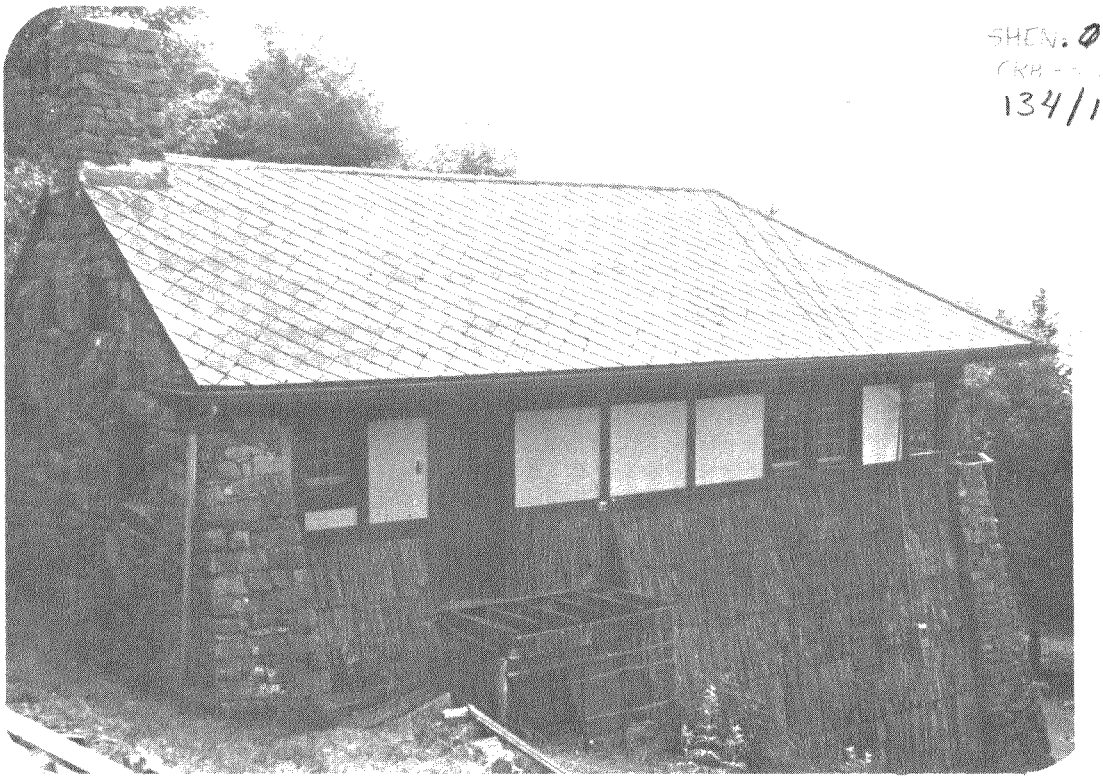
SHEN. 024 c2
CRB -
134/135775



Shenandoah

National Park

Second Annual Shenandoah Research Symposium
April 1977

Natural Resources Report
Number 15

U.S. Department of the Interior
National Park Service

COVER PHOTO:

Massanutten Lodge, Skyland, Shenandoah National Park

NPS Photo

ABSTRACTS

OF

PAPERS PRESENTED

AT THE

SECOND ANNUAL

SHENANDOAH RESEARCH SYMPOSIUM

LURAY, VIRGINIA

21-22 APRIL 1977

U.S. Department of the Interior, National Park Service
Natural Resources Report Number 15 ● 1978

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all of our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

DR. CHARLES FUNNELL, HISTORIAN, VALLEY FORGE NATIONAL HISTORICAL PARK, COULD NOT GIVE A PAPER ON VALLEY FORGE BECAUSE OF HIS SERIOUS ILLNESS AT THAT TIME. TRAGICALLY, HE DIED ON APRIL 28, 1977.

TO DEDICATE THIS PUBLICATION TO HIM IS THUS APPROPRIATE. DR. FUNNELL POSSESSED THE HIGHEST SCHOLARLY ATTRIBUTES. ONLY THIRTY-TWO, HE LOVED TO LEARN, SOLVE RESEARCH PROBLEMS, AND WRITE STYLISHLY. HIS NATIONAL PARK SERVICE COLLEAGUES HAVE LOST A STEADY FRIEND, HIS SCHOLARLY PEERS A STAUNCH COMPANION, AND ALL OF US A STRONG HUMAN BEING.

INTRODUCTION

Since 1916, the National Park Service has preserved nationally significant natural and historic areas. It has supported research so that park development would not result in immediate or eventual damage to an area. Today, National Park Service research is extensive and broad; it is a tool whose precise use improves natural and historic park management.

This symposium's participants reported on research conducted in the Mid-Atlantic Region. The panelists discussed projects in natural science, archeology, historical architecture, and history. Although individual emphasis was on specific studies, their cumulative work underscores the variety and extent of their investigations.

Most of the papers were by non-National Park Service individuals. Research done at Shenandoah National Park was discussed by professors who have, for the most part, conducted their projects without federal funding but with the permission and approval of the Park Superintendent. Research at other parks was done largely by contractors who conducted NPS-funded projects.

Five papers were given by National Park Service employees. The one by James Sullivan, Superintendent, Colonial National Historical Park, contrasted sharply and interestingly with the others because it dealt with research from a Park Manager's point of view, discussing items of special usefulness to those who might do contract research for the National Park Service.

Shenandoah research exemplifies the National Park Service's desire to encourage cooperative research by qualified individuals. It is hoped that this meeting spurred greater interest in cooperative scholarly study in parks, regardless of its kind.

This conference is an outgrowth of Superintendent Robert R. Jacobsen's 1976 Research Symposium, which was limited to research at Shenandoah. His willingness to expand this meeting's spectrum afforded attendees the opportunity to consider a broad variety of research in the Mid-Atlantic Region, which, we hope, will contribute to a general understanding that the National Park Service certainly feels that *just* "A little learning is a dangerous thing."

Acting Regional Director Benjamin J. Zerbey supported this symposium wholeheartedly, as he did the first, and his interest is acknowledged gratefully.

WELCOME

Robert R. Jacobsen

Superintendent
Shenandoah National Park

It is a pleasure for me, on this fine spring morning, to welcome each of you to this Second Annual Shenandoah National Park Research Symposium.

I have awaited this moment for almost a year to see if we could rekindle that special magic which each of us saw and felt during our first symposium at Skyland last spring. In reviewing our list of distinguished participants and friends who are in attendance today, I feel confident that success will shine on our venture again. The only difficulty I can foresee may be our inability to cover as much ground as we have staked out--in only a 2-day period. We will need, therefore, to cooperate fully with our two symposium coordinators as they gavel us through our various sessions.

But why have we gathered together again? The reasons are much more important than good fellowship among kindred souls. Were I to list three objectives for this meeting, they would be as follows:

1. I remain convinced that too much research is narrowly focused within its own discipline--and that a synergistic effect can be achieved by sharing information. This was exemplified most effectively last year when Dr. Reed of the U.S. Geological Survey, who had come to present a paper on the relationship of the Blue Ridge Mountains to the theory of plate tectonics, said that he could answer the questions raised by Dr. Richard Highton, of the University of Maryland, who was concerned about the critical rockslide habitat of our rare Shenandoah salamander. The effect occurred again as I watched Dr. Mike Hoffman (University of Virginia) light up while listening to the presentation by Dr. Elwood Fisher (Madison College) on plant succession at abandoned homesteads within the park. An archeologist had just discovered a new source of cultural history information! I feel it is very

important, therefore, to provide opportunities at this meeting today for sharing data sources, methodology, and conclusions among researchers who "work on a common territory."

2. My second objective for this gathering today is to acquaint researchers and organizations and institutions with research capability with the research and resource management needs and opportunities that this park, and other national parks in this region, can offer--and to encourage their inquiry into these problems. I regret, indeed, that our ability to assist in the funding of necessary research is so very limited, but I assure you, within this park--as at most others--that we will extend ourselves as much as possible in providing operational assistance and cooperation. What we lack in financial support we hope to make up in encouragement and in the excellence of our research and resource opportunities. I anticipate, for example, that Dr. Hoffman will tell you again that he has found Shenandoah National Park to be a treasure trove of prehistoric archeology. Jack Raybourne, State Game Research Biologist, can tell us that this is the best place in the Commonwealth of Virginia--if not along the Eastern Seaboard--for the study of black bears. Elwood Fisher said last year that the park is without parallel in the Eastern deciduous hardwood forest for studying plant succession--and our intensity of backcountry use, which far surpasses that of any other area in the National Park System, has aroused enough attention and interest within the fraternity of backcountry and wilderness managers to have encouraged Dr. Ray Leonard of the United States Forest Service Research Station in Durham, New Hampshire, to enter into a written cooperative agreement with us to help us study our backcountry resources and use for consideration elsewhere in the country.

Speaking in terms of this park alone, we need assistance from knowledgeable individuals and from the academic community in identifying and classifying the park's critical habitats and outstanding natural features and communities--for such knowledge is essential in our day-to-day management decisions involving both development and visitor use. We need studies of our 13 indentifiable forest types to ascertain their seasonal values and importance to wildlife. We need someone to identify and measure such key environmental and social parameters affecting our various wildlife populations as food availability, population density, harassment during critical periods, etc. We need to know more about forest succession, about the

historic role of fire in our forest environment--and about the effect of fire upon watershed production and upon water quality.

Often we are unable to wait for research results and must make decisions and initiate immediate management actions without their benefit. I feel that our track record in such cases has been generally good--but I sincerely doubt that a number of the visitor use facilities in this park would have been located where they are now had we had the advantage of our present knowledge 30 years ago.

3. My third and final objective for this year's seminar is that I hope--by this staging and this demonstrated outpouring of interest and cooperation--to further dramatize the need for greater emphasis by the National Park Service itself on Research and Resource Management activities; and I further hope that something might be said or be done by someone during these next 2 days which will inspire our parks, or our regions, or our Washington Office to find new words, or new justifications, or new ideas which might, through some new process of alchemy, turn our enthusiasm and needs into the personnel ceilings and gold that are so badly needed in the advancement of research and resource management purposes.

It is a very great honor for me, on behalf of Shenandoah National Park, to welcome each of you as friends from the academic community, from interested organizations, from cooperating state and federal agencies, and from our sister parks, and our Regional and Washington Offices of the National Park Service to this Second Annual Shenandoah National Park Research Symposium.

TABLE OF CONTENTS

NATIONAL PARK SERVICE

DEPENDENCE UPON RESEARCH

Benjamin J. Zerbey[1]

It is gratifying to attend the Second Annual Shenandoah Research Symposium. I attended last year's conference, finding it most stimulating, and I congratulate Superintendent Jacobsen for initiating and continuing this series of symposiums.

While pleased to welcome National Park Service attendees, I am also happy to greet visitors from institutions of higher learning, state offices, and the general public. It is you we really want to talk to about the role of research in the National Park Service. We hope in particular that you will become aware of opportunities for cooperative study in our parks and how you may use a park's resources for your research.

Just as a tree's roots sustain it, so is the National Park Service fed by research. That nourishment, moreover, is illustrated by this symposium's agenda, listing as it does papers in natural science, archeology, historic architecture, and history.

