In point of fact, the site followed the outlines of a crossroads. In a second example, features excavated in conjunction with a data recovery project are cursorily described. The profile drawings of one feature illustrates one very large pit with two narrow "tunnels" extending on either side. Treating the feature as a cultural manifestation, the report's authors fail to discuss the possibility that this unusual pit was actually a tree, nor is any discussion of the fill provided.

Such unscientific, unrealistic, and inadequate descriptions of archaeological sites and features can only create serious elements

of doubt regarding the quality of the entire investigation and the professionalism of the archaeologists reporting such information.

Additional inadequacies/failures which should not but do commonly occur in the research of professional archaeologists practicing in South Carolina include but are not limited to:

--Failure to develop well-planned and thorough research designs.
--Failure to employ experienced, qualified field directors or technicians.
--Failure to closely supervise and train inexperienced laborers.
--Failure to properly budget a project so that an adequate amount of time is allocated for field and laboratory investigations, artifact conservation, processing of field records and artifacts for curation, and distribution of multiple copies of the final report.
--Failure to report inventoried sites and the results of investigations in a timely manner because the sponsor wants to maintain secrecy.
--Failure to submit artifacts and records to a central repository.
--Failure to utilize the American Antiquity Style Guide (1983).
--Failure to distribute final reports to agency, state, university, and local libraries.

These cases and examples are contradictions of the lessons our mentors attempted to teach; they violate the spirit of the historic preservation legislation. Moreover, interested lay persons, experienced technicians, and students are astonished and feel betrayed when they work on such projects and read the resultant reports of investigation. What are the implications of a situation in which persons who don't meet the defined criteria of the "professional archaeologist" actually exceed the abilities of an archaeologist who, at least on paper, meets those criteria? We must consider the immediate and long-range damage unprofessional and unscientific practices inflict upon the resource as well as the profession. If archaeology is to be considered a legitimate profession and not just an advocation which anyone can practice, we must be professional.

This view of archaeology conducted by professionals in South Carolina has focused on the negative for two major reasons. First, these are very real and destructive problems. Second, archaeologists "talk" behind closed doors about the unprofessional and unethical practices of other archaeologists but do nothing about it. Since we have no peer review and sanctioning procedures which universally apply to our profession, the time has come to openly address the problems in order to force ourselves to correct them. Consequently, my vision for the future of archaeology consists of major measures which, it seems to me, must be implemented.

Archaeologists must be licensed. Physicians, attorneys,

accountants, morticians, and cosmetologists are all licensed or certified. We cannot expect legislators, agency personnel, and the general public to perceive of and treat us as professionals until we have official credentials. Presently, there is no evidence that membership in the Society of Professional Archaeologists does or will have the validity of licensing. Licensing can be expected to encompass standards ranging from a demonstrated ability to practice to professional ethics. We can expect that licensing requirements will include attainment of a graduate degree in anthropology, demonstrated ability to conduct archaeological field and laboratory research, demonstrated ability to complete quality reports of investigation, and a passing score on a written licensing examination.

Second, certification, within specific areas, of field and laboratory technicians should be implemented. We welcome the assistance and dedication of interested lay persons to our science; in turn, we must expect their work to be of a professionally acceptable caliber. For example, receipt of certification would be beneficial to the profession, the archaeological resource, and individuals who wish either to be salaried technicians or to be volunteers on valid, scientifically acceptable archaeological projects. An added benefit might be the demise of the term, "amateur archaeologist." It is a term which is just as detrimental to the science of archaeology as would be an amateur surgeon to medicine. The Abandoned Shipwreck Act of 1986 may be one mechanism through which South Carolina can commence certain certification programs. Certification requirements should include demonstrated experience and abilities as well as acceptable performance on written examinations.

Third, graduate programs must implement stringent, mandatory, and comprehensive archaeological field and laboratory courses. Many graduate programs have relied upon large federal projects (i.e., reservoirs) to employ and train their students. For the most part, large projects such as those appear to be of a past era. It is a fact that there are more and more individuals holding the masters and doctorate degree, with a specialty in archaeology, who have had little or no extended field and analytical experience under the supervision of a skilled archaeologist. Therefore, graduate programs must require scholastically and professionally supervised field and laboratory courses which exceed the typical four- to six-week field school. In a second phase of training, graduate students would supervise projects under the monitoring and direction of their professors.

Fourth, Federal and State agencies, with responsibilities which impact upon archaeological resources, must employ an adequate number of professional archaeologists to assist the agency in carrying out its responsibilities. It is irresponsible of any such agency to fill positions which require archaeological expertise (or for which the position title is "archaeologist") with individuals

who are not educated, trained, and skilled archaeologists. Today, there are many capable professional archaeologists who can and should occupy these positions; to do otherwise simply denigrates the profession.

Fifth, and of extreme urgency, standards and guidelines for compliance archaeological investigations in South Carolina must be developed and implemented. Theoretically, most of the problems discussed above should not occur; if they do occur, they should not recur. The fact is they do occur for a variety of reasons. Perhaps the two major causes are the competitive aspect (low bid) of business/contract archaeology and a severe gap in the training and experience of some professional archaeologists. It can be anticipated that written, detailed standards and guidelines will result in project time/cost estimates and investigations proposals (field investigations, laboratory analyses, curation practices, and interpretative reports of investigation) which are more comparable than the current monetary extremes. Mandatory standards should also force archaeologists to implement and produce more scholarly and scientific research.

In conclusion, in one segment of "St. Catherines: An Island in Time" (DePriest 1989), a video about archaeology on St. Catherine's Island and at Santa Catherina de Guale, a prominent archaeologist states, "As an archaeologist, I'd rather be lucky than good" (David H. Thomas in DePriest 1989). Giving the archaeologist the benefit of the doubt, perhaps this statement was taken out of context by a zealous editor. Nevertheless, the message the audience receives is that this professional archaeologist would rather be lucky than good. As professional archaeologists, surely we want South Carolinians to know that <u>we</u> would rather be <u>good</u> than lucky. Our research, on every level, should be aimed at demonstrating we are archaeologists who practice our science with expertise and conscientiousness. We must make the positive, scientific and ethical changes I have discussed before our luck runs out. If not, we are not only endangering the resource but, also, our own discipline of archaeology.

OUTDOOR USE ETHICS: THE PRESERVATION AND INTERPRETATION OF SOUTH CAROLINA PREHISTORIC AND HISTORIC SITES

Fritz Hamer

"It doesn't matter just so long as its pretty."
A misguided preservationist, 1983

"It was late afternoon, and [we were] crossing an area between two known Civil War campsites; one had been for officers and the other for enlisted men. Folly has always been a good place to hunt, both because of the amount of material to be found there and the condition of the artifacts."
Lowcountry collector, June 1988

"Allowing a bottle club to 'excavate' an archaeological site is somewhat akin to allowing a small group to enter a public library and cut pages from books."
An archaeologist describing the seriousness of historic site looters, June 1988

In these three quotes lies the contradiction that faces the future preservation of our nation's remaining historical heritage. On the one hand we have many interested citizens who enjoy the thrill of finding and keeping a part of our past; in some ways I am pleased that there are many who are interested in their history. The problem is that so many historical "enthusiasts" think they should own a piece of it, as though they were acquiring a stereo or a car for themselves. They do not comprehend that the material remains of our history are public property that should belong to everyone. For all of us to get the most out of our varied historical sites, each must be preserved and maintained by all of us.

Like the collector, there is the fledgling preservationist who wants to preserve parts of our built environment, a noble cause. However, many of these individuals have a misguided attitude that only the big and the beautiful structures of our forefathers are worthy of keeping. Such an opinion leads to a skewed perspective of our past that has, and is still, creating many myths about our history.

Confronting these two approaches are trained archaeologists,

historians, historic preservationists, and museum professionals who are struggling with the issue of how to protect our historical sites from obliteration. They realize that, while part of their duty is to protect these sites, it is more important than ever before that the public have access to these sites so they, too, can learn to appreciate their significance and help the professionals protect them.

With these observations as a back drop I think it is useful to take a brief look at the history of preservation and interpretation in the United States, in particular what has gone on the in Southeast and South Carolina, the region with which I am most familiar. This will help us to understand where we are today. Perhaps that history can provide us with some clues as to how we can overcome the many serious problems we face in our attempts to make visitors more conscious of the fragile nature and need to protect our remaining historical sites.

America's premise since European colonization has been that it is a land of infinite opportunity and resources. Only in the last thirty or so years have we begun to realize that such is not the case. As acid rain, beach front erosion, and nuclear waste dumps continue to have growing impact on our daily lives we are slowly seeing that we must start to conserve all of our remaining resources before we use up what is left. Historical sites are facing the same issue.

In the early nineteenth century, when the preservation movement began, conservation was not an issue. The preservationists of the day were seeking to maintain shrines to the great founding leaders of the nation. One of the earliest preservationists of this era was a South Carolinian, Ann Pamela Cunningham, who led the national campaign in the 1850s to preserve Mount Vernon, George Washington's home on the Potomac River. Her successful efforts spurred later movements in the country to save other historical sites, such as Thomas Jefferson's Monticello, and Gunston Hall, the home of George Mason.

The aftermath of the Civil War saw the growth of the "Lost Cause" in the South. In this, both veterans and their relatives and friends did all they could to defend the memory of the Confederate cause and to rationalize the loss of so many lives in a war that remains our nation's bloodiest. Monuments were erected in nearly every county seat in the southern states during the 1870s and 1880s to honor those who had fought for "states' rights."

These two movements in the latter half of the nineteenth century led to an appreciation of a special type of historic site -- those associated with past leaders and the elite of the South. Today we maintain places like Drayton Hall near Charleston, built in the 1730s, one of the best intact examples of Palladian architecture, to which thousands of visitors flock every year.

Redcliffe Plantation in western South Carolina, completed in 1856 and the seat of former Governor James Henry Hammond, is another fine example of plantation architecture that is now a historic site open to the public. Unfortunately, many people today apparently seem to think that most people in the South lived in houses such as these prior to 1861.

In the last year the homestead of another renowned leader of our nation has grabbed the attention of the public. This is Snee Farm near Charleston, the home of Charles Pinckney, one of the signers of the Constitution. Threatened by emersion in another residential subdivision, this historic site has been saved by local preservationists who managed to attain a $1 million loan from a local bank, as well as donations from private citizens, state agencies, and businesses. The total cost to "save" the house and 25 acres was approximately $2 million. This is another example of the continuing interest we have with our famous forefathers, which is fine. But, until recently, we ignored the many common houses and industrial sites where the vast majority of our ancestors lived and worked during the past 300 years. Thus, much of the vernacular architecture of our past, along with the artifacts associated with it, are lost.

Now, before I go any further, I want to make it clear that I do not oppose the preservation of these grand edifices. They are very worthy of our concern and should be maintained and interpreted for the benefit of the present and future public. The question is, what can we do to give a more balanced interpretation?

All of the "big houses" just mentioned were associated with prominent families from South Carolina's past. Until recently, however, the rest of the story behind these edifices was hardly told. These stories are those of the men and women who built these homes, maintained them, and served the "great" men who owned them. They were the slaves, the men, the women, and the children who actually made the political and economic elite prominent in their day. Slaves built and maintained the homes and cultivated and harvested the cotton and rice that made it possible for the South Carolina elite to attain and hold the positions they did in the colonial and antebellum eras of our history. But blacks did much more than serve others. They had their own personal lives beyond the watchful gaze of the planters and the overseers. Unfortunately, few of their houses and tools remain. However, enough remains for us to interpret them in conjunction with the big houses. Their story is just as fascinating, and, in a profound sense, more compelling, because they lived a dual life, one at the whim and fancy of the slaveholders, and another that was very private. This latter was a separate existence that flourished despite the demeaning conditions they were forced to live under -- that of human beings considered as nothing more than the legal property of someone else.

Just as significant as the history of the African-Americans is the story of Native Americans and Euro-Americans who struggled to survive in a society controlled by an elite minority often indifferent or opposed to their needs. There are few historic sites in this country devoted to the interpretation of Indian history, either before or after European settlement. This is particularly strange, since Native Americans lived on this continent for thousands of years longer than any other ethnic group. What happened to these original inhabitants? We need to deal with this issue in a much more appropriate manner, both now and in the future. We have literally thousands of sites on this continent by which we can greatly improve our interpretation of this poorly understood part of our heritage.

What about the rest, the Euro-American farmers, craftsmen, and laborers? How did those persons, members of neither the political or economic elite, live and work? Many more historic sites have been developed to interpret this part of our history. Examples such as Old World Wisconsin, Old Sturbridge Village, and the Georgia Agrirama, to name just a few, are the living history sites organized in the last few decades to interpret rural nineteenth century life in different regions of this nation. Many other examples could be cited. But while much more is now being done to interpret more than just the famous personages of our heritage (at least as far as Euro-Americans are concerned), there is much that remains to be done. These sites have a tendency to idealize the rural life as if it were utopia that we now miss. The reality of rural life is often overlooked on these sites in favor of painting a rosy picture that never existed.

Now that I have outlined how preservation and interpretation have evolved we need to consider how these sites should be used and, additionally, we need to identify some of the problems that have arisen in the past. As I have already tried to point out, at least indirectly, the entire story of a historic site must be told. That means not only the positive parts, of which we take pride, but also the negative and ambivalent parts. Human history is not a bed of roses. One of the major problems with almost all plantation sites that I have seen in the Southeast is the dearth of information about the slaves who worked the estates. Their labor and their skills made the manors viable. Thus, sites of this nature must examine the issue of slavery, its contradictions, cruelties, and inhumanity instead of making it appear that everyone lived in one big happy family.

To tell the entire story, of course, takes personnel and money. Museums and historic sites are generally the last to receive public funding, and what they get is usually a fraction of what is needed to do the job properly. However, I think enough money is available to create a more balanced interpretation than what we usually see. The problem is often politics. Local legends, extolling the past without looking at the whole picture, are hard

to change. It takes time and patience. On one historic site where I was employed, the important story in the mind of the locals was that the site was the home of a prominent Spanish American War hero. I soon found out that this episode in the site's history was rather insignificant in comparison to the entire history of the site, which dated back to the 1830s. Consequently, I added more to the site's interpretation by examining antebellum history and the family that lived there.

State agencies responsible for historic sites are now starting to examine the other issues that many have ignored for so long. One of the best examples of this is Stagville, an antebellum plantation site near Durham, North Carolina. Here the small staff has integrated the entire society of the plantation together better than any other site of its kind known to me. The descendants of the plantation's slaves still live in the area providing many important oral histories which contribute valuable new data about the area in such aspects as African holdovers in religious practices and medical cures, in addition to many other aspects of life. Although Stagville is under the authority of the State of North Carolina and gets most of its support from state funds, the staff has relied on local support for collections and small financial support. Privately run historic sites in the South must begin to emulate what Stagville has done if an accurate interpretation is finally going to be reached on plantation sites.

The other issue is the nuts and bolts of preservation. How can we protect sites? There is legislation at both federal and state levels, designed to protect historical and archaeological sites, but they actually have very limited effect. The National Historic Preservation Act, passed in 1966, was designed to encourage government agencies to preserve and protect historical and archaeological sites based on a broad variety of criteria. Note that the emphasis in this act is the word "encourage." By law, any development that takes place using federal money, lands, or licensing must carry out a cultural resource assessment before construction begins. It is, the responsibility of the federal agency to take into consideration the effect of the undertaking on all properties listed on the National Register of Historic Places, eligible for inclusion on the National Register, or potentially National Register eligible.

In South Carolina some federal agencies, especially the Department of Housing and Urban Development and the Charleston District of the United States Army Corps of Engineers commonly fail to meet their compliance responsibilities and significant resources are destroyed. The act cannot save any site, no matter how significant it might be, from destruction if the powers that be wish to advance the development. Although the people that wish to disregard the act cannot be legally prosecuted, they often think twice about razing a significant historic site because they may lose local support in the community. That is, at least, the hope of

historians, archaeologists, and preservationists. The problem is that, as our lands become more developed and the business community sees the great profits that can be made from new developments, the effect of the National Register has less persuasive power. There have been many examples during the past twenty years of historic sites on the Register being razed, despite the public outcry against destruction. In 1984 Columbia High School, Columbia, South Carolina, completed in 1922, was razed for a parking lot even though it was a rare example of Italian Renaissance architecture in the state. Although it was not on the National Register, the Charleston Orphan House was a fine example of Italianate architecture that was razed for a Sears Department Store in the 1950s. Ironically, local people campaigned, unsuccessfully, to have portions of the 1790s structure rebuilt on the same site when the Sears store was recently demolished for the construction of a college dormitory.

South Carolina has enacted another piece of legislation, the Coastal Zone Management Act of 1977. This act requires that cultural resources which are classified as Geographic Areas of Particular Concern (GAPC) must be taken into consideration prior to final certification of an undertaking. GAPCs are properties which are listed in, eligible for, or potentially eligible for listing in the National Register of Historic Places. In compliance with this act, the South Carolina Coastal Council, in consultation with the State Historic Preservation Office, may stipulate that undertakings requiring Coastal Council certification or licensing must inventory and assess all cultural resources within the project area. Properties determined Register eligible or Register listed must be preserved in place or subjected to data recovery. Unfortunately, regulations applicable to the Coastal Zone Management Act have not been developed. As a result, the Coastal Council is often inconsistent in its implementation of the stipulations.

The future of historic sites is not only endangered by potential destruction, but also by the impact of new developments adjacent to them. This may now be the single greatest problem facing all historic sites. I have already mentioned the tremendous development that threatened Snee Farm. This is something that is becoming an ever growing problem in South Carolina and the rest of the country. By now everyone has heard about the "lovely" mall that is planned next to the Manasses (Bull Run) Battlefield in Virginia. It seems that Congress will now vote the funding to prevent this from being built, but this is only one site that has been saved. All we have to do is look at Gettysburg Battlefield Park to see what happens to historic sites that allow retail and food chain developments to build right up to their park boundaries. Many other historic and archaeological sites are now being effected by these never-ending developments. Antietam Battlefield outside of Sharpesburg, Maryland, is just one important national site that may soon be encroached on by another development project. If this and many other developments are not stopped soon they may turn our

remaining historic sites into insignificant spots between huge shopping malls and sky scrapers.

In some cases old structures cannot be maintained or saved because they are structurally too weak to save, or they may be located in isolated areas, where they are not useful for interpretive or adaptive reuse purposes. Such seems to be the case with the thousands of tobacco barns that dot the Pee Dee and other tobacco growing areas of northeast and central South Carolina. However, efforts need to be made to record and preserve at least a representative sample of this important economy. I am pleased to say that this has been started under the guidance of one of the local colleges in the region. It is the duty, even if it is not the law, for landowners who have old structures like these tobacco barns to have a trained historic preservationist make careful records of the structures, so that documented information is preserved for future generations.

The last critically serious problem to be discussed here, is vandalism of historic sites. This can range from breaking windows or defacing woodwork on a historic building to digging holes looking for artifacts on an archaeological site. This is also a major problem at historic cemeteries. Although I think it is obvious to everyone that defacing a historic building and knocking over tombstones are highly unethical and illegal, the issue of digging holes in search of artifacts, on the other hand, apparently, is not. However, this is, in one sense, more unethical than the other two forms of vandalism. When a collector goes out to dig for artifacts he has no interest in the soil and other aspects that may be associated with the objects. Often the collector is interested in only those pieces that are complete or readily identifiable to him or her. This is indiscriminate destruction of information that trained archaeologists could use to learn more about the lifeways of the site's past inhabitants. But once a collector has shovelled the dirt, the information is irretrievably lost.

So what are the solutions to these serious threats to our historical heritage? I have outlined the acts to encourage preservation now on the books, but as we can readily see, they have no binding effect in legal terms. Part of the solution is to make the National Historic Preservation Act stronger, with rigorous penalties for those who try to destroy sites that are on the National Register or which have been found to be eligible for such listing. For this to happen voters must make their representatives, at all levels of government, aware that they are concerned about historic site preservation.

A tougher National Historic Preservation Act will help, but the general public needs to be better educated about our past for it to have any lasting effect. If user appreciation is to be improved, user education must start in the schools, where we need

to make students more aware of the importance of our past so that they can understand why they need to support the conservation, preservation, and interpretation of all our historic sites. All grades need to create courses or workshops that give both a more balanced analysis of our past (let us get away from the idea that George Washington and John C. Calhoun were the only ones who mattered in out past) and provide hands-on experiences for students during which they can work with archaeologists, historians, and architectural historians on historic sites. They should be introduced to archaeology and historic preservation at any early age so they can learn about how these disciplines help us to find out about our past. In this way we can teach young people the ethical implications of digging up sites for "enjoyment" or tearing down old buildings for "progress."

With a public better educated in history, coupled with stricter preservation laws, the opportunity for everyone to learn more about their past will increase tremendously. The archaeologists and historians can then be more assured that sites are protected for public education and enjoyment while also being preserved for future generations. The thrill of discovery for everyone can then be saved for centuries to come.

THE ETHICS OF METAL DETECTORS AND RELIC COLLECTING: A PROFESSIONAL RESPONSE

Michael Trinkley

Archaeologists, and those interested in archaeology, frequently talk about the subject of their study being "non-renewable," part of our nation's cultural heritage, and needing preservation for future generations. And yet, many of us find it difficult to address candidly the question of site destruction by bottle collectors, metal detector enthusiasts, and others. A few of us are even hard pressed to defend the needs for and goals of archaeological preservation. Before I go on, please allow me to emphasize that I am not addressing the practice of surface collecting, as long as it is coupled with site recordation.

It seems clear that the threats to America's archaeological resources are at an all-time high. Not only does continued economic growth jeopardize the past, but those who want to possess a part of that history seem to be both more numerous and more active. On a national level, the National Park Service has recognized this problem, creating the LOOT Clearinghouse, an acronym for "Listing of Outlaw Treachery." In response to an alarming increase in vandalism and looting at federal archaeological properties, the Federal Law Enforcement Training Center, in conjunction with the National Park Service, has developed a course entitled, "Archaeological Protection Training for Cultural Resources and Law Enforcement Managers and Specialists." Several federal agencies have co-sponsored an international symposium on site vandalism this past year. The disgraceful looting of human burials at the Slack Farm site in Kentucky received national attention as a grand jury issued indictments for ten individuals. The first conviction under the Archaeological Resources Protection Act (ARPA) was obtained last year, and the Society for American Archaeology has launched its own anti-looting project which involves a plenary session in 1989 and a traveling exhibit.

Here in South Carolina archaeological looting and site vandalism is a real and constant problem. A major Civil War campsite in the Charleston area was heavily vandalized by individuals searching for bottles, buckles, and other collectibles. A colonial period site in Mount Pleasant, being professionally investigated as part of a compliance project, was almost destroyed by a weekend looter. Bottle collectors in Charleston routinely "dig" privies, destroying untold archaeological evidence. In

Beaufort, the South Carolina Educational Television channel has shown episodes of a program entitled "The Treasure Hunter," where collectors use a metal detector to search and dig for "relics" in church yards and historic sites. In Columbia the NBC affiliate hosted "relic collectors" glorifying their "hobby" on a morning talk show. Newspaper articles and columns have on several occasions favorably spot-lighted "relic collectors" and their "hobby." In Charleston, a glossy tourist magazine featured an article which extolled the thrill of digging privies for "unique" bottles and other artifacts. Elsewhere in the state prehistoric sites are robbed of burials and grave goods. The fact that shrubbery is given more legal protection in South Carolina than are her irreplaceable cultural resources underscores that our state offers archaeological remains virtually no protection from wanton looting.

However widespread site vandalism is in South Carolina, much of the blame must be directed to the professional community. Too often professional archaeologists choose to ignore the looting rather than to confront the problems of bottle collectors, metal detector enthusiasts, and pothunters. Some of us have the attitude that, if ignored, the problem will go away. What we are seeing is that the problem doesn't go away, it simply gets worse. Some of us believe that "reformation" is incompatible with a strong, vocal stand against site vandalism. It is not -- archaeological site vandalism must be confronted through education, strong laws, and clear ethical statements. Some of us are simply too busy and too deeply buried in our research, compliance studies, and science, to become involved in such mundane matters. And some of us, truly and honestly, simply do not understand the seriousness of the problem and the extent of site looting.

The glorification of archaeological site looting can be found all around us. A children's book, entitled Treasure Hunting (Shircore 1980), and sold for only $1.99, justifies the use of metal detectors to hunt for relics and explains how to go about digging. The introduction states, in part,

> [b]eautiful coloured bottles, potlids, and clay pipes lie buried where they were thrown away on Victorian rubbish dumps. With a few tools and a little knowledge about where to look, you can begin to find these treasures from the past (Shircore 1980).

While the book cautions not to dig on "official archaeological sites" the looting of "unofficial" sites is apparently acceptable. While the thrill of history is loudly proclaimed, the author seemingly fails to recognize both the goals of archaeology and the destruction that "treasure hunting" causes.

For adult readers undertaking the renovation of their old house, perhaps in Charleston, a book called The Old-House Doctor,

published in 1986, explains why the new owner should undertake "archaeological digging." The reasons for digging are simple according to the author: "(1) It's an exciting and enjoyable pastime; (2) You **might** unearth a pot of gold coins, a heap of rare bottles, or other valuable artifacts; and (3) You're sure to learn many fascinating details about the history and personality of your old-house . . . " (Evers 1986). Again, the thrill of discovery and ownership of the past is stressed. This publication offers a "how-to" approach on archaeology, much as it offers a "how-to" on replacing plumbing. There is no recognition of the destruction to the archaeological record that will result, or that this evidence of the past is more than just curious "relics."

Turning to the professional metal detector users, magazines such as Treasure and Western and Eastern Treasures (subtitled, "The Favorite Family Outdoor Sports Magazine") are widely available and offer clear instructions on looting archaeological sites. In one issue alone, articles included:

> "Finding Those Rare Relics," which stressed that good sites still exist and that "trench holes" should be refilled. One illustration was of a handgun recovered from the Antietam battlefield.
>
> "Three B's in Civil War Country," which describes a pilgrimage from New Jersey down to Virginia in order to dig up Civil War sites. At one site the author describes digging a "three foot deep 'fire-pit' hole."
>
> "Pssst! Wanna Be A Relic Collector," in which the author encourages relic collectors to use research materials in order to find choice items. The author states, "many fantastic relics are being found by those relic hunters who find, dig, and sift these sites. You may find a 4-5' probe a help in determining some of these sites" although it will "take months to put a dent in the relics on even a medium-sized virgin site."
>
> "How to Find New Sites The Way Archaeologists Do," which needs no further description.
>
> "E-- F-- - Profile of a Relic Collector," describes how this individual found his best site by noticing "a New York State historical marker on the side of the road." He states, "I worked that site for four years, not only using a metal detector, but excavating and sifting the soil surrounding the remains of six blockhouses. Today the results of those four years form the core of artifacts in a very extensive collection."

The attitude of these relic collectors toward historic preservation is clearly shown in their appeal to help gut the

Archaeological Resource Protection Act of 1979. These individuals are attempting to raise over $13,000 to lobby congress to get "Federal and State land opened to you, the hobbyist." The ad bemoans the fact that, "every day more and more land is being closed to detecting because of this Act." Another article stated, "The injustices perpetrated upon the treasure hunter by misrepresenting the Archaeological Protection Act of 1979 must stop . . . ."

In addition, the Federation of Metal Detector and Archaeological Clubs, Inc. lobbied for the defeat of Senate Bill 858, better known as the Abandoned Shipwrecks Act. Their position was simply stated, "The private sector needs the incentive for searching for wreck sites. . . ."

These few examples provide a clear view of "relic" or "treasure" hunters. In virtually every case the "thrill" of the hunt is emphasized, as is the possession of a part of history. In no article was the importance or meaning of these "relics" to the larger picture of lifeways reconstruction recognized. What was stressed in the articles were ways of finding more sites and more intensively "collecting" them. Lip service is paid to obtaining the owner's permission, although one author added the caveat, "if possible." The articles also reveal the extensive damage done by these individuals to the fragile cultural heritage of the United States.

Faced with this overwhelming evidence, what is the appropriate response by those of us who are concerned with history and preservation of cultural resources? From my perspective there are six essential, integrated aspects of our response.

First, we must be convinced that this history is worth saving. This necessitates that we step back from our research designs and compliance studies, and clearly realize that our ultimate goal (and ethical directive) must be making history understandable, interesting, and worthwhile to the public. It is clear, from sources such as Archaeology Magazine, National Geographic, and other popular literature, that the public is tremendously interested in archaeology. But the public is often stymied by obtuse, uninteresting, and poorly presented professional approaches to the study of the past. We must emphasize more strongly that archaeological sites, as evidence of past lifeways, belong to all people and that the conversion of this common heritage to private ownership steals from us all. The past is one of the few things that all citizens share in common. This must be an important cornerstone of our approach.

Second, there are too many times when archaeological reports are not even distributed to our colleagues, much less the public. Occasionally, reports are not even written. If we are going to call what we do, "public" archaeology, then it must be made accessible

to the public, and accessible does not mean three or four copies of a report buried away at governmental or private repositories. Public means available through libraries, such as county public libraries and state libraries. It also means producing reports that are interesting and useful not only to other professionals, but also to lay audiences. I should emphasize that I am not talking about simply massive research undertakings, but also survey reports conducted for developers as a requirement for compliance with public laws. In addition, these reports, if they are in the form of brochures or pamphlets (and there should be many more of these being produced), should be made widely available through libraries, museums, and schools.

Third, we must engage in a more active educational campaign, beginning with the schools, which offers alternatives to "relic collecting" and which explains, clearly and simply, why this activity destroys our past. Certainly we all realize that a child's early years are formative. If a child is never told that digging holes to look for "arrow heads" and "relics" is destructive then who is to blame -- the child grown up as a relic collector, or the preservation community which never got around to education.

Fourth, it is essential that the collecting of archaeological materials by professional archaeologists be recognized as inconsistent with preservation goals. I am aware of at least one situation where a professional archaeologist purchased an artifact, with privy soil still adhering, from an antique store for a personal collection, believing that this was consistent with some sort of preservation philosophy. It is not since it can destroy public confidence and provides the appearance of impropriety.

Fifth, it is essential that laws be enacted protecting terrestrial sites from vandalism and looting. I believe that more than just archaeological and historical sites on state owned property should be offered protection. There should be effective laws offering the private owner a recourse when an archaeological site on his property is damaged by "relic collectors." It is not even necessary to create a new section of law, since Section 16-11-610 of the South Carolina Code of Laws, which currently covers "Entry on Another's Land for Various Purposes Without Permission," could be easily modified to include archaeological remains.

Sixth, those of us interested in the preservation of the past must be willing to take a strong and unequivocal stand against site vandalism. This is not the place or time for "situational ethics." As James Agee said,

> I would suppose that nothing is necessarily wrong with compromise of itself, except that those who are easy enough to make it are easy enough to relax into it and accept it, and that it thus inevitably becomes fatal. Or more nearly, the essence of the trouble is that

compromise is held to a virtue of itself (Agee and Evans 1969:309)

The preservation of the past and the protection of our State's heritage are issues on which we must not compromise. We must be vigilant for articles, television shows, and public presentations which promote a careless disregard for the past. We must be willing to take time from our research or compliance studies in order to write letters to magazine editors, newspaper editors, television producers, and others to explain why "relic collecting" destroys the past which belongs to us all. Taking a stand against site vandalism, metal detectors, privy hunting, and bottle collecting will frequently be difficult and may earn us some strong enemies, but if we truly believe that the past is worth saving, then we have no choice. We must also be willing to more extensively work in and support public education programs, including the dissemination of archaeological studies.

Finally, it is not my intention to cast stones from the vantage point of a glass house. I doubt that there is a single professional archaeologist in South Carolina, and I certainly include myself, who has done all that they could or should have to help protect the past. As a consequence, my comments are directed to every professional in the state -- we all need to accept our personal, ethical responsibility to help protect the past.

NEW CONSERVATION FACILITIES AT THE OLD BROWN'S FERRY BUILDING

Ruth Trocolli and Bruce Thompson

For a decade now the junior author has been involved, in one form or another, with archaeological material recovered from underwater environments. Archaeologically controlled excavation of underwater sites has become a reality only within the last 30 years. In the early 1960s Dr. George Bass excavated a Late Bronze Age vessel in Turkey which yielded few artifacts and little or no hull remains. Although the conservation requirements of that excavation were limited to casting, cleaning and a few chemical processes, that and similar experiences became the impetus for archaeologists around the world to improve techniques for the collection and preservation of data from these important shipwreck time capsules.

Until the dawn of shipwreck archaeology, iron objects were given little attention by conservators because they were the least aesthetically pleasing and the more numerous, therefore troublesome, of recovered artifacts. They were usually utilitarian in nature and of little interest to collectors and museums. With the concentrated proveniences of shipwreck remains and the limited inundation of modern materials on most submerged sites, all data no matter how apparently insignificant, became important in interpreting the chain of events which led to the wrecking.

Encompassed in these relatively plain iron objects were clues to the major accomplishments of a particular vessels' native land, technology, commerce and military. Iron fasteners tell the story of a ship's construction (technology); iron hoops describe the chandler's art (commerce); cannons illustrate the vessel's power to defend itself (military); and forged iron tools provide clues about the ship's capability to reclaim itself through time.

Conservation of artifacts excavated in the 1970s from the A.D. 1554 Padre Island wrecks, illustrate some of the major problems to be confronted when dealing with iron objects deposited in salt water for hundreds of years. Using these mid-sixteenth century artifacts, Dr. Donny Hamilton conducted some of the first ferrous metal conservation studies. These studies formed the basis of his doctoral dissertation, now commonly regarded as the text book for conservation of metals recovered from underwater environments.

Excavation of a seventeenth century Portuguese site off Mambasa, Kenya, exemplifies the difficulties of conserving large

quantities of submerged artifacts. Greater than 6,000 artifacts consisting of a wide variety of materials such as iron, bronze, lead, rope, wood, sailcloth, and bamboo had to be conserved in a laboratory built within the walls of an eighteenth century Mombasa prison kitchen. With most historically significant sites appearing either in poor locations (reefs, deep seas, beneath sediments, etc.) or in economically poor countries (Jamaica, Haiti, Kenya, etc.), archaeologists are often forced to become rather creative when implementing necessary conservation processes. Regardless of the adverse conditions, we still must maintain detailed recording of all conservation. One day these records may serve to produce cheaper and more efficient conservation techniques.

The following is a second example of a project which required years of cataloging, cleaning, recording, and conservation of artifacts. Under the auspices of the Institute of Nautical Archaeology, investigations of sixteenth century exploration ships left behind by the Spanish in the Caribbean seas off Jamaica, Dominican Republic, Turks and Caicos, Cuba, Panama and Haiti were conducted from 1983 to 1987. One wreck off the island of West Caicos in the lower Bahamas produced iron military objects dating to the early sixteenth century.

A conservation laboratory was established in a three garage firehouse which provided ample room for conservation equipment and the artifacts. Since most of the artifacts were iron (16 swivel guns and two lombards, two haquebuts and two crossbows) a mass production electrolysis process capable of simultaneously conserving as many as 10 cannons and over 60 small artifacts was set-up. Other materials such as lead and bronze were conserved using contemporary chemical processes.

The junior author came to South Carolina in September 1987 to serve as conservator/archaeologist for the South Carolina Institute of Archaeology and Anthropology (SCIAA). The vast resources at hand in South Carolina surpassed all expectations. These resources included a broad range of both historical and prehistorical sites, many dedicated archaeologists and historians, a variety of interested anthropology students, and the raw resources for a first-class conservation facility at the Old Brown's Ferry Building in Columbia, South Carolina.

A new Conservation Laboratory Facility (CLF) was established at SCIAA as the result of five months' work, four determined people, and a $3,000 expenditure. A fourth factor, which stands alone, was the able help of the University of South Carolina's physical maintenance crew who did the plumbing, fencing and electrical work needed to facilitate the activity to be done there. Besides being a place to preserve the clues of the past, the new Conservation Laboratory Facility is a teaching facility -- just as any aspect of underwater research must be. SCIAA staff (Harold Fortune), a USC anthropology graduate student (Ruth Trocolli), and

undergraduate work-study student (Christian Masarik) have all been building while they learn and have done an incredible job.

The decision to establish the CLF in the Brown's Ferry Building was based on the significance of the tank in which the Brown's Ferry vessel is soaking. The new SCIAA Conservation Laboratory Facility has the Brown's Ferry vessel at the center of its operations (Figure 1). Separate areas have been set up for each type of activity that occurs; conservation of metals, organic materials, delicate and fragile items; photography; recording of artifacts; maintenance and storage facilities; and an office for administration. The work areas were designed to maximize efficiency while observing standard safety practices concerning some of the hazardous substances we use there.

The Brown's Ferry vessel tank limited the floor space we could use for the various activity stations. However, the side aisles were perfect for the location of the main work areas, the lines for the conservation of organic materials and metals. The unused space outside of the lab has been converted to the cannon treatment area, and the chemical storage facility.

The importance of record keeping in the conservation process is no less important than the laboratory facilities and equipment. Before any treatment can begin, an artifact must be properly drawn and photographed. This insures that the artifact can be identified should it be lost or damaged by the conservation process. A second more important feature of good record keeping is the data it provides to future conservators investigating better techniques.

To standardize the record keeping process CLF initiated the use of an oversize card file for all materials coming into the lab. This system was adapted from a form devised by Dr. Donny Hamilton in Texas. We request that the archaeologist submitting artifacts fill out the card and provide the initial photograph and drawing. This saves time and insures that individuals submitting the artifacts have gotten the information that they feel is important. We do not do "cookbook" conservation at the CLF. Every item is treated as an individual, and the subsequent treatments vary depending on artifact composition, condition and archaeological deposition. All of the processes that an object undergoes are recorded on the artifact cards. In the future, questions may arise concerning the treatments a given artifact received. If this happens, the cards constitute the primary resource for this information.

The processing of metals is a large part of our current work in the CLF (Figure 2). The last of the metal artifacts from Santa Elena are being processed and the materials from the Civil War encampment of Folly Beach are nearly completed. Many of the techniques for treatment of metals were devised through necessity by underwater archaeologists attempting to preserve the remains of

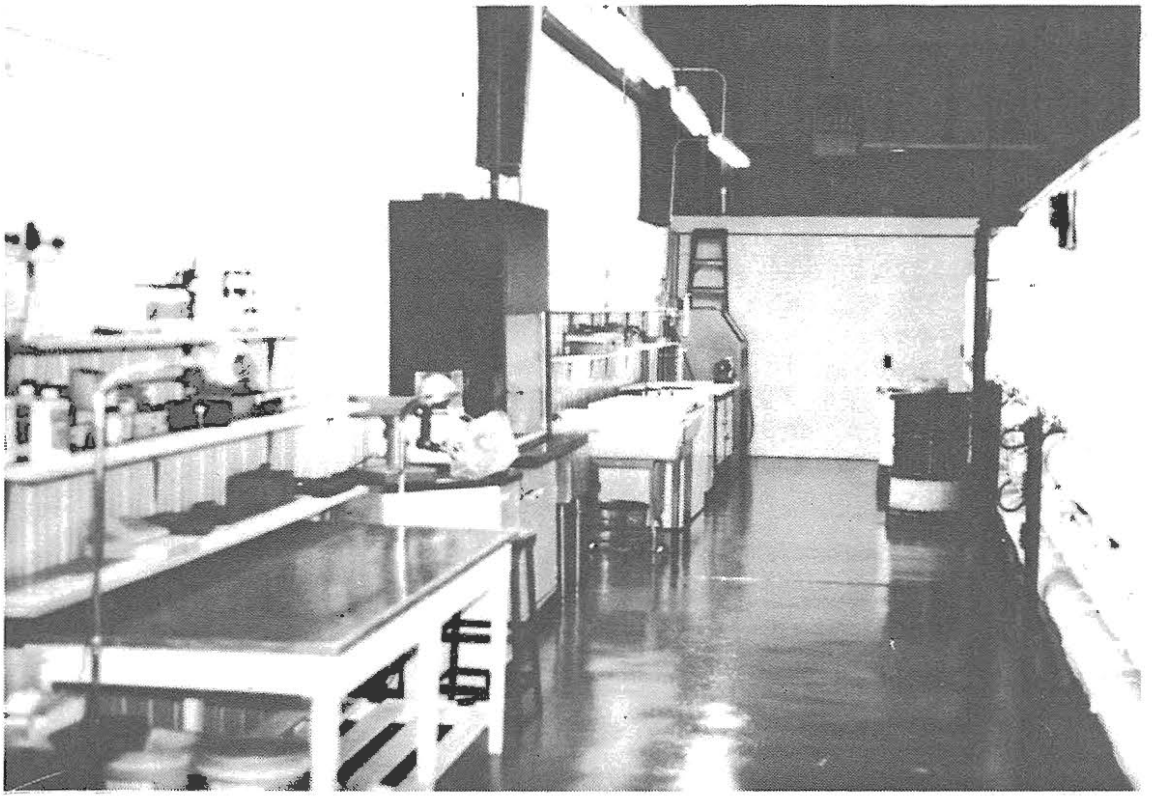

Figure 1. Organic artifacts processing line on the north side of the Brown's Ferry tank.

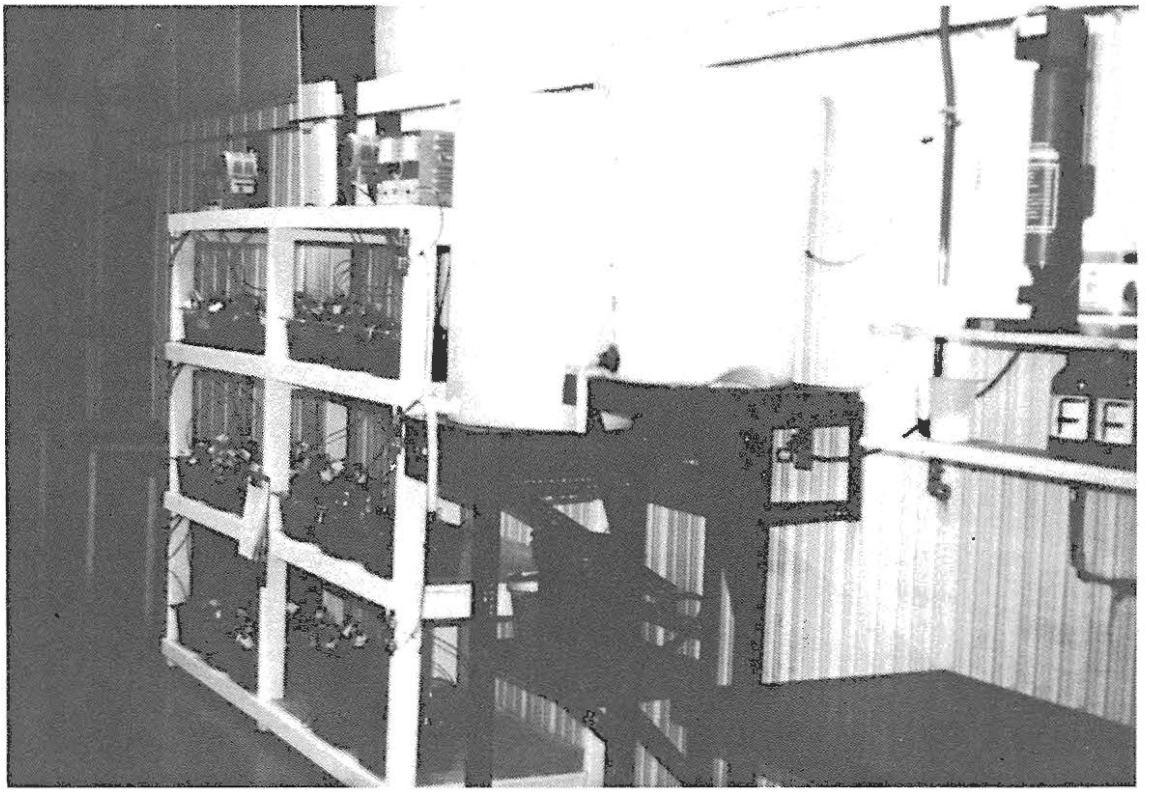

Figure 2. Small artifact electrolysis area.

shipwrecks and have been modified and improved through time.

The metal conservation line and the organics line both start with a work table for the check-in recording of artifacts and storage shelves where the artifacts await treatment. A plastic tag is made for each item which includes the site designation or project name and the artifact number. This tag accompanies the artifact through every process. Examination of each artifact to determine the appropriate treatments takes place at this stage. Additional photographs or x-rays may be deemed necessary at this point.

Metals, whether silver, gold, brass, bronze, lead, iron, tin or their alloys usually need preliminary mechanical cleaning. This includes brushing, picking and chiseling to remove concretions and corrosion products. The pneumatic chisel is an air driven device that is very useful for removing calcareous deposits that would take much longer to remove by hand.

Proper stabilization of metals requires the removal of chlorides to halt the corrosion process. The most effective method for chloride removal is to reduce the metals electrolytically. The process involves submersion of the artifacts in a bath of electrolyte solution. A negative electrical line is attached to artifacts, and a positive line is attached to the metal cathodes which are also suspended in the solution. The electrolyte completes the circuit between the charges attracting the negatively charged chloride ions into the solution. The solution is changed when it becomes saturated with chlorides. The process continues until all of the chloride ions are removed from the artifacts. Brass and copper-bearing metals may take less than an hour for electrolysis, while some larger iron objects may take months. Artifacts recovered from salt water usually take much longer to stabilize than those from terrestrial sites.

Large objects such as cannon provide a whole set of obstacles which must be overcome to complete the conservation process. Their sheer size makes them difficult to move and work with. Mechanical cleaning is time consuming, and the recording process is tedious under the best of conditions. Electrolysis of such large, dense objects is tricky. This fall, the CFL purchased an airplane battery charger to provide the necessary current for cannon electrolysis. If the guns are loaded or armed, the situation takes on an added air of danger.

Currently, there are seven cannons undergoing conservation in the laboratory. Three are from the eighteenth century shipwreck at Little Landing on the West Branch of the Cooper River. All three of the guns were loaded when the ship went down. The other four cannons are Parrot Guns, abandoned by retreating Confederate troops in Chester, South Carolina. To make the guns useless to pursuing Federal troops, shells were rammed down the tubes backwards. The

shells are frozen in place by corrosion and we have not found a satisfactory and safe method of unloading the Parrot guns. We would like to retrieve the shells intact and are hoping that the ordnance experts at Fort Jackson will be able to help with this problem.

The final treatment for all metals involves providing a stable and protective coating. After the metals are free of chlorides, they are chemically treated so that a stable, non-reactive surface is obtained, and then they are sealed with either microcrystalline wax or clear acrylic lacquer.

Metallic concretions from marine sites are amorphous lumps of barnacles, iron, and artifacts cemented together by the minerals in the seawater. The pneumatic chisel is perfect for the "excavation" of these concretions -- each artifact that is removed is "provenienced" so the relationship of all of the artifacts within the mass is preserved. Concretions also form around objects that eventually corrode away to nothing. A cavity is left within the lump which may preserve the surface detail. Invaluable information can be retrieved from these concretions if casts are made of the cavity. A two-part epoxy-based molding compound is poured into the cavity which picks up details of the missing artifacts. In the case of partial iron retention, more information can be obtained from the casting than from what is left of the original artifact.

A wide variety of techniques are used on organic materials such as wood, bone, shell, antler, leather and fabric. After recordation and examination, most organic materials are cleaned. The mechanical cleaning techniques used for metals are also used for organics, although a much lighter touch is necessary. Rinsing and soaking in deionized water removes foreign substances. Additional treatment with acids or bases to change the pH may be necessary. Stains and discolorations are also removed. For consolidation and preservation one of the most useful compounds is polyethylene glycol (PEG). A synthetic wax in waterlogged wood, PEG replaces the water in wood cells and prevents shrinking or warping of dried objects. PEG also imparts flexibility and suppleness to leather, rubber and cloth. The wax is introduced to the artifacts by painting or soaking. After treatment with PEG, the materials are slowly air dried. Some artifacts require freeze drying in a vacuum. Our freeze drying system, which is able to accommodate objects up to two feet in length, is located in the center of the organics line.

The Brown's Ferry vessel is the largest organic artifact undergoing conservation at this time. The 50 foot boat is submersed in a tank equipped with a pump and heater to keep the PEG solution warm for maximum wood penetration. Recently core samples were removed from several parts of the boat and sent to Clemson University for analysis. This study confirmed our suspicions that the wood is well saturated with PEG. The vessel will be dried and cleaned, raising our hopes that it will not be long until the

conservation is complete.

An interesting feature of life on the Sea Islands of South Carolina is the need for fresh water wells. Barrels that lined the wells of sixteenth century Spanish settlers at Santa Elena on Parris Island and the nineteenth century Union military encampment on Folly Island are undergoing treatment at the CLF. The Santa Elena barrel, excavated by Stanley South of SCIAA, is exceptional for the preservation of the wood staves, wood and wicker bands, and iron hoops. Because the barrel is a composite artifact, comprised of several materials, the conservation procedures are more complex. PEG cannot be used to treat the wood because it adversely affects iron. However, electrolysis to stabilize the iron will not harm the wood. First, the iron will be stabilized. Then the barrel will be immersed in a solution of organic waxy resin, dissolved in acetone. The resin replaces the water in the same manner as PEG, and also seals the iron. Two barrel wells were recovered from Folly Island by SCIAA. One is nearly complete having intact iron hoops. All that remains of the second barrel are the wood staves, as the iron bands have disintegrated. The barrel without hoops is currently soaking in a 7% solution of PEG. The larger barrel is awaiting electrolysis and will be treated with the acetone/resin method.

Conservators have to be flexible in their attitude toward selecting a proper course of treatment for a given artifact. Factors such as whether an artifact will be on display, or the use of hazardous substances must be carefully considered. It may be necessary to experiment with several methods to determine the one appropriate method, or the combination of methods for a given set of conditions.

For example, a method of preserving a tabby brick fireplace excavated at Wachesaw Plantation needs to be developed. It is expected that the fireplace will be exposed as part of a display with a sunroof or gazebo erected over it to protect it from direct sun and rain. However, since tabby is lowfired and not very water resistant, it may need some form of penetrating consolidant that will help it stand up to prolonged exposure. A sample of the brick has been sectioned by the USC Geology Department and the CLF is monitoring the penetration of different compounds into the brick and the resulting weathering properties. Of course, such a treatment, if used, is not easily reversible.

A final area of operation to be considered is the handling of fragile and delicate artifacts. We are currently dealing with only a few items of this nature, but our facilities have the potential to handle a wide variety of materials. Archaeologists from a variety of countries have sought out the SCIAA Conservation Laboratory Facilities for help with a number of problems.

A human effigy made of bone, sent to the CLF from Louisiana, is undergoing reconstruction, after a long period of desalination.

Unfortunately, this artifact was mailed to the CLF in an envelope; when it arrived, it was in a number of small, dusty fragments. The exterior is being repaired, but we are unable to restore the interior of the bone, much of which was pulverized. Fortunately, the archaeologist did have the foresight to provide a drawing which has helped the restoration immensely.

A clay cuneiform tablet from a site in Iraq was sent to the CLF for replication. This multi-step process required the application of layers of gauze and latex molding compound to build up a sturdy reverse image of the original, thereby providing the cuneiform writing specialists a copy for analysis.

The study of a Mississippian period burial urn and cover vessel was conducted for SCIAA with the help of Dr. Chester DePratter. The burial was recovered from Darlington County and consisted of a complicated stamped cooking vessel that had been "ritually killed." The cremated remains of a child were placed inside the pot and a covering vessel was placed on top. The pressure of the soil forced the covering pot to slip inside the lower vessel. Before the burial was excavated in the lab, x-rays and CAT scans, performed by the USC School of Medicine, revealed the previously unseen covering vessel. A saw was used to remove a section from the stamped vessel in order to see the inner covering. Restoration involved mending the vessel, and replicating the stamped pattern on the mended areas. A plaster mixture was used; we did not try to duplicate the original color and texture of the vessel. A restoration such as this one should be unobtrusive, yet still signal to the viewer that it has been restored. This vessel is now on display at the Darlington County Museum.

The main goal of conservators is to preserve as much of an artifact as possible through reversible methods. In the future, better treatments will certainly become available. What we save from the past can be effectively preserved for future generations to study.

Although what is described in this paper only touches on some of our projects, it represents extensive time and energy by the conservation staff. This is only Phase I of a three phase plan we envision, ultimately resulting in one of the best and innovative conservation facilities in the country. Eventually we hope to use this facility to incorporate interdisciplinary research at the inter-university level programmed at investigating less costly, more effective, and safer conservation techniques.

[Editors Note: Bruce Thompson joined the Maryland Historical Trust in September 1989. To date, the SCIAA Conservator's position remains vacant.]

OUR DEBT TO THE PAST, OUR PROMISE TO THE FUTURE: THE CONSERVATION OF ARCHAEOLOGICAL COLLECTIONS

Debi Hacker

That "conservation" of archaeological specimens has come into vogue, or at least that its importance is better understood, seems clear enough. For years the archaeologist's conservation bible was Plenderleith's The Conservation of Antiquities and Works of Art (Plenderleith and Werner 1971), first published in 1956. However obtuse and difficult this volume might have been to use, it was one of the few sources on conservation which consistently could be found in archaeological libraries. Strangely enough, the volume was often in mint condition, with the binding barely broken.

The more recent interest in archaeological conservation is evidenced by Curt Moyer's regular column in the Society for Historical Archaeology Newsletter, A Conservation Manual for the Field Archaeologist (Sease 1987), and The Conservation of Archaeological Artifacts from Freshwater Environments (Singley 1988). Now, perhaps for the first time, the archaeologist has sources readily available which provide information on the conservation of excavated specimens.

This has created for many an ethical dilemma. We archaeologists have gradually come to realize that artifacts lie buried in soil, or submerged in water, for years, often reacting to the environment surrounding them. Frequently, the artifacts reach a point of equilibrium in this environment. Excavation, however, thrusts the specimens into a new, and often hostile, environment with greatly fluctuating temperature and humidity. This new setting will eventually cause the destruction of many artifacts -- sometimes slowly as is often the case with ceramics and glass, sometimes quickly as in the case of most iron artifacts from the Coastal Plain of South Carolina.

When there were few sources on the techniques of archaeological conservation, and even fewer conservators, we archaeologists could, with little thought or guilt, use china menders for our pottery and throw our nails in a plastic bag after they were counted. Now we are confronted both by our knowledge of the inevitable deterioration of the artifacts we have worked so hard to find and catalog, as well as the increasingly available sources and technology to ensure that these remains are preserved for future generations.

At Chicora (Chicora Foundation, Inc., Columbia, South Carolina), this confrontation with the duty owed to the archaeological record has come slowly and with great pain. We have faced the costs of conservation and the seemingly insurmountable logistical problems conservation can create. This paper, we hope, will discuss how we have worked to resolve these problems in our organization.

Conservation, very simply, is the process of cleaning, repairing, and treating artifacts in order to stabilize their physical condition and to prevent further deterioration. Often the process can reverse some of the existing degradation of the specimen. Conservation, however, is not the same as restoration, which is the process of restoring an artifact, as closely as possible, to its original state. Conservation implies stabilization; restoration implies replacement of parts, painting, and producing an aesthetically pleasing specimen. This, of course, is a significant difference. Conservation requires that treatments be reversible: what is done to an object must have the ability to be undone. For example, an adhesive to mend a ceramic vessel must be completely soluble in a solvent that will not adversely affect the vessel. An epoxy that cannot easily be dissolved, but must be chipped away, is not appropriate in conservation. In addition, the axiom "less is best" often applies and clearly distinguishes conservation from restoration. Finally, conservation requires documentation of all treatments, including the procedures and the chemicals used. It is essential that in the future, should any of the treatments need to be redone or reversed, all prior information is available.

At Chicora, our introduction to conservation came through the realization that iron specimens cataloged in seemingly good condition a few years ago, when re-examined, were barely recognizable. Sometimes they were simply powder, at other times they were a mass of oozing corrosion. It seemed simple enough to establish a system of electrolytic reduction for iron specimens and maintain simple logs for each artifact. Then we began to notice bright green corrosion on brass buttons. We found that bits of leather found in damp conditions were one-third their original size and very brittle. The gold gilt on the porcelain and the red pigment on pottery sherds when they were found in the field, were no longer found during analysis. It became increasingly clear that many artifacts other than just iron specimens were slowly being lost.

We were fortunate to have the assistance of the conservator then at the South Carolina Institute of Archaeology and Anthropology, Curtiss Peterson. With his assistance we slowly began to develop a strategy for dealing with what we decided were our obligations to the archaeological record.

But, of course, our problems were only beginning. While we at

first established only simple laboratory protocols for treatment, we quickly discovered that it was equally as important to establish some mechanisms for routinely handling items in the field. Even on small projects we found that items were returning to the laboratory in worse condition than when originally recovered, largely through improper packing and delayed examination. As a result, field crews are now trained to at least recognize items, such as bone-handled knives or overglazed porcelain, which need special treatment immediately. These items are often packed separately in the field and transported back to the laboratory before completion of the field project. Naturally, it requires extra effort to ensure that the specimens are accounted for and are not "overlooked" during analysis.

We quickly found that on industrial sites, where most of the specimens are iron, it was logistically impossible to stabilize artifacts in a sodium carbonate solution. While this is the preferred technique, it resulted in a large quantity of plastic buckets filled with artifacts which had to be cleaned, cataloged wet, replaced in a fresh solution, treated, and then integrated into the existing bagging and boxing framework. Since this effort, we have compromised by ensuring that analysis and conservation treatments begin as soon as practical after the end of the field project.

In all cases the field director notifies the lab, before the project's conclusion, of the types of material which may require conservation treatments. This allows us to plan our conservation schedule and order any special materials necessary for treatments prior to the arrival of the materials. Of course, we also have a good idea of the types of material expected at a site before we go into the field and this permits us to minimally budget for conservation needs.

We have also trained those individuals who work in the lab to be mindful of specimens requiring additional care during washing and drying. In the case of the Broom Hall Plantation (38BK600) excavations, we had sorted out most of the overglazed porcelain in the field, but those specimens not identified in the field were set aside before washing. Some materials, such as brass and leather, of course, are not washed at all, but are only dry brushed.

Once the materials are cleaned and the analysis process begins, all specimens are evaluated for their conservation needs. This seems simple enough, at least until one is faced with 700 machine cut nails in various stages of deterioration from one provenience. Here again, we found it essential to establish a lab protocol, but this also had to be refined considerably over the past year.

Today we routinely provide treatments to the few leather specimens we recover, as well as to all composite specimens, such

as bone-handle knives. Cupreous specimens which evidence active corrosion are set aside for treatment. Historic ceramics and glass which show clear signs of deterioration are also routinely scheduled for treatment. Altered bone specimens receive treatment only if they lack sufficient integrity to be stored safely. Virtually all iron specimens exhibit signs of advanced corrosion, but only those which are diagnostic receive treatment. For example, we do not treat every piece of strap metal or kettle fragment from every provenience. In fact, we do not even take a sample from every provenience. But, we do ensure that from each site there is a small sample of such items conserved. In the case of nails, we randomly select a 1% to 5% sample from each provenience for treatment. All potentially diagnostic iron specimens, such as buttons, belt buckles, architectural hardware, and so forth, receive treatment.

Each specimen pulled for conservation is first cataloged. We have found that it is an administrative nightmare to begin conservation treatments, many of which can last several months, using only field specimen numbers or other temporary designations. Each artifact, or the case of similar artifacts such as nails, each lot, is documented using a conservation form. This form provides information on the catalog number, a description of the specimen, its current condition, and the treatment procedures. Although ideally, each object would be photographed both before and after treatments, under our current time and budget constraints this is rarely possible. When as many as 100 nails from a single site are being treated, the cost of the film alone, ignoring archival processing and the labor involved, is prohibitive. We have chosen, instead, to photograph the more unusual objects or those submitted to a more unusual treatment, after the work is done. When treatments are completed and the collection is sent to the curatorial facility, these forms remain with the materials as part of the permanent documentation.

We have found it most convenient to pack conserved specimens separately from those not requiring treatments. While this does break up the collection, it allows us to pack the bulk of the specimens as analysis proceeds. In addition, this procedure also clearly designates those boxes which contain specimens which have been conserved, making it easier to periodically check the materials to ensure that the treatments were successful and that additional work is not required. It also allows curatorial facilities easier access to specimens which may be useful for display.

There are many simple conservation treatments used in the Chicora labs. Glass and ceramics which require mending or stabilization of glazes are treated with various concentrations of acryloid B-72 in toluene, which is inexpensive, stable, non-yellowing, and easily reversible. Because most mended vessels are rarely displayed and create difficulties in storage, we prefer to

pack matched pieces together without mending.

Iron specimens which lack solid metal, but are represented only by corrosion by-products, typically receive multiple deionized water soaks until their soluble chloride levels are under 0.1 ppm. Iron specimens which contain a solid core of metal are typically subjected to electrolytic reduction in a sodium carbonate at about 3 amps for periods ranging from a week to several months. Afterwards they are soaked in deionized water to remove soluble chlorides to a level of less than 0.1 ppm, dried in acetone baths, and receive coatings of 5% phosphoric acid, 20% tannic acid, and 10% acryloid B-72 in toluene.

Non-ferrous metals, primarily copper and brass specimens are also subjected to electrolytic reduction, although a stronger sodium carbonate solution and a higher amperage is generally used. These specimens are also soaked in deionized water to remove soluble chlorides and are dried in acetone baths. While we have used a coating of Incralac and toluene on some, we have found that generally B-72, without the chelating agent benzotrizole, works satisfactorily. We have chosen to minimize our treatment of metals such as lead and pewter because the wastes from such treatments contain the toxic heavy metal lead. Such wastes cannot be easily disposed of in an environmentally sound manner. Where it has been essential to clean lead we have found that a 5% solution of ethylene diamino-tetra-acetic-acid (EDTA) is satisfactory.

Organic remains which we have treated include bone, leather, and wood. Treatments vary greatly, depending on the specimen's condition and the ultimate use of the object. Bone is usually treated with several coats of dilute acryloid B-72 since consolidation is all that is usually necessary. Leather, which has been found in moist field conditions, has been treated by first rinsing in deionized water, then soaking in baths of dilute oxalic acid followed by ammonium hydroxide. After again rinsing the leather in deionized water to remove the chemicals, the leather has been dried in acetone baths. Afterwards, it has been treated with a neatsfoot oil and lanolin mixture. A leather shoe heel, recovered in poor condition from dry conditions, seems to have been satisfactorily treated using only multiple coatings of very dilute B-72 in order to consolidate the layers. Wood specimens have thus far been treated with saturated solutions of sucrose, although the performance of this treatment is marginal and we will probably begin using polyethylene glycol.

Composite artifacts are among the most difficult for us to treat and require the most time. Perhaps the most common types contain ferrous metal and bone, such as bone handled utensils. While we have tried separating the bone and metal to permit independent treatments, this has been unsatisfying and, of course, results in damage to the specimen. We are now manually removing corrosion from the accessible parts of the iron and soaking the

specimen in deionized water to remove soluble chlorides. The bone then receives several coatings of B-72, while the iron is coated with phosphoric and tannic acid. The entire specimen receives a final coat of B-72. Our results have been generally satisfactory, although occasionally such specimens will require retreatment.

On the one hand, these treatments may seem simplistic to trained conservators, while on the other hand, they may seem complex to those who have not faced the conservation of archaeological specimens at all. We, however, feel that Chicora is providing a minimal level of conservation to a sample of virtually all specimens that we collect. Naturally, these treatments have real, monetary costs. We estimate that the cost of conservation supplies and equipment is about 5% of each project budget. The time required for conservation is even greater. For every eight field days, one day of conservation time is required, although the total time involved in conservation treatments may stretch out over months. The long periods involved in soaking specimens to remove chlorides, for example, means that it is not possible to transport collections to the curatorial facility for up to four months after the completion of the field work. Our initial investment in equipment was approximately $1000 and we have found that at least 200 square feet of lab space must be dedicated to conservation treatments. There are no shortcuts in the conservation of archaeological specimens -- the work requires money, time, and patience.

However, rather than asking how much conservation will cost, we at Chicora have been forced to ask ourselves what it will cost <u>not</u> to perform conservation treatments. The answer to that question is clear -- without such treatments large portions of our excavated archaeological heritage will simply deteriorate and disappear. We feel that <u>if</u> it is in the public interest to excavate the specimens, then it is also in the public interest to ensure the preservation of the collections for future generations. After all, the underlying goals of archaeology are the preservation of the past and the education of the public. We do not believe that either of these goals can be achieved if we do not properly care for the building blocks of our discipline --the artifacts themselves. Consequently, at Chicora we have chosen to ensure that our debt to the past is paid and that we ensure the preservation of our future.

UPGRADING SOUTH CAROLINA'S SITE FILES

Charles J. Rinehart

In the late fall of 1988, the Information Management Division of the South Carolina Institute of Archaeology and Anthropology ("Institute") received a grant to upgrade or "clean up" the state's archaeological site files. The activity that is the subject of this paper has been financed in part with Federal funds from the National Park Service, Department of the Interior, and administered by the South Carolina Department of Archives and History. However, the contents and opinions do not necessarily reflect the policies or views of the Department of the Interior or the South Carolina Department of Archives and History.

This upgrade consists of a multi-stage process designed to confirm each site's permanent site number, its correct location on USGS topographic and county highway maps, and establish a minimum level of correct, usable information for each site. This paper briefly describes some of the problems we have encountered thus far in the project and will present some observations and suggestions concerning site forms and archaeological site record keeping.

Record keeping is an extremely important part of the discipline of archaeology. It is, or should be, a primary responsibility of archaeologists to keep extensive records on the sites they are discovering and investigating. Of all the information that can be recorded about a particular site, the most critical would include: 1) what the site is (i.e., type of site and what is found there), 2) where the site is (i.e., clear, detailed locational descriptions and maps), and 3) a description of the site's environment and/or it's surroundings (Hester et al. 1975:38).

South Carolina's state site files and file system were first organized in 1969. In the early days, the main goal appears to have been recording any and all known sites, irrespective of the actual information provided. The first official state site form consisted of one page. At that time, there were no requirements for submitting locational maps along with the site form.

In 1980 the site form was expanded to a six page format. This new form included more information about the type of artifacts and the geographic/environmental surroundings; it also required a sketch map of the site. Even at that time professional

archaeologists in the state recognized that the early site records has been filled out to varying degrees of completeness. It was hoped that the 1980 version would bring consistency to the data recording (South Carolina Institute of Archaeology and Anthropology 1980:1-8).

Further revisions of the site form were introduced in 1985. At that time the site form was reduced to four pages. The artifact checklist, adopted in 1980, was omitted and replaced with a block listing for artifacts. The 1985 form was condensed yet did not leave out any pertinent data for assessing the significance of a site. In addition, photocopies of county highway and USGS topographic maps giving the site's exact location were required for the first time (South Carolina Institute of Archaeology and Anthropology 1985:5). The current site file grant is designed to, as much as possible, update all the existing files to the 1985 specifications.

There are a number of very important benefits of the upgrade project. First of all, the greatest benefit will be the creation of an improved, more reliable archaeological data base. This is critical to conducting all levels of archaeological research and cultural resource management in South Carolina. Second, a duplicate set of site forms, including county road and USGS topographic maps with site locations, is being made for the South Carolina Department of Archives and History. In the event that the Institute's site files were to be destroyed, there would be a backup copy of the site records on file in a different building. The third major benefit has been that the guidelines and operating procedures established (as a result of encountering and solving the many site file problems) has insured that these problems will not be repeated in the future.

The results of cleaning up the archaeological site files have been eye-opening, and will benefit archaeologists throughout the Southeast. There are a number of recurring problems. Examples include two locations having the same permanent site number, one location having two different site numbers and/or having been reported more than once. There are also instances in which sites have been incorrectly plotted on South Carolina's master locational maps or have been left off completely. Finally, there are a fair number of sites that were so poorly documented that even after our clean up attempts they remain non-locatable (Table 1).

Non-locatable sites are sites whose placement is questionable due to vague or incomplete site descriptions and/or mapped locations. Examples of vague descriptions include: "south of Ninety Six, east of 248/255 junction" or "on crest of a narrow, flat-topped hill overlooking flood plain of Saluda River." In both cases it is impossible to accurately place the site on master topography maps -- or any map for that matter.

Table 1.
Non-locatable sites by county, percentages rounded off to the nearest whole number.

County	Number Non-Locatable	County Total	Percent
Abbeville	6	463	1
Aiken	33	467	7
Allendale	24	163	15
Anderson	26	145	18
Clarendon	35	84	42
Chester	8	158	5
Dorchester	6	100	6
Edgefield	5	239	2
Fairfield	42	262	16
Florence	8	192	4
Georgetown	58	341	17
Greenville	8	176	5
Greenwood	10	449	2
Kershaw	14	181	8
Lancaster	11	259	4
Laurens	13	209	6
McCormick	2	702	0
Newberry	12	206	6
Richland	29	323	9
Sumter	11	93	12
Union	10	282	4
York	23	155	15
Total	394	5649	7

Taking a closer look at the non-locatable sites, most of them occurred before 1981 (Tables 2 and 3). In 21 of 22 counties cleaned up so far, over 70% of the non-locatables fell between 1969 and 1980. Furthermore, if this time span is divided in half, the picture becomes even clearer. In 13 out of 22 counties there are 75% or more non-locatable sites in the years 1969 through 1974. From this we can see that observers began filling out forms more thoroughly after the first few years. It can probably be assumed that the 1980 and the 1985 form revisions led to further improvements in data collection and/or record keeping.

Although recent site records are vastly improved over earlier ones, problems still do exist. As recently as 1988 a number of sites were submitted accompanied only by detailed site project maps. These maps are of great value, but only when submitted with the required USGS topo maps. Archaeological site locations plotted on detailed project maps do not readily transfer to topo maps. Since USGS topographic maps (7.5′ series) are the base maps for archaeological site locations in South Carolina, sites must be recorded on these maps.

Table 2.
Non-locatable sites by time period.

	1970-1974			1975-1979			1980-1984			1985-1988		
County	A	B	C	A	B	C	A	B	C	A	B	C
Abbeville	5	92	5	0	206	0	1	96	1	0	28	0
Aiken	28	174	16	4	160	3	1	73	1	0	26	0
Allendale	18	72	25	4	23	17	2	57	4	0	9	0
Anderson	25	38	66	1	33	3	0	3	0	0	29	0
Chester	7	62	11	0	46	0	1	10	10	0	38	0
Clarendon	32	39	82	6	15	40	0	30	0	0	1	0
Dorchester	2	8	25	1	12	8	3	63	5	0	10	0
Edgefield	5	15	33	0	26	0	0	116	0	0	80	0
Fairfield	38	98	39	4	35	11	0	21	0	0	104	0
Florence	5	34	15	2	15	13	0	181	0	1	11	9
Georgetown	14	28	50	29	53	55	15	202	7	0	125	0
Greenville	7	26	27	1	65	2	0	49	0	0	31	0
Greenwood	5	18	28	4	27	15	1	358	0	0	46	0
Kershaw	12	25	48	2	21	10	0	146	0	0	32	0
Lancaster	10	17	59	1	42	2	0	140	0	0	51	0
Laurens	8	13	62	1	89	1	4	72	6	0	30	0
McCormick	0	3	0	2	113	2	0	341	0	0	234	0
Newberry	12	26	46	0	21	0	0	94	0	0	64	0
Richland	12	87	14	13	119	11	4	75	5	0	41	0
Sumter	9	11	82	2	19	11	0	55	0	0	8	0
Union	2	14	14	8	108	7	0	118	0	0	42	0
York	13	20	65	8	88	9	2	15	13	0	52	0
Totals	269	920	29	93	1336	7	34	2315	1	1	1090	0

A=number of non-locatable sites
B=total number of sites
C=% of sites non-locatable (to the nearest whole percentage)

Since the 1985 site form revision was adopted, photocopies of county highway maps have been required with each site form. The wisdom of using such maps has often been questioned. However, there have been many sites whose locations were more clearly plotted on county highway maps than on USGS topographic sheets. There are still 12 fifteen minute series topographic maps in use in South Carolina. These are very outdated and are poor site locational maps. Many of the 7.5' series maps are somewhat outdated and do not reflect the existing road network and community development that are shown on the more updated county road maps.

Another major problem lies in the correct plotting of Universal Transverse Mercator (UTM) coordinates. UTM coordinates were first required with the 1980 site form revisions and instructions for their calculation were included in both the 1980

Table 3.
Non-locatable sites for 1970-1979.

	1970-1974			1975-1979		
County	A	B	C	A	B	C
Abbeville	5	6	83	0	6	0
Aiken	28	33	85	4	33	12
Allendale	18	24	75	4	24	17
Anderson	25	26	96	1	26	4
Clarendon	32	38	84	6	38	16
Chester	7	8	88	0	8	0
Dorchester	2	6	33	1	6	17
Edgefield	5	5	100	0	5	0
Fairfield	38	42	91	4	42	10
Florence	5	8	63	2	8	25
Georgetown	14	58	24	29	58	50
Greenville	7	8	88	1	8	13
Greenwood	5	10	50	4	10	40
Kershaw	12	14	86	2	14	14
Lancaster	10	11	91	1	11	9
Laurens	8	13	62	1	13	8
McCormick	0	2	0	2	2	100
Newberry	12	12	100	0	12	0
Richland	12	29	41	13	29	45
Sumter	9	11	82	2	11	18
Union	2	10	20	8	10	80
York	13	23	57	8	23	35

A=number of non-locatable sites in time period
B=total number of non-locatables
C=percentage of county's non-locatables (rounded off to nearest %)

Table 4.
Incorrectly calculated UTMs from selected counties.

County	Number Incorrect	Total Number of Sites After 1980	Percent
Allendale	32	42	76
Anderson	20	34	59
Chester	36	40	90
Dorchester	56	65	86
Edgefield	138	179	77
Lancaster	168	191	88
Laurens	67	102	66
McCormick	435	575	76
Newberry	125	158	79
Union	127	160	79

Mean incorrectly calculated UTMs = 78%

and 1985 "Handbook to the Site Forms." Nevertheless, site records from 10 selected counties submitted after 1980 indicate that most of these calculations were done incorrectly. In those counties between 59% and 90% of the UTM's were incorrect (Table 4). There is no reason to believe that this trend will not continue for the remaining counties.

Problems with the UTM calculations range from misreading of the site's grid coordinates and reversing the easting and northing figures, to simple gross miscalculations. These miscalculations are often only 10 to 40 meters, however, they can be by several miles. The greater the number of sites located in a small area, the more disastrous the outcome when UTMs are misplotted. In terms of grossly miscalculated coordinates, a few would seem to indicate that we have recorded sites in South America and American Indian villages on the bottom of the Waccamaw River.

Having summarized some of the problems we have encountered thus far in the site file clean-up, how may we insure that these do not recur in the future in South Carolina? Some of the solutions have already been stated. First, verbal descriptions of site locations must be clear and complete. Good verbal descriptions would include road net mileage, nearby landmarks, and surrounding geographical features.

Second, submission of all required locational maps in a given state is essential (Hester et al. 1975:38; Joukowsky 1980:39-41). Detailed project level and city street maps may also contribute to precise site location, and thus are welcomed where appropriate.

Third, site coordinates must be calculated correctly. In South Carolina UTM coordinates are required. The advantages of using UTMs over latitude and longitude is that one can locate "one of a series of sites in a small area" and a site can be pinpointed to within 10 meters (Edwards 1969:180).

There is a cardinal rule in submitting site locational information. Make certain that from your verbal description and maps the site can be relocated by someone who has never visited it (Dills 1970:389; Joukowsky 1980:91). Following this rule will ensure a locatable site.

This upgrading of the archaeological site files has been much like getting an athlete into shape with a proper diet. When the project is completed, the site records will be a sleek archaeological data base. We will have burned off the fat, that is declared some sites as non-locatable. We will have added the essential vitamins (topo maps, county highway maps, etc.) to those sites that were deficient. As a result, with proper exercise by professional archaeologists, interested researchers, and the Information Management Division, we can have olympic quality site files.

THE PRESERVATION OF ARCHAEOLOGICAL FIELD RECORDS: IS THERE A FUTURE FOR THE PAST?

Michael Trinkley

Introduction

As archaeologists we frequently characterize the subjects of our study as non-renewable resources and we emphasize the importance of the "conservation" of the archaeological record, usually meaning archaeological sites. In addition, we acknowledge that all excavation, even properly conducted scientific investigations, destroys that archaeological record and requires extraordinary care in data recordation. There is even occasional mention made that the results of these excavations will be stored by a curatorial facility "in perpetuity." While there is considerable diversity of opinion among archaeologists about many topics and concerns, it is likely that most would agree that the results of archaeological studies should be "preserved for future researchers."

In addition, I believe that most archaeologists recognize the importance of their state site files as one of the major archaeological data banks. In many states thousands of sites have been recorded through surveys covering fifty or more years. These site files are often the first source consulted by archaeologists conducting research studies. The files may represent an amazing accumulation of information about the cultural resources of a state.

In spite of these areas of basic agreement, archaeologists have been slow to recognize the need to preserve the results of their studies or the data base of state site location files. The 1976 Society of Professional Archaeologists Standards of Research Performance requires only that records be deposited at a curatorial facility and that care be taken with records to ensure contextual relationships not be obscured. It has been eight years since Curator published the 1979 Society of American Archaeology symposium papers on "The Curation of Archaeological Collections." A careful reading of these papers reveals a clear recognition that the curation of archaeological documentation is important and that it has received insufficient attention in the archaeological community.

Lindsay and Williams-Dean (1980:19-42) provided the first

widely available account of the National Park Service's 1978 Curation of Collections Project (see also Lindsay et al. 1980). That study, which incorporated 20 institutions in 17 states found serious problems in the curation of archaeological remains. For example, only 35% of the institutions had conservation programs for the preservation of the artifactual remains, and only 20% consistently maintained adequate environmental conditions and had records to document temperature and humidity levels (Lindsay et al. 1980:55-56). The report only briefly mentions the treatment of paper documentation, although the suggestion is that the treatment of this documentation is no better than the treatment of the actual artifacts (Lindsay et al. 1980:49-52).

Partially as a result of this study, the National Park Service has been developing 36CFR79, "Curation of Federally Owned and Administered Archaeological Collections." Although the proposed regulation has not yet been enacted, it documents the growing concern in the profession for the adequate curation and preservation of archaeological research. The proposed regulation, however, still emphasizes the curation of artifacts, rather than the curation of paper records and documents.

The reasons that curation studies and standards have emphasized the artifact, without giving equal consideration of the associated documents, are varied and may include our professional preoccupation with "artifacts," the general absence of archival or conservation training in graduate programs, the background and training of collections managers, and the very infrequent contact between archivists, conservators, and archaeologists. An exception is the recent publication of Preserving Field Records: Archival Techniques for Archaeologists and Anthropologists (Kenworthy et al. 1985). This study provides a thorough overview of preservation principles and practices relating to paper records, photographic materials, and electronic data.

The purpose of Chicora's study is to examine the methods used by a number of major Southeastern repositories to curate field records, specifically paper and photographic materials. The techniques of curation revealed by the study are then evaluated for their effects on the stability and life expectancy of the records. The goal is to emphasize the importance of preserving the written and photographic documentation comprising site and excavation files. Just as the sites themselves are non-renewable resources, so too are the files which contain the primary notes and documentation relating to these sites. Archival storage methods and materials, which would guarantee the preservation of these irreplaceable documents, are discussed and the costs are addressed.

This study was confined to the Southeast, although the general conclusions and recommendations are certainly applicable to all other areas of the country. A detailed, six page questionnaire was sent to 17 institutions in 10 states. Sixteen institutions,

representing all 10 states, responded. Nine of the institutions represent official state repositories of site form information. Institutions participating in this study include the S.C. Institute of Archaeology and Anthropology (University of South Carolina, Columbia), Office of Archaeological Research (University of Alabama, Moundville), Laboratory of Archaeology (University of Georgia, Athens), Research Laboratories of Anthropology (University of North Carolina, Chapel Hill), Office of State Archaeology (Department of Cultural Resources, Raleigh), Historic Sites (Department of Cultural Resources, Raleigh), Florida State Museum (University of Florida, Gainesville), Division of Historic Resources (State of Florida, Tallahassee), Office of State Archaeology (University of Kentucky, Lexington), Museum of the University of Kentucky (Lexington), Department of Anthropology (Catholic University, Washington, D.C.), Museum of Geoscience (Louisiana State University, Baton Rouge), Tennessee Division of Archaeology (Nashville), Frank H. McClung Museum (University of Tennessee, Knoxville), Virginia Division of Historic Landmarks (Richmond), and an institution which requested anonymity.

The questionnaire was divided into four sections. The first dealt specifically with site forms and was primarily aimed at those institutions which serve as either the actual or de facto repository for this data. The second and third sections dealt with the curation of photographic materials (black and white and color transparencies). The fourth section dealt with the curation, storage, and preservation of all other paper records. These final three sections, of course, applied to all of the institutions. Questions within each section attempted to reveal how various items were stored, safe guarded, and used. The questionnaire requested actual samples of paper records, photocopies, and storage media for archival stability tests. The results of these questionnaires are discussed in a following section of this paper.

The Nature of Paper Records

In order to fully understand the reason that paper documents require special curatorial care it is necessary to understand the nature of these materials. As Ruwell notes,

> despite the care and diligence with which researchers collect their data, they are often recorded on highly impermanent media. In-attention to paper, film, or ink qualities, for instance, may lead to serious problems of deterioration over the years. Records, even those stored carefully, have become irretrievably damaged or barely salvageable because of the type and quality of material used (Ruwell 1985:3).

Common writing, printing, and photocopier papers may be said to have a relatively high degree of "inherent vice." That is, the manufacturing processes result in products that, regardless of

their storage, are prone to rapid deterioration. While most people recognize that newsprint will remain usable for only 15 or 20 years, few archaeologists realize that common photocopier paper has a life expectancy of about 50 years. Cotton bond, although frequently expensive and thought to be "long lasting," may actually have as short a life span as less-expensive papers.

The most significant enemies of paper include groundwood, low pH (or high acidity), and the presence of alum and alum-rosin size. Modern papermaking processes frequently use mechanically reduced wood fiber or "groundwood." This groundwood produces a weak paper that contains a high proportion of lignin. Lignin is a large complex organic molecule which easily breaks down to form numerous acids and peroxides. After 1850 not only did the use of groundwood increase in paper production, but so too did alum-rosin sizing (which makes paper less absorbent). The rosin tends to oxidize, causing brittleness in the paper and alum is an acid salt which degrades to form sulfuric acid. It is clear that not only does acid find its way to paper through inks, atmospheric pollutants, and transfer from adjacent materials, but also as integral aspects of the manufacturing process. Extensive testing has revealed that acidity is one of the primary causes of paper deterioration. The acidity causes the hydrolysis of the cellulose molecules. As they break down the paper becomes weak, brittle, and stained (Clapp 1972; Ritzenthaler 1983; Van Houten 1985).

In addition to the "inherent vices" of paper, its storage will have a tremendous affect on its ability to survive. Major enemies of paper include both visible light (which fades and discolors) and ultraviolet (UV) light (which fades and causes photochemical reactions), heat (which increases chemical reactions), both high and low humidities (below 40% and above 60%), and biological agents (such as insects and fungus).

Paper can be said to vary in both permanence and durability. Permanence refers to the ability of a paper to remain chemically stable and resist deterioration, while durability refers to a paper's ability to retain its original physical strength and mechanical properties. The paper used in a telephone book needs to be durable, but need not be permanent. Paper used in reference books, however, must be both permanent and durable. Standards are available as ANSI Z39.48.1984. Typically, permanent paper, which has the ability to last at least 200 years, should have a minimum pH of 7.5, an alkaline reserve equal to a 2% calcium carbonate buffer, contain no groundwood or unbleached pulp, and meet certain requirements for tear resistance and folding endurance. It may also be useful to ensure that paper intended for archival copies be free of lignin. It is also worthy to mention that all "acid-free" material is not of archival quality, nor should any materials be accepted for use without independent testing (which is easily performed using several available test kits).

In addition, when discussing the preservation of paper it is appropriate to also mention the use of different types of ink. Very few commercially available inks offer archival permanence and ball point and felt-tip pens (being neither light nor water fast) should never be used on records of enduring importance. While permanent inks are available from archival supply companies, the least expensive archival choice for field notes is a pencil. Carbon typewriter ribbons yield permanent images, although the film ribbons used in many typewriters today do not provide a permanent image.

Paper should be stored in the dark and used in light which has been UV filtered. Exposure to sunlight should be avoided. The temperature of storage should be as low as possible, but certainly no higher than 75°F. Recent studies have shown that storing paper at 86°F will reduce its life expectancy to one forth that of storage at 68°F. Relative humidity should be controlled and contained to a range of 40-60% RH. Below 40% the paper becomes dry and brittle, above 60% inks can run, insects are more numerous, the risk of fungal attack is dramatically increased, and chemical reactions are speeded up. If some fluctuation in humidity is unavoidable, it should be as gradual as possible. Recent work by the Getty Conservation Institute suggests that paper is buffered from humidity variations by proper boxing. Paper should be stored in a building with an operational HVAC filtration system to reduce or eliminate gaseous and particulate pollution. Finally, paper documents should be stored in such a way to prevent acid migration, exposure to gaseous pollutants, and physical stress. Little is accomplished if the paper is of archival quality, but the records are stored in acidic commercial office folders, in oak filing cabinets which give off formaldehyde and other pollutants, and the papers are folded and bent because the folders are either too tightly or too loosely packed.

Another significant concern is the stability of various photocopying processes. It is clear that copies made by various photochemical or "wet" processes are inherently unstable. On the other hand various "dry" copying processes tend to be stable, <u>if</u> the machine is in proper working order. Unfortunately, often these machines are not.

A final concern with paper records involves the use of various tapes, staples, and clipping devices. Any form of pressure sensitive tape, including Scotch™, masking, and drafting tapes, should be avoided. If tape must be used, there are pressure sensitive document repair tapes available which are somewhat less damaging than commercial tapes. The best recourse, however, is isolation of damaged items and appropriate storage. Staples should generally be avoided since they not only damage the integrity of the paper, but rust in high humidity. The rusting process not only stains the paper, but also causes damage through chemical decomposition. If staples must be used, there are non-rusting

stainless steel staples available. Likewise, paper clips and other metal fasteners cause mechanical damage to the paper and typically rust. Better choices are either plastic, brass, or stainless steel.

The Nature of Photographic Material

The photographic materials considered in this study include color transparencies, black and white negatives (largely polyester based, although some cellulose acetate negatives are included), and black and white prints (including both fiber and resin-coated papers).

Color transparencies are considered to have a very high level of inherent vice, which is to say that they are inherently unstable and cannot be considered archival. Regardless of the treatment they receive, they will have a definite useful lifespan. There are, however, certain differences in types of film used and there are ways to improve the life expectancy of slides.

In general, Kodachrome slides tend to have a longer useful life than Ektachrome slides, although Ektachrome slides tend to hold up better if the slides are intended only for projection (Keefe and Inch 1984:259-261). While other manufacturers, such as Fuji, may have slides with similar archival characteristics, little research has been done on any material other than Kodak's. It is therefore wise, if possible, to minimize the number of different brands of slides used.

Environmental storage conditions have a tremendous effect on the longevity of slides. The ideal storage is at temperatures of 0° and 10° F and a relative humidity of 25% to 30%; although clearly this is impractical for frequently used collections. Storage should be in total darkness at as low a temperature as possible (Eastman Kodak Company 1979; Ritzenthaler et al. 1984). There are a number of possible storage arrangements for slides, including metal cabinets and various plastic enclosures. In the case of metal cabinets they should be determined to be air and dust tight, and the paint should not off-gas damaging substances, such as formaldehyde. Plastic enclosures may be made of polyester, polypropylene, triacetate, or polyethylene. In no case should polyvinyl chloride (PVC) be used with any photographic material.

Black and white photographic materials can be processed for archival permanence and, as a result, are much more stable than either color transparencies or color prints. Such processing for permanence, however, requires care and attention beyond that usually given film in commercial laboratories. In addition, archival processing requires more than simply using a hypo-eliminator. Detailed instructions for permanent processing are offered by Eastman Kodak Company (1979) and Keefe and Inch (1984). The processes involve strict control of chemical quality and

mixtures, exact timing, close attention to temperatures, careful fixing using a two bath system, the use of a hypo-clearing agent, sufficient washing, toning (although recent work is questioning the usefulness of this step), and finally, routine testing to verify the archival permanence of the film. This testing may be accomplished through the use of several common test kits.

The processing of black and white prints is not substantively different from that of film. The fix should be ammonium thiosulfate at film strength, rather than the more common sodium thiosulfate, and no acid hardener should be used. The use of both a washing aid (such as Kodak Hypo Clearing Agent, Hustler, Orbit Bath, or Permawash) and a hypo eliminator (Kodak Hypo Eliminator HE-1) is necessary. Finally, periodic testing of both chemicals and the final prints is essential to ensure that the process has been successful. Resin-coated paper is not considered archival since the emulsion can lift from the underlying backing. Only fiber based papers are considered of archival quality.

The archival storage of black and white film requires temperatures of 50° to 60° F and a relative humidity of 30% to 45%, although storage at temperatures of up to 70° F and 50% RH is acceptable. Glassine envelopes should not be used since they are acidic, contain a volatile plasticizer, usually have a center seam, and use a hygroscopic glue. If paper envelopes are used they should be acid and lignin free, have side seams, and probably should not be buffered. Kraft paper envelopes should not be used. There are a number of plastic holders available, although polyvinyl chloride should not be used. Plastic enclosures should be used with care where humidity control is less than adequate since moisture can be trapped within the plastic housing and cause ferrotyping on the film.

The Study Results

State Site Forms

Nine of the 16 responding institutions represent the official repository of their state's site form files. These files provide primary information on sites: location, environmental conditions, temporal periods of occupations, collections, and so forth. Eight of the nine institutions were able to estimate their holdings, although one institution indicated that they had no idea of how many site forms were present in their collection. The eight states include a total of approximately 122,000 site forms, with a range from 2000 to 45,000 and an average of 15,250 forms. In only three cases are duplicate copies of some type maintained elsewhere in the facility, although in five cases copies of site files are available elsewhere in the state. The importance of these observations is tremendous -- in several cases the state files have no backup what-so-ever, so that any disaster, such as a fire or flood, could wipe out the entire state's inventory. Only three institutions have

made an attempt to duplicate site files and store them separate from the main files. One of the more notable cases is the State of Florida which has computerized their site files, instituting a hierarchy of backups.

Seven of the nine repositories store their paper site files in folders, while two use ring-binders. Only one institution in the nine is using any acid-free enclosures, and only a small proportion of their files are protected in this manner. Commercial office folders examined by this study (including Oxford Esselte R752, Globe-Weis 14, and Oxford Pendaflex) are uniformly acidic (<6.0 pH) and test positive for alum size. Groundwood, however, was not detected in the samples examined. Clearly these folders offer inadequate protection.

In five cases the institutions acknowledged that a variety of items were placed in the site form file. Inclusions such as newspaper articles may be highly acidic and permit migration of acid to other valuable documents.

Only three of the nine institutions had any requirement regarding the writing media used on site forms and these requirements were of limited value since they specified only the color of the ink (i.e., black or blue-black) or that the ink be "permanent." The remaining six institutions have no requirements at all.

Only two of the nine official repositories indicated that there was constant environmental control in the site form storage area, although neither institution maintained any records of that environmental control and neither institution had information on the typical humidity range. Among the seven institutions which claimed no real controls, temperature variations of at least 65° to 78° F and relative humidity variations of at least 45% to 75% were noted. Three institutions allow smoking in the site form area and six allow eating and drinking among the site forms records.

Only one institution has a policy for the regular inspection of the site forms to assess damage, deterioration, and loss of records. Another institution said that such inspections took place "irregularly," while the remaining seven institutions have no policy for inspections. None of the institution have developed any disaster plans to insure the protection of these irreplaceable records from natural and man-made disasters (although one institution has a disaster plan covering the electronic media).

All nine states provided copies of their site forms for testing. Of these, seven were offset printed and two were photocopied. One photocopied form failed to yield a stable image. Of the nine forms, seven tested positive for alum size and six yielded an acidic pH (<6.0). Two site forms, used by the States of Georgia and Tennessee, were printed on acid-free, buffered paper,

free of both groundwood and alum size. The site form for the State of Alabama yielded a pH >6.7, but tested positive for alum size. As a result, only two site forms may be considered archival and capable of lasting several hundred years. The other forms would be expected to have life spans of about 50 years. In addition, several of the forms were multipages and staples were used to bind the pages together. In one case the form sent as a sample was already showing rust staining around the staple. One state uses both carbon and carbonless multicopy forms, although carbon and carbonless copies are not archivally stable.

Black and White Photographic Materials

A total of fifteen of the sixteen institutions responded that they housed black and white photographic collections from site surveys, their own excavations, or from projects conducted by archaeologists outside their institution. The most common storage media for black and white negatives are plastic pages (used by 10 institutions), although paper envelopes are used by five institutions, glassine envelopes are used by four, and mylar envelopes are used by one. Samples of the plastic pages revealed that all are archivally safe, although the glassine envelopes supplied tested acidic. Paper envelopes supplied included both Hollinger and Savage brands. The Savage brand contains groundwood, has a pH <6.0 (i.e., is acidic), and contains alum size. The Hollinger envelope was buffered and evidenced no alum or groundwood.

Processing was by commercial establishments at six of the fifteen institutions, by in-house photographers at five, by an archaeologist at one, and by various combinations at three additional institutions. Six institutions stated that their negatives were not processed to archival standards, six indicated that they did not know, and three said that archival standards were used. Among these three institutions, however, the concept of archival standards varied. One responded that Permawash was used and hence archival quality was obtained, another stated that their processing was done "to National Archives standards." The third did not know what archival processing was done, but was certain that their collections were archivally processed.

In cases where photographic materials are accepted for curation from outside researchers, 12 institutions indicated that they did not require the materials to meet any archival standards. One institution did require archival processing, but required no documentation of processing methods and performed no spot checks for negative stability. Two institutions do not accept collections from outside researchers.

Eleven of the fifteen institutions routinely print all of their negatives, although none of the institutions print enlargements, only contact sheets are made. This limits the use of

these prints to identifying negatives -- they could not be used as second generation originals if the negatives were lost or damaged. In addition, only one of the 15 institutions indicated that these prints were processed to archival permanence, although two additional institutions reported that "some" of their prints are archival.

Only one institution requires that prints submitted for curation by outside researchers be processed to archival standards, although those standards are not stated nor are the prints routinely checked to ensure that they are processed for permanence.

Prints seem to be stored with less care or consistency than negatives. Two institutions use commercial (i.e., highly acidic) folders, four use binders, one mounts the prints on cards (the cards are acidic and the mounting tissue is damaging to the print), two use acid free envelopes for storage, and one institutions remarked that their prints were stored "everywhere."

Color Transparencies

Fifteen of the sixteen institutions report curating color slides. The bulk of these slides are Kodachrome (10% to 90%, average of 67%), although Ektachrome accounts for 100% of one collection (range of 10% to 100%, average of 33%). Other slides are uncommon. Storage is primarily by slide pages and the samples sent all appear to be stable and archival. Five institutions store at least part of their collection in metal cabinets and three report using plastic boxes (which probably off-gas plasticizers).

Six of the institutions report constant environmental control in the area of slide storage, although only four can provide temperature ranges and only two can provide humidity ranges. Those two institutions which offered complete data report storage at temperatures of $60\pm5^{\circ}$ F and $68\pm2^{\circ}$ F and relative humidities of $45\pm4\%$ and $50\pm5\%$. Three of the six indicate that the humidity is monitored, while three do not maintain any monitoring. The remaining nine institutions report temperatures fluctuating from 65 to 90° F and relative humidity ranging from 40% to 90%.

Three institutions report that they have no slide duplicates, while twelve indicate that there are duplicates of some, but not all slides. Twelve institutions allow the projection of all of their slides, while one does not allow the projection of any of the collection. Two institutions report that projection of some slides is allowed.

Paper Records

All sixteen of the respondents reported that they curated

paper records. Only 10 of the institutions could estimate the linear feet of documents that they maintain and the total is at least 1190 linear feet. Half indicated that their holding were unique in the state, five institutions indicate that the percentage of their unique records range from 20% to 90% (average is 65%), and three institutions report that they do not know what documents are unique to their facility. Only five institutions routinely store duplicates of all records separately from the originals, although an additional four institutions maintain duplicates of some records. Those records which are duplicated are photocopies in seven cases and microfilm copies in two.

Only four institutions know that some of their paper records are on acid-free or archival papers and the average percentage of documents on archival paper among these four institutions is only 5% (range of 1% to 10%). A total of 41 different forms used by nine different institutions were supplied for analysis. Everyone of these forms revealed an acid pH (<6.0) and all contained alum size. The most common papers used are photocopy paper (one sample, Cascade X-9000, yielded an acid pH of <6.0 and tested positive for alum size). These papers, as previously discussed, are expected to have a lifespan of about 50 years.

Of the four institutions which accept documents from other researchers, only one requires that the records be on archival paper, although that institution does not examine the documents to ensure that those requirements are being met. None of the institutions surveyed had any requirements regarding the writing media used.

Most institutions (10 out of 12 responses) do not permit smoking, eating, or drinking in the document storage areas. Eight of the sixteen institutions claim to have constant environmental controls, although three of those institutions do not know what the controls are and only four institutions monitor the temperature and humidity on a regular basis. Of those that claim controls, temperatures range from 55° to 72° F and relative humidity ranges from 41% to 60%. For those institutions claiming no controls, temperature ranges of 50° to 90° F and relative humidity ranges of 40% to 90% were reported.

All institutions (except for one no response) indicated that their documents were stored in folders and thirteen of those institutions use highly acidic commercial folders. Only three institutions report the use of acid-free folders. Over size documents are stored in a variety of ways, including flat at fourteen facilities, rolled at nine, and folded at seven. Only one institution reports that any of its documents are encapsulated.

Only four institutions have a policy regarding periodic inspections of their paper holdings. The time period involved was

reported to range from yearly to every two years, although one response was simply "periodic" and another was at unknown intervals. Only two institutions have disaster plans which incorporate the paper records. One plan, developed in 1982, was updated in 1988 but has never been tested. The other plan was developed in 1984, is updated yearly, but also has never been tested.

Evaluation of Records Care

It is clear from these questionnaires that the archaeological record in the Southeastern United States is in jeopardy. Very few of the site forms, which contain the basic information of each state's cultural heritage, are on paper which will survive to the year 2030. Since many of these forms were probably completed in the 1930s, it is likely that a number of documents are coming, right now, to the end of their serviceable life. Likewise, very few of the documents which contain the primary information on excavated sites are on archival paper. Few of the files are acid free. Very few files are duplicated and stored in separate buildings for security. Records are stored in every possible way at most institutions -- flat, rolled, folded. The documents are frequently stapled and a number of different items are frequently placed into one file. There are no meaningful requirements concerning the types of ink that are used on the documents.

Photographic materials, while largely stored in archival files of one sort or another, are rarely processed with archival permanence in mind. Prints are not made of negatives, so there is no safety margin. Slides, with their high sensitivity to light and heat, are routinely allowed to be projected.

Environmental controls are clearly inadequate in most facilities, and the adequacy in the rest is incompletely or poorly documented. While this survey did not consider aspects of building condition or security, these are probably equally significant concerns. Likewise, exposure of documents and photographic materials to both natural and artificial lighting is a major concern. Disaster plans are rare and frequently cover only parts of the documentary collections. Policies frequently allow the exposure of irreplaceable documents to the dangers of smoking, eating, and drinking. Few institutions have any meaningful inspection of documents to assess their condition and the extent and content of some collections has never be determined.

This survey, then, has revealed an alarming situation. Much of the irreplaceable archival material relating to the prehistory of the Southeast is clearly at risk. Many of the site forms, excavation files, photographs, and slides will probably not survive another 20 years of benign neglect. This situation requires that we, as archaeologists, begin to seriously accept our responsibility to ensure the preservation of these records into the next century.

Recommendations and Costs

Perhaps the first step which needs to be taken is to identify within each institution the unique archaeological documentation it possesses. In addition, it is likely that we will be forced to establish priorities regarding document preservation. Some documents will simply be too damaged and others, while salvageable, may not warrant the expense. Our limited resources must be wisely spent and those decisions can perhaps best be determined by curatorial facilities within a single state meeting and exploring their collections. This step is perhaps the least costly of the various suggestions since it requires only staff time.

The archaeological community, as part of this first step, must also begin to take bold steps to develop a strong computer data base. While electronic media have their own inherent problems, this approach may offer long-term solutions to the overflow of paper records and inability to retrieve significant documents quickly.

The second step is to develop, disseminate, and enforce strict guidelines by each curatorial facility for the documents that it will accept. It would be self-defeating to improve the condition of existing collections while an institution continues to accept site forms and field records which will become equally serious "preservation time bombs."

Minimally these guidelines should require:

1. All written documentation should be on acid-free paper with a minimum 2% calcium carbonate buffer and free of groundwood and alum size. Examples of such paper include Howard Permalife or University Products PermaDur.

2. Only pencil, (non-film) carbon typewriter ribbon, or archival ink (i.e., Pigma Acid-Free Fade-Proof pens, Black Actinic ink, Conservation Resources Archival Ballpoint ink pens) should be allowed on paper documents.

3. All field notes should be provided to the facility in acid-free, buffered folders. Oversized materials should be supplied flat. If necessary, one lose fold (with the grain of the paper, not against) is acceptable. The materials, less desirably, may be loosely rolled on acid-free, buffered cardboard tubes, or regular tubes first covered with acid-free paper or mylar.

4. Black and white film should be processed for archival permanence, following the specifications established by the curatorial facility (e.g., Keefe and Inch 1984). The facility should routinely spot check all negatives. Enlargements or contact sheets should be on fiber-based

paper (there seems to be little reason to require archival processing of contact sheets, although consideration should be given to requiring archival processing of enlargements). The negatives and prints should be provided to the facility in archival holders, as specified by the facility.

5. Consideration should be given to limiting acceptance of color transparencies to specific types of film, processed by the original manufacturer (e.g., only Kodak films, or perhaps only Kodachrome, processed by Kodak). Slides should not be projected prior to acceptance by the institution. Slides should be labeled and provided the facility in archival holders, as specified by the facility. The institution should consider requiring both original and duplicates of each image.

The costs to the curatorial facility associated with these changes will be minimal since these requirements apply to collections "donated" by outside researchers. The costs to the specific project will, of course, vary upon the type and extent of the research. But, if all curatorial facilities within a state develop essentially identical requirements that are consistently enforced, the cost of preserving field records will be spread among all of the archaeologists doing work within that state. In addition, the difference in cost between preparing field records to archival conditions and ignoring their long term condition is not actually that great -- what cost can possibly be placed on the lost of irreplaceable documents relating to our cultural heritage.

For example, the cost of archival Permalife paper, suitable for photocopying field records, costs from $7.25/ream to $8.85/ream in bulk, while good photocopier paper (such as Hammermill FORE 9000DP) costs about $8.75/ream in bulk. Of course it is possible to purchase common photocopier paper for as little as about $7.00/ream and this very inexpensive copier paper may be routinely used by many institutions. The difference, then, can be as much as an additional $0.004 per copy to ensure that the paper survives 200 rather than 50 years.

File folders for the records, if commercial grades are used, might cost from $9.90 to $13.00/100, depending on the quality. Archival folders, because of the heavier weight of the paper, would cost from $12.00 to $20.00, depending on the manufacturer and quantity ordered. While in this case the cost differential could be as much as $0.19 per folder, with careful purchasing the difference could be reduced to about $0.11 per folder. This is a more significant difference than the paper, but these folders will probably never be replaced in our lifetime and when the costs are examined from the perspective of potential lifespan, the least expensive commercial folders are costing about $0.002/year, while the most expensive archival folder is costing only $0.001/year.

Miscellaneous supplies add additional costs to archival preservation. For example, stainless steel staples cost about $20/box, while common staples cost $3 to $5/box. Stainless steel paper clips cost about $5/box, while "regular" paper clips cost about $4/box. Archival adhesive labels cost about $5.50 to $5.75/100, while commercial labels cost about $4.75. There are commercially available pens available which cost no more than $.58 each, while archival pens will cost about $2.00 each (although refills for one brand of archival ball point pen are available for as little as $1 each). If document cases are used, their costs, for small quantities, can range from $2/box to $4.60/box, depending on the quality.

The costs associated with archival film processing are more difficult to establish, since much of the black and white process involves an increase in staff time. The costs associated for commercial archival processing are high and this work would need to be done "in-house." The additional chemicals, however, would add little more than a few cents to each roll of film or each print. The storage media for black and white negative and color slides costs from $20 to $26/100, although bulk purchasing can reduce theses costs.

These figures suggest that if archaeologists would devote as little as 1% of their budgets to the preservation of their field records it would be possible to ensure the preservation of these documents for future researchers. One surveyed institution voiced the objection that if "archival" standards were required of outside archaeologists, "we'd have the collections but no documentation." Clearly it is essential that viable standards be enacted and strictly adhered to. If a particular institution is required by law to accept collections, then the law must be changed to require that documentation meeting minimum preservation standards is provided.

Third, the repositories of archaeological archives, such as field records and site files, must begin to find more satisfactory physical plants. This study clearly documents the inadequacy of available HVAC facilities and it is assumed that a more detailed survey would have found additional problems with the total structure. One respondent reports that, "we are a state agency and subject to the department's placement of us in rental space. Currently, we are in a basement area of a historic building. The temperature and humidity vary radically day to day." Another institution has been without air conditioning for the bulk of the summer because of a variety of mechanical failure. These are not unique situations, but they must be recognized as doing untold damage to irreplaceable records. Failure to make substantive changes condemns these records to certain destruction.

While it frequently is not possible to redesign or purchase HVAC equipment, or it may be impossible to alter a historic

building, it is possible to begin monitoring, on a regular basis, the environmental conditions of the storage area. This can best be done with a recording hygrothermagraph, available from a number of suppliers for about $600. In addition, a sling psychrometer, which costs about $50, is necessary to calibrate the instrument at least once a week. With these records in hand it is possible to clearly document the environmental fluctuations of the storage area. This will certainly help when funds are requested for improved HVAC controls or movement to a new facility. In addition, it will be possible to quantify the damage to your collections. In addition, it may be possible to use relatively inexpensive dehumidifiers (costing $200 to $500) to control excess relative humidity, one of the major enemies of both paper and photographic materials. There are additional options which can be taken to improve the environmental stability of the records, such as the use of small window air conditioners and fans to improve circulation of air.

Fourth, the repositories of state site files where primary documentation is the paper form should begin printing their site forms on archival paper, using archival binding methods, and require the use of archival inks. Not only should all new forms meet the minimum preservation standards outlined here, but the current forms should be rapidly replaced with archival copies. For the average institution, with 15,250 four-page site files, the cost of archival photocopy paper would be only $450, although this does not include machine rental costs, or the time of several work-study students to perform the task. In addition, at least $1800 would be required for archival folders and another $500 would be needed for miscellaneous supplies. As a consequence, for less than $2800 the average state site file repository could convert its deteriorating site file records to the archival permanence they deserve.

Fifth, the repositories of site excavation data need to evaluate the stability of existing collections and their need for immediate preservation treatment, such as replacement photocopying of records on archival paper and the re-fixing or more intensive washing of black and white negatives to remove excess hypo. It is impossible to offer any estimate for either the time or cost of such activities, or even the preliminary evaluation process. Failure to undertake this step, however, will result in the loss of extraordinarily important and unique documents. At least one facility questioned has taken the bold step of requesting funds from the National Science Foundation to completely upgrade the collections. In addition, it would be appropriate to explore other avenues of grant funding, perhaps through the Institute of Museum Studies, to conduct needed collection preservation.

Sixth, each institution which houses archaeological records needs to implement a series of policies dealing with eating, drinking, and smoking in the storage areas. All of these activities should be eliminated since they endanger the collections both directly (such as through fire) and indirectly (such as

through increased pest control problems). Each institution should develop a detailed disaster plan and periodically test and update the plan. This plan should cover the reasonable natural and man-made disasters particular to each state (see Murray 1986; O'Connell 1983).

Seventh, there needs to be an increasing awareness among graduate programs in archaeology that conservation and archives management are essential skills for the archaeological community. While few graduates of such programs actually go into records management at curatorial facilities, a greater sensitivity to the needs and requirements of the paper and photographic records is essential if these documents are to be preserved. Coupled with this increasing emphasis on conservation and archives management, there must be the development of clear ethical statements among archaeologists which acknowledge the need to ensure the preservation of these records and which place the burden of that preservation on the individual or group which generates the records. We must begin to recognize that it is not ethical to dig sites, record findings, and allow these records to slowly deteriorate while we begin the cycle anew.

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