HUNTERS AND GATHERERS, VILLAGES AND FARMS:

A PRESERVATION PLAN

FOR

LITCHFIELD COUNTY'S PAST

Report prepared for the Connecticut Historical Commission. Edited by Russell G. Handsman with Roberta Hampton, Christine Hoepfner, Colette B. Moore, Stephen Post, and John Stech.

Research report submitted by:

Russell G. Handsman
Research Department
American Indian Archaeological Institute
Box 260
Washington, CT 06793
(203) 868-0518

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AMERICAN
INDIAN
ARCHAEOLOGICAL
INSTITUTE

Washington, Connecticut
06793

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I. Introduction and Acknowledgements

Project Background

In 1971, the Shepaug Valley Archaeological Society was established as an educational and research organization interested in compiling information on the prehistory of a 200 square mile area, primarily Litchfield County, in western Connecticut. Working from a loose alliance in 1968, the Society, by 1974, had worked on 25 sites and accessed a collection of over 300,000 artifacts. The Society continues to exist in the form of the American Indian Archaeological Institute (hereafter AIAI), which has become a resource center for anthropological education in the region (Swigart 1974:1, 1978).

The Institute is now at a critical juncture of its short existence as its budget and planned activities grow at a rapid rate. As part of a recent evaluative process, the Research Department has developed a long-term plan for anthropological studies centered on the Housatonic Valley Drainage System. This research will encompass both the prehistoric and historic periods and is particularly concerned with a critical exploration of the concept of cultural process, that is, studies of the dynamics of societal adaptation, form, content, conflict, change, and perception.

Additionally, it is felt that any long term research program must be intertwined with two goals that underly both the Shepaug Valley Archaeological Society and its reincarnation in the American Indian Archaeological Institute. Those goals are public education and the conservation of the cultural resource base of the region. In fact, the public needs to be educated not only in terms of what the prehistory and history of the region look like, but also what cultural resources are and what these entities can tell us of behavior and meaning in the past.

By cultural resources, we mean the traditional resource base of prehistoric and historic sites, structures, and objects as well as those sources of cultural information which could prove valuable in anthropological research. Such sources of information include church and town geneologies, tax records, account books, local persons' diaries, census records, historic maps, newspaper archives, and local historical society's collections. This sort of information could be used in the study of the evolution of socioeconomic classes, of the Congregational Church as a socio-religious power, and of the entire development and decline of the eighteenth and nineteenth century colonial agricultural and industrial complexes. In addition, some of our studies have been concentrated on the cultural forms that American society uses to think about and study the past (Handsman 1977, 1978). Thus we propose to broaden the traditional boundaries of cultural resources as anthropologists and educators, a step which reflects federal activity in historic preservation.

In terms of the National Park Service's (1975:II-1) Management Policies, as a first step, we are interested in developing a resources basic inventory, described as a compilation of "natural, historic, social, economic, and demographic data for planning and management" of federally-owned or managed properties and/or parks. In the case of the Housatonic Valley Drainage System, the relevant land is not under direct federal ownership; however, proposals have been prepared to declare portions of our research area to be eligible components of the National Wild and Scenic Rivers System. Such proposals, if they come to fruition, would represent a joint management/planning venture of non-federal and local town planning boards. The non-federal agencies involved include a regional planning authority, the Northwestern Connecticut Regional Planning Agency of Warren, Connecticut. Such proposals necessitate that involved personnel have knowledge of the regional resource base (Mead 1976), one of the goals of our summer's research.

Given these management and research desires, it became necessary, in 1977-78, to undertake a feasibility study, Phase One of our plan. Again it must be emphasized that this plan is the Institute in the sense that we have intermeshed our desires as professional anthropologists with the Institute's goal of education and conservation. Throughout, our plan was and is guided by a philosophy of conservation. We want to achieve our research goals as protectors of the extant cultural resource base. Obviously, this articulates closely with the federal government's (then called the Bureau of Outdoor Recreation) proposal to establish sections of the Shepaug River and the Housatonic River as components of the National Wild and Scenic River System.

These proposals would aid in protecting the natural <u>and</u> cultural resources of both these rivers from unplanned and unmanaged development and use. As components of the National System, the Shepaug and Housatonic Rivers would be declared to possess outstanding values which should be preserved for the benefit of present and future generations. The values which would be protected, through a regional management plan, include historic/cultural resources (United States Code - 1970, Title 16, Chapter 28, Section 1271--The Wild and Scenic Rivers Act).

Any management plan which is developed for components under the Wild and Scenic River System needs to have access to a cultural resource inventory of the region. Given such an inventory, it will be possible for involved agencies to determine which localities should be conserved under a system of zoned growth and managed recreation. With a cultural resource inventory, the values of the rivers to be preserved will be expanded to include significant components of the region's prehistory and history. Without such an inventory, involved agency personnel may be forced into developing land use policies detrimental to the conservation of Western Connecticut's cultural resource base.

Thus one outcome of our research would be the compilation of information on the distribution and extent of cultural resources in the Housatonic River Drainage System. Such information can then be organized into property tract maps indicating the potential density and significance of cultural resources. These maps would prove invaluable to various agencies concerned with planning future land use in the region (see Chapter V).

The development of management models <u>and</u> processually oriented research models need not represent any sort of conflict between a conservationist philosophy and an academically oriented research design aimed at the exploitation of available resources. First it can be argued that the units involved in both models ought to be equivalent. That is, one may justify a regional perspective for cultural resource management research as easily as for problem-oriented research. For example, one may argue that an informed policy of land use planning and resource management depends upon the completion of a region's cultural resource inventory. Without this basis, one cannot make rational decisions about which resources or localities can be disturbed and/or destroyed since one would have no way of evaluating the relative degrees of significance of competing resources. In fact, the problems which the profession seems to be facing in regards to "determinations of eligibility" (Glassow 1977) are usually the result of an unsystematic, piecemeal approach to management and preservation (see Gluckman and Thompson 1977).

Thus the articulation of a regional management perspective with a research oriented program can aid in limiting the ever present and developing crisis in American archaeology (King 1971). This crisis revolves around a conflict between "the needs and ethic of an explicitly scientific approach to archaeology and the operating assumptions of those governmental agencies that support archaeological salvage" (King 1971:255). Contract archaeology in the Northeast continues, in large part, to be both mechanical or empiricist and non-anthropological. Hopefully, our study will aid in isolating those problems and questions which can be studied in the future. Then further contract work in a region can be better articulated with problem oriented research.

Implementation

Given this background statement, which summarized our management and research interests in the summer of 1977, a proposal was prepared for the Connecticut Historical Commission which requested funding to support an initial year of cultural resource survey. The proposal was accepted in the late fall of 1977 and a total of more than $34,000.00 became available with the assistance of a matching grant-in-aid from the Heritage Conservation and Recreation Service (U.S. Department of the Interior), through the Connecticut Historical Commission.

Archival research began during late February of 1978, with field research starting in early June. A field crew of six experienced laborers and numerous volunteers and participants in field schools worked intensively through the summer. A crew from the Archaeological Program at the Gunnery School completed survey and testing at several sites in the Shepaug Valley during the fall of 1978. Thus the report represents the outcome of almost ten months of field and archival research by crews and individuals affiliated with the AIAI.

Acknowledgements

The Institute's research staff is most grateful to those patrons who provided funds to help us meet the match required under the guidelines of the Connecticut Historical Commission. In particular, we would like to thank one donor whose generosity made the project work. Of course, we also acknowledge the Commission for its matching grant-in-aid, made under the provisions of the National Historic Preservation Act of 1966. Several staff members (Dave Poirier, Renee Main, Judith Paine) at the Commission made our lives easier by answering numerous questions about record keeping and other details. In particular, Dave Poirier proved to be an able coordinator and colleague.

Manpower for the project came from a variety of sources including a dedicated cadre of volunteer workers who walked acres of plowed fields and dug hundreds of test pits. In particular, we thank Chip Pennington, Winona Whitehead, and Helen Maltby for their efforts. Three research teams from EARTHWATCH provided invaluable help for six weeks as well as financial support. Team II was especially helpful in completing the field research at Amesville.

The University of Hartford, the Connecticut Center for Continuing Education (Fairfield University), and the Teachers' Center of Fairfield University also provided students in field courses. Members of the Institute's Training Sessions helped to test floodplain sites along the Shepaug River.

Room facilities and meals were provided by the Gunnery and we thank those staff members who helped to make our stay enjoyable. In particular, Joseph Ghering, our cook, was outstanding and helped to keep all the workers in good spirits. The Institute's secretarial staff aided our preparations for research while Mrs. Dorothy Henry successfully fought the intricate bookkeeping system. As usual, Ned Swigart provided useful information and commentary on the project as did Roger W. Moeller, Director of the Research Department.

Roger also directed field crews during the summer and lightened my burden as project director. I am grateful for his efforts and willingness. The crew itself did an outstanding job under the able direction of John T. Stech, one of my research assistants. Crew members included Steven A. Massaroni, Paula Zitzler, Heather Moeller, Chrissie Hoepfner, Mary Anne Murray, who helped direct EARTHWATCH crews, Mary K. McEndorfer, who kept my books on mileage and hours, and Colette "Ting" Moore, who also wrote an analysis of the Amesville Historic District. All of these not only did their jobs but also made extra contributions to keep the project going and everyone in mostly good spirits.

Several consultants provided invaluable information including Peter Patton, our geologist, and Greg Laden and Wendy, who helped us with our historic ceramics. Mark Passler agreed to pilot a plane so we could do some aerial photography and analysis of land forms. Joanne Bowen, an Institute staff member, undertook analysis of archival documents during the fall while Chrissie Hoepfner drafted figures and tables. Jean Pruchnik continues to catalog our finds with her usual patience and expertise. Sharron Turner helped with early publicity, which made our job easier. The manuscript and many of the forms used to record sites were typed by Deborah Handsman.

The project could not have been undertaken at all without the cooperation of the staff members of town offices and property owners along the Housatonic and Shepaug Rivers. They provided access to documents, records, land, and sites.

I also wish to thank my assistants and colleagues in the Research Department, Roberta Hampton and Stephen Post. Both labored through the winter to complete background studies, directed field crews, and did photography. Roberta helped with the finances and Steve organized our Litchfield County collections. This project was theirs as well as mine and they got the job done.

A Note on Organization

What follows is a report of the research we completed during the past year. Several individuals wrote chapters which I edited and put together with several other concluding sections. We have kept specific discussion of individual sites to a minimum since much of the relevant information is contained on inventory forms completed for the Connecticut Historical Commission. We have not included maps which locate individual sites for the protection of those resources.

The report is primarily concerned with describing our methods for our colleagues and summarizing our results for both our colleagues and others. Those who are interested in our project from the perspective of management and the river corridor can probably read Section V as a single unit. Portions of Chapter IV are also relevant for planners; the remainder is probably for those interested in anthropology and archaeology.

II. An Introduction to the Research Design

by Russell G. Handsman

During the first year of our multi-year program, our research universe was confined to the major river corridors of the Housatonic and Shepaug Valleys in Litchfield County, Connecticut. The perimeters of this initial research area, to be expanded in future years, were primarily defined on the basis of our interest in cultural resource management. The floodplain zone, along each bank, will be the management corridor, under the provisions of plans associated with the National Wild and Scenic Rivers Act. The extent of this corridor has not been explicitly defined by involved agencies for either the Housatonic or Shepaug Rivers. Nevertheless, our corridor's width will certainly include the management corridor which, in the past, has not extended across the entire valley floor.

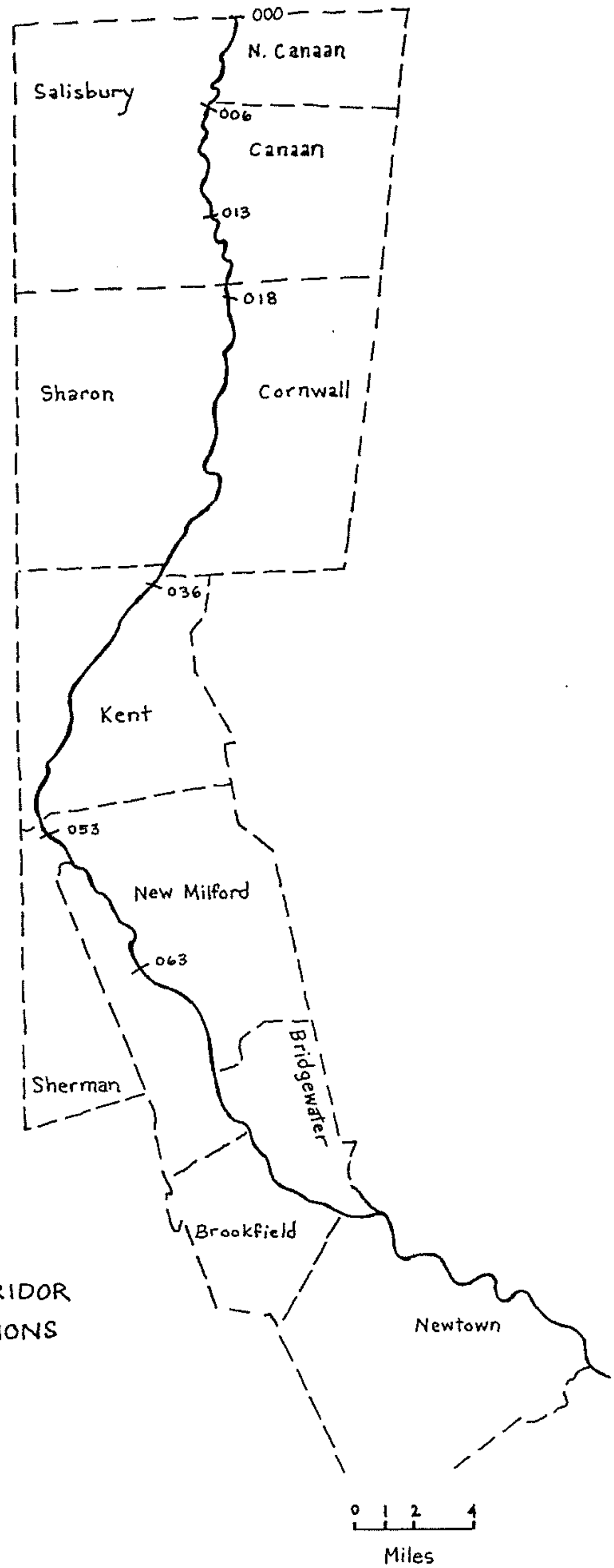
The Institute's geographical area of research interest is known as the Housatonic River Drainage Basin, defined as that area drained by the Housatonic, and its major and minor tributaries, in Litchfield County, and the northern portion of Fairfield County, Connecticut. Within this area, survey crews concentrated on the valley floor of the Housatonic, north of New Milford, as well as the floodplain and terraces of the Shepaug River (see Figures 1, 2).

From the Massachusetts border, the Housatonic River continues in a southerly direction for a total of 63 kilometers to Boardman Bridge, the southern terminus of the management area, under the proposed Wild and Scenic Rivers Plan. This boundary is located north of the center village of New Milford, but within the town's geographical and political limits (Figure 1). No field studies were undertaken south of Boardman Bridge. The eight kilometers between here and Lake Lillinonah will be surveyed in future years.

A second research corridor, along the Shepaug River, extends for a total of 35 kilometers between the Shepaug Reservoir in the Town of Litchfield and Lake Lillinonah, near Roxbury Falls (Figure 2). This perimeter is substantially the same as that defined in the preliminary study, but excludes a segment of the Bantam River. This corridor will be surveyed during the summer of 1979.