Having been employed by the Service for 30 years, about one-half of its existence, I can testify to the influence of research upon park preservation and use. In Manager assignments at Isle Royale National Park, Hopewell Village National Historic Site in Pennsylvania, and Minute Man National Historic Park in Massachusetts, I used the results of numerous archeological, architectural, and historical research projects. In my present position, I can never forget the need for research. And if I did, our Office of Planning and Resource Preservation would remind me.

Three weeks ago, I visited an archeological project at George Washington Birthplace National Monument. The aim there was to locate and identify two early 17th-century house sites and to secure enough information about them so that a complete

[1]Acting Regional Director

archeological study of them could be conducted in the future. This was accomplished. Dr. John L. Cotter, our Regional Archeologist, the Service's Senior Archeologist, and one of today's panel chairmen, supervised the project, and I know he will not mind my saying that it greatly impressed me, for it made obvious once again the information gaps that need filling in every park.

There are additional reasons for supporting research. Today, the rapid expansion of knowledge in all branches of learning demands that we keep current in National Park Service research. Additionally, expanding national interest in conservation, whether natural or historical, forces the National Park Service, even if it did not want to, to conduct research that contributes to the resolution of ceaseless management problems.

In the Service, research is a management tool. A research project should have a definite objective, one responding to a park need. In reaching research objectives, however, we are delighted when findings prove valuable to scholars. Our obligation to make research findings available is obvious. Many research reports are published by the National Park Service's Office of Professional Publications in Washington. Within a park, artifacts produced by an archeological project are preserved according to professional standards. Historical research materials used in writing reports are cataloged and retained. I might point out that the historical files created for Independence National Historical Park have not only served park needs but those of numerous scholars.

It is a great pleasure to welcome you to the symposium. I hope you will find the papers stimulating, the discussions interesting, and the 2 days enjoyable.

THE NATURAL SCIENCE PROGRAM,

MID-ATLANTIC REGION

R. Stottlemyer[1]

The natural and social science program in the Mid-Atlantic Region is yet to come of age. Funding ($38,000) transferred from Washington 3 years ago remains the base total. One difficulty, being slowly corrected, has been the justification of research projects. Increased demand from WASO to justify programmed projects, including research, through approved planning documents should help in developing more solid research justifications. The resource management plan will be used to justify and prioritize the natural science research program.

The attempt has been, in all our research, to improve the parks' information bases in disciplines clearly needing additional data.

Dr. Dean Cocking provided Shenandoah with the objective basis for using fire to maintain Big Meadows. This is both economically and ecologically more desirable than mowing. Dr. James Whalen is examining the existing information on the possible ramifications of the current bear management effort at Shanandoah.

Visitor use in the backcountry is one of three significant issues facing park management. Mr. Gordon Wissinger has begun to examine qualitative aspects of visitor use capacity, and Ms. Mary Beth Gouveia has been querying visitors on their knowledge and attitude toward black bears.

Dr. Robert Dolan's research on the dynamics of barrier islands, including Assateague, is an excellent example of the benefits of long-term research in changing and adding credibility to the management of such areas. Dr. Ronald Keiper also has used Assateague to conduct basic animal behavior research on one of the few undisturbed pony herds left in the United States.

[1]Ecologist, National Park Service

PLANT COMMUNITY RESPONSES

TO PRESCRIBED BURNING AT BIG MEADOWS

W. Dean Cocking[1]

Active study of fire ecology within Shenandoah National Park was initiated in the spring of 1975 when eight small 50-m^2 plots were burned under controlled conditions and compared to unburned vegetation in similar plant communities. Careful analysis of soil, plant, and animal components of the ecosystem has led to the conclusion that the use of prescribed burning is a suitable alternative management practice to the previously used fall mowing treatment for maintaining open space within the park. The overall impact of burning on the plant community is in fact very similar to that of periodic mowing. Brush islands within the vegetation mosaic are killed back to soil surface level, but are readily reestablished by root sprouting. The herbaceous community similarly is burnt to ground level, but a diverse plant cover obliterates visible traces of the fire within one month after spring treatment. The success of this pilot study encouraged the park management to burn much larger tracts within Big Meadows in the spring fire seasons of 1976 and 1977. The results to date do not alter the original conclusion concerning the suitability of the management practice.

Several differences in individual species responses, however, have become evident. Under the previously used mowing procedure, black locust (*Robinia pseudoaccacia*) appeared to be the major woody increaser species. There was considerable concern that it eventually would establish stems too thick to be mowed and would dominate the plant community. Under prescribed burning, it appears that the black locust is kept fairly well under control. However, the second shrub species (*Rubus spp.*), the common blackberry, thrives following the spring burn and therefore still presents a significant encroachment threat on

[1]Department of Biology
James Madison University
Harrisonburg, Virginia 22801

the herbaceous component of the vegetation mosaic. Therefore, the present 1977 burn program includes several plots that will be stressed repeatedly during the summer in hopes that this will deplete nutrient stores in the roots and ultimately shift the balance back toward herbaceous vegetation. If this works, then an economical management procedure will have been found for stablizing open space within Shenandoah National Park.

BEAR/HABITAT RELATIONSHIPS

IN THE SHENANDOAH NATIONAL PARK

James B. Whelan[1]

A method for habitat analysis and evaluation is described whereby any forest stand can be analyzed according to the structural and functional aspects of the various stand components that significantly influence black bear.

The major considerations in the approach for evaluating habitat potential are:

(1) Vertical stratification or partitioning of forest stand components beginning with soil variables and extending upward through the overstory canopy. This classification system provides data for a matrix analysis to determine the relative importance of components, as indicated by the magnitude of physiological-behavioral responses of black bear.

(2) Quantification of important stand variables using an inventory system developed for relatively rapid estimates of black bear food and cover components. These data were used to rank different habitat types according to their potential for black bear.

(3) Relating important stand variables to the energy, nutrient, and cover requirements of the black bear and expressing these relationships as production functions for major habitat types. These functions can be used to predict the trend for the Shenandoah

[1]U.S. Fish and Wildlife Service
Virginia Cooperative Wildlife Research Unit
Department of Fisheries and Wildlife
Virginia Polytechnic Institute and State University
100C Cheatham Hall
Blacksburg, Virginia 24061

bear population as influenced by habitat changes (natural succession, prescribed burning, recreational developments, etc.).

Preliminary data from the current investigation support the feasibility of using the structural-functional approach for evaluating forest-wildlife habitat to obtain the type of information needed for making sound management decisions.

BACKCOUNTRY USE AND PRIVACY:

A STUDY OF SOCIAL CARRYING CAPACITY

OF FOREST BACKCOUNTRY AREAS

Gordon H. Nissinger[1]

Over the past decade, land management agencies such as the National Park Service have been encountering increasing demands from clientele and interest groups, resulting in new laws, regulations, and policies aimed at satisfying such demands. The use preferences, expressed as demands, by overnight backcountry users at Shenandoah National Park were the focus of this study. A theoretical base was developed using various aspects of personality, comparison level, privacy and crowding theory to determine how such user preferences are developed.

It was found that most user preferences did intercorrelate to produce general use preferences that could apply to a theoretical model of carrying capacity. Backcountry users were found to desire low levels of development and appeared to desire high levels of intergroup solitude, especially while camping. Such use preferences failed to be explained by background variables such as general privacy preferences.

While the backcountry use levels of Shenandoah is considered high by many managers, most backpackers did not perceive the area as overcrowded (72%) or overused (73%). It appears that a dispersal system, such as the one used at Shenandoah, may be a valid approach to providing for user needs while assuring minimal amounts of resource deterioration.

[1]West Virginia University
Division of Forestry
Morgantown, West Virginia 26506

A SURVEY OF VISITOR KNOWLEDGE, ATTITUDE, AND JUDGMENT CONCERNING BLACK BEARS AT SHENANDOAH NATIONAL PARK

Mary E. Baptiste Gouveia
and
James B. Whelan[1]

Because of the rising numbers of visitors and availability of picnic and camp foods, Shenandoah National Park has been plagued in recent years with increased contact between bears and visitors. Reports of damage to visitors' property have evoked in park authorities a concern for public safety. Officials feel that most visitors are anxious to see bears, but do not realize their potential danger. To determine park visitors' appreciation of the bear problem, a questionnaire survey of 688 visitors was taken and the results were analyzed to specify a level of public acceptance for noninjurious human-bear interaction, as determined by visitor attitudes regarding the presence of black bears.

The questionnaire included questions on knowledge of bear habits and dangers, attitudes toward bear management practices, and judgment as measured by reactions to hypothetical encounters with bears. General information and demographic questions also were included. Questionnaires were distributed at campgrounds, picnic areas, lodges, trailheads, and backcountry permit-issuing locations throughout the park. Sampling was done on weekends from August to October 1976. Factor analysis procedures were used for data reduction, and mean response levels were examined for pertinent information.

Factors concerned with educational-socioeconomic status, visitor welfare, opinions of stringent measures for dangerous bears, knowledge and consistent attitudes, effectiveness of park literature, and visitor penalties were identified. Of

[1]Department of Fisheries and Wildlife Sciences
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24061

particular importance, the educational-socioeconomic status factor indicated that highly educated, city-dwelling people who work in prestigious positions are most aware of the dangers associated with bears, particularly sows with cubs. By contrast, people who are less educated, work in lower positions, and live in rural areas are less likely to realize the danger involved. The mean age of the sample was 32.03 and the mean education level was 13.79 years. A majority of the sample worked in jobs requiring either extensive education or considerable training and lived in metropolitan areas. High average scores on knowledge items suggested that the sample of visitors was well-informed about habits and dangers associated with bears; low scores for two of the judgment items indicated that many visitors were uncertain of the best action to be taken when in the vicinity of a bear. Certain attitude items found to be correlated with each other were grouped into three clusters and treated as three single variables called *removal*, *concern*, and *damage*. On a scale of 1 to 4 where a score of 1 denoted agreement and a score of 4 indicated disagreement, the mean response levels for these three variables were: *removal*, 2.33; *concern*, 1.55; and *damage*, 3.50. The nearly neutral mean response for the *removal* variable implies that those people who do not find bears threatening and do not advocate their removal are nearly as prevalent as those who do. The mean *concern* score suggests that the average park visitor realizes that visitor carelessness is the cause of most problems with bears, and therefore believes that the park should assume responsibility for both public safety and the well-being of bears. The mean response for the *damage* variable indicates a general unwillingness to risk any damage or injury to have the opportunity to see bears.

PREPARING AN ATLAS OF ENVIRONMENTAL DYNAMICS FOR ASSATEAGUE ISLAND NATIONAL SEASHORE

J. Heywood, R. Dolan, and B. Hayden[1]

The national seashores contain the most dynamic and vulnerable landscapes of any area administered by the National Park Service. In addition to management concerns regarding flora, fauna, geology, and public visitation which are common to interior parks, the seashores have the added concern of rapid geomorphological change caused by coastal storms and incessant wave activity. The *Atlas of Environmental Dynamics* is designed to summarize the process-response relationship between the storm-wave climate and the configuration of barrier islands in general, and of Assateague Island specifically.

The intended audience for the *Atlas* is the park superintendent, park planners, and anyone else who may benefit from an understanding of the historical processes that have formed Assateague Island, and of the current processes that are changing the landscape. It is hoped that the information will contribute to more sound day-to-day management policies, and to more enlightened planning for the future.

There will be five major sections in the *Atlas*. The first section will deal with the geology of barrier islands, including geological history and physical features that define the landscape.

The second section will describe the physical processes (wind and water) which cause the changes in the barrier island landscapes. Data on the wave climate and storm climate for Assateague Island will be presented.

[1]Department of Environmental Sciences
University of Virginia
Charlottesville, Virginia 22903

The third section will describe how barrier islands respond to storm activity. We will present data on shoreline erosion for Assateague and will describe the method we have developed to obtain this data. The method is based on a grid address system which can be applied to the collection of other forms of data as well.

In the fourth section we discuss how the data can be beneficial in a management context. The last section will contain fold-out maps of Assateague that will show historical shoreline change, a vulnerability assessment, and projected coastal configuration in the year 2001.

THE BEHAVIOR, ECOLOGY, AND SOCIAL ORGANIZATION OF THE FERAL PONIES OF ASSATEAGUE ISLAND NATIONAL SEASHORE

Ronald R. Keiper[1]

Since 1975 over 1,500 hours of direct field observation have been conducted on the feral ponies that inhabit Assateague Island. Despite the fact that these animals live within the Assateague Island National Seashore, they lead a relatively wild existence, roaming freely about the island and obtaining their own food throughout the year. Significant data have been collected on three general aspects of pony biology: ecology and population dynamics, behavior of individual animals, and social organization.

With respect to population dynamics, the birth rate for the Assateague ponies for 1975 and 1976 was approximately 60% while the death rate was about 15% for the same period. The sex ratio of the 99 foals born during the course of the study was roughly 60% male and 40% female. Births began as early as February and continued until October, but most births (65%) occurred in May.

Ecologically, the ponies used all six of the different kinds of habitats on Assateague Island, although they spent most of the time grazing either in the saltmarsh or in the dune and inner dune zone.

Although a number of other animals also live on Assateague Island, few interactions occur between them and the ponies. One unique relationship exists between the ponies and birds called Cattle Egrets. The birds pick insects off the undersides and legs of the ponies and perch on their backs. In this example of symbiosis, the birds get more food with less

[1]Department of Biology
Pennsylvania State University
Mont Alto, Pennsylvania 17237

work while the ponies receive relief from the biting flies.

Mosquitoes and biting flies create serious problems for the ponies from June to October. In response to high insect population, the ponies exhibit several unusual behavior patterns that can be considered anti-insect in nature. These include wading out into the calm waters bordering the island on the western side, "circling" behavior, abnormal amounts of rubbing and biting behavior, and "running."

Data were collected for each month of the year on the maintenance behavior of individual ponies, using check sheets where various activities were recorded at 1-minute intervals for each hour of daylight. Grazing activities occupy the major portion of the day, although resting and grooming behavior was always seen.

By far the most important food plants were *Spartina alterniflora*, *S. patens*, and *Ammophila breviligulata*. In addition to grazing on these grasses, the ponies were observed to feed on a variety of other herbaceous plants and to browse on a number of woody species. In late winter the shrub *Iva fruscens* forms the bulk of their diet.

The ponies were observed to drink from a variety of sources including permanent waterholes, temporary puddles of rainwater, tidal streams, and the waters of Chincoteague Bay that form the western boundary of the island. During the summer, the animals move to water twice daily, just after sunrise and just following sunset. During periods of abundant water, no movement to water occurs and the animals take numerous small sips from the water puddles found in the marsh. Most heavily used sources of water contain about 1-5 ppm of salt.

The Assateague ponies were organized socially into 17 different herds ranging in size from 3-16 animals. Most herds consisted of a dominant stallion, 2-15 mares, and their offspring. Two herds were composed entirely of young "bachelor" males, while several other herds had more than one adult stallion.

Changes in the size and composition of many of the herds occurred during the study, but these were due largely to deaths and removal of animals by man. Since June 1975, 28 deaths have occurred, and over 50 animals have been removed.

In addition to these changes in herd structure, other changes were noted. Fusion of two herds took place when the stallion from one herd took over leadership of another. Young

males were chased from their family herd by the dominant stallion and these formed an all-male herd.

The study is continuing in an attempt to obtain a clearer picture of the behavior and ecology of these feral animals.

NATURE RESTORED:

A HISTORY OF SHENANDOAH NATIONAL PARK

Darwin Lambert[1]

In 1934, a year before this park became an official entity, its 302 square miles along the Virginia Blue Ridge between Front Royal and Waynesboro had a resident population of 2,310 remaining from a larger number that reached its height about 1900. During two centuries, the forest had been thoroughly timbered, most of it several times. Much of the land was cleared for farming or grazing. The area also had been exploited by mining, hunting, trapping, and tanbark stripping, and it had been ravaged by man-caused fires. Now, the mountains and hollows are covered by wild forest that is enjoyed by nearly three million visitors a year, forest of such quality that in 1976 Congress designated 125 square miles of it as wilderness. The research is intended most fundamentally to discover the combination of attitudes, ideas, programs, and events that, contrary to the usually inexorable push of civilization to intensify exploitation, created a situation allowing nature to restore its wild diversity and beauty.

Letters, pamphlets, newspaper items, magazine articles, unpublished accounts by participants, and surviving files of the state of Virginia reveal much about the decisive decade of eager propaganda, lobbying, campaigning for donations, land condemnation, and court tests before title to the land could be accepted by the Federal Government in December 1935. Files of the National Park Service, though but partially saved, at Shenandoah and in the National Archives, furnish endless details about administration of the park. The researcher's intermittent personal contact with the area, with residents being evicted, and with the park staff from the mid-1930s to the present, and correspondence or interviews with persons involved at various periods help interrelate the details and avoid omission of meaningful episodes. The park superintendent has recently been gathering background facts into a "statement for

[1]Luray, Virginia

management," and the interpretive office is currently gathering and arranging historical papers; both projects aid this researcher's effort.

The search for facts is little more than half completed, and this paper deals mainly with the park's genesis. In the 1920s there was an unusual convergence of seemingly diverse factors. Director Stephen Mather of the National Park Service and his chief, Secretary of the Interior Hubert Work, felt the almost-total absence of national parks in the East to be unfortunate and unnecessary, and they tried to remedy the lack. The South, long quiescent, became eager to "rise again" in an economic way; Governor Trinkle was traveling "to sell Virginia to Virginians" and thus generate effective "boosterism," patterned to some extent after Florida's; and just before Work announced appointment of a Southern Appalachian National Park Committee a large gathering of business and professional people at Harrisonburg had organized Shenandoah Valley, Inc., a regional chamber of commerce. Many people in Washington, as in eastern cities generally, were feeling the tightening pinch of urbanization, becoming conscious of a need to "escape," and with eyes on the Blue Ridge were organizing the Potomac Appalachian Trail Club. George Pollock, who founded an eastern "dude ranch" in the 1890's (later called Skyland) on a high bench of Stony Man Mountain above Luray, was persuaded by friends from Washington that his holdings could and should become the nucleus of a new national park, and with extraordinary drive and public relations genius he plunged into an all-out effort to sell Work's committee, and the world if possible, on this location.

The quietly persistent negotiating skill of L. Ferdinand Zerkel, Luray realtor, blended the diverse factors into unity, and the administrative ability of Col. H. J. Benchoff, headmaster of Massanutten Academy at Woodstock and president of Shenandoah Valley, Inc., made the unity powerful. Additional influences and individual leaders joined. The push--though confronted by stubborn obstacles such as the resident population, private ownership of the land in thousands of tracts and its importance in grazing and other economic enterprises, and the competition of other areas in the southern Appalachians--became increasingly potent. Virginia's governor-elect, Harry Flood Byrd, already familiar with Pollock and Skyland, hailed the park proposal as a great economic opportunity . Virginians mobilized to persuade not only Work's committee but also the public of the eastern part of the country, the President, and the Congress. Soon after taking office, Governor Byrd created a new state agency, the Virginia Conservation and Development Commission, with Shenandoah Park its number-one project, and

persuaded the remarkably effective William E. Carson to become chairman. He also persuaded the General Assembly to appropriate a million dollars to help buy needed land.

Secretary Work, President Collidge, and Congress were ready to authorize the park--but unwilling to spend federal money to acquire land. Presidents Hoover and Roosevelt, in turn, became active supporters and participants, largely through the skillful behind-the-scenes work of Carson. Yet, despite all this strength and ability, the specter of possible defeat hovered over the proposed park through long years of struggle. There was opposition from landowners and others. Though it never organized tightly enough to become effective politically, this opposition brought difficulties and delay, especially through court action. But in November 1935 the U.S. Supreme Court removed the last obstacle by finding the state's land-condemnation procedure unquestionably legal. The land, though far less than first sought, then came promptly under National Park Service protection. The key condition for restoration of natural conditions was thus firmly achieved. (Details of National Park Service management, of park development, and of the gradual return of wilderness to the mountains --though part of this overall history project--are beyond the scope of the present paper.)

THE DEVELOPMENT OF ARCHEOLOGY AS A RESOURCE

John L. Cotter[1]

We shall never cease from exploration
And the end of all our exploring
Will be to return to where we started
And know the place for the first time.

T. S. Eliot, Little Gidding

Exploring is the quest which leads visitors to enter any National Park Service area. If they had no curiosity about what is there, they would not bother to come. Furthermore, many visitors make a considerable commitment in money and time to visit our areas. They have an investment, and they expect to get a return in knowledge and a feeling of having identified with the theme of the area they visited.

Archeology is exploration, discovery. It is analysis of what is found and the reporting of new glimpses of the past through the medium of reports. Park interpreters bring the discoveries to the public. If the interpretation is done skillfully, the visitor shares the thrill of discovery. He has found something interesting. What is found is part of his or her heritage.

Archeology is not generated in a vacuum. It is dependent upon many disciplines and skills of a special nature to perform the quest, make the discovery, and present the news to the professional and lay public: physics, chemistry, natural history, ethnography, anthropology, history, folk crafts, sociology, phychology, and so on, all factor into the archeological quest.

[1]Regional Archeologist
Mid-Atlantic Region
Chairman

This symposium has been fortunate in mustering a panel of some of the foremost investigators of archeological sites in the Mid-Atlantic states. All of the panelists are addressing themselves to securing and organizing data for better understanding of the resources in historical and prehistoric evidence in the parks: Michael Hoffman for Shenandoah, aided by the research efforts in Paleo-Indian site evidence in the Shenandoah Valley of William Gardner; Fred Kinsey for the upper Delaware lands of Delaware Water Gap National Recreation Area; Dan Crozier for the Civil War sites at Fredericksburg, Edward Rutsch for Valley Forge, in the light of his exhaustive investigations into the evidence at Morristown, as well as his exploration of the Crater Site at Petersburg; and Norman Barka for the extensive discoveries at Yorktown.

This session is directed toward evoking concepts of modern application of research to produce useful data from archeological evidence. These concepts are presented to the scholarly community and to the National Park Service for their consideration and discussion.

MAN, LAND, AND ENVIRONMENT IN THE SHENANDOAH NATIONAL PARK: AN ARCHEOLOGICAL PERSPECTIVE

M. A. Hoffman, Robert Foss, and Robert Vernon

A cultural resources survey of the Shenandoah National Park initiated in early 1975 has yielded a hitherto unsuspected number of prehistoric archeological sites located in a variety of topographic zones. These sites (about 100 in number, 71 surveyed and 27 reported) span a time range of approximately 8,000 years, beginning around 6000 B.C. and terminating about A.D. 1600. In some instances, well-stratified sites have been located and tested, promising a reliable chronological sequence for the Piedmont-central Blue Ridge area of Virginia. A survey of historical sites and structures in the park conducted primarily between October 1975 and May 1976 revealed the location of 800 pre-park sites through bibliographic and cartographic research and suggested the presence between 30 and 40 mid-18th to mid-19th century structures, including farmstead, inns, and industrial zones. Unfortunately, the documentary evidence is so extensive and many of the commonly employed dating techniques so unreliable that any future analysis of the historic settlement of the park area will have to rely heavily on historic archeology coupled with intensive archival research. Studies of the historical demography and ethnohistory of the park and its recent inhabitants, when viewed from the perspective of long historical time of our multidisciplinary program, suggest some interesting revisions of the standard ways in which the historic people of the Blue Ridge and their traditional culture have been interpreted.

Recent analysis and quantification of the data from the park have focused, due to budgetary limitations, on delineating the relationships between prehistory and ecology to produce a more accurate explanation of cultural-ecological change and adaptation in the Blue Ridge, formulate new research designs and directions for future archeological work and, finally, to develop an efficient, practical, and reliable sampling procedure

for prehistoric sites in heavily forested, temperate mountainous zones. Because of the lack of preservation of bone and macrofloral remains on prehistoric sites, we have been deprived of some of our most potentially useful archeological-environmental evidence. The lack of a refined chronology has also imposed serious limitations on our interpretations, especially since we were unable to carry out planned excavations at a stratified rockshelter and in the Big Meadows area. Nevertheless, we have tried to exploit the available information by viewing prehistoric archeological sites in terms of three levels of analysis: Intrasite variability, intersite variability within defined topographic zones, and regional site variability within the Shenandoah National Park. On the first level of analysis, we will consider the evidence gleaned from the detailed "surface excavation" of one extensive Archaic site in particular, the Blackrock Springs Site and the stratigraphic excavation of rockshelter, AU-158. The paucity of structural, occupational, and biological remains forced us to rely heavily on artifact analysis. In an attempt to establish symstematic classificatory criteria, a binomial morphological-functional system of stone artifact analysis has been employed in quantifying and analyzing almost 3,000 artifacts from Blackrock Springs and over 18,000 artifacts recovered so far from the park. Generalizing our level of analysis from the individual site and its several different occupations to a subregion, we have divided the number of potentially habitable areas in the park into eight subregions: (1) hollows; (2) ridges; (3) meadows; (4) gaps; (5) peripheral saddles; (6) rockshelters; (7) foothills; and (8) mountain slopes. For purposes of relating culture and environment, we are regarding each subregion as a sampling stratum. Although we relaize that it is likely that prehistoric people exploited most of these strata and that they were not "independent" from the cultural viewpoint, we have found this approach the most useful available to us in exploring the possibility of significantly different man-land relationships through millennia of prehistory. Each subregion is discussed in reference to the possible interrelationships of prehistoric settlement patterns and local floral, faunal, hydraulic, altitudinal, and palaeo-climactic data. Finally, we present a tentative reconstruction of the settlement pattern and site frequency for the entire park by establishing a mean site frequency for each subregion type and multiplying by the number of subregions in the park. A brief account of the assumptions and problems involved in our mathematical calculations will be included.

Based on the preliminary conclusions reached after 2 years of work in the Shenandoah National Park, the region is viewed as an example of a temperate mountain forest and suggestions

offered for future survey in areas of this type. This pragmatic problem of the effect of climate, pedology, and ground cover on the location, definition, and excavation of archeological sites is raised and discussed in relation to some of the recent generalizations proposed by arid zone archeologists. Our presentation will conclude with a consideration of the interrelationship between archeological method and theory in designing an efficient, affordable, and stratistically valid technique for locating and sampling sites in zones environmentally similar to the Shanandoah National Park.

Finally, it is hoped that our program in the Blue Ridge will be incorporated into an areally extensive program of archeological and paleo-cultural-ecological research that will include the work of Dr. Gardner and his associates in the Valley and of Dr. Holland, Dr. Barka, and their associates in the Piedmont and Tidewater. Such aereally oriented programs already have been initiated in the American Southwest and provide the manpower and wide technical expertise needed to conduct meaningful multidisciplinary work on a cooperative basis.

PREHISTORIC SITE DISTRIBUTION

IN THE MIDDLE SHENANDOAH VALLEY OF VIRGINIA

William M. Gardner[1]

The Middle Shenandoah Valley is defined as that area from the headwaters of the South Fork of the Shenandoah River to the junction of the North and South Forks at Front Royal. The area lies in the Ridge and Valley Province, with the western borders at the Allegheny Front and the eastern borders marked by the Blue Ridge system.

Prehistoric occupation in this portion of the valley extends from ca. 10,000 B.C. to approximately A.D. 1500. The sequene is continuous in two as yet unconnected segments. The first of these covers the Paleo-Indian to terminal Early Archaic, or from ca. 10,000-6500 B.C. The second begins just before 6000 B.C. and runs to the final Indian occupation.

The ecological backdrop changes considerably through time. On a macroscale, at least three major climatic-biotic episodes have been outlined with many minor as yet unrefined microalterations. The first of these is the Late Glacial-Early Post Glacial which corresponds closely with the Paleo-Indian to Early Archaic period. The second encompasses the Atlantic climatic episode and correlates with the Middle and Late Archaic. The third period, the Post-Atlantic, includes the Woodland era. Numerous other aspects of the total environment also are important but remain relatively fixed. These include underlying lithography, hydrology, litic materials, edaphic factors, etc.

During the Paleo-Indian to Early Archaic, the following environmental variables are seen as important in the settlement location choice: The distribution of suitable types of cryptocrystalline stone; accessible surface water; tributary junctions and other habitat overlaps and the fauna which they were

[1]Department of Anthropology
Catholic University
Washington, D.C.

exploiting; and landscapes that maximized the amount of available daily sunlight and minimized wind chill factors. The climate at this juncture was somewhat cooler and moister. Vegetation was distributed in a mixed mosaic pattern that does not necessarily correspond to habitats known today. The dominant element, wet spruce parkland which grew in the Great Valley proper; coniferous forests in the slopes and uplands of the narrow valleys; deciduous elements in the flood plains of creeks and rivers; and limited arboreal growth in the higher slopes and mountain tops. Such a pattern favored the large grazing herbivores of the grasslands and reduced, but did not extinguish, the more solitary forms such as deer, elk, and moose. The climatic trends during this period were toward increased warming and drying, with a reduction in grassland extent and increase in the coniferous elements. This led to wholesale reductions of numerous Late Pleistocene forms and their gradual replacement by forest and forest-margin adapted forms. The types of sites known during this period are quarries, quarry reduction stations, quarry-related base camps, and isolated point localities. Each has its own specific set of environmental correlates, tool kits, and sets of activities that were carried out.

Rapid warming during the Atlantic episode resulted in the spread and domination of deciduous forest elements and associated plant and animal species. The variety and density of riverine resources increased. Biotic resource distribution took on the horizontal and vertical zonal patterns evident today. Seasonal variation in the availability of resources also became marked. The important site prediction parameters during the Middle and Late Archaic period adaptations to these ecological changes are: Distance from higher order streams; availability of surface water for drinking purposes; distribution of lithic raw material (not restricted now to jaspers, cherts, etc.); habitat overlaps; and seasonal availability of resources.

Climatic changes and shifts in adaptive patterns are not as well worked out for the later Woodland periods. It is evident, however, that the shift in settlement is toward a focus of the riverine-flood plain habitats, with periodic seasonal forays into other zones.

By plugging this into a macrophysiographic division of the Ridge and Valley Province into the Great Valley, North and South Fork valleys, uplands, foothills, and mountains, it is possible to predict site location with some degree of accuracy. For instance, because of the nature of their adaptive pattern, the climatic and vegetation conditions, and the nature of the fauna

they were exploiting, Paleo-Indian and Early Archaic sites are to be expected only in the first three of the above zones. Base camps during this period are found near primary outcrops of suitable cryptocrystalline stones such as jasper which formed along the thrust fault at the zone of contact between the Blue Ridge system and the limestones of the valley floor. Large hunting camps are found only in zones of habitat overlap or in such special habitats as salt licks, which served to attract large numbers of fauna despite periodic onslaughts and in which escape-potential for these animals was limited. Smaller hunting sites are less amenable to prediction but are invariably near tributary junctions and on south-facing slopes.

Middle and Late Archaic sites, on the other hand, can be predicted for most of the zones and are distributed according to the parameters noted above. As an example, in the flood plain the sites of this period are focused on swamps or springs in close proximity to the river. In the uplands, they are on relatively level areas, near seasonal, wet-weather, or now extinct springs and streams and where the terrace gravels from the ancestral Shenandoah were available for reduction into stone tools. In the area between Front Royal and Luray, this is between the 600- and 800-ft contour levels. In the foothill zone, except for occasional small chipping clusters, prehistoric sites are absent unless there is a suitable primary outcrop such as quartz, quartzite, or silicified sandstone. Mountain sites are focused again in areas where raw material was nearby, e.g., quartz. To be sure, some transportation of raw material between zones exists but this would not suffice for extended periods of stay, and is probably a pattern more correctly associated with the Woodland period when permanent villages were beginning to be established in the flood plain.

This model has been tested to some degree in our work on cultural resource reconnaissances for such agencies as the U.S. Corps of Engineers in the Verona area of the Middle River, and for the U.S. Forest Service in the George Washington National Forest, and it has proved to be an invaluable aid. Unfortunately, specifics of the model are restricted in applicability because of environmental variation. It works for the Middle Shenandoah Valley, but not elsewhere. The approach, however, and the generalities, e.g., the lithic requirement, the drinking water requirement, etc., can be transferred and local and regional models can be generated. This has been demonstrated by us in at least two other areas, the Piedmont and Coastal Plains of the upper Potomac and western Chesapeake Bay, and the Blue Ridge Province on the New River. This work has been done in conjunction with cultural resource reconnaissances.

PREHISTORY ALONG THE DELAWARE RIVER, DELAWARE WATER GAP NATIONAL RECREATION AREA, BUSHKILL, PENNSYLVANIA

W. Fred Kinsey III[1]

The Delaware Water Gap National Recreational Area (DWGNRA), a viable part of the de-authorized Tocks Island Reservoir, is a tract of 70,000 acres notable for scenic beauty and important historic and prehistoric cultural resources. When completed, the park will extend for 37 miles, from the Water Gap to Port Jervic, N.Y., along the flood plain and adjacent uplands of northeastern Pennsylvania and northwestern New Jersey.

Since 1964, major archeological work in the valley has been done under National Park Service contract by personnel from Franklin and Marshall College and Seton Hall University. Twelve or more summer sessions of investigation by each of these institutions, as well as work by others, have produced what is perhaps the most comprehensive cultural-historical sequence for any river valley segment in the northeastern United States. The Upper Delaware Valley presents an impressive data base where heretofore there was a void. Research strategies involved five interrelated processes: survey; testing; deep stratified block excavations; analysis, description, and chronology building; interpretation, interrelationships, and processual analysis.

Paleo-Indian components are illustrated by the work of American University at the deeply stratified Shawnee-Minisink site, with four C-14 dates ranging from 9100 to 7360 B.C. Related scattered surface finds come from the flood plain and interior site locations along borders of small Pleistocene lake terraces. This material is Eastern Clovis with associated scrapers, spurred endscrapers, gravers, and biface knife forms. Black flint and jasper are the preferred lithnic materials. A

[1]Franklin and Marshall College
Lancaster, Pennsylvania 17604

bogged mastodon, excavated by the PHMC at Marshalls Creek, produced two C-14 dates: 10,210 B.C. and 10,070 B.C.

Early to Late Archaic components are represented by 14 C-14 dates; 5570-1440 B.C. Archaic components have been found in deep stratigraphic sequences at Shawnee-Minisink, Harrys Farm, Faucett, Brodhead-Heller, and other sites. Projectiles associated with the Early Archaic are Kirk-like, Lecroy-like, Kittatinny points, and other small side and corner-notched points. Associated lithics are mainly black flint and jasper. Tools include scrapers, bifacial knives, utilized flakes, choppers, hammerstones, and others. Late Archaic is strongly represented, especially at the Faucett site, by pre-Vosburg (4200 B.C.), Vosburg (3620 B.C.), Brewerton-like (3230 B.C.), and multiple Lackawaxen components of the Piedmont Archaic (2610-2180 B.C.). Lackawaxen is the dominant complex of the Late Archaic. Projectile points, frequently made of local shale, are relatively long, narrow, and thin with narrow stems. Settlements show rather dense concentrations of rock-lined hearths and lithic workshops. Bifacial knives, netsinkers, shoppers, and groundstone tools are but a few of the associated artifacts.

Lake Archaic Broadspear Tradition is represented by Koens-Crispin, Lehigh, Perkiomen, and Susquehanna components and is dated by six C-14 determinations (1720-1500 B.C.). Community settlements are small, compact, and mostly limited to the flood plain. These are distinctive and regionalized complexes during a time of relatively low population density. Jasper is the preferred lithic material for Perkiomen and Lehigh broadspears. Large quantities of utilized and nonutilized jasper flakes are present at Perkiomen sites. On the basis of stratigraphy, seriation, C-14 dating, and typological considerations, it is hypothesized that the Fishtail Tradition derives from the preceding Broadspear Tradition. Dry Brook and Orient components are conspicuous and represented strongly in the Upper Delaware Valley. Four C-14 dates place this complex at 1280-810 B.C. Sites are numerous and appear to be large, warm-weather fishing camps especially noted for their big (40 ft across) rock-lined hearths which may be associated with community-wide processing of migratory fish. Early cord-marked pottery is found in the later Orient components.

In addition to Orient, several small Meadowood components are manifestations of Early Woodland. At the Faucett site (750 B.C.) and elsewhere, low feature and artifact density suggest short-term, warm-weather occupancy. Relationships to western New York are apparent. In New Jersey the Rosenkrans site (610 B.C.) illustrates Adena influence in the form of many

Adena-related objects and cremated burials.

Four C-14 determinations place the Bushkill complex between 480 and 100 B.C. and it is strongly represented by an intensive and extensive occupation at the Faucett site. Features include numerous rock-lined hearths, shallow pits, different activity areas, and a probable house with a circular configuration. Artifacts are numerous Rossville and Lagoon-type projectile points along with a minor side-notched form, also knives, drills, scrapers, netsinkers, choppers, bola stones, celts, and many ground stone tools. Varieties of net-marked, fabric-impressed, dentate-stamped, and cord-marked ceramics are present. Trade-travel connections are indicated by the heavy use of argillite, a nonlocal rock.

Late Woodland components are numerous and widespread throughout the valley. Two major complexes Owasco (A.D. 1195-1500) and Tribal A.D. 1400) are identified according to ceramic styles. Both show close affiliation to proto-Iroquois and Iroquois of eastern New York State. Features for these complexes include deep storage pits and houses. Owasco houses are circular, while Tribal affiliated houses have parallel sides and rounded ends. Flood-plain sites of the later complex are nonnucleated, dispersed, horticultural, kin-related settlements. Stockades and clan or family-type cemeteries are absent. These are base camps, some being occupied year-around; others represent spring to fall habitation sites. The pattern is identified as historic Munsee or Minisink Indians.

AMERICAN INDUSTRIAL BEGINNINGS: THE YORKTOWN POTTERY FACTORY, COLONIAL NATIONAL HISTORICAL PARK, YORKTOWN, VIRGINIA

Norman F. Barka[1]

The Yorktown Pottery Factory (ca. 1720-45), located within Colonial National Historical Park, is one of the most significant and complete archeological discoveries pertaining to colonial American industry yet found. Excavation has revealed a well-preserved complex of buildings and features which includes two kilns, factory workshops, waster pits, as well as a large sample of pottery fragments and kiln furniture. The extensive archeological remains represent a well-developed, local pottery industry, which must have formed an important segment of the Yorktown economy. The evidence further suggests that 18th century Southern industry was much more developed than formerly had been assumed.

The lots on which the pottery factory was built belonged to William Rogers, an entrepreneur involved in many Yorktown activities. It seems most probable that Rogers financed the pottery operation. However, the identity of the actual potter(s) is not known, although certain ceramics indicate at least one potter was of Germanic or Dutch origin.

Although archeological research is incomplete, the main factory complex has been revealed to be a row of interconnected workshop-storage buildings and kilns, measuring ca. 190 ft in total length and ca. 20 ft in width. The kilns measure 21 x 10 ft and 12 x 6 ft, respectively. The kilns are similar in construction, being made of brick with arches over a main flue. The arches supported the floor upon which pots were placed to be fired. Both kilns were used for the manufacture of stone-

[1]Department of Anthropology
College of William and Mary
Williamsburg, Virginia 23185

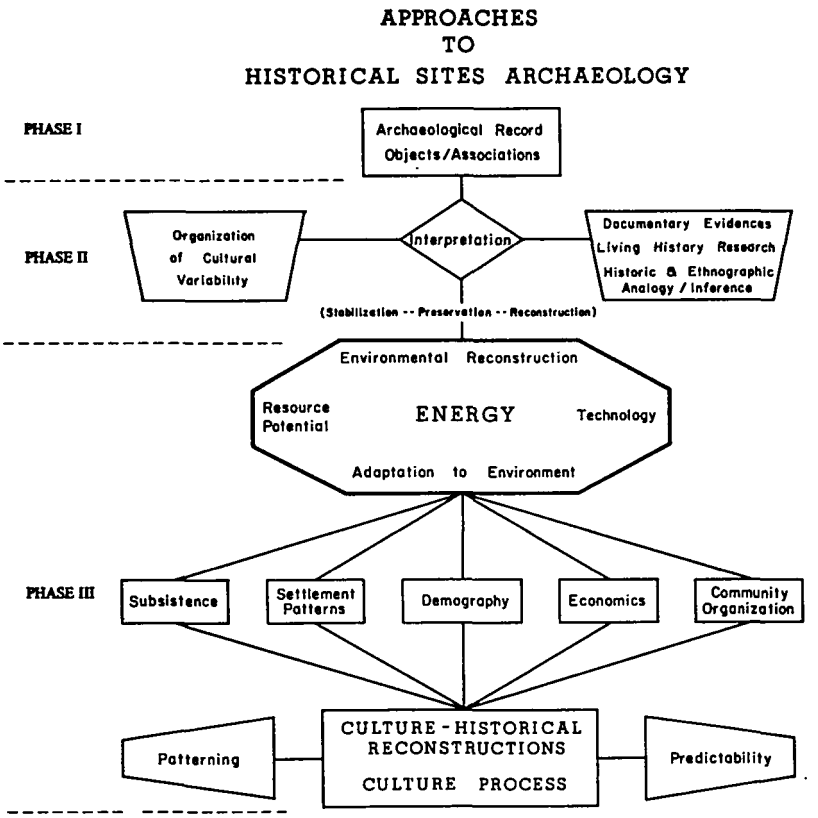
ware, as both kiln interiors are heavily salt-glazed. However, earthenwares may have been fired in the kilns at lower temperatures. Surprisingly, the kilns resemble tin-glazed earthenware kilns of Europe more than they resemble the usual circular stoneware-lead glazed earthenware kilns.

Large quantities and numerous varieties of pottery were manufactured at the Yorktown factory by accomplished potters. A total of 105 rim shapes have been discerned thus far, although analysis is far from complete. Salt-glazed stoneware, some of the earliest made in North America, includes the following basic shapes: mugs (four sizes), storage jars, bottles, bowls, pipkins, and chamber pots. Specialized kiln furniture, including three different saggar sizes, was used in the firing of stoneware. Lead-glazed earthenware was manufactured into at least 20 kinds of vessels, including mugs, milk pans (16 different rims), jars, bottles, dishes, slip-decorated platters, betty lamps, funnels, bird bottles, stove tiles, etc. Historical records suggest that Yorktown pottery was sold not only in Tidewater, Virginia, but exported to New England, the West Indies, and the Carolinas, probably in ships owned by William Rogers.

The Yorktown Pottery Factory is a truly unique site within the National Park System by which to interpret the colonial pottery industry.

EXCAVATION OF THE CHANCELLORSVILLE INN, FREDERICKSBURG, AND SPOTSYLVANIA COUNTY BATTLEFIELD MEMORIAL NATIONAL MILITARY PARK AND CEMETERY, FREDERICKSBURG, VIRGINIA

D. G. Crozier[1]



[1]Department of Anthropology
Temple University
Broad and Montgomery
Philadelphia, Pennsylvania 19122

One approach used by archeologists of historical sites in assembling an archeological record will be reviewed through illustrations of the investigation and stablization of the Chancellorsville Inn. An archeological site is the function of human (and animal) behavior and geologic processes; an archeological record, therefore, which is used to visually preserve portions of our cultural heritage or reconstruct patterns of human behavior, must include all available data. Such a record will indeed be a sound document of the future.

EXPLORATION OF A UNIQUE SITE, THE CRATER, PETERSBURG NATIONAL BATTLEFIELD, PETERSBURG, VIRGINIA, AND A BRIEF COMMENT ON RESEARCH AT MORRISTOWN AND VALLEY FORGE NATIONAL HISTORICAL PARKS

Edward S. Rutsch[1]

The purpose of our research project at the Crater, Petersburg National Battlefield, was to discover why the gound surface was collapsing over the Civil War tunnel dug by Union soldiers to undermine the Confederate fort at Petersburg, Va. We found that since the war and before the National Park Service took over the site in the 1930's, the original tunnel had been re-excavated, enlarged, used as a tourist attraction, and subsequently abandoned. Although its entrance to the Crater had been sealed, the tunnel still acted as a drain through the red Virginia clay, establishing an erosive drainage pattern that contributed to the ground's collapse.

The primary lesson reaffirmed by our project is that archeological excavation--we hand-dug a 17-ft hole--is only effective when it is coupled with documentary research into the historical record of the resource. Our investigation included study of the large body of Union Army documentation of their unsuccessful attempt to breach the Confederate earthworks at the mined place, as well as accounts of land use and modifications of the site since the war as a farm, golf course, and visitor attraction. In this last use, the tunnel had been re-excavated, enlarged, shored, and equipped with electric lights early in the 20th century.

Historical research into the use of the site by the National Park Service was also important and rewarding. Park records revealed extensive 1930s WPA work and hints of earlier archeological research projects. Park data such as Superinten-

[1]Historic Conservation & Interpretation, Inc.
17 Van Houten Street
Paterson, New Jersey 07505

tendents' Reports are an often forgotten but very important source of land-use information.

Our work in Morristown National Historical Park, an inventory of cultural resources within the park, where a similar infield and documentary data base exists, resulted in our suggestion of a cultural resource management plan for park use in development, maintenance, and interpretive programs.

ARCHEOLOGICAL RESEARCH AND MANAGEMENT NEEDS

W. James Judge[1]

The fundamental premise underlying this paper is that there need not be a dichotomy between *legitimate* or *scientific* archeological research and research in the interest of resource management. Researchers should not only be cognizant of management needs but should consciously direct the results of their research efforts to the solution of management problems. This does not mean that managers should dictate the nature of research designs. It does mean that researchers and managers should communicate during planning, data collection, analysis, and interpretation so that the relevance to management of the research done is both enhanced and communicated.

The paper outlines a multistage approach to archeological research in National Park Service areas which will serve to enrich both professional and managerial interests. Since National Park Service managers are charged with the responsibility of very long-term resource management, and since cultural properties are nonrenewable resources that disappear if not managed properly, close cooperation between research and management is seen as mandatory. Data from an ongoing National Park Service research project in Chaco Canyon are offered as examples of how such a program can be implemented.

The program begins with a detailed assessment of existing knowledge, including a literature search of cultural resources in the park area as well as in a larger, regional context. Results of this initial effort include a synthesis of local data, interpreted in a regional context. The latter is emphasized since management priorities should be established with reference to a regional, rather than strictly local, data base.

[1]Chief, Division of Chaco Research
National Park Service
P.O. Box 26176
Albuquerque, New Mexico 87125

Also, at this time, immediate managerial needs in terms of preservation, protection, etc., are to be specified.

The next stage involves a field inventory of the cultural resources in the park area. Although 100% coverage of the area is desired and should be attained eventually, the acquisition of an estimate through the use of an unbiased sample is possible. Sampling methods can be designed accurately and efficiently through the use of remote-sensing techniques based on aerial imagery. Concommitant with the inventory should be an investigation of the past environments of the area, based on stratigraphic studies attained through limited test excavations. The understanding of past environments is essential to the proper evaluation of the cultural resources.

Perhaps the most important stage involves evaluating the significance of the resources located by the inventory since this evaluation is crucial to the definition of long-term management needs. In this paper, the concept of three "levels" of significance is proposed, along with management-oriented categories of significance for the middle level. It should be noted that such concepts have not been adopted officially by agencies responsible for preservation of historic properties. They are offered here to stimulate discussion in an effort to relate more closely the assessment of site significance to managerial priorities. The "levels" of resource evaluation suggested are *exceptionally significant*, *significant*, and *important*. Within the *significant* class, management categories include scientific, chronological, interpretive, conservation, and noncultural. These categories are discussed in some detail in the paper, in an attempt to illustrate the importance of such categories as management tools.

The final part of the program involves the production of resource base maps indicating the location of cultural resources by time period as well as by selected environmental settings (topographical, vegetative, etc.). Most important is the generation of a document, oriented specifically for use by the area manager, outlining both long-term and short-range protective, preservative, and interpretive needs as determined by the inventory and evaluation research. Further, a schedule of resource reassessment and ongoing monitoring (e.g., by remote-sensing techniques) should be established at this time to enable the manager to plan accordingly.

To summarize, it is felt that a multistage research program such as outlined in this discussion is mandatory for managers charged with the responsibility of protecting our cultural resources in perpetuity. I hope that the discussion

illustrates further that the relevance of such an approach to management neither precludes nor detracts from its value as a fully professional research endeavor.

BUILDINGS, PRIME ARTIFACTS

Henry J. Magaziner, FAIA[1]

Thus far, we have been dealing with archeology, through which we have learned so much of the past. It is my contention that buildings are nothing but the largest archeological artifacts. Clearly, nothing is a better demonstration of a way of life than is a building. The building's method of construction shows the state of technology at the time it was erected. Its symmetry or asymmetry, its massing, its textures, decorations, etc., show the taste of the period. Its size and quality of construction show the economic situation of its owners. Even its alterations tell a story. They show how the building evolved to meet new needs.

From the point of view of the interpretation which the public expects of the National Park Service, nothing is interpreted more easily in a park than its key buildings.

We have assembled here a group of people, each of whom has made notable contributions to the preservation, stabilization, and restoration of historic buildings.

John Dodd did a magnificent job for the region in his List of Classified Structures. He and his associate, he wife Cherry, visited the many hundreds of structures which comprise our region's architectural and historical resources. For each structure they provided a complete analysis of its architectural distinctiveness and its physical condition. Finally, they gave us budget figures for needed work.

Edward Rutsch was the man who, through archeology, discovered how the surface drainage system at Fort McHenry was designed. It was through his discovery that we were able to see, for the first time, why the Star Fort walls were deteriorating so badly. It was because the clever original design had been

[1]Historical Architect
for the Mid-Atlantic Region
National Park Service

completely subverted.

Nicholas Ginaopulos, a nationally prominent structural engineer, has worked on some of the National Park Service's most historic buildings, including Independence Hall. At Hampton, where for decades the great riddles had been, "What is really ailing the building?" and "What is keeping the cupola up?" he was the first person to make a complete diagnosis of the building's structural system and problems. Then he designed an ingenious system of structural reinforcement that leaves the original construction in place, but braces it where necessary.

Jack Boucher is the Chief Photographer for the National Park Service's Historic American Buildings Survey. He has been photographing historic buildings for the National Park Service for 16 years and has recorded over 5,000 structures in 49 states and 3 territories. Recently, he was elected a Fellow of the world's oldest photographic society, the Royal Photographic Society of Great Britain. Time and time again, he has shown how photography can be an important architectural tool.

Hugh Miller was a construction unit commander in the Corps of Engineers, stationed in France and Germany. He has worked as architect and planner, both in private practice and government. He has worked on restoration of some very notable buildings, including Philadelphia's City Hall, Academy of Music, and Independence Hall. For 5 years he served as advisor to park and antiquity departments in Jordan, Lebanon, Greece, Turkey and Iran. Currently, he is a member of the AIA's National Committee on Historic Resources and of the board of the Association for Preservation Technology. He is in the office of the Chief Historical Architect of the National Park Service.

THE LIST OF CLASSIFIED STRUCTURES IN THE MID-ATLANTIC REGION

John Bruce Dodd and Cherry Dodd[1]

From 1 October 1975 through the summer of 1976, this survey was conducted for all parks in the region. At Gettysburg the literally monumental task was performed by staff personnel. The List of Classified Structures (LCS) for Shenandoah was compiled by Michael A. Hoffman, University of Virginia; the remaining work throughout the region was performed under a contract with John Bruce Dodd, Architect.

The end product of the LCS was one completed form (only rarely two or more sheets) for each historic structure owned by the National Park Service in the region, documenting name, precise location, description (including one photograph), historic value, condition, recommended treatment, and a budget cost for work of any kind that needed to be done relative to the structure. Additionally, in *this* region, the survey gathered more detailed information, including complete photographic coverage, which was tabulated on additional sheets familiarly known as "Henry's forms."

The objectives of this list were:

1. To furnish the Congress with an overall statement of the problems that face our historic structures, and the probable costs of researching, preserving, and/or restoring them.

2. To provide a badly needed reference source for the use of park superintendents, historians, and interpretive personnel, and of regional technical specialists, not only listing and documenting all structures believed to be of historic or cultural value but further placing them in a context commensurate with their intrinsic value and their mission in the park in which they are located.

[1]P.O. Box 43
Layton, New Jersey 07851

Some factors which contributed to the need for the LGS:

1. Growth of the National Park Service in recent decades, resulting in acquisition of large numbers of historic properties.

2. Extreme variation in the types, ages, and historic values of these properties, further complicated by the vastly differing goals of the individual parks.

3. Increased public interest in the nation's heritage, coupled with a much greater appreciation of recent artifacts, not previously considered to be of historic significance.

4. A refreshingly new dedication to conservation of resources.

5. Changes in planning through the years, which have altered the significance of the individual structures to the park's interpretive programs.

Our initial, self-conscious approach, based on unfamiliarity with the history at each park, was soon replaced by an enthusiastic feeling that it was a most relevant endeavor and that our fresh eyes were a decided asset to the evaluative process. A wide variety of information was for the first time discovered, sorted, evaluated, and recorded. It became evident, however, that the job would have been done better by a permanent regional technician, slowly, methodically, and with continual updating over the years. A beginning was made, nevertheless, with great help from staff at the parks, to whom we shall ever be grateful. The LCS must now be kept up!

Before starting, we visited 10 of the parks to estimate the scope of the work. We arranged for help, contracting with an archeologist, a husband and wife team of surveyors primarily for Civil War earthworks and roads, a construction estimator, specialists in monuments, masonry restoration, and waterfront structures, additional typing personnel, and a most cooperative photography shop. We preplanned our systems carefully, including recordkeeping, filing, methods of note-taking, check lists for both descriptive details and condition of structures, standard abbreviations, and a numbering and designation system for photographs. We acquired a Dodge Maxi-van and converted it for standing headroom, with facilities for conferences with park personnel on the site, typing, filing, storage, eating, and resting while in the field. Our 18-ft travel trailer was brought out and winterized for use as living quarters.

The principal initial decision we made was that each structure could *not* be surveyed in the field, written up, cost estimated, and typed in final form as we progressed with the job. This order would have vastly simplified the handling and storage problem, with entire parks or units being submitted to regional for approval and immediate use. We realized, however, that it would have produced unbalanced evaluation with fictitious recommendations and cost estimates and that it was essential to gather information, confer with the superintendent and his staff, and study the park as a whole in the light of its own planning, before making decisions about the individual structure. Furthermore, almost invariably, we were working on the next park before all the information had been assembled from the various sources on the last one! We tried hard to eliminate subjectivity and not to overrate something we found especially fascinating.

Because this is written far from the office, we have no record of the number of structures surveyed; the finished work is available in Philadelphia. It includes buildings as diverse as Hampton, Fort McHenry, Independence Hall, Van Campen Inn, Ennis House, and the ASIS CG Station, earthworks from the Crater to Drewry's Bluff to the mole-like digs at the Wilderness; ruins like the ALPO engine houses; historic roads; the HOVI races, and so forth.

ARCHEOLOGY ASSISTS ARCHITECTURE AT FORT McHENRY NATIONAL MONUMENT AND HISTORIC SHRINE, BALTIMORE, MARYLAND

Edward S. Rutsch[1]

Because of the extensive water damage to Fort McHenry's walls, the National Park Service hired our firm to conduct an archeological investigation of the original drainage system of the star fort, completed in 1802. Documentary and archeological research revealed that the carefully engineered and successful drainage system of the ramparts had been interfered with first by the filling in of the moat during the site's use as a military hospital in World War I, then by attempts to recreate the moat by superficial landscaping, and finally by WPA repointing efforts along the foundation. All these modifications had combined to prevent the ramparts from draining properly, which resulted in the deterioration of mortar in the brick-faced rampart exterior.

Fort McHenry and its surrounding embankments and batteries have a simple but effective surface drainage system. Surface runoff from within the fort is removed via brick gutters and the postern gate sewer complex. Surface water outside the fort runs from embankments and batteries to the center of the dry moat and then along it toward drains at the ravelin and bastion 3. Deep drainage of ground water is provided only for the walls or ramparts. Fort McHenry's ramparts are basically two masonry walls set into the dense clay of Whetstone Point and containing an 1833 infill, designed to improve drainage, of ". . . chips of stones laid in with some care, & without mortar; the object being to allow the free passage of water to the foundation that otherwise would rest against the back of the wall & prevent the induration of the mortar--." Water that seeped into the ramparts drained through this infill to the wall's foundations, where it exited through the purposely mortarless footing stones

[1]Historic Conservation & Interpretation, Inc.
17 Van Houten Street
Paterson, New Jersey 07505

into the moat, which was designed to slope away from the fort's walls. Wall seepage thereby joined the surface runoff in the moat and drained with it.

This historic system no longer functions because the dry ditch was filled in with debris from the Army hospital construction on the site in 1919 and the Army Corps of Engineers' landscaping endeavors in 1929. The moat was filled with up to 3 ft of debris and ash and was also surrounded by a new musketry step in 1929 in the Corp's attempt to recreate the former moat configuration. The mortarless footing stones, set an inch apart to facilitate drainage, were therefore covered over, and, combined with the new landscaping, caused the water within the walls of the fort to seek new exits through the masonry, hasteing its decay. The problem was compounded further when WPA workers ditched around the foundations and filled in around the footing stones with modern cement in the 1930's.

Our conclusions were that the moat, or dry ditch, should be returned to its original contour for the sake of historical accuracy and drainage. Also, the mortar between the footing stones should be removed to allow the free passage of water tapped behind the rampart wall. In our research, we reviewed and evaluated a vast amount of material about the fort's historic and more recent drainage systems, including the National Park Service's attempts to answer drainage problems. Most of these data were found in the archives and Superintendents' Reports, and included hundreds of photographs of 20th-century excavations. We suggested that a system should be set up whereby all maintenance and construction excavations within a National Park Service property should be accurately mapped and recorded, for such records are vital to site analysis.

HAMPTON DIAGNOSIS

HAMPTON NATIONAL HISTORIC SITE

TOWSON VICINITY, MARYLAND

Nicholas L. Gianopulos, P.E.[1]

Hampton Mansion, the late Georgian-style residence of Captain Charles Ridgely, was constructed between 1783 and 1790 on the high terrain north of Baltimore. The large-scaled, three-story, stuccoed, stone masonry country house, with cupola and dormers that have dominated the locale for years, has concerned past and present owners with certain structural limitations that are inherent of the original construction. While the primary and obvious concern to owners has been the limber wood-framed floors which have contributed to cracking of finishes and occupant discomfort, the recent structural investigation disclosed that inherent deficiencies of the third-floor cupola supports and roof trusses were such that remedial repairs were needed there, also.

The primary response by owners to the limber floors consisted of shoring the first floor with light steel framing from below and the reinforcement of the two longer-spanned, second-floor bedrooms with supplemental steel. Whereas the first floor and one-third of the second floor had been strengthened, the central hall portion of that floor, with its highly ornamented and relatively heavy closet partitions, remained unstrengthened. Although the initial primary investigation was centered on an evaluation of the unreinforced deficiencies of the second floor, the overview approach to the building framing disclosed an interrelated behavior between the second-floor central hall and the third-floor cupola base supports immediately above.

Determination of the 42 ft high cupola weight and consequent calculated stresses plus deflections of the third-floor

[1]Keast & Hood Co.
Structural Engineers
Philadelphia, Pennsylvania

timber beam supports indicated severe overstress and the need for supplementary support of the cupola. Similarly, evaluations of two of four major roof trusses indicated the need for development and extension of the proposed attic supplementary support system to also relieve those trusses. The new attic support system will relieve the existing cupola supports and also eliminate the heretofore downward pressures transmitted through the partitions to the limber second floor below.

The unreinforced deflected second-floor areas are to be strengthened by the removal of the plaster ceilings below and the installation of supplementary steel beams and headers to shorten and stiffen the wood floor joists. The new level ceilings, including the original wood cornices, are to be constructed a few inches lower below their original elevations.

The logistics and procedure of structural operations relative to installing the second- and third-floor reinforcements are derivative of procedures developed for strengthening other historic buildings for the National Park Service in the recent past.

ARCHITECTURAL PHOTOGRAPHY OF HISTORIC STRUCTURES

Jack E. Boucher[1]

A picture is worth 10,000 words. The ancient Oriental saying coined by the Chinese more than a millennium ago is as accurate today as then. The question is, however, just how accurate is the story depicted by the picture?

If it is a painting or drawing, has it been distorted by so-called "artistic license?" If it is a photograph, has much of the story been lost by poor composition, inferior equipment, or the unskilled application of such equipment through poor technique?

Photography of architectural and engineering structures, especially those of historic merit can be recorded by anyone with any camera, but it is inevitable that much will be lost through an amateur approach to a professional problem. In the case of documentary photographs, posterity is the eventual loser. If the photographs are to be published, they may fail to illustrate and, indeed, may be rejected by a publisher and even cause the rejection of an entire paper or article.

Quality professional photography, using specialized cameras with a variety of lenses (each of which by itself would be worth many times the value of the entire equipment inventory of most amateur photographers) in the proper hands, will produce razor-sharp images in correct perspective in which the most minute structural detail can be examined. The photographer will not redesign a structure optically or through poor technique.

[1]Supervisor of Photography & Pictorial Records
Office of Archaeology & Historic Preservation
National Park Service
Washington, D.C.

The professional in his laboratory will process photographs so as to obtain maximum quality, and any good photograph depends on three factors, equally rated, to determine quality: (1) ability of the photographer; (2) quality of his equipment; (3) photo laboratory technqiue.

Many a good photograph is ruined in the laboratory, many a poor photograph can be rescued in the laboratory . . . . to a point.

You will be introduced to an assortment of professional equipment, and you will see an exhibit that will demonstrate the value of professional photography. You will receive some hints that will help you make some types of photographs yourself with modest equipment.

As times permits, the presentation will touch upon interrelated fields of professional photography including aerial, infrared, remote-sensing, X-ray, and photogrammetry, defining each briefly, and noting some specific applications of each.

There will be a question and answer period, and the speaker will be available for much of the day to discuss specific problems.

COMMENTS FOLLOWING PANEL DISCUSSION OF "BUILDINGS: PRIME ARTIFACTS"

Hugh C. Miller, AIA[1]

The theme is research of resources that are nonrenewable. This fact should not be forgotten. Development of basic information through research is essential to the management, preservation, and interpretation of any resource.

It is amazing that until recently the National Park Service had no centralized reference that cataloged how many, what type, what conditions, or cost for preserving its historic structures. The current survey to establish the List of Classified Structures (LCS) is the first step in developing a basic inventory system. The LCS is conceived as a *continuously updated* inventory reference for planning, programming, and budgeting purposes. It is an essential reference for top management to develop program priorities and budget justifications to the Department, the Office of Management and Budget, and the Congress. At regional and park levels, the LCS should provide a base for constant review of all the historic structures in the unit in terms of program needs for research studies and preservation treatments. One spinoff has occurred in this region with the use of the LCS Field Inventory Reports to establish a maintenance dossier for each structure. This is an orderly step in the management of historic structures maintenance and should lead to subsequent programming and completion of historic structures preservation guides for each building or specific complexes of buildings.

The use of photography for recording is fully recognized as an essential element in development of the inventory base. For elevations and details of buildings it is faster and much more accurate than the traditional "inch worm" drawing method long used by the Historic American Buildings Survey (HABS) Program. We are now designing a systemwide program to establish

[1]Cultural Resources Management
Washington Office

a photographic record base. This program will be beyond the scope of the HABS collection because our mission needs for architectural records go far beyond those of HABS, whose criteria is for documentation of architectural style as a service to scholars. Our photo data base will document the physical extent, dimensions, materials, and condition of National Park Service historic structures. It is essential that these programs for collection of basic data be a continuous process of input that is concurrent with the program cycle.

The National Park Service long has used research methods for the analysis of historic structures. Interdisciplinary studies by historians, archeologists, and historical architects to synthesize documentation and the physical evidence found in the building or its surrounding environment result in the historic structures report. These studies are basic decision-making tools for the preservation and interpretation of the structure. (We are interpreting too little of the architectural significance and the restoration process in our public programs.) These investigations should lead to a full understanding of the characteristic of the historic structure and its limitation for possible restoration, interpretation, or adaptive reuse. Those latter decisions must be based on the suitability and feasibility of the proposed uses and the overriding considerations to preserve the integrity (the completeness and the honesty of the structure) as a historic artifact. The development of the preservation treatment--preserving in entirety, restoration (to remove later parts and replace missing parts of a significant period), or reconstruction--requires the collection and evaluation of the information gathered in the historic structures report. The timely and complete HSR is necessary for the professionals involved in preparing the construction documents--drawings and specification and supervision of the work. Lack of follow-through with contract supervision by persons knowledgeable with the research and the intent of the project documents often is the weak link in the whole historic structure preservation process. The inclusion of park maintenance staff on the work during the preservation treatment phase is desirable to provide a continuity of preservation after the development funds are expendable.

Most essential in the research activity is the scheduling of the research so that it is accomplished in a timely manner to meet the objectives (mission) of the overall program. Too often inventories and initial evaluations are not complete when master planning decisions are made; archeological or structural evaluations have not been started when development conceptual plans are approved. All too often historic structures reports are scheduled so that construction funds are used for basic

history studies rather than to restrict the scope of the history study to the understanding of structure. Furnishing plans sometimes are completed prior to the development of historic structures reports. This often results in drastically changed programs of development because the building resources will not allow the proposed use or treatment.

The policy's standards are clear in their requirements for orderly planning and design of research for preservation of historic structures. Unfortunately, the programmatic concerns and pressures of other motivating forces have often telescoped or leap-frogged the essential elements of the research process. Only through an interdisciplinary evaluation focused directly at the mission objectives to preserve can we expect to develop appropriate plans for the treatment and maintenance of our nonrenewable resources--the historic structures of the National Park Service. This must be done in the development and management process!

RESEARCH AND THE MEDIA

Arthur P. Miller[1]

Public recognition and support can be gained for archeological, historical, and ecological projects undertaken by the National Park Service through the Regional Public Affairs Office.

An archeological excavation, a historic structure renovation, or a historical research project often can generate a newsworthy feature that will be published or broadcast in external or internal media. Or a news release may trigger a reporter's interest and motivate him to cover the story in greater depth.

Public Affairs can advise the park superintendent or the National Park Service contractor on the newsworthiness of a project, the timing of a release of information to the public, photographic potential, and which aspect of a project would most interest the general public. The Public Affairs Office at regional headquarters is prepared to handle such media interest or coverage in a way that will produce an accurate report of the project in the press, prevent damage to the resource, and not interfere with day-to-day operations. Such public information may pay dividends through demonstration of National Park Service achievements, evidence of public support and interest, or even through private contributions generated by a news report of the project.

[1]Assistant to the Regional Director
for Public Affairs,
Mid-Atlantic Region

CLIO AT HOME

IN THE MID-ATLANTIC REGION

John W. Bond[1]

I should like to think that in meetings such as this, involving the National Park Service, the academic community, and others with special interest, we are working toward the better development of an awareness of the resources that are in the parks, and through this greater awareness we are better interpreting and managing these resources. I see research as the very foundation on which this awareness is awakened, developed, and maintained. We in the National Park Service possess a certain amount of expertise because of our academic backgrounds and our professional experiences. But we certainly do not pretend to know all about our areas. We have long realized the interdependence between specialists such as historians, archeologists, biologists, etc., in the parks and specialists such as yourselves outside the National Park Service.

Because of the unique nature of the parks included within the National Park System--and they are unique because it was their national significance for the most part that caused them to be added to the system--we believe there are golden opportunities for the advancement of knowledge through the mutual cooperation between park staffs and outside researchers. Because of the park specialist's intimacy with the resource, he is in a favorable position to identify gaps in the knowledge of that resource. The academic community, on the other hand, might be better equipped to close these gaps through its high degree of specialization and the greater opportunity it is afforded for applying a broader interdisciplinary approach to answering specific questions. All of this is to say that we in the National Park Service would like to encourage a broader exchange between the Service and the academic community and others who are actively involved in the pursuit of knowledge

[1]Chief
Division of Resource Preservation,
Mid-Atlantic Region

about resources within the parks we manage. Perhaps through a more comprehensive identification of our research needs and developing a system of making these better known to you, there can be a more effective meshing of these needs with your academic interests.

The first person on our panel, as a former historian and as a park manager today, knows first-hand of the absolute necessity for accurate and complete information necessary for the bicentennial development he directed at Yorktown and Jamestown and for the planning of a similar development at Independence National Historical Park. Superintendent James Sullivan of Colonial National Historical Park also understands the importance of knowing the resource in sufficient depth to determine where the informational gaps are and how to get them filled. His work with Dr. Norman Barka has been a perfect example of the interdependence between the parks and academicians.

A continuing concern of ours is that we keep up with advancement in scholarship as it affects the story we tell in the parks and how we manage the resource. One area which has received special attention lately is Booker T. Washington National Monument near Roanoke. The story is slavery in the area where Washington spent his first 9 years needs to be developed more fully. Some time ago I spoke with Dr. Oscar Williams, Chairman of the Department of History at Virginia State College in Petersburg, about this need and he gladly consented to present a discussion on slavery in the Blue Ridge and its relevance to Booker T. Washington.

Often we have special research needs which cannot be met in a timely manner, if at all, through our regular programming procedures. One such need was to learn more about the impact of the Civil War on the lives of the people who lived in the Village of Appomattox Courthouse where General Lee surrendered the Army of Northern Virginia to General Grant, and for all intents and purposes, ended the Civil War. We were able to apply some unexpended regional money to meet this need. Then, the park made us aware of Dr. John Moore, who has done extensive research into the socioeconomic history of Virginia, and most recently in his *Albermarle: Jefferson's County, 1727-1976*.

A major research project presently underway involves sorting the myths from the facts as they pertain to our newest park, Valley Forge Historical Park. Dr. Charles Funnell, who came to work for the National Park Service about 2 years ago, is an untiring detective when it comes to historical research. When we needed to establish the validity of the claim that Mark Byrd's Furnace in Berks County, Pennsylvania, produced cannon

for the Revolutionary War, we assigned the task to Funnell. True to our expectations, he found previously uncited sources to substantiate the long-held tradition that Revolutionary War cannon were in reality produced by Mark Byrd at his Hopewell Furnace.

The man in our regional setup who plays a decisive role in how the information that results from research is translated into various forms for the visiting public is Chester Harris, the Regional Chief of Interpretation. Harris, a biologist by training, before coming to the Mid-Atlantic Region, was in charge of the Interpretive Program for the National Capital Parks in Washington, D.C.

BICENTENNIAL HISTORICAL RESEARCH

AT COLONIAL NATIONAL HISTORICAL PARK

James R. Sullivan[1]

Dr. Sydney Bradford, the Associate Regional Director for Professional Services, asked that I speak on the subject of Bicentennial historical research at Yorktown. I was both pleased and somewhat at a loss to meet with such an august group and try to promulgate in 20 minutes all the answers and questions, or perhaps it should be questions and answers, relating to historical research and its impact upon the development program at Yorktown. According to the National Park Service's Management Policies Book, we should do the following, *The National Park Service shall faithfully preserve the historic resources entrusted to its care and provide for their understanding, appreciation and enjoyment through appropriate programs of research and interpretation.* I shall not attempt to go through all of the Acts of the Congress or Executive Orders or laws or rules and regulations dealing with historic preservation, as I am sure that you will have had a sufficient amount of this prior to our session.

I am concerned about the programming of research, the assignment of historians, archeologists, or historical architects to carry out research with sufficient lead time that proper managerial decisions can be made and construction programs be thought out with care and precision. I wish I could report that all of this happened at Colonial in that manner, and I suspect that my remarks may apply to Independence National Historical Park as well where I served before coming to Yorktown. We at Colonial operated under a crash program, some of it caused by individuals, some caused by the National Park Service as a whole, spurred on by its various components. I must say that it would have been much simpler if we could have gone about this entire task in a very methodical and thoughtful process.

[1]Superintendent
Colonial National Historical Park
Yorktown, Virginia

Hindsight always has the advantage over foresight. I would hope that future efforts toward research for programs of the magnitude of the Bicentennial, and I would even suspect going back to 1960-65 for the Civil War Centennial, would be programmed in a timely and organized way to meet our obligations as a preservation agency.

We have just completed a multimillion dollar expansion program at Colonial. This included many projects of a widely diverse nature, from restoring fortifications to preparing scripts for audio stations. It entailed a vast amount of use of data about the park's resources. Fortunately, this was not the first such commemoration and a significant amount of information was on hand. However, despite a carefully devised planning procedure, much of the data generated by the National Park Service's multidisciplined research approach was too late to be of use as a management tool. And unlike so much of the historical research field, the National Park Service research in history is very project-oriented. This meant that many projects had to be completed before a reasonable percentage of their information was available, and this is not the first time that we have experienced this sort of dilemma. Why did we have this problem at Colonial? We believe, first, because we did not have the depth and specific knowledge available in the form of skilled historians. In our case we lost an experienced employee at a critical time. The individuals who were recruited to fill in, fortunately, proved to be extremely dedicated and capable. However, their backgrounds were far different academically from the material with which they would work. There is no reflection upon the individuals involved, but valuable time was lost. This was never to be made up insofar as providing material for management decisions.

How could this problem have been resolved. First, the research should have been defined into a distinctive, logical, controllable module. This would then have been placed under the direct supervision of a single *on-site* research coordinator. This individual would have authority over all disciplines. He or she also would have controlled scheduling, fiscal allocations, and personnel actions. This person would answer only to a highly placed development supervisor. He or she would be responsible for using all available local resources (i.e., local scholars and collections and local National Park Service expertise). This individual would be responsible for maintaining a rigid interlock of disciplines to assure maximum use of resources and minimum overlap. Where possible, work would be contracted with rigid time frames. The unit would be inviolate until its mission was complete. Responsibilities would be pinpointed and those who did not meet them would be weeded out.

This sounds authoritarian and unacademic, but if we are to do the best in the field of preservation and meet our obligations to the taxpayer we must adopt stern measures.

THE SOCIOECONOMIC IMPACT OF THE CIVIL WAR ON THE VILLAGE OF APPOMATTOX COURT HOUSE, VIRGINIA, AS REFLECTED BY CONDITIONS AT THE TIME OF LEE'S SURRENDER

John Hammond Moore

Momentous as events of 9 April 1865 were, only by accident did Lee and Grant end up in the living room of Wilmer McLean, the man who fled from northern Virginia to escape the ravages of war. When Lee evacuated the Richmond-Petersburg area a week earlier, he headed for Danville; but, harrassed by Union forces, he and his men veered northward and Lynchburg became a sustitute goal.

Late on Saturday afternoon, 8 April, Confederates reached the vicinity of Appomattox Court House. An attempt to obtain badly needed food and supplies at the railway station 2 miles away was thwarted by the enemy. During the night, it became obvious that northern cavalry blocked the route west. An early morning feint got nowhere. The only course possible was surrender.

The setting for this drama was a tiny agricultural village of perhaps 30 houses and a very new county seat by Virginia standards, only 20 years old. It was a relatively isolated community, at least well insulated from the strife of war. Yet Appomattox Court House was close by a rail line which functioned throughout the entire conflict and only a dozen miles from the James River Canal.

These facts--east-west rail and water connections and relative isolation--help to explain why the Civil War had limited impact upon this center of county government. Anything a Richmond, Petersburg, or Lynchburg merchant had on his shelves could be delivered at the rail depot within a day or so--that is, *if* one was willing to pay inflated wartime prices.

No battles, save for the final skirmishes which hardly rate that name, were fought in the region, and one must question traditional tales of food and fodder shortages in the immediate vicinity. Southern Claims Commission records (1871-80) and diaries penned by southern deserters indicate the opposite was true.

It would appear that, long before April 1865, most residents concluded the *Lost Cause* was indeed lost. Why contribute more goods and money to a doomed dream? Thus it seems that Appomattox Court House, like most Virginia towns and villages not in the path of armies, was barely touched by war. This is not to overlook the departure of scores of sons who marched away, never to return, yet this was a tragedy experienced by communities both North and South.

But by 8 April the village was in the path of not one, but *two* armies, and for a week or so the fact of surrender had profound effects. Thousands of men encamped nearby. Horses, cattle, mules, supply wagons, guns, all sorts of war machinery littered the hills of this pleasant rolling countryside. That, however, is a post-capitulation phenomenon, a very unique situation which lasted for only a brief time. Nevertheless, the decision reached in McLean's living room had profound impact upon Appomattox, Virginia, the South, and the nation, far greater than the agony of the Civil War itself.