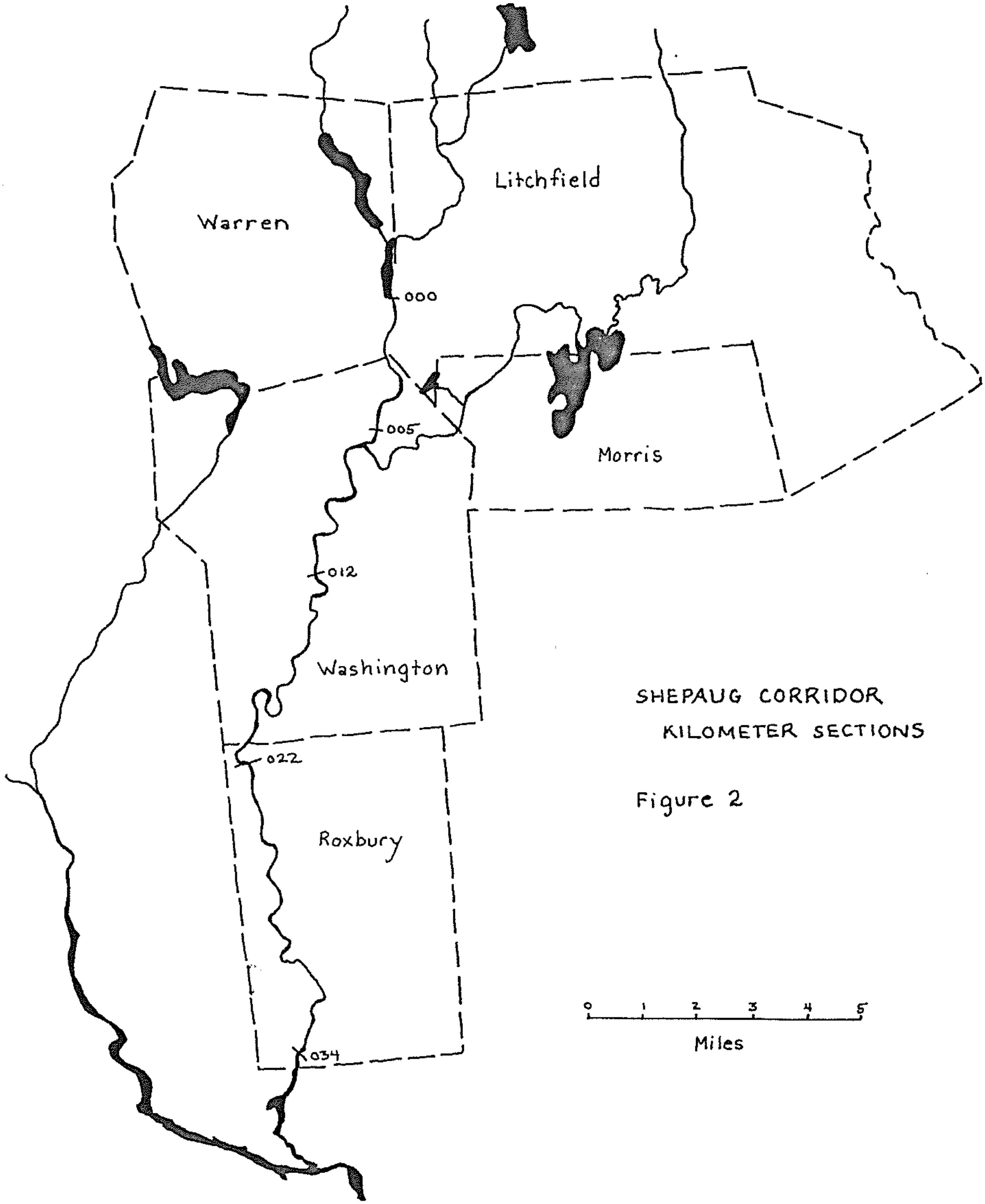
Our research universe, as defined for the first phase of our studies, covered a total of 98 kilometers, distributed among 11 towns in Litchfield and Fairfield Counties. Of this total, field research was undertaken on tracts in 40 of these kilometer sections, distributed among 10 of the 11 towns. Litchfield was the only town which was not at least partially surveyed; an intensive project is planned for the summer of 1979.

Upland areas, above the valley floor, were not systematically surveyed during the first phase. It was necessary to concentrate along the river corridor so that our results would prove to be most beneficial to those concerned with planning patterns of future land use. Both of the river corridors, as described, have been determined to be eligible for inclusion in the National Wild and Scenic River System, on the basis of natural and cultural features which each is supposed to possess. Both of the preliminary studies contained evaluations of the valley's archaeological potential:



HOUSATONIC CORRIDOR
KILOMETER SECTIONS

Figure 1



SHEPAUG CORRIDOR
KILOMETER SECTIONS

Figure 2

> The archeological value of the Housatonic River is unique in New England due to its stratified soils and generally undeveloped streambanks. Thus, the Housatonic River Valley has an outstanding potential to yield significant archeological finds (Bureau of Outdoor Recreation n.d.:4).

and:

> Besides being rich in historical interest, the Shepaug Valley has outstanding potential for yielding significant archaeological data. The Shepaug Valley is unique in being among the very few rivers in this part of New England having deeply stratified floodplains. These undeveloped floodplains offer an ideal setting for the systematic investigation of Indian cultures dating back 10,000 years (Bureau of Outdoor Recreation 1977:4).

By concentrating on the valley floor during our first year of research, we are now in a better position to evaluate the validity of both of these statements. Concurrently, agencies who use this report should be better able to develop appropriate management plans and protective measures which will vary as one moves from segment to segment along the corridors (see Section V).

The Goals of Research

Under the provisions of federal preservation law and an agreement with the Connecticut Historical Commission, the AIAI was contracted to undertake an archaeological survey to locate and identify cultural resources along the Housatonic and Shepaug Rivers. More specifically, the following series of goals were to be achieved:

1. To begin a prehistoric and historic site, structure, and object inventory survey in selected portions of the Housatonic and Shepaug Rivers and their tributaries;
2. To assess, in a preliminary fashion, the research potential of located resources;
3. To assess the effectiveness of various survey methods including the excavation of subsurface shovel test pits, systematic informant survey, and other techniques;
4. To develop viable procedures for cost estimates so that a long term management study will be grounded on a sound financial basis;
5. To educate the public to both the management and research interests involved;
6. To formulate a model which would allow us to predict the locations of prehistoric sites as a result of research on the process of prehistoric adaptation;
7. To formulate a similar predictive model for historic site location, including both industrial and agricultural resources.

The information resulting from our research was then organized into a series of maps which define the cultural sensitivity of each kilometer section along the river. These planning maps can now be used by regional and local agencies concerned with developing management plans. The results of our study are discussed in Sections III, IV, and V of this report.

A Theoretical Premise

Most contemporary preservation surveys, and ours was no exception, are organized with two contrasting approaches in mind. One may attempt to locate as many sites or structures as possible and, by doing so, to produce a "total" inventory for as large an area as possible. The alternative approach is one of a search for patterns rather than resources so that coverage and specific knowledge is sacrificed in the hopes of gaining a predictive capability. Fundamentally, these two approaches (usually called an inventory survey and a predictive survey respectively; see King et al. 1977: 105-120, 145-173) are incompatible since, by choosing one, an archaeologist usually precludes the other.

Of course, it has been argued that careful planning and background studies may offer one the opportunity to blend these two approaches into a single research design which attempts to discover as many sites as possible, the patterning of which may allow the formulation of one or more predictive models. In another sense, inventory and predictive surveys are equivalent since they tend to be based upon an identical set of assumptions about the past. That is, it truly does not matter which approach an archaeologist chooses since ultimately both depend upon a set of implicit cultural rules about how the past is organized and, thereby, how one can know it.

These rules are implicit enough that archaeologists rarely come to the understanding that their study of the past is as cultural a phenomenon as the objects they study. At least one way to recognize these implicit rules is to reflect upon the theory of predictive surveys. In order for these surveys to work, it is necessary to perceive behavior and the past as a set of static units or rules, usually of adaptation or socioeconomic organization. Anthropologists have known for a long time that these rules are usually the creation of anthropologists themselves (see Murphy 1971) but only rarely has this idea filtered into archaeology (see Handsman 1977). When it does, it implies that social life is both contradictory and in a state of constant flux so that patterns, based upon the lack of flux and contradictions, become illusory. Ultimately, this suggests that predictive surveys cannot work since they must deny constant variability, flux, and contradictions to isolate patterns and processes.

After beginning with this critique of archaeology's theory of knowledge, it was necessary to formulate a research design which focused our interests on a search for variability within and between different sections of the rivers. Tracts were judgementally selected for research on the basis of both similarities and differences, as these qualities were defined on the basis of prior history, topography, present use, geomorphology, and location. The results of our studies follow.

III. Field and Archival Studies: Methods and Results

The following series of papers are descriptions of the methods and results of various facets of our research program. The first two (by Handsman and Post and Hoepfner) are concerned with specific research techniques while the paper by Stech describes and evaluates a variety of methods employed by our field crew. Ting Moore's paper is an intensive analysis of the Amesville complex, an important series of historic sites which date to the nineteenth century. The paper by Peter Patton is a preliminary study of the geological processes and contexts of localities along the Housatonic and Shepaug Rivers, particularly as this data reflects upon the archaeological potential of specific tracts. In each case, the author attempts to describe results, evaluate a method's usefulness, and criticize its shortcomings.

A. Mail Questionnaires as a Research Technique: A Preliminary Assessment.

by Russell G. Handsman and Stephen E. Post

The Problem

In designing a regional strategy for locating prehistoric and historic cultural resources, archaeologists depend upon a variety of information drawn from prior field and archival studies, within and outside of the research area under consideration. Prior archaeological surveys may offer one the opportunity to isolate patterns of site location which can then be used, with some amount of anthropological modeling, to predict where specific kinds or densities of cultural resources might be found. Thus, a pattern or model of site location, inferred from earlier survey efforts, might be transposed into a predictive model for locating archaeological sites in poorly known localities or regions.

The actual process of formulating a model for site location depends upon two sorts of analysis. First, one must have access to earlier data gathered by way of a field survey which systematically covered a portion of each locality in one's research universe. If earlier surveys tended to be biased towards particular geographical settings away from other localities, then the resultant patterns of site location will always be suspect. Archaeologists have known for more than 20 years that their patterns of site distribution tended to reflect personal research habits and beliefs rather than historic or prehistoric behavior. This sort of bias is of a methodological nature and contemporary archaeologists have learned to manage its effects.

However, a second, less obvious and more implicit bias can also control the formulation of archaeological research models. Rather than methodological, this bias is epistemological and derives from the current theoretical fascination with the ecological process of adaptation. We reason that if we understood how prehistoric or historic populations adapted, ecologically and economically, then we could know how each group used its landscape and what these patterns of use (patterns of sites) would be. It would then be a methodological problem to translate these models of site distribution into viable field exercises, check the validity of the research model, and change the model as anomalous sites or patterns were isolated.

The current source of such theoretical models is the "anthropological" mind of the archaeologist. On the basis of earlier research in one or several regions, each of us builds up a model of expectations which eventually is translated into an explicit model for research. Such thinking tends to assume that each region is similar or that each population in each region would adapt in similar ways. We know as anthropologists that neither of these two assumptions can be defended and, in fact, that the second is an implicit denial of the concept of culture.

Each of these methodological and epistemological problems suggests that archaeologists should be critical of both prior surveys and models derived from a priori anthropological expectations. More importantly, we need to formulate models which offer us the best chance of discovering sites in localities whose existence is not predicated upon either prior data or models.

With both of these problems in mind, we approached our research universe with some amount of hesitation. One of the only ways to generate data about the location, integrity, and content of sites in this archaeological frontier was to literally ask the people who owned the land. The resultant information, in true fashion, did little to solve our problem, but did convince us that systematic surveys of informants can produce invaluable information. Further, this method is less costly than others dependent on intensive field surveys or archival analysis.

Technique and Results

Through the cooperation of numerous town clerks in Litchfield County, a survey team of three persons gained access to each town's property maps. Most of the towns had a set of these maps which were often associated with high quality aerial photographs. Each map pertaining to our research area was traced and notes made as to ownership and size of tracts. Separate files, usually in the tax assessor's office, allowed us to locate current mailing addresses for each property owner. Our set of traced maps were used to quickly identify property owners and boundaries for tracts that we wished to test. A mailing list for our questionnaire was developed from the names and addresses taken from current tax lists.

A total of 623 questionnaires were mailed to owners of land along the Housatonic and Shepaug Rivers (see Table I). Each questionnaire was sent with a cover letter and a stamped, self-addressed envelope, making it as easy as possible for the landowners to reply. Individuals were asked to respond to seven questions:

1. How long has their family lived on the property?
2. How old is the house that they live in or rent?
3. Has any recent (post 1900 A.D.) land disturbance taken place on the property?
4. Are there any old house or mill formations on the property?
5. Have any Indian or Colonial artifacts been found on the property? If so, do they have a collection?
6. Do they know of any sites in the area not on their own property?
7. Do they know any individuals who have specific knowledge of the history or prehistory of the area?

Of the total of 623 questionnaires which were mailed, 143, or approximately 23%, were filled out and returned to the Institute. The rate of return varied from town to town and ranged between a low of 16% and a high of 38% from the village of Falls Village (see Table I). Fifty-two of the returned questionnaires contained valuable information about the presence of unknown prehistoric or historic sites or the names and addresses of knowledgeable individuals.

Three important historic archaeological complexes were identified by respondents including the Amesville complex (see Moore's paper), a series of cellar holes and mill sites in Sharon, and an impressive nineteenth century sawmill site in New Milford. Several unrecorded prehistoric sites were also reported including the significant locus known as Nelson I from the upper Housatonic Valley. Further analysis of our set of questionnaires will take place during the winter of 1978 and the spring of 1979.

Table I. Results of Systematic Questionnaire Sent by the AIAI, 1978.

Town	Number Sent	Number Returned	% Returned	Number Useful
Cornwall Bridge	42	9	21.42	3
Falls Village	21	8	38.09	3
Kent	92	21	22.82	6
New Milford	111	18	16.21	7
North Canaan	72	17	23.61	4
Roxbury	35	9	25.71	3
Salisbury	25	6	24.00	4
Sharon	101	26	25.74	7
Washington	82	17	20.07	8
West Cornwall	42	12	28.57	7
TOTALS	623	143		52

Overall Return Rate: 22.95%
Useful Return Rate: 8.34%

Assessment

On the basis of our experience, we would suggest that systematic questionnaires can be a valuable technique for discovering unknown prehistoric and historic archaeological sites. The technique is less costly than hiring a survey crew of two or three persons to cover an equivalent amount of area. The total cost for the questionnaire, including labor, was less than $500.00. However, the data do suffer from one drawback: the information retrieved is not about patterns or processes but is concerned with the location of cultural resources. One cannot rely upon the quality of negative data since there are a multitude of reasons why individuals would not report the presence of archaeological deposits, including a simple lack of knowledge. Thus questionnaires are probably one technique to employ on regional surveys as long as one understands that the data are of a locational nature.

B. Historic Maps as Anthropological Informants: Methodological Approaches and Theoretical Problems

by Russell G. Handsman and Christine Hoepfner

Introduction

As part of the survey program, archival research was undertaken in an effort to understand the socioeconomic and settlement history of towns in Litchfield County. The data which resulted from these studies allowed us, in a preliminary fashion, to isolate those significant social patterns and processes which evidently have been operative during the eighteenth and nineteenth centuries. More intensive studies of the historic resources and sociocultural processes of selected towns will begin early in 1979.

Another result of these archival studies, of greater importance to our fieldwork, was the identification and use of a series of mid-to-late nineteenth century maps, as informants. These maps were used to locate historic sties or structures along the river corridor. The following discussion summarizes our methods and results as well as our problems of theory and context.

Methods and Results

Two archival resources, the wall map of Litchfield County by Richard Clark (1859) and the County Atlas of Litchfield published by F. W. Beers and Company (1874), were crucial in determining the form of historic towns as well as the location of settlements and individual houses or mills. Evidently, the 1859 Clark map is based upon a series of individual town(ship) maps, also published by Clark, which date between 1850 and 1855. The Beers' Atlas is also based upon field surveys, probably dating from the early 1870's, so that these two maps are separated by some 15 to 20 years.

Upon detailed study, it is apparent that the later Beers' maps are not based solely on those of Clark since obvious differences can be isolated between them. For instance, by comparing one to the other, it is possible to find identical structures or groups of structures which are associated with different owners. One example of this sort of change in ownership is discussed by Moore in a later section on the Amesville Historic District.

In order to use these documents as field informants, it was necessary to transfer their information to a set of U.S.G.S. 7½" quadrangle sheets. The research corridor, as defined in Chapter II, was superimposed on the maps, and structures isolated which fell within the corridor. These structures then had to be transferred to a modern set of quad sheets.

To make this transfer, it was necessary to compare the natural and cultural features associated with an historic structure to (hopefully) similar features shown on the topographic maps. We found that the position and form of roadways as well as the local drainage features were the most efficient and accurate indicators of location.

Once a complete set of modern maps had been prepared with these nineteenth century resources, those kilometer sections which contained significant clusters or individual structures of interest were systematically walked. If sites were located, they were mapped and, sometimes, tested. It was on the basis of these maps that the significant cluster of sites known as HELCO or the Amesville Historic District was discovered. Likewise, the group of sites identified as Stanley Works I-VI and Housatonic Meadows III-VI, VIII, and X were first identified as potential sites from these historic maps (see Table II).

It was also possible to use these maps to check the reliability of field surveys. For instance, a field crew discovered a nineteenth century midden (Bottas IV South) in a plowed field along the Housatonic River in the Town of Salisbury. There were no standing structures adjacent to this site but both maps show a house in this locality between 1850 and 1880. A similar situation was also identified in the Town of North Canaan (Foley East). Thus these maps are not only reliable informants in that they can be used to locate sites, but are also useful as interpretive devices.

However, like most archival documents and informants, they do have their drawbacks. Problems of comparing the scale of historic maps to that of modern documents are always troublesome, especially in the absence of distinctive natural and/or cultural features. A second obvious problem is that these maps tell us little of the historic resources of the eighteenth and early nineteenth centuries. In fact, we located a number of historic sites, both residential and industrial, which were not depicted on either map and probably pre-date 1850 (see Table II). Thus, for most towns in Litchfield County, the exclusive use of these maps as informants would mean that a minimum of 100 years of occupation and industry would potentially be neglected. Both the Clark's map and the Beers' Atlas seem to be reliable informants within the context of the second half of the nineteenth century.

Problems of Theory and Context

Problems of scale and historical context can always be minimized through careful historic research including the cross-checking of a series of primary documents. However the use of these maps does present problems of a more implicit, less manageable form. One of these problems is contextual and associated with the concept of maps as artifacts of nineteenth century America. The easiest way to understand this problem is to realize that the reliability of these maps can be "tested" in terms of both known and unknown sites. On the basis of known sites and structures, we have judged Clark and Beers to be reliable informants.

However we have no way of evaluating their shortcomings as models of reality since we do not know what structures existed at that time which were not mapped. Since this data is not represented, it is assumed to not exist.

It is now being suggested that these documents must be studied within the context of map-making, as a business and profession, in nineteenth century America. We know next to nothing about how F. W. Beers went about creating a county Atlas even though the Beers family published numerous atlases over a period of more than 50 years. Most of these atlases seem to be based upon field surveys but the actual methods and theory are unknown. In addition, there is an obvious relationship between these documents, their form, and the public who served as a willing market. What were they used for, who bought them, and how were they made? These questions are contextual and the research of them will, in large part, determine their reliability as mirrors of reality.

The problem just discussed is not only contextual but is also reflective of a theory of perception which is implicit in modern America. Maps are not seen as artifacts but as documents which can be studied for their information rather than as signs of past meaning and behavior. In the same way, maps are studied as slices of time rather than as forms which result from both historical and cultural processes.

Maps of the mid-nineteenth century depict settlements in a specific manner, usually as a nucleated cluster of houses, commercial buildings, and industrial facilities. While these representations may reflect reality at the time they were drawn, they tell nothing of what historical processes are responsible for a settlement's form. For all their timeliness, maps tell us nothing of time, change, and process--they are timeless. Thus, by looking at maps of the nineteenth century settlements in Litchfield County, one can learn nothing about cultural processes, socioeconomic change and variability, and cultural innovation and devolution. Since these entities are what anthropologists study, the intensive use of maps, to the exclusion of detailed historiography, may lead us away from anthropology to chronicle.

Table II. Relationship between Historic Maps and Historic Sites.

Located Historic Site	AIAI #	Town/Site #		Field Strategy	Clark 1859	Beers 1874	Age (Ceramics)
Bottas IV (N)	0105	122	010	S	No	Yes	1820-1900
Bottas IV (S)	0106	122	011	S	Yes	Yes	1820-1900
C L & P II	0118	31	002	E	No	No	1790's-1850's
Dutchers Bridge Burying Ground	0101	122	007	S	Yes	Yes	
Falls Village Power Canal	0177	21	008	W	No	No	
Foley Field (E)	0095	100	001	S	Yes	Yes	1820-1900
Gay I	0164	125	011	M	No	No	
Gay II	0165	125	012	M	Yes	No	
Goodwin I	0089	122	003	S	No	No	1790's-1850'
Helco I	0132	122	020	S M E	Sc	Yes	1820-1900
Helco II	0133	122	021	S M E	Sc	Yes	1780-1900
Helco III	0134	122	022	S M E	Sc	Yes	1780-1900
Helco IV	0135	122	023	S M E	Sc	Yes	1780-1900
Helco V	0136	122	024	S M E	Sc	Yes	1780-1900
Helco VI	0137	122	025	S M	Sc	Yes	
Helco VII	0138	122	026	S M	Sc	Yes	
Helco VIII	0139	122	027	S M	Sc	Yes	
Helco IX	0140	122	028	S	Sc	No	
Helco X	0183	122	037	M	No	Yes	
Helco XI	0184	122	038	M	No	No	
Helco XII	0185	122	039	M	No	No	
Helco XIII	0186	122	040	M	No	No	
Helco Stone Quarry	0146	122	034	S	No	No	
Helco Tenant I	0141	122	029	S M	Yes	Yes	
Helco Tenant II	0142	122	030	S M	Yes	Yes	
Helco Tenant III	0143	122	031	S M	Yes	Yes	
Helco Tenant IV	0144	122	032	S M	Yes	Yes	
Helco Tenant V	0145	122	033	S M E	Yes	Yes	
Housatonic Meadows III	0149	125	004	M	Sc	Yes	
Housatonic Meadows IV	0150	125	005	M	Sc	No	
Housatonic Meadows V	0151	125	006	W	Sc	Yes	
Housatonic Meadows VI	0152	125	007	W	Sc	No	
Housatonic Meadows VIII	0154	125	008	M	Yes	Yes	
Housatonic Meadows X	0166	31	006	W	No	Sc	
Jacot Grist Mill	0157	96	009	M	No	Yes	
Jacot Saw Mill	0158	96	010	M	No	Yes	
Lardner I	0121	96	002	S M	Yes	Yes	
Lardner II	0122	96	003	S E	Yes	Yes	1800's
Lardner III	0123	96	004	S M	No	Sc	
Lardner IV	0124	96	005	M E	No	Sc	1800's
Lardner V (Saw Mill)	0125	96	006	S M	Yes	Yes	

Table II. Relationship between Historic Maps and Historic Sites. (cont.)

Located Historic Site	AIAI #	Town/Site #		Field Strategy	Clark 1859	Beers 1874	Age (Ceramics)
Stanley Works I	0172	68	004	S W	No	No	1820-1900
Stanley Works II	0173	68	005	S W	No	Sc	1800's
Stanley Works III	0174	68	006	W	No	Sc	
Stanley Works IV (Alder	0175	68	007	W	No	Sc	
Stanley Works V City)	0176	68	008	W	No	Sc	
Stanley Works VI	0178	68	009	W	Yes	Yes	
Steep Rock I	0179	150	005	M E	Yes	Yes	1760's-1850'
Swifts Bridge I	0161	125	009	M	No	No	
Swifts Bridge II	0162	125	013	M	No	No	
Swifts Bridge III	0163	125	010	W	No	No	
Swifts Bridge IV	0180	31	005	S M	Yes	Yes	1800's
Swifts Bridge V	0181	31	007	M	Sc	Sc	

Key:

E=Excavated blocks and STP's
S=Surface collected
W=Walked/located
N=Mapped
Sc=Problem of scale

C. Field Methods: Description and Evaluation
by John T. Stech

Introduction

A variety of field methods were used to undertake research on more than 50 distinct property tracts along both the Housatonic and Shepaug Rivers. The methods employed on each tract depended upon a variety of localized conditions including the nature of vegetation cover, the geomorphology and sedimentology of the tract, and the type of cultural resources. The following paper describes these methods and evaluates their use in terms of results achieved on spceific tracts.

Surface Reconnaissance

Where access to plowed fields was available and ground cover absent, large crews could effectively be used for controlled surface reconnaissance. Horizontal distributions of artifacts were observed and mapped, resulting in a complete picture of where concentrations of cultural materials were located within a specific tract. The density of material, the size of horizontal distributions, and the presence of diagnostic artifacts revealed important information as to the significance and extent of each site located by this method.

The fields tested had been plowed and planted with corn in the early spring. A total of 33 tracts were treated in this manner, consisting of approximately 350 acres. Excellent visibility of the surface was afforded during the early part of the summer while the corn was low. The use of weed killers by farmers varied from field to field but in a majority of cases, this practice kept the ground between successive rows clear.

The crew was lined up side by side in a sweep line that extended perpendicular to the orientation of the corn rows. Each crew member would walk between corn rows from one end of the field to the other, while staying abreast of each other. Each person would examine the ground directly in front and in the space between rows to the left and right. In this way each row would not have to be walked. The interval of empty rows between crew members was based upon the relative height of the corn and the amount of weed growth covering the surface. Following the corn rows provided a systematic method of obtaining complete surface coverage while maintaining a uniform and consistent interval between crew members.

The crew chief followed the sweep line, recording surface finds on a sketch map of the field. At first, surveyor's flagging was tied to corn plants to mark locations of individual finds or to delineate areas of artifact concentrations. Then the taped areas were recorded on the sketch map. This method proved inefficient since the tapes were not easily visible in a sea of corn plants and extra time was needed to relocate the marked areas.

Instead, each time a crew member found something, that person would simply stop and call out what the artifact was. The crew chief could then immediately plot the item on the sketch map by pacing the distance from the field edges or by counting corn rows from the field edges. As each sweep of the field was completed, the sketch map would slowly reveal horizontal locations and distributions of cultural materials.

We were able to test the effectiveness and accurary of this method of surface reconnaissance by applying it to fields known to contain sites as reported by local collectors. If the sketch maps revealed site locations that corresponded with known "hot spots", then an assessment of the validity of the method could be made. Two such fields, known to collectors, are Potter V and Nelson I in the towns of Canaan and Salisbury.

Both fields were walked, using the normal procedure, and produced maps with several surface concentrations and diagnostic artifacts. In Nelson I, an informant had stated that the eastern edge of the field was a particularly good spot to find "arrowheads". This location was in fact the area with the greatest concentration of surface material. By testing the accuracy of our method when applied to known sites, we were more certain that results observed from fields of unknown potential were valid.

The question of the validity of survey results became paramount quite early in the summer. In the upper Housatonic Valley there were many plowed fields located on large floodplains, adjacent to secondary drainage brooks. By employing a predictive model commonly used in locating sites, indications seemed to be that many sites would be located in these areas. Yet, the majority of fields yielded little or no cultural materials. Concurrently, fields which were slightly elevated and further from the river contained prolific sites with respect to size and density of cultural material.

The Potter farm in Canaan exhibited examples of both phenomenon. Potter I is an enormous corn field lying directly adjacent to the east bank of the Housatonic River. Typically its terrain exhibited almost no elevation changes and the soils were composed of sand and silt. Three artifacts were found in this entire field of 55 acres, without any associated chippage and at great distances from one another.

Potter IV is a smaller corn field, bordered on the west by the Housatonic and on the south by the Hollenbeck River. It is also very flat and sandy and two to three meters above the surfaces of both rivers. Only one broken, non-diagnostic biface was found. No other cultural material of any sort was seen on this lowland field located directly at the confluence of the Housatonic and one of its major tributaries.

Several fields on the Potter farm were located 1/2 to 3/4 miles away from the river at a slightly higher elevation than the floodplain areas. These were also walked but were found to contain important sites. Potter II and V exhibited rather extensive site remains with respect to both size and quantity of materials. The pattern exemplified by these fields became increasingly common as survey continued: non-sites in lowland areas of assumed high potential and significant sites elevated and away from the present location of the river.

Aerial photographs provided important clues as to the cause of this phenomenon. The topography of the upper Housatonic Valley, in most areas, is one of wide, flat floodplain formations. Extensive fluvial erosional activity was evidenced by the presence of active meanders, ox-bow remnants, and old meander scars that spanned the entire valley floor in many locations (see Handsman 1978 and Section IV).

These features were not readily visible from ground level. The wide floodplain is condusive to extensive meandering of the river bed. Such erosion and redeposition is very destructive to the lowland sites which were once located along the riverbanks. This helps to explain the presence of sites on slightly elevated tracts, away from the present river, and the absence of sites on the floodplain.

Evaluation: The speed of the crew was determined by several factors, including the amount of cultural material present. Naturally if nothing was found, the field was quickly and easily walked. Observations as to vegetation cover, soil and sediment types, and the presence or absence of cultural material were recorded and the field dispensed with.

If substantial amounts of material were present, the sweep line would necessarily slow down to allow for adequate recording of artifact locations. Another factor affecting pace was the degree of ground cover. When no weeds were present and the corn was low, progress was speedy and the interval between crew members could be increased. If the corn was high or the weed growth substantial, visibility of the surface was impaired and closer and slower examinations were required. The interval of empty rows between crew members was also reduced, resulting in an increase in the total number of rows that were actually walked.

Weather conditions were also a factor affecting the pace of the crew. On days when temperature and humidity were excessively high, progress would understandibly by adversely affected.

The procedure used to locate historic structures was different. After archival research had yielded the preliminary locations of historic remains, a reconnaissance crew was sent out to visually locate the sites. The size of the crew was variable depending on the amount of area to be covered and the extent of vegetation cover. A five meter interval between searchers was generally employed although dependent on the amount of vegetation cover. The crew members would generally keep abreast of each other and move together in a sweep line as in the corn fields. Topographic maps were carried by the crew chief and were consulted in order to maintain the correct orientation. The search areas were usually small and exhibited obvious topographic landmarks, fence lines, or stone walls which were visible on the map and facilitated movement.

Upon finding an historic site, the vegetation cover was cleared from the immediate foundation to allow for efficient mapping procedures. An effort was made to not clear too much vegetation, so that the site would not become more visible from public roads or the river. This was done to avoid possible looting by "bottle hunters" active in the area. Many of the sites were in good condition due to their concealment or their location on land not generally accessible to the public.

Surface collection of ceramics and other datable artifacts was occasionally done when judged to be an advantageous procedure. The specific location of artifacts was carefully recorded. A mapping crew would then be assigned to record the remains of cellar holes, standing walls, privies, wells, or other related components.

Shovel Test Pits

In areas where plowed fields were not present, surface reconnaissance would not be effective, due to the lack of visibility. These areas were either privately-owned fallow plots and hay fields or fields planted with a cover crop that would eventually be plowed under as fertilizer.

The best method for testing these areas was to excavate a series of shovel test pits (STP's). These units are relatively small holes, 30-40 cm wide and approximately 1.0 meters deep. They are arranged at the intersection of transect lines at 10 meter intervals to form an extensive grid. Although too small and unwieldy for intensive studies, STP's can be used as indicators of site size, density, and degree of stratification. They are particularly effective and produce significant results if used in an extensive grid arrangement, at a reasonably close interval. A total of 18 tracts were tested using this strategy, which accounted for a total of approximately 50 acres.

Several steps were involved when a tract was to be testing using this method. First, a mapping crew was assigned to shoot in two baselines at right (90 degree) angles. The location of the instrument station is important to facilitate complete coverage of the field by the transects and to allow for easy relocation in the future. Usually the highest spot in a field was chosen and the baselines placed somewhat parallel to the exterior boundaries of the selected tract.

Depending upon topographic limitations, the two baselines ran either through the center of the field or along two adjacent edges (with the instrument station in a corner). The intersecting transects were then plotted at 10 meter intervals along the baselines, by using a Brunton Compass or handheld 30-meter tapes extended from each baseline.

At every intersection of two transects, orange flagging was tied to a stake or to vegetation. Each flag would then be numbered consecutively with waterproof marker from one end of each transect to the other in one direction only. A scale map corresponding to the actual grid would simultaneously be plotted on graph paper while the grid was being laid out.

A crew of two people, supplied with a small STP sifter (½" mesh), a shovel, a trowel, a tarp, and a clipboard with a data sheet would be assigned to dig a complete transect. All fill was sifted onto the tarp by one person while the other dug the pit. Artifacts were collected in envelopes or bags and their provenience recorded along with soil type, color, and stratigraphy. The use of the tarps made backfilling neat and easy.

Recording of the soil and provenience data was done in two ways, dependent upon manpower conditions. Usually one of the two people digging the pits would complete the recording and then move on to the next location. Sometimes, there was a surplus of manpower due to fluctuating numbers of volunteers; not enough screens were available to supply an unlimited number of two-person crews. In this case, individuals with shovels would dig out all the pits in a transect and place the fill on a tarp. Following crews would screen the fill back into the hole after recording soil data.

Fortunately this method was only rarely used. It was quickly realized that more accurate observations could be made by the people actually digging the pit rather than by a following recording crew. Observations as to soil compaction, textural differences, and depths of artifacts are difficult to determine unless the recorder supervises the actual digging.

Upon completion of excavation, the data sheets were examined to determine which pits contained cultural material. Symbols were used to differentiate historic or prehistoric materials so that concentrations of either became immediately obvious. The data sheets were then reexamined to determine the relative densities and depths of artifacts. These data were then used to determine the extent and significance of subsurface cultural deposits.

Shovel test pits are an important and accurate tool which can be utilized for site location within specific tracts. The effectiveness and accuracy of the method can be tested by applying the technique to tracts that have sites already known to collectors or landowners. If the grid map is accurately representative of a known site, we can assume that the method probably identified unknown sites, in most localities.

In Gaylordsville, we tested an area known to contain several prehistoric sites on some upland property owned by John Brothers. The tested area was a hay field that had been plowed in previous years. It is located on a bluff between two known prehistoric sites, one in a corn field, 100 meters east of the grid, and another in a forest 100 meters west of the grid.

The area tested also yielded surface finds such as projectile points and knives in past years. After shovel testing, a concentration of pits which had yielded prehistoric material became evident in the northwest quadrant of the grid. The concentration indicated by the grid map corresponded precisely with the location of surface finds reported by Mr. Brothers prior to any excavation. Subsequent block excavation reinforced the validity of these initial results. Blocks placed within the artifact concentrations showed further evidence of aboriginal presence while blocks placed outside these areas contained little or no cultural material.

On another tract in Gaylordsville, a shovel test pit grid was mapped and excavated in a field of unknown archaeological potential. The Jacot pasture is located on a terrace just north of the confluence of Wimisink Brook and the Housatonic River. Concentrations of both historic and prehistoric artifacts were located in this field. Prehistoric material was primarily concentrated in the southern half of the field in an area sheltered by a higher glacial outwash terrace and bordered on two sides by water sources.

A smaller cluster of pits containing prehistoric material was found at the northern edge of the grid. Historic artifacts were found in many pits located in the southern half of the field. This material was concentrated in an area associated with known historic sites along Wimisink Brook. Archival data combined with visible remnants of foundations lead to the identification of several historic sites: a grist mill, saw mill, dairy house, and ice harvesting pond.

Unlike either of these examples, we did face situations where the results from excavating STP's were less than gratifying. The Titus field, for example, lies on a well-stratified floodplain adjacent to the Shepaug River near

Washington, Connecticut. Records of the Titus family (one of the earliest into the area) mentioned the presence of Indians in these fields. We fully expected significant results from this area. Unexpectedly, only two STP's (out of 72) contained artifacts of any type and these were single flakes.

Block excavations also revealed no indications of a real site, only infrequent isolated materials. Although all indications were favorable and even reinforced by local written records, no sites could be located here, using two different testing methods.

Block Excavations

A nested research design requires additional procedures that are used to investigate preliminary indications provided by initial surface reconnaissance or shovel testing. Wherever applicable, block excavations were done to provide information which could be compared with the results of shovel tests. In areas where we tested fields with no surface visibility, we immediately followed preliminary indications with deep subsurface block excavations. Usually the backfilling job from the shovel test pits was very neat and landowners had no objections to further excavations on their property.

The areas to be excavated had already been mapped in detail while constructing the shovel test pit grid and required no special mapping procedures prior to excavation. A total of 16 tracts were tested through the excavation of 43 one and 1.5 meter squares.

The preliminary use of block excavations was to reinforce or supplement indications provided by shovel testing through increasing the sample size and quality of data retrieved. Controlled deep testing provided an acceptable understanding of site conditions necessary before management recommendations could be made.

Another use of block testing was as a test of the effectiveness and significance of shovel testing. Squares were placed within concentrated areas of cultural material and also within areas shown by the STP's to have little or no cultural material. This allowed us to further determine the effectiveness of our research methods and to refine them for subsequent use.

At the Brothers site, in Gaylordsville, this kind of comparative research was carried out. Blocks were dug within areas where sites were located by shovel testing. Blocks excavated in areas shown to contain no cultural material yielded no material but were useful in checking the effectiveness of the STP method.

Blocks were also excavated at historic cellar holes as an aid to determining age and the form of the associated cultural deposit. The prime objective of these units was to locate the builder's trench and retrieve an adequate sample of ceramics which could be used to check the reliability of age estimates based on archival documents.

Mapping

The accurate mapping of all tracts and structures was a necessary prerequisite to the accurate recording and subsequent relocation of these resources. Different mapping procedures were associated with each specific research method.

The simplest mapping technique was that of the sketch map, used for recording results of surface reconnaissance. The technique required that an outline of the field's borders be drawn in the crew chief's notebook. This was done from an elevated spot while the crew was lining up across the corn rows. Topographic features within each field were noted and drawn on the sketch map.

As cultural material was found, its position was recorded in the corresponding location on the map. Absolute precision was not deemed necessary with respect to each artifact observed. The content and extent of such sites were described in field notes and locations of deposits recorded on the sketch map. In this way it would be possible to later return and employ a systematic and controlled application of subsurface testing to further determine site size, content, and condition.

The most common mapping technique employed for subsurface testing was the construction of a grid for shovel testing. An instrument station was chosen, either in the center of a field or in one corner, preferably on the highest ground available. Two baselines were plotted at 90° to each other and roughly parallel to the borders of the tract. Transects were then extended 90° from each baseline at every 10 meters in order to form an intersecting grid with 10 meters between pits in every direction.

The transects could be plotted in two ways. The initial method utilized Brunton Compasses to sight along a tape extended 90° from the baseline. Error was found to be large when the 10 meter interval was checked with tapes. For example, if we used a north-south baseline and wanted to run east-west transects, each transect had to be individually sighted with the Brunton first on the east side of the baseline and then on the west side. Often these transects were rather long, sometimes exceeding 100 meters in either direction. Error in sighting the tape at that distance with no magnification or in reading the degree bearings was common. Even a slight error at less than 50 meters became greatly exagerrated at more than 100 meters. Transects were checked at extreme distances from the baseline and sometimes found with error greater than 2.0 meters.

An alternative was arrived at by using 30 meter tapes, one extended from each baseline so as to intersect at 10 meter intervals. Each quadrant of the grid was plotted in this fashion using real measurements and straight lines represented by the hand-held tapes. In this way, error is minimized through constant measurement. At a distance of 180 meters from the baseline, the error was found to be less than .5 meters, using this method.

Historic resources required the mapping of all structures and related features such as wells, sheds, barns, privies, and middens. Detailed measurements were made of the structure's width, length, wall thickness, wall height, and portal openings. A crew of four was utilized to take measurements and record the data.

A Brunton bearing was taken along one of the major walls and all other features measured in relation to it, using the 30 meter tapes. Once the structure was mapped, the distance from two different corners was measured to one immovable datum point to facilitate precise relocation. Such detailed mapping procedures demonstrated the size, configuration, number, and proximity of outbuildings and other structures and can aid in leading to significant determinations as to use, age, and occupational duration of such resources.

D. The Amesville Historic Complex: Description and Interpretation.

by Colette B. Moore

Introduction

On the basis of intensive field and archival research, a significant cluster of nineteenth century historic sites was isolated in kilometer section 012, along the west bank of the Housatonic River. This complex, consisting of 15 sites, has been named the Amesville Historic District, and is here interpreted to be eligible for inclusion on the National Register of Historic Places. What follows is an analysis of this significant complex, based upon field research completed by the crew as well as a study of primary historic documents undertaken by Joanne V. Bowen and Colette B. Moore.

Field Studies

As part of the cultural resource survey conducted by the AIAI during the summer of 1978, investigations were made in Amesville, Connecticut on a tract of land currently owned by the Hartford Electric Light Company (Helco). The community of Amesville is located in the northeastern portion of the town of Salisbury. It consists of a narrow floodplain bounded on the east by the Housatonic River and on the west by hills of moderate elevation. At present, Amesville is a residential community consisting of a few dozen houses.

The property on which the investigations were conducted is located just north of the sill dam across the Housatonic River constructed by the power company. It exists as a series of thirteen cellar holes, a water raceway, and a stone quarry and is bisected by the Housatonic River Road. Vegetation cover includes very dense brush and small to moderate sized trees. Poplar and ash predominate near the river and white cedar on higher elevations to the west and north. The southern end of this property is open to the public as a boat launching area.

The field activities undertaken at Amesville were of two kinds: 1) surface survey which includes walk reconnaissances, surface collection of artifacts, and mapping of cellar holes and 2) subsurface investigations which include the excavation of shovel test pits and one meter squares.

A preliminary survey of the area was conducted on July 4, 1978 by a field crew including members of an Earthwatch Team. At that time the cellar holes were located and assigned site numbers in order of discovery. A surface collection of artifacts was also made during this survey. Following this preliminary reconnaissance, more intensive fieldwork was completed over the course of five days, by a field crew and individuals from Earthwatch Team #2, in late July.

Site Description

Helco I is an 11 x 14 m cellar hole located on the west side of Housatonic River Road, approximately 70 meters north of the access road to the boat launch. It is constructed of stone blocks and mortar and the walls are in good condition. Two depressions are associated with this cellar hole, one near the west wall and the other near the northwest corner of the foundation. Some debris was visible on the cellar floor but the foundation does not appear to have been used as a dump. Ash and cinders were visible on the ground surface along the north, west, and south walls. A one meter square was excavated near the central portion of the east wall. Artifacts recovered include pipestem fragments, ceramics, glass, and brick. A complete list of ceramics from all excavations can be found in Table III.

Helco II is a 10 x 14 m cellar hole located on the west side of River Road, 13 meters south of Helco I. Construction is identical to that of Helco I, and all the walls are in good condition. A large pile of ash and cinders mixed with ceramic, glass, and slate fragments is located in the cellar hole. Cinders and slag are scattered over the ground surface near the southwest corner of the foundation.

A square, stone-outlined depression, filled with brick and rubble, is located 17 meters west of the southwest corner of the foundation. A one-meter square was excavated outside the east wall near the northeast corner of the cellar. Glass, nails, brick, and pipestem fragments were recovered as well as an exceptionally large number of ceramic fragments (see Table III).

Helco III is a cellar hole measuring 6 x 14 m and is located on the east side of River Road, approximately 200 meters north of the access road. Construction is of cut stone; the walls are heavily overgrown and are in poor condition. There is a heavy scatter of cinders and slag on the surface between this foundation and the backwater pool of the Housatonic River. A one-meter square was excavated outside the south wall and produced nails, ceramics, bone, slate, brick, mortar, and some pipestem fragments.

A stone-covered water conduit is located north of this foundation. It runs from west to east, starting at a culvert under the Housatonic River Road and terminating in the backwater pool of the river. There are three surface exposures along its length of 85 meters. The westernmost exposure is a section where a partial collapse of the conduit occurred. The second is a stone-lined rectangular opening with outward sloping edges. The easternmost opening is Y-shaped and appears to mark a point of intersection with another collapsed raceway joining it from the north. This opening is constructed of cut stone and mortar. The water drops 1.5 meters at the base of the "Y", passes through an iron-barred grate, and continues underground to its termination point.

Helco IV (10 x 11 m) is located south of Helco III on the east side of the road. The construction is of stone blocks and mortar. The walls, particularly the south and east walls, are in very poor condition and heavily overgrown. A scatter of cinders and ash covers the ground surface between it and the backwater pool of the river. A stone-lined well, approximately 1.60 meters deep, is located four meters east of the foundation. A one-meter square was excavated along the east wall near the southeast corner. Excavated artifacts include glass, ceramics, bone, nails, and brick fragments.

Helco V (8 x 12 m) is located several meters south of Helco IV on the east side of River Road. The walls were built of cut stone and mortar and their interior faces are in very poor condition. A pile of brick rubble, possibly a remnant of a fireplace, is located inside the cellar hole, midway along the south wall. A stone-lined, shallow well is located 6 meters east of the southeast corner of the foundation. A one-meter square was excavated near the southeast corner of the cellar hole. Artifacts include glass, nails, ceramics, pipestem fragments, and other articles.

Helco VI is located several meters south of Helco V on the east side of the road. The construction is of cut stone and mortar. The dimensions of this cellar hole are rather unusual, being 22 meters long and only 7 meters wide. A low cut stone foundation wall, 6 meters east of the cellar hole, runs parallel to the east wall for approximately 10 meters and terminates, at the south end, in a brick section which may be the foundation for a chimney. The walls are generally in good condition, although covered with vegetation. The length of the structure in relation to its narrow width suggests that its function may not have been residential. This site was not tested.

A group of 27 shovel test pits were excavated at 10 meter intervals in the area between the backwater pool and the cellar holes of Helco III, IV, and V. The whole area covered by the grid appears to be a refuse midden with cinder and ash as its main component. Artifacts, exclusive of this debris, include ceramics, glass, nails, shell, and brick fragments.

South of Helco VI, just north of the access road to the boat launch, field crews isolated a surface scatter of historic artifacts. While there are no visible remains of house foundations, Richard Clark's map of 1853 shows a structure in this locality. It seems that this structure, as an archaeological site (Helco IX), was destroyed by recent bulldozing, associated with the construction of a transmission line.

Helco VII is a foundation located 20 meters north and 50 meters east of the culvert previously mentioned. It appears to be a three-sided structure built of cut stone and mortar. All three walls are intact, and there is no sign of a fourth wall to the south. The outside ground surface of each wall is level with the height of the foundation walls. This three-sided structure may have been used as a barn, a building into which wagons could be drawn, or possibly something in association with a weigh-scale thought to be located in this area.

Helco VIII is located 100 meters north and 30 meters east of the culvert beneath the Housatonic River Road. This is a rectangular cut stone and mortar foundation (5 x 13 m), badly deteriorated on the northeast corner and along the east wall. There is an interior structure midway along the north wall which projects about 2 meters into the cellar hole and may be a chimney foundation. Neither Helco VII nor Helco VIII was excavated.

A group of five cellar holes (Helco Tenant Houses I-V) are located along an old road which runs due west from the Housatonic River Road, at a point opposite Helco VI. These structures appear on the 1853 and 1859 Clark maps and evidently belonged to the Ames Iron Company. The group is also present on the 1874 Beers' Atlas map (see Figure) but identified as the property of the Housatonic Railroad Company. It is assumed that these structures were built to house families who worked for the Iron Company or, later, for the Railroad. Only one of these sites (House V) was tested this summer.

Tenant House I is a cut stone and mortar rectangular foundation, 9 x 10 m in size. The walls are in poor condition. The interior of the cellar hole has been used as a recent dump and contains the remains of a 1930 vintage automobile. Large cedars are growing on the interior and along the northwest side of the foundation. Four depressions are associated with this cellar hole. Two are located three to four meters south of the south wall, one is about a meter north of the north wall, and the fourth is six meters north of the north wall. This depression is outlined with cut stone. No well was found nearby.

Tenant House II, 8 x 11 m, is constructed of cut stone and mortar and has also been used as a garbage dump. Four depressions are associated with this foundation: a small, circular depression two meters from the northwest corner; a small, square depression one meter from the southeast corner; a large, square depression one meter from the south wall and filled with brick, mortar, and stone rubble; and a small, rectangular depression one meter from the center of the north wall.

Tenant House III is a square, cut stone and mortar foundation, 8 x 11 m. There are no interior wall extensions or exterior cellar openings. There is a pile of brick rubble along the center of the south wall which may be the remains of a fireplace. The walls are in generally good condition with no recent disturbance of the structure. However, the foundation has recently been used as a garbage and trash dump. There is a square depression associated with this foundation approximately three meters south of the southeast corner. A very low stone wall, running in an east-west direction, is located about 4.5 meters from the south wall.

Tenant House IV is a 8 x 16 m foundation of cut stone and mortar and is in fairly bad condition. The exterior walls are covered with earth and an overburden of garbage and trash. The interior walls are intact. There appear to be no interior walls or exterior cellar openings. There are two square depressions located south of the south wall. The first is stone-lined and filled with earth. The second, directly south of the first, is also stone lined and filled with brick and mortar rubble. A collapsed stone-lined well is located nine meters north of the northwest corner of the foundation, near the edge of the road. Since no other well was found in the area, is it assumed that this well supplied water for all five tenant houses.

Tenant House V is a square cut stone and mortar foundation. Both inside and outside walls are in good condition. The cellar hole (9 x 18 m) has been used as a garbage dump, but the amount of material is noticeably less than in the other foundations. There are no exterior openings to the cellar. A square stone lined depression is located four meters south of the southwest corner of the cellar hole. A one meter square was excavated along the outside of the east wall in an attempt to locate and date the builder's trench. Artifacts recovered included buttons, nails, brick, glass, and an 1867 nickel. No ceramics were recovered from this excavation.

A stone quarry was located about 50 meters south of Helco II and continued in a northwesterly direction along the base of low bluff. Initially this area appeared to be a natural ravine, filled with ash, cinders, slag, and ceramic and metal fragments. Upon closer examination, it became evident that both the narrow ends were terminated by vertical rocks approximately 1.5 m high. Quarry marks were present at these ends and along both the north and south faces. A surface collection was made in an attempt to date the material. This collection was selective, consisting primarily of utilitarian vessels of salt glazed stoneware or glazed earthenware. The glass jars and bottles appear to be of the "patent medicine type" popular during the late nineteenth and early twentieth century.

Helco X has been identified as the reservoir shown on the Beers 1874 map (Figure 3). It is located approximately 60 meters north of the backwater pool previously described. The north wall of the reservoir is built into the hill which rises to the north of the site. The other three sides are enclosed by earthen banks at least one meter thick at the top. The earth enclosure is mounded on top of the stone foundation walls to a depth of 15 cm. Its construction is of stone and mortar with a brick cap about 25 cm thick. The bottom of the reservoir appears to have been cut from bed rock, with stone blocks laid on top of the bed rock base in order to increase the depth. The interior of the tank is lined with mortar on all four walls to a height of approximately one meter. This lining has pulled away from the foundation along the north wall. The area has been used as a recent dump and has also been filled with trees and branches apparently cut by the power company. Due to the excessive amount of debris, it was not possible to determine the construction of the pit bottom. The walls are in generally good condition with the exception of the northeast corner where both stone blocks and brick capping are missing from the east and west faces. A large stone retaining wall runs in an east-west direction along the southern base of the reservoir "hill".

Helco XI is a small foundation (6 x 6 m) located a few meters south of the above mentioned retaining wall. It is located slightly to the northeast of the site numbered Helco VII and 40 meters north of the backwater pool. The east and west walls are of stone and mortar construction, being approximately one meter thicker at the base than at the top. Earth is mounded against the outside walls to a thickness of at least one meter and along the top of the walls. The north wall is mostly brick construction and appears to be built into the hill. A low ridge of rubble and brick is located where a south wall would naturally occur. Whether or not this is a collapsed foundation wall could not be determined without further excavation.

This building appears to have been a secondary reservoir and to have been associated with the functioning of the main reservoir. No excavations or collections were made at these two locations.

The two stone and mortar foundations known as Helco XII and XIII are located on the west side of the Housatonic River Road, north of the road leading to the tenant houses. These structures are not shown on the 1874 Beers map but appear on the 1899 Sanford map, as the property of the Railroad Company. They are almost identical in dimension (6 x 12 m) and general plan and it is assumed that they were constructed after 1874 and before 1899 as additional housing for the railroad workers.

Helco XII has been used as a recent dump and is heavily overgrown with brush and weeds. A large pile of rocks seems to have been dumped into the cellar hole along the west wall. Otherwise, the walls are in generally good condition, although overburdened with dirt and missing stones.

Helco XIII, located about five meters south of Helco XII, shows few signs of disturbance and is covered with noticeably less vegetation. This may be due to the shade of a large maple tree growing at the edge of the south wall almost within the foundation, and a large apple tree on the northwest corner of the house. The walls are in generally good condition except for the cellar stair opening at the southwest corner which has slumped badly into the foundation. No excavations or surface collections were made at either of these locations.

Documentary Research

Early Settlement

The sale of the towns of Salisbury and Canaan took place in 1738. Prior to that time, the area had been chosen for settlement by a few prosperous farmers from New York State (Fales 1972:8). They were soon followed by some enterprising businessmen who recognized the potential of the natural resources of the area--superior iron ore and an abundance of water power. In 1731, a group of seven wealthy stockholders acquired the property subsequently known as Ore Hill and, in 1732, started mining operations there. This mine became one of the most productive in Salisbury.

Shortly thereafter, Thomas Lamb acquired the rights to another ore bed between Lakeville and Salisbury, built a forge on the Salmon Kill River in Lime Rock, and acquired extensive water rights throughout the area (Pettee:7). Thus, at the time the town was sold, both farmers and industrialists were firmly established in the region.

After the sale of the town, the new proprietors were quick to take advantage of the available natural resources. In 1738, a sawmill was built on the east side of the Housatonic River near the Great Falls. A gristmill soon followed and, within the next several years, a bolting mill, a fulling mill, and two iron works were in business (Graham 1975:12).

In 1744, a bridge was erected over the river just below the falls. Up until this time the river had been crossed either at a ford below the falls or by canoe. The construction of the bridge simplified the commercial relations which had already been established between the towns of Salisbury and Canaan. Before long, the west side of the river, known today as Amesville, began to be developed. The Ensign family, who already had business interests in Canaan, built a sawmill and a papermill on the river near the Little Falls. They also ran an Inn and a store nearby. A few years later, Bradley's furnace went into operation, just north of the bridge (Graham 1975:13).

As the towns continued to grow, furnaces and forges were started in various locations throughout the region. Populations tended to cluster around these new industrial centers. By the close of the eighteenth century, a number of small villages, separated by farmlands, were established throughout the area. It is interesting to trace the growth of the two settlements of Amesville and Falls Village. Although separated geographically by the river and politically by town, their development pattern implies that they considered themselves as one community. For a number of years they even shared the name of "Falls Village".

Ames Iron Company

The first purchases of land connected with the Ames Iron Company were made in 1832. John Eddy, Horatio Ames, and Leonard Kinsley bought two adjacent tracts from John Adam and Nathaniel Church. The property was located about one-half mile north of the Falls Bridge, bounded on the east by the river and on the west by the "highway", now the Housatonic River Road (Salisbury Land Records, Volume 19:133, 134).

Although there are no direct documentary references to the construction of the ironworks, it must have been built between 1832 and 1835. In a deed dated March 26, 1834, Leonard Kinsley released his interest in all lands, "buildings, tools, and all articles manufactured in and upon the premises" to Horatio Ames (Salisbury Land Records, Volume 26:46). During the next few years, Oliver Ames bought out the interests of Eddy, Kinsley, and his brother Horatio. According to the 1838 Salisbury tax records, by 1838, Oliver Ames, a non-resident, was the owner of four houses and two business establishments (Salisbury Grand List 1838).

In this same year, the Housatonic Railroad Company was granted a charter to construct and operate a rail line between New Haven and the Massachusetts border. By 1841, the railroad had reached Canaan and a spur line was constructed across the falls, directly into the Iron Works (Fales 1972:12).

The arrival of the railroad ushered in a period of economic growth, both for the Iron Company and for the community. Travel, which up until this time had been by horse and wagon over muddy roads, was greatly facilitated. The accounts of P. Mansfield of North Egremont, Massachusetts for 1841 show that a large number of wagon repairs were made for Oliver Ames.

In 1844, the Iron Works were expanded. Horatio Ames acquired land on the west side of the highway, as did Oliver in 1846. In 1847, Horatio bought out Oliver's interest in the works for the sum of $40,000.

Unfortunately, the tax records for the town of Salisbury for the first half of the nineteenth century are very sparse and, as a result, tracing the growth of the industry has been difficult. The 1853 and 1859 maps by Richard Clark show the Iron Company as a cluster of structures on the east side of the road. Some of these structures are noted as being "works," "store," "forge," etc. However the designations on the 1853 map do not match those on the 1859 map and it is impossible to locate any of these structures with confidence. Both maps, however, do show a group of five buildings located at the end of a lane, due west of the plant. These structures are noted as belonging to H. Ames Iron Company, and have been identified as tenant houses built by the Company to house their workers. Exactly when the buildings were constructed is not known, but the land on which they are located was acquired in 1844 (Salisbury Land Records, Volume 23:468).

By 1850 the Ames Iron Works was valued at $150,000.00, was doing $180,000.00 worth of business annually, and was employing 80 men. It is listed as the most valuable works in the area at that time.

Expansion of the works apparently continued into the next decade. In 1852, Horatio Ames bought a number of building lots along "a newly laid road" near the iron works (Salisbury Land Records, Volume 26:81, 82, 83, 84). This road is presently known as Puddlers Lane and the houses on it appear to be of similar construction and age. Since all the sellers of these lots who appear in the 1850 Federal Census records are listed as being either refiners or forgemen, it is assumed that these houses reflect an increase in the number of industrial workers.

Shortly after this, in 1853, Horatio Ames put all his property in the name of the Ames Iron Company (Salisbury Land Records 26:518). During this time of expansion, the community of Falls Village was also experiencing a period of growth. New businesses and houses were built near the station (Fales 1972:14). The Iron Bank opened in 1847 (Fales 1972:19). A cursory examination of some account books located in the Falls Village Historic Society shows that business was brisk. Among those having accounts with the Belden and Miner Company in Falls Village during 1848-1849 were Horatio Ames, the Ames Iron Company, and the Housatonic Railroad Company. Customers from both Amesville and Falls Village seem to be equally well represented.

Before the outbreak of the Civil War, the Iron Works began to experience some financial difficulty. According to an article in the Connecticut Western News (August 25, 1871), this was due to the importation of cheap English iron and the use of cheap English labor. In 1861, Ames began the manufacture of wrought iron cannon for the United States Navy. These 50-pounders were the first wrought iron guns of any size to be made in this country (Harte:19). In spite of the superior quality of these cannon, Ames' financial difficulties continued. In 1863, the plant went into receivership (Salisbury Land Records, Volume 29:75) and was bought by Oliver Ames (Salisbury Land Records, Volume 29:80, 81). The end of the Civil War destroyed the market for cannon. Horatio Ames took out patents in his own name in both England and France, apparently with the idea of manufacturing cannon in Europe (Connecticut Western News August 25, 1871). Nothing seems to have developed and, in 1871, after a period of ill health, Horatio Ames died. Less than two months after his death, Oliver Ames Jr. sold the entire property to the Housatonic Railroad Company.

Housatonic Railroad Company

The acquisition of the property by the railroad signaled a period of change in the Amesville community. These changes were evidenced by 1) an extensive reconstruction program within the industrial area and 2) a shift in the population, as railroad employees replaced the skilled iron workers who left to find employment in other towns.

According to a series of articles published in the Connecticut Western News during this period, a number of the buildings connected with the Iron Works were torn down in order to permit the construction of a railroad roundhouse and other buildings. In addition, the height of the railroad tracks crossing the river was raised by four feet, as was the area beneath the roundhouse itself (Connecticut Western News, August 2, 1872). A reservoir was constructed on "the hill behind the works" in order to assure a constant supply of pure water, needed to service the locomotive engines. Gas was also manufactured by the company in a "gas house on the hill" and used for lighting in the shops (Connecticut Western News, January 10, 1873).

Reconstruction activities were not confined solely to the industrial complex. At the time of the sale, the property included "17 dwelling houses, which contained 25 tenants" (Connecticut Western News, July 21, 1871). These houses were repaired and repainted and new wells were dug (Connecticut Western News, July 31, 1872). At the same time, "a drain, inlaid and covered with quarry stone" was constructed across the entire site, running from the culvert beneath the River Road to the Housatonic River (Connecticut Western News, August 2, 1872). This drain has been identified as the water conduit described in the previous section. The stone used in building the drain was undoubtedly drawn from the stone quarry behind Helco II.

In addition to progress reports on the new building program, newspaper articles at this time are filled with the names of the iron workers who had been forced to leave the community to find jobs, and the names of the new Railroad Company employees.

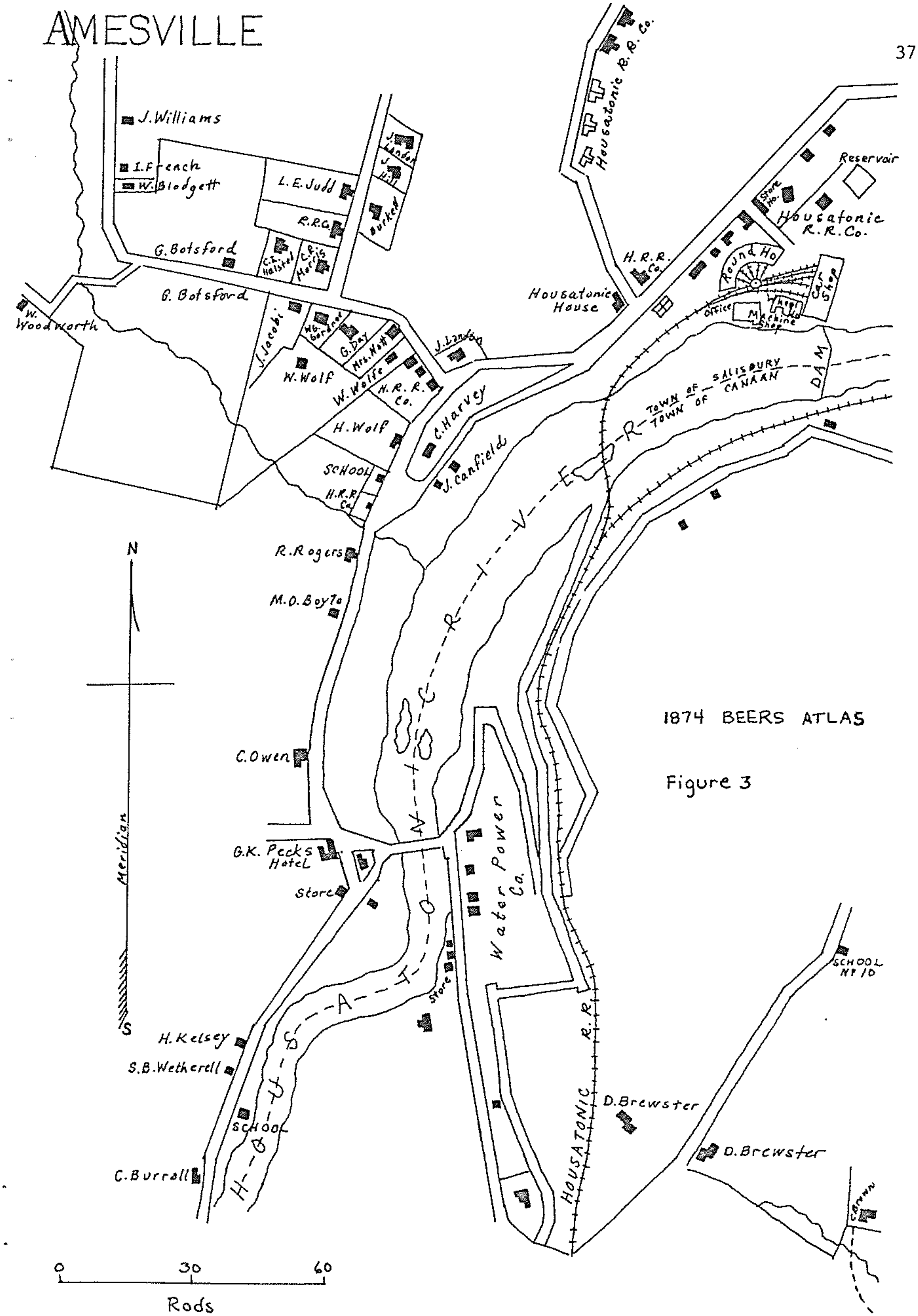
By 1880, a whole new industrial population had appeared and the only familiar names in the 1880 Census Records are those of the farmers who remained in the community during these changes.

Information about the decline of the railroad industry toward the later part of the century is rather sparse. On April 1, 1893, the Housatonic Railroad Company leased the Amesville property to the New York, New Haven, and Hartford Railroad Company (Fuller n.d.). During the next few years the volume of work done at Amesville declined. Newspaper items frequently refer to the loss of work and the gradual transfer of workers out of the area. In March of 1898, the Housatonic Railroad Company was merged with the New York, New Haven, and Hartford Railroad Company. This merger apparently signalled the abandonment of the site until, in 1912, the property was acquired by the Connecticut Power Company (Fuller n.d.).

Mrs. Otho Sabine, a local resident, recalls that at that time the industrial buildings were blown up, and the tenant houses were either moved or torn down. She remembers being frightened by the noise of blasting and that "the whole place was full of red dust from the bricks" (Wingard 1978:D4).

Construction by the Power Company has been confined to the east side of the Housatonic River and, except for dumping activities and the use of the area as a boat launching site, the property has remained relatively undisturbed until the present time.

AMESVILLE



1874 BEERS ATLAS

Figure 3

Analysis and Interpretation

The Amesville locality has been interpreted as a nineteenth century industrial site, having both an industrial and a residential component. This interpretation is based on documentary evidence including land records, tax and census records, and newspaper articles along with information gathered from field activities during the summer of 1978.

Unfortunately, little can be said about the archaeology of the industrial component, as the area in question was destroyed after each industrial occupation. As previously discussed, the majority of the industrial buildings associated with the Iron Works were dismantled and the area was filled. The blasting of the Railroad Company's industrial complex has totally destroyed the integrity of the land in this location, resulting in the creation of the backwater pool. The only buildings connected with the industrial complex which remain are the reservoir and the small building south of the reservoir. Therefore any information pertaining to this component must be based on documentary evidence.

The residential component, however, appears to be fairly intact and undisturbed. The cellar holes are generally in good condition, and the ground surface around the cellar holes seems to have suffered minimal subsurface disturbance.

As discussed in a previous section, it is difficult to conclusively identify any single structure (except the reservoir) in terms of Clark's, Beers', or Sanford's maps. The foundation of Helco III appears to be the same general shape and is located in the same area as that structure noted on the Beers' 1874 map as "Store House." However, since the water conduit does not appear on any map, and since the ground surface south of Helco VI has been disturbed, identification of this foundation must remain tentative. A few structures are shown on both the Beers and Sanford maps located close to the Housatonic River Road and north of the main cluster of buildings. Repeated searches failed to uncover any traces of these structures in the field.

The Helco VIII foundation appears to be the structure on the Sanford map, located west of the reservoir and at an angle to the Housatonic River Road. A building oriented at a similar angle is shown on the Beers Map, but much closer to the main cluster of buildings. Whether or not the same building is being represented on both maps is not clear. Since no excavations were undertaken near this foundation, no further interpretation can be made about this building.

The remaining cellar holes (except for Helco VII) apparently represent the foundations of tenant houses, lived in by the factory's employees. Most of the houses were originally built by the Ames Iron Company and later refurbished by the Railroad Company. Two structures, Helco XII and Helco XIII, are thought to have been built by the Railroad Company in the 1880's.

The artifacts recovered from the excavations at Helco III, IV, and V are fairly uniform in terms of artifacts type and frequency. Nails, glass, and metal fragments, plus some sherds, were found in all squares. Pipe bowl fragments were found at Helco III and Helco V. Nails and glass fragments were numerous in the upper levels of excavation while ceramics were generally found in all levels. The large proportion of nails and glass near the surface is consistent with the documentary evidence pertaining to the destruction of the buildings at the close of the nineteenth century. Window glass fragments outnumbered other artifact types.

Other than window glass, ceramics were the most frequent artifact class. The dateable fragments fall into a time span between the late eighteenth and early twentieth centuries. Most material was either pearlware or white earthenware, although a number of creamware fragments were found at Helco II. Some fragments were identifiable as plate rims; other fragments, decorated on both surfaces, were identified as portions of bowls or cups. Although many fragments were too small for detailed analysis, the majority of the sherds are undoubtedly parts of eating and drinking vessels rather than cooking and storage vessels (represented by lead glazed earthenwares and stonewares).

In view of the types of artifacts excavated, it seems clear that this part of the site was used primarily as a residential area during the entire period of site occupation. The excavated ceramics date to the nineteenth century. Although there are no direct references in the documentary records as to the time when these structures were erected, the Salisbury Grand Lists show a steady increase in the number of dwelling houses owned by the Ames Iron Company in the late 1840's and early 1850's. It is reasonable to assume that they were constructed by the Iron Company during this period. The more recent ceramics associated with surface collections were probably deposited after the site was abandoned.

Since no excavation was done near the Helco VI foundation, no artifacts are available to aid in interpreting the function of this building. Because of its unusual dimensions (7 x 22 m), it was at first considered to be part of the industrial complex. However, newspaper articles from the 1870's suggest that all the industrial buildings were torn down and only the dwelling houses left standing. Unfortunately, no structure of these general dimensions is shown on any of the maps. Without archaeological evidence, no further interpretation can be made.

The artifacts recovered from excavations at Helco I and II are similar in type and age to those recovered from the east side of the Housatonic River Road. Ceramic artifacts from Helco II are more numerous than from any other square within the area of investigation. Whether the larger number of artifacts reflects a more intensive use of this particular site cannot be determined at this time. Since only one square was excavated at each cellar hole, this discrepancy may simply be due to the location of the square relative to the builder's trench.

Aside from the differences in relative frequency, the ceramics from Helco II tend to fall within the same time span and typological categories as those from the Helco III-V excavations. Pearlware and white earthenware are equally well represented and found in every level. Creamware fragments, although fewer in number, are also found in all levels. Nails, glass, and pipe fragments seem to be associated with the upper levels. Evidence from primary archival documents suggests that both Helco I and II were used as dwelling houses for families who worked at either the Ames Iron Company (1850 Federal census) or, later, the Housatonic Railroad Company (1880 Federal census).

It is also assumed that the Helco Tenant Houses were used as residences, first by the Iron Company employees and later by the Railroad Company workers. This cluster of buildings appears on the earliest maps (1853, 1859) as belonging to "Ames Iron Works." They are listed on the Beers and Sanford maps as belonging to the "Railroad Company."

The houses' distance from the main cluster of buildings may be explained by geographical factors. The houses are located on a high ridge of land west of the Housatonic River Road. The small terrace below this ridge is poorly drained as is the land directly west of the Housatonic River Road and north of the Helco I and II sites. This ridge may have been the most suitable building place at the time.

A single one-meter square was excavated within the Tenant House cluster. Although the square yielded no ceramics, a large proportion of artifacts connected with clothing (buttons, studs, etc.) was recovered, as well as a nickel dated 1867. On the strength of the documentary evidence and the few artifacts recovered, these foundations have been interpreted as residential units.

The two structures known as Helco XII and XIII do not show on the Beers map but appear on the Sanford map (1899) as property owned by the Railroad Company. The water conduit, built by the Housatonic Railroad Company, may have facilitated the drainage of some of the wet area west of the road and permitted building at this location. Some fill may also have been added to raise the grade. The similarity in size and in plan of these two structures makes it almost certain that they were built by the Railroad Company after 1874. They were probably additional tenant housing, but since no excavations were conducted at these locations, this can only be an assumption, pending further work.

The Helco VII foundation located north of the water conduit has been interpreted as a barn constructed by the Iron Company. Since no excavations were conducted here, no artifactual evidence is available. However, two documents pertaining to this occupation mention the presence of a barn. One, a land deed from Sewell Abbott to Oliver Ames (Salisbury Land Records, Volume 21:105), mentions a "building now used as a horse shed." The other is a newspaper article which mentions "a barn worth $6000.00" among the assets of the Ames Iron Company (Connecticut Western News, July 21, 1871). The three-sided construction and the absence of any indication of a fourth wall also suggests a barn-type structure.

In summary, the majority of visible structures remaining on the site are thought to consist of a residential component associated with the two industrial components which existed here during the nineteenth century. The uniformity of artifact classes throughout the site and through time (levels) makes it doubtful if much information can be gathered to help distinguish one industrial occupation from the other. However, if both occupations are considered as a unit, i.e. nineteenth century small scale industry, further excavations might increase our understanding of the domestic lives of the average nineteenth century industrial employee.

The Amesville Historic District may be unique in this respect for two reasons. First, the dates of site occupation lie tightly within the second half of the nineteenth century. Site habitation began by 1833 or 1834 and terminated by 1900. Secondly, the portion of the site which remains entact has been relatively undisturbed since the site was abandoned.

It is also important to consider this site in relationship to the larger community. As previously discussed, the development of Amesville is interrelated with the development of Falls Village, the Amesville community representing an industrial-residential complex and Falls Village representing the commercial complex. At present there is some discussion taking place concerning the establishment of an historic district in Falls Village. In view of this interest, it is important to recognize that the development of Falls Village is inseparably intertwined with that of Amesville. It is clear, particularly from newspaper reports, that the inhabitants of both villages considered themselves as one community, in spite of their geographical and political separation.

Given this larger frame of reference, continued research in both areas will be important in contributing to our understanding of the process of community development in northwestern Connecticut and perhaps lead to new viewpoints regarding the social and economic interrelationships between the agrarian, industrial, and commercial aspects of these historic communities.

Table III. Ceramic Types Excavated from Sites Associated with the Amesville Historic District

	Stoneware	Red Earthenware	Buff Colored Earthenware	Porcelain	Undecorated Creamware 1762-1820	Decorated Creamware 1775-1820	Undecorated Pearlware 1780-1830	Decorated Pearlware
Helco I	1 SG			3				
Helco II								
to 90 cm	2 SG	22 GL						
		19 UGL	1		26		12	
90-100 cm	1/3 SG	20 GL						
		10 UGL	1	2	53	4	25	3
100-115 cm	3 SG	43 GL						
		38 UGL			87	1	51	1
115-120 cm	3 SG	13 GL						
		12 UGL			22		18	
120-128 cm					1		4	
Helco III								
000-020 cm	2 SG	6 UGL					1	
020-040 cm	1 SG	1 UGL					1	
040-087 cm		1 GL						
Helco III STP's	4	5 UGL		3	1		2	
Helco III-VI surface				1				
Helco IV								
subsoil	1 SG	1 UGL	2					1
subsoil 51 cm								
Helco V								
subsoil I								
subsoil II					1		2	
Helco IX survace					6		3	1
Helco stone quarry	6							
	16 SG	1 UGL	1	1				
TOTALS	11	99 GL						
	32 SG	93 UGL	5	10	197	5	119	6

Table III. Ceramic Types Excavated from Sites Associated with the Amesville Historic District (cont.)

	Blue Hand-Painted Pearlware	Blue & Green Edged Pearlware	Annular Pearlware	Finger-Painted Pearlware	Transfer Printed Pearlware	Polychrome Hand-Painted Pearlware	Undecorated Whiteware	Decorated Whiteware
	1780-1820	1780-1830	1790-1820	1790-1820	1795-1840	1820-1840	1820-1900	
Helco I							8	
Helco II								
to 90 cm	2	2			3 BL	2	12	1
90-100 cm	10	7	2	1	1 BR 7 BL	2	31	
100-115 cm	12	14			5 BL	9	75	
115-120 cm	1	4			2 BL		2	
120-128 cm		1					7	
Helco III								
000-020 cm							1	
020-040 cm	1						1	
040-087 cm								
Helco III STP's		3			2		10	1
Helco III-VI surface								1
Helco IV								
subsoil		1			2		1	1
subsoil 51 cm		1			1			
Helco V								
subsoil I		1			2			
subsoil II		1					3	1
Helco IX surface		4			2			
Helco stone quarry							1	
TOTALS	26	39	2	1	1 BR 17 BL 9	13	152	5

Table III. Ceramic Types Excavated from Sites Associated with the Amesville Historic District (cont.)

	Polychrome Hand-Painted Whiteware 1810-1840	Transfer Printed Whiteware 1820-1900	Blue Hand-Painted Whiteware 1820-1900	Finger-Painted & Annular Whiteware	Vitreous Whiteware 1813-1900	Miscellaneous
Helco I		4			1	2
Helco II						
to 90 cm	3	10 BR 2 BL 2 RD				4
90-100 cm	6	28 BR 3 BK 9 BL 2 RD	3	2 FP		10
100-115 cm	7	28 BR 10 BK 3 BL 8 RD	4	4 AN		15
115-120 cm	4	5 BR 4 BK	2			3
120-128 cm			1			
Helco III						
000-020 cm		1 RD		1	1	1
020-040 cm		2				
040-087 cm						
Helco III STP's	2	7 3 BL 1 BR	1	2	6	5
Helco III-VI surface		2			1	
Helco IV						
subsoil		1				
subsoil 51 cm		1				
Helco V						
subsoil I		1				1
subsoil II		1		1	1	
Helco IX surface		3		1	3	1
Helco stone quarry					8	1
TOTALS	22	72 BR 17 BK 17 BL 13 RD 22	11	11	21	43

KEY: AN-Annular ware; BK-Black transfer print; RD-Red transfer pring; BL-Blue transfer print; BR-Brown transfer print; UGL-Unglazed red earthenware; FP-Finger-painted; GL-Glazed red earthenware

E. The Fluvial Geology of the Housatonic River Drainage System
by Peter Patton

Introduction

Preliminary investigations of the Shepaug and Housatonic Rivers in western Connecticut have been made to determine the age and origin of the Quaternary deposits along these rivers. The purpose of these studies has been to attempt to isolate those geomorphic features which have the greatest potential for containing stratified archaeological sites. The significant deposits can be separated into basically two morphologic types: terraces and debris fans.

Glacial and Fluvial Terraces

Terraces are defined as abandoned floodplain surfaces formed when the river was at a higher elevation (Leopold et al. 1964). This vague definition allows for a great deal of interpretation as to what actually constitutes a terrace. Mechanisms of terrace formation are numerous and those that are applicable to western Connecticut streams are briefly reviewed.

Pleistocene Glacial Terraces

Kame terraces are common depositional forms created during deglaciation. Kames, or ice-contact ridges, are formed by the deposition of glacial outwash along a valley margin between the valley wall and the stagnant ice. When the stagnant ice has completely melted the ice-supported side of the deposit collapses, leaving a steep scarp (Flint 1971). The terraces formed in this manner are usually narrow, are not continuous along a valley margin, and are usually dotted with kettles. Where exposed, the internal stratification of kame terraces is convoluted, indicating a collapse of buried ice lenses. The highest terraces along the Shepaug and Housatonic Rivers have been mapped as kame terraces (Flint 1930).

Meltwater from the front of either a stagnant ice mass or an active ice front is usually overloaded with sediment which causes aggradation of the valley downstream. The valley train deposits formed in this manner generally become thinner away from the source of the sediment, decrease in grain size downstream, and are often wedge-shaped in longitudinal cross-section (Moss 1974).

When the sediment supply is removed, these deposits are usually trenched, forming paired terrace sequences. At one time, it was considered that each terrace level represented one period of glacial aggradation followed by a period of interglacial downcutting. More recent investigations have shown that several terraces can be formed during a single period of downcutting (Schumm and Parker 1973, Womack and Schumm 1977). This occurs when the sediment eroded upstream by the trenching process is transported and deposited downstream creating a younger and usually smaller inset fill. This fill is eventually trenched, creating a new terrace.

Glaciofluvial terraces have been mapped on the Shepaug and Housatonic Rivers (see Malde 1967). Generally they are at lower elevations than the kame terraces but still at higher elevations (usually greater than 5 m) above the present stream. These terraces are difficult to recognize without detailed studies.

These terraces, in western Connecticut, are not continuous enough to demonstrate paired relationships without detailed profile measurements. In addition, the sedimentologic characteristics of these terraces are similar to Holocene fluvial terraces which makes determination of their mode of formation difficult.

Holocene Fluvial Terraces

Several mechanisms for fluvial terrace formation have been proposed for streams which transport large quantities of bedload. It is quite probable that several different processes are responsible for the development of Holocene terraces along the major streams in western Connecticut.

As a stream moves laterally across its valley, its channel deposits gradually form a floodplain (Wolman and Leopold 1957) which evolves into unpaired terraces as downcutting continues (Mackin 1948). The laterally accreted terraces have sedimentologic characteristics similar to the point bar and channel deposits of the modern stream (Wolman and Leopold 1957). The thickness of gravel on these terraces is approximately equal to the depth of scour of the stream which deposited them.

During extraordinary floods on high gradient streams which transport coarse bedload, terraces can be built by overbank deposition of poorly sorted bouldery alluvium (Hack and Goodlett 1960, Stewart and LaMarche 1967, Patton and Baker 1977). The bars are generally several meters above the normal low flow channel. Although the bars usually have smooth surfaces, occasionally the upper surface of the bar has an undulating surface topography. This relief is caused by the slip-faces of gravel waves which form the bar. The gravel in the bars is typically poorly sorted and often exhibits reverse grading (Krumbein 1942). The reverse grading is the result of a gravel lag which armors the surface of the bar (created by winnowing of the bar surface during the flow recession) (Baker 1973). Gravel levees are typical features on streams which have terraces formed in this manner.

Both vertically accreted flood bars and laterally accreted floodplain deposits will eventually be mantled by finer-grained overbank sedimentary deposits. The thickness of these deposits will depend on the amount of fine-grained sediment transported and the rate at which the modern floodplain deposits are reworked by the existing stream (Schumm and Lichty 1963). These deposits smooth the topography of the original terrace and can make interpretation of the origin of the terrace difficult.

Relation to Archaeological Investigations

The precise origin of terrace deposits is important in determining the age of the deposit and its relevance to archaeological investigations. For example, lateral accretion deposits form slowly and the age of a terrace surface formed in this manner may differ significantly between its initial edge along the valley margin and its margin along the present river. Thus it might represent a fairly stable geomorphic surface which might contain a sequence of cultural artifacts stratified both vertically and horizontally as new floodplain was created.

Lateral accretion deposits should be present over an entire reach of the river and should form a recognizable regular sequence of terraces. Thus, correlations between terrace deposits should be possible. Conversely, vertical accretion flood bar deposits form, from a geologic point of view, nearly instantaneously. Because deposition only takes place where hydraulic conditions at high flows are conducive to sedimentation, their location along a river reach is severly restricted. Cultural sites on flood deposits may have a seemingly random distribution and, as floods create new bars, habitation patterns may shift in a rather sporadic fashion.

The age of the terraces along the Shepaug and Housatonic Rivers is important in archaeological site selection because the age of the deposit places a limiting age on the cultural remains that can be found on top of the terrace. An additional factor is the rate and amount of overbank sediment that buries the terrace. This is important for artifact preservation and for creating the necessary vertical stratification that aids in the proper discrimination of occupation floors. Based on reconnaissance studies of Quaternary terraces throughout Connecticut and analyses of soils on terraces, several preliminary hypotheses can be made concerning the age of terrace formation and their archaeological potential.

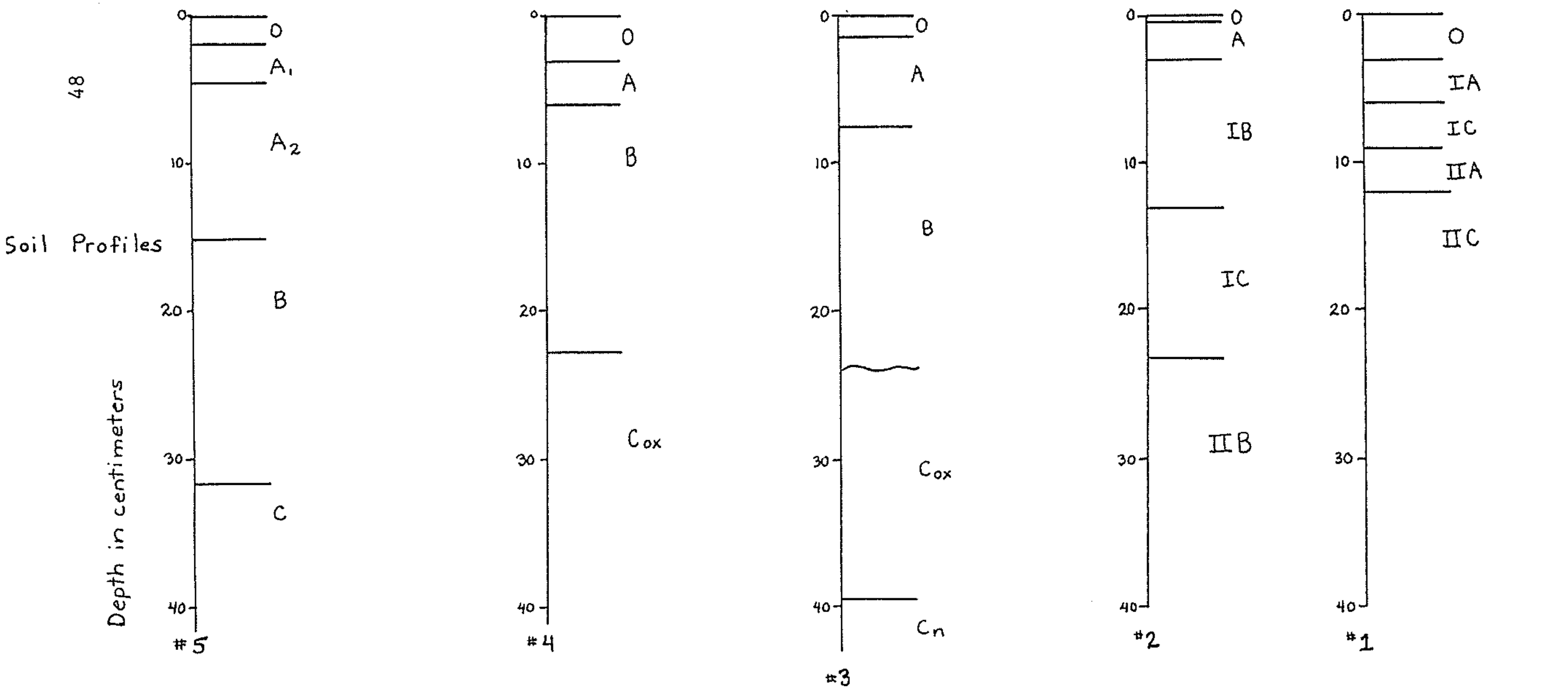
Terraces at Housatonic IX

The terraces along the Housatonic River north of Cornwall Bridge provide an excellent sequence to study the mechanics of formation and relative age of terraces in western Connecticut. Including the modern flood plain there are five terrace levels along this reach of the Housatonic (Figure 4). The terraces differ in elevation above the present river, in the characteristics of the soils developed on the alluvial deposits, and in mode of formation.

The highest terrace is a kame terrace, one of numerous kames at about 520 feet in elevation throughout the Housatonic River basin (Flint 1930:135). The terrace is bounded by a steep scarp which is the ice contact margin. The deposit consists of coarse, poorly sorted outwash which is deposited in discontinuous terraces along the valley margin. The kame is approximately 12 m above the present level of the Housatonic River.

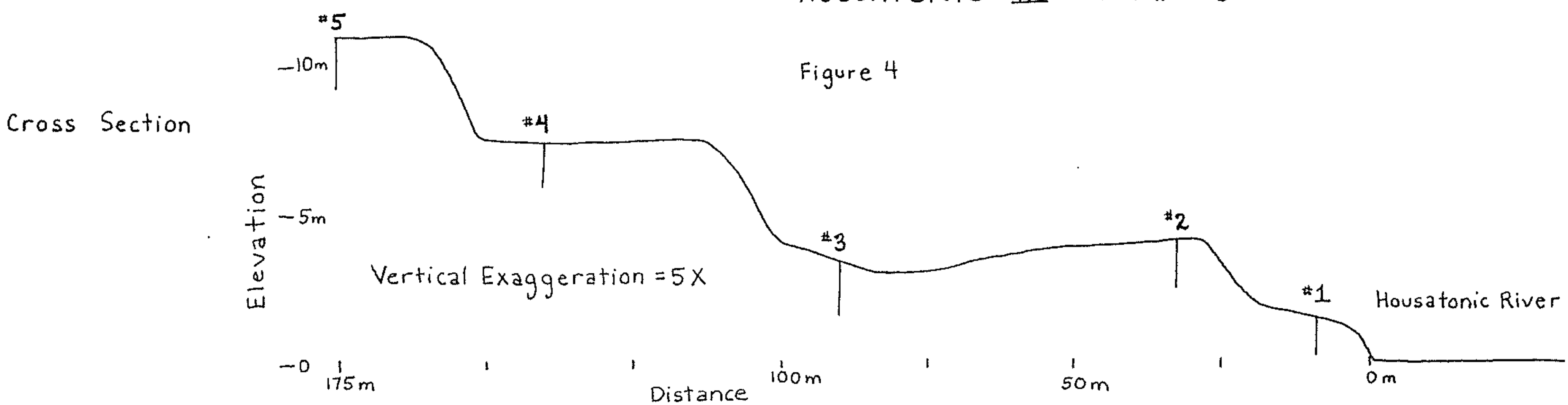
Another obvious terrace is inset against the kame, approximately 7 m above the river. This terrace is also composed of bouldery alluvium and does not have a significant accumulation of overbank sediment on its surface. This terrace (#4) may represent a glaciofluvial terrace formed during the final deglaciation of the Housatonic valley. This is consistent with its high elevation above the present river and its similar textural characteristics to the kame terrace. If terrace 4 is a fill terrace, subsequent mapping should demonstrate other terraces along the Housatonic graded to this elevation.

Terraces 3 and 2 occur at elevations of 3.5 m and 4.5 m respectively above the Housatonic River. The terraces are not distinct from one another and terrace 2, because of its slightly higher elevation, appears to be a levee bordering the river. Both terraces are capped by overbank sediment as they are both well within the range of flood elevations of the river.



HOUSATONIC IX : TERRACES

Figure 4



Terrace 3 is probably the result of either lateral migration of the Housatonic River or a fill terrace created by the sediment derived during the incision that created terrace 4. In either case it is probably near the Pleistocene-Holocene boundary in age. If either mode of formation is correct, the terrace should be a prominent feature throughout the Housatonic valley. If the terrace is the result of lateral planation one might expect a gradual decline in terrace elevation toward the river and perhaps the terrace might merge with the active floodplain. At Housatonic IX, the relationship of terrace 3 to the active floodplain is obscured by the existence of terrace 2.

Terrace 2 has the shape of a natural levee and it is probable that the terrace is a flood related deposit. The shape is typical of documented gravel levees present on New England streams. Terrace 1 is the active floodplain of the river and is 1.5 to 2 m above the present stream.

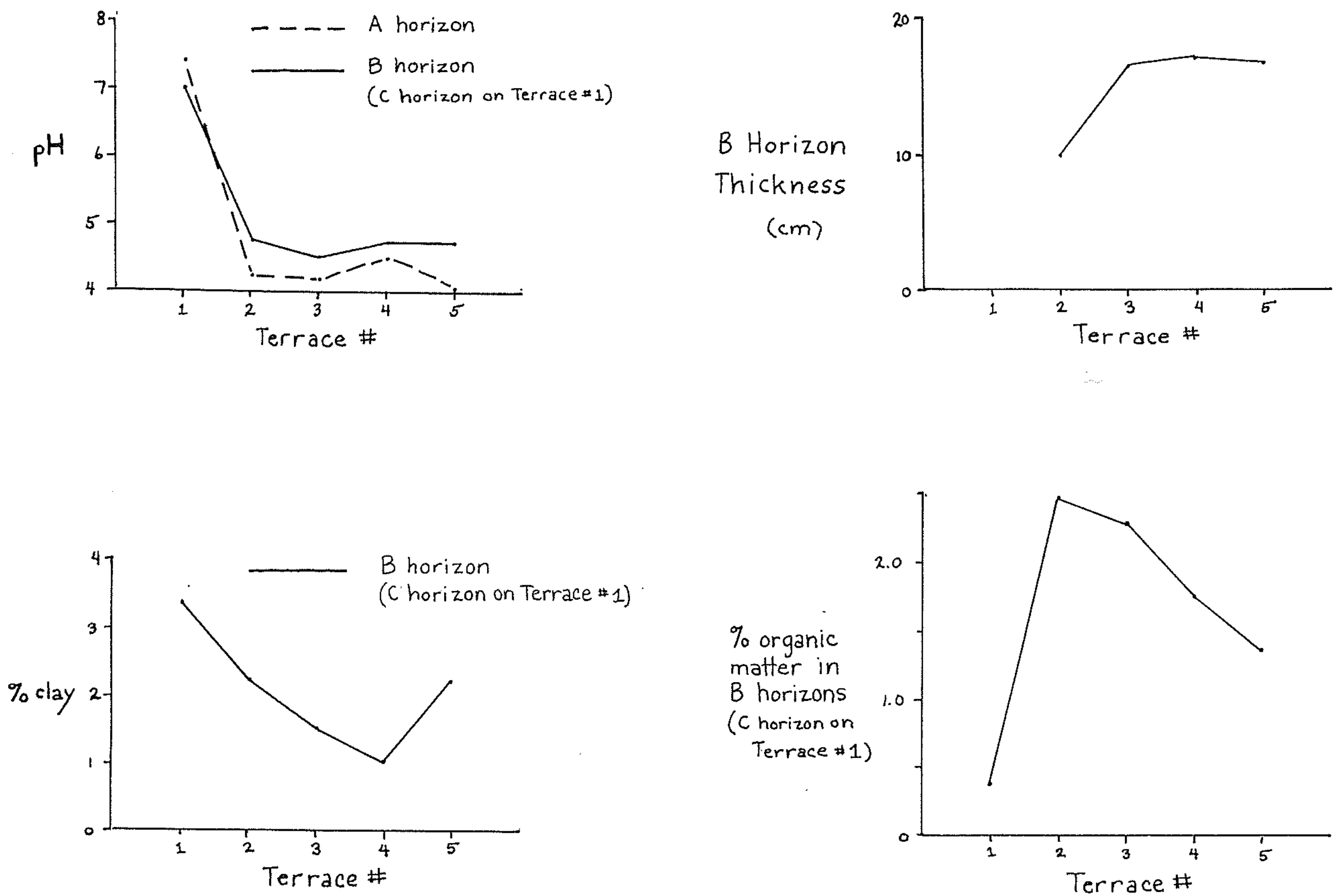
Pedological Studies

A study was made of the degree of soil development on these terraces to help determine their relative age (Figure 4). Because of their elevation and their position relative to the modern river, each terrace can be considered to be a unique time interval with terrace 5 being the oldest. Field observations were completed of the occurrence and thickness of soil horizons and laboratory measurements were taken of color pH, clay content, soil organic content, and exchangeable cations. Analyses were made by standard methods (Folk 1974, Jackson 1968, Perkin-Elmer 1976). The data indicate that certain soil characteristics such as pH and thickness of soil horizons equilbrate rapidly whereas other characteristics such as clay and the organic matter content of B horizons and available exchangeable cations have not yet equilibrated with the present environmental conditions (Figures 5, 6). A brief summary of the soil data follows (Table IV).

Clay Content: Clay minerals can accumulate in B horizons either by translocation of clays from the A horizon or by the dissolution of silicate minerals and the reprecipitation of clay minerals (Birkeland 1974). Because the original clay content of the river alluvium is low, textural B horizons in these soils will require significant weathering of existing silicate minerals. There has been no formation of textural B horizons in these soils (Figure 5).

Changes in clay content are probably related to differences in parent material or even leaching of available clays from the profile. The textural data confirm Lyford's (1946) description of Brown Podzolic soils in New England. He noted that the soil horizons did not differ in texture and had low percentages of clay ranging between one and two percent. Incipient textural B horizons in Spodosols have been identified on 10,000 year old lake terraces in Michigan (Franzmeier and Whiteside 1963). Therefore, it is not unusual that the Connecticut Spodosols do not have textural B horizons.

Organic Matter: Oxidizable organic matter in the B horizon is a function of the presence of organic carbon in the A horizon and its ability to be mobilized, transported, and stored in the B horizon. The ability of Spodosols to retain organic matter in the B horizon is dependent on the weathering of silicate minerals and the presence of metal cations, specifically iron, which allow the immobilization of humus (Franzmeier and Whiteside 1963). The low percentages of organic matter in the C horizon of the soil on terrace 1 reflects the low



pH
8
7
6
5
4
A horizon
B horizon
(C horizon on Terrace #1)
1
2
3
4
5
Terrace #
B Horizon Thickness (cm)
20
10
0
1
2
3
4
5
Terrace #
% clay
4
3
2
1
0
B horizon
(C horizon on Terrace #1)
1
2
3
4
5
Terrace #
% organic matter in B horizons (C horizon on Terrace #1)
2.0
1.0
0
1
2
3
4
5
Terrace #

Figure 5

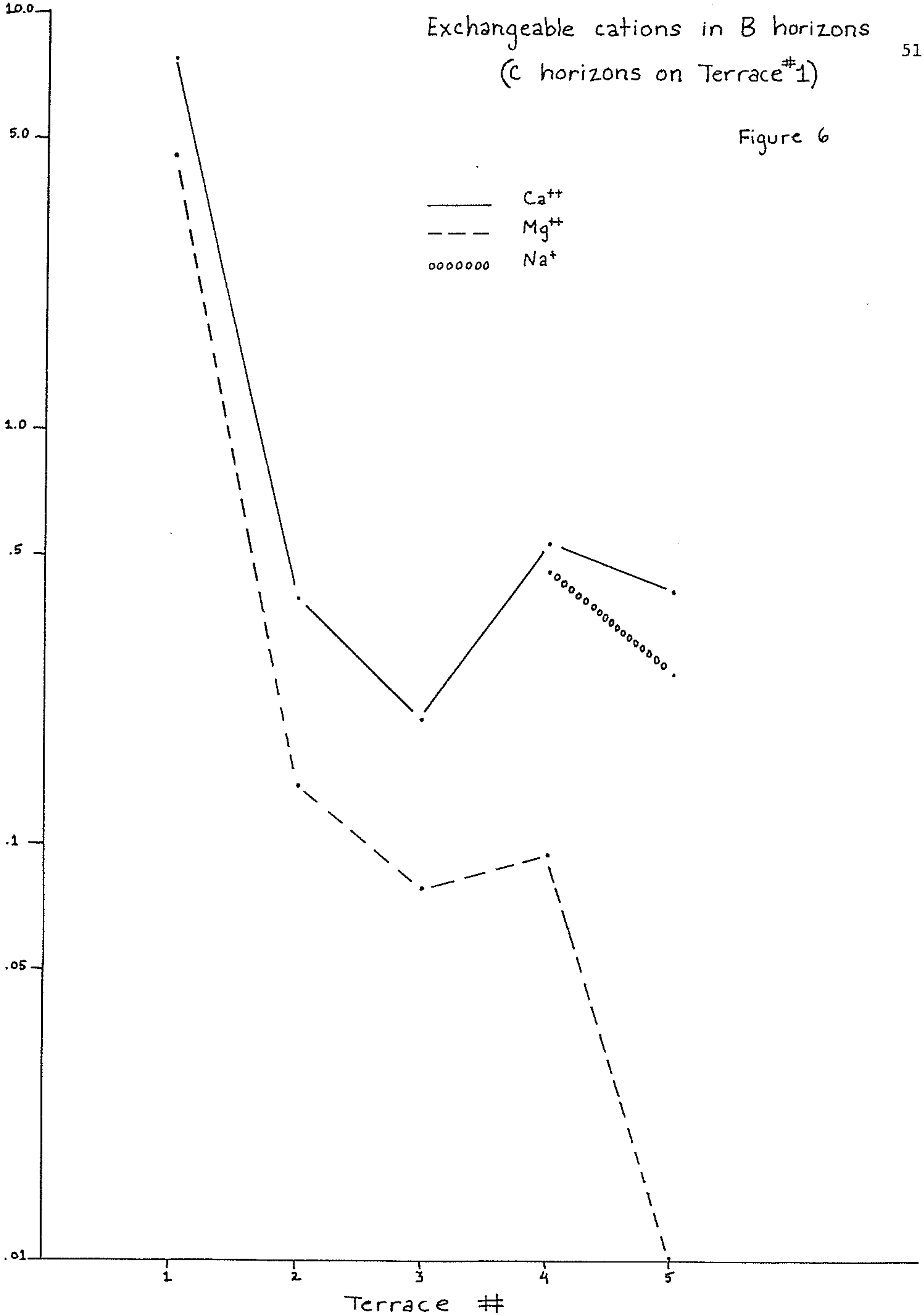

Exchangeable cations in B horizons
(C horizons on Terrace #1)
Figure 6
Ca++
Mg++
Na+
10.0
5.0
1.0
.5
.1
.05
.01
1
2
3
4
5
Terrace #

Table IV. Soils data for the soils developed on terraces at Housatonic IX.

Terrace	Horizon	Depth (cm)	Thickness (cm)	Color	pH	Clay (percent)	Organic Carbon (percent)	Exchangeable Cations (meq) Na	K	Ca	Mg
1	0	0-3	3								
	IA	3-6	3	10YR 4/3	7.43						
	IC	6-12	6								
	IIA	12-15	3	10YR 5/4	7.17						
	IICox	15-		10YR 5/4	7.07	3.37	.38	-	-	7.80	4.57
2	0	0-.5	.5								
	A	.5-3	2.5	10YR 4/2	4.25						
	A2	3-13	10	10YR 5/4	4.49	1.80	1.34				
	IB	13-23	10	10YR 5/4	4.75	2.24	2.50	-	-	.40	.14
	IIB	23		7.5YR 6/6	5.05		2.13				
3	0	0-1.5	1.5								
	A	1.5-7.5	6	10YR 4/2	4.20						
	B	7.5-24	16.5	10YR 5/4	4.54	1.5	2.34	-	-	.20	.08
	Cox	24-39.5	15.5	10YR 5/4	4.69	2.37	.91				
	Cn	39.5		10YR 5/3	4.90	3.19	.61				
4	0	0-3	3								
	A	3-6	3	10YR 4/2	4.48						
	B	6-23	17	10YR 5/4	4.73	1.03	1.77	.46	-	.54	.10
	Cox	23		10YR 6/6	4.89	1.51	1.52				
5	0	0-2	2								
	A	2-4.5	2.5	10YR 3/2	4.00						
	A2	4.5-15	10.5	10YR 4/4	4.60						
	B	15-31.5	16.5	10YR 5/6	4.68	2.25	1.40	.26	-	.41	.01
	C	31.5		10YR 5/6	5.14	2.74					

Water quality of small streams near Housatonic Meadows[1]

	Na + K	Ca	Mg
Flat Brook	2.1	30	13
Robbins Swamp Brook	3.8	40	16
Wangum Lake Brook	3.7	25	12
Tanner Brook	4.8	21	9.5

1. from: Quality of Surface Waters of the United States, 1967, U. S. Geol. Survey Water Supply Paper 2011, 982p.

amount of organic matter in the alluvial parent material. The higher amounts of organic material in the other terrace soils may be the result of high iron content which is identified by the increased oxidation color of the B horizons (Figure 5). Significant accumulations of organic matter in the B horizons of the Lake Michigan terrace soils occurred between 3,000 and 8,000 years before present (Franzmeier and Whiteside 1963).

Exchangeable Cations: Exchangeable cations are cations which are held on the surfaces of mineral grains and on humus by electrical charge imbalances. Up to a certain point, the greater the chemical weathering of the B horizon the more sites are available for cations and therefore the greater the number of exchangeable cations. In this study, the concentration of Ca^{+2}, Mg^{+2}, Na^{+1}, and K^{+1} was determined for subsurface horizons to measure any increased weathering from terrace 1 to terrace 5.

The results show a high concentration of Ca^{+2} and Mg^{+2} in the C horizon of the soil on terrace 1 (Figure 6). The concentration of these elements abruptly decreases in the soils on the older terraces. The high concentrations in the terrace 1 soil are related to the high natural concentrations of Ca^{+2} and Mg^{+2} in the surface water of the Housatonic basin (Table IV).

Because Spodosols repidly become acidic, the basic cations are leached from the soil. At Housatonic IX, the cations leached are not retained in the subsurface horizons because of the lack of sites on weathered mineral grains. No exchangeable Na^{+1} or K^{+1} exist in soils on terraces 1, 2, or 3. Na^{+1} is present in small amounts in the B horizons of terraces 4 and 5. This may represent Na^{+1} liberated during mineral weathering that is being retained in the soil horizon. This suggests that the soils on terraces 4 and 5 may be the oldest.

By comparison with the Lake Michigan terrace soils, the Housatonic terrace soils on terraces 2, 3, 4, and 5 may range in age from about 2,000 years B.P. to around 10,000 years B.P. Although the correlation is crude, the limiting age of 10,000 years B.P. may not be a bad estimate. Recently Newman and others (1978) have suggested that isolated valley glaciers may have existed in southern New England until 11,000 years B.P. Terrace 5 is clearly an ice contact deposit and is the lowest ice contact terrace in this reach of the Housatonic (Flint 1930).

It is therefore the youngest deposit that records the presence of ice in the Housatonic valley and could conceivably have formed as late as 11,000 years B.P. If terrace 4 is a glaciofluvial terrace it would have formed soon after the deposition of terrace 5 (Koteff 1974). The similarities in soil characteristics between soils on terraces 4 and 5 also indicate that they may be similar in age. The organic matter content of B horizons on terraces 2 and 3 indicates that these soils may be greater than 2,000 to 3,000 years old. If this is the case terrace 3 may represent a large part of the Holocene. Terrace 1 would therefore be only about 1,000 to 2,000 years old.

Archaeological Potential of the Housatonic River Terraces

The information on the terraces collected so far suggests that the archaeological potential for the preservation of Paleo-Indian sites on the terraces is poor. The surfaces that would be available for habitation about 10,000 years B.P. would be ice-contact deposits and other glaciofluvial and glaciolacustrine terraces (Koteff 1974). These deposits would not be mantled with thick accumulations of fine-grained sediment and therefore Paleo-Indian sites would not be deeply buried and preserved. The younger terraces (terraces 2 and 3) probably were either not formed or in the incipient stages of formation about 10,000 years B.P. If terrace 3 began to form about 10,000 years B.P., the margins of the terrace near the valley walls should have the greatest potential for Paleo-Indian sites.

Although terraces 2 and 3 may be poor sites for Paleo-Indian remains they should have excellent potential for Archaic sites. It is hypothesized that the time of formation of terraces 2 and 3 spans the time range of the Archaic period. Terrace 1 has probably only been in existence for the past 2,000 years. Its prehistoric archaeological potential is limited to Woodland sites as well as those of the historic period.

Debris Fans

Debris fans are the other major depositional forms found in the valleys of the Housatonic and Shepaug Rivers. Debris fans are deposits of coarse-grained alluvium that resemble a fan in plan view which are deposited by tributary streams at the confluence with a larger stream. Numerous debris fans can be recognized on the topographic maps where small streams flow into the Shepaug and Housatonic valleys.

Not easily recognizable on maps, but readily apparent in the field, are smaller fans formed at the intersection of almost all high gradient streams in western Connecticut. Debris fans form because the small high gradient streams are capable of transporting larger sized sediment than the stream into which they flow. This imbalance in competence causes aggradation and formation of a fan at the stream juncture. The fans commonly influence the topographic course of the larger stream by forcing it to migrate to the opposite side of the valley.

The sediment transport necessary for debris fan formation occurs only during flood flows. Because the drainage area contributing to the fans is usually small, the fans are active during both regional storms (Williams and Guy 1973, Jahns 1947, Hack and Goodlett 1960, Wolman and Eiler 1958) and isolated thunderstorms which center over their drainage basin (Renwick 1977).

Debris fan deposition has been noted during hurricane related floods in western New England. Jahns (1947) describes debris fans and gravel deltas created where high gradient tributaries flowed into the Deerfield River during the March 1936 floods. During the August 1955 hurricane floods in western Connecticut similar deposits were formed (Wolman and Eiler 1958). During these floods, a gravel lobe is deposited parallel to the stream on the fan. This eventually causes the tributary to shift its position across the fan and, through time, deposition occurs as discrete lobes across the fan surface.

An excellent example of a debris fan in western Connecticut is the fan formed at the mouth of Mallory Brook where it flows into the Shepaug River. The right bank of lower Mallory Brook is a bar deposited on the fan during the 1955 floods. The bar extends to the junction of the brook with the Shepaug River. In addition to historical debris found in the bar, no soil development has occurred on the deposit. This is in sharp contrast to an older lobe exposed in the left bank. This lobe is buried by nearly a meter of overbank sediment on which a well-developed soil is developed. Paleo-Indian artifacts and a radiocarbon date on the surface of these gravels give a minimum age of 10,000 years to this deposit. Therefore the gravel lobes exposed in opposite banks of the brook are greatly different in age.

The area of the debris fan adjacent to the main stream is often a hydraulically optimal location for the formation of large eddies which trap large amounts of suspended sediment. The hydraulic conditions are favorable because the tributary mouth often forms a re-entrant in the valley wall causing a channel expansion during high flows (Patton 1977).

Debris fans, therefore, have several geomorphic and sedimentologic characteristics which make them archaeologically valuable. The debris fans are old. The radiocarbon date indicates that they could have begun forming during the wanning stages of glaciation and thus provided habitation sites for Paleo-Indians. Debris fan lobes commonly extend to the confluence with the main stream. Therefore alluvial sites adjacent to and at low elevations relative to the main stream would have existed as potential Paleo-Indian sites. The fact that debris fan areas trap large quantities of overbank sediment makes deep stratified archaeological sites possible. Therefore, the Paleo-Indian site found on top of a debris fan deposit on Mallory Brook should not be an isolated example.

The difficulty with finding archaeological sites on debris fans is in determining where the oldest gravel lobes will occur. Two possible methods might solve this problem. The first would involve measuring the thickness of overbank sediment on top of the gravel fan. The areas of greatest sediment accumulation might be the oldest although the local hydraulic conditions during flooding would be a complicating factor. The second approach would be to map the distribution of surface and buried soils to determine the relative age of the different segments of the fan. Using both of these techniques it should be possible to delineate those areas on debris fans which could have the greatest potential for early archaeological sites.

IV. Project Results: Reflecting on Predictive Models and the Record of the Past in Litchfield County

by Russell G. Handsman

A total of 101 discrete localities were examined this summer in 40 kilometer sections along the Housatonic and Shepaug Rivers. Of these localities, 53 were identified as historic sites and 42 as prehistoric cultural resources. A total of 7 localities contained no artifactual materials of any kind and are considered to be areas of "no resources".

This basic data set has been analyzed in a number of different ways, to provide information useful to those concerned with historic preservation in Connecticut. Inventory forms have been completed for each locality and submitted to the Connecticut Historical Commission. Each form summarizes the ecological, historical, geographical, and geological context of each locality and summarizes our findings and evaluations of archaeological potential.

Additionally, a series of maps and tables have been prepared, for the Commission, which locate each tract along the rivers and the specific resources within each tract. The following chapter discusses these maps and tables from the perspective of management and planning. The remainder of this section discusses the outcome of our research from the perspective of contemporary anthropology and archaeology.

Evaluating the Role of Predictive Models

For almost a decade, archaeologists in America have been struggling to keep their discipline from dividing into two irreconcilable parts. Archaeologists, who for many years were proud of their ability to interpret the past, have found themselves having to defend their methods and goals to non-anthropologists. In particular, as archaeologists became involved in historic preservation, they found that traditional methods of research seemed to be inadequate to meet the demands of various federal and state agencies who were concerned with planning growth.

Many aspects of this new relationship continue to trouble the discipline and are the result of archaeologists having to move into what is still, for them, unknown terrain. For example, when a local community desires to improve its facilities for treating sewage, it may decide to use available federal funds to help meet project costs. If such funds are granted, then it becomes necessary for that local community to evaluate the probable effects that construction will have on extant archaeological sites and historic standing structures. Usually archaeologists are hired to do such evaluations and may find themselves working in localities where no self-respecting anthropologist had ever thought of working. Worse, archaeologists find that they are expected to not only interpret the prehistoric record but also excavate, evaluate, and describe mid-nineteenth century farmsteads, colonial saw mills, historic railroad stations, and nineteenth century sewer systems.

Even the least provincial among us find it difficult to meet these new demands. Worse, many find that they are slowly turning into archaeological technicians hired to locate and evaluate prehistoric and historic sites as natural objects instead of cultural phenomenon. The best archaeological studies done over the past theee hundred years are those which went beyond description of artifacts and sites to talk of people, lifeways, customs, and behavior. It is the idea of culture which seems to be very much absent in contemporary archaeology.

The discipline has known for years that its ties to anthropological beliefs and practices were threatened by its interest in preservation and management (see King 1971). American archaeologists have tried to meet the challenge by demanding that a strong connection be maintained between anthropology and historic preservation (King et al. 1977). The nature of this connection is often left unspecified but apparently can be developed, in part, through the use of predictive modeling and preservation surveys.

Briefly, a predictive survey hopes to identify the variety of prehistoric and historic cultural resources which are present in a region and to isolate any patterning which these resources may exhibit. If sites and structures are distributed across the landscape in a non-random fashion, and if archaeologists can discover what this pattern looks like, then they can study these rules as behavior and seek "cultural" explanations. Concurrently, by knowing where sites are and are not located, it will be possible to plan future growth and construction around "culturally" sensitive localities.

During the summer of 1978, research teams from the American Indian Archaeological Institute began a multi-year research program of locating and evaluating prehistoric and historic sites in Litchfield County, Connecticut. One of the aims of our research project was to develop a predictive model for locating archaeological and historic resources. This model, based upon intensive field research, will eventually represent an alternative to the ecological model of prehistoric site placement which now exists in western Connecticut (see Swigart 1977a, b).

Swigart's recent study of the regional and environmental distribution of prehistoric sites in western Connecticut suggested that:

> The immediate availability of water would appear, therefore, to be of primary importance in the selection of a prehistoric campsite, and especially so when larger riverine waters are involved (Swigart 1977a:65).

This statement, and the analysis upon which it is founded (as well as a multitude of similar studies), depends upon a basic archaeological assumption: the spatial and/or temporal patterns of site distribution within a regional landscape are a "true" reflection of prehistoric (or historic) behavioral reality. This is supposed to be true because each pattern is interpreted to be the result of some sort of behavioral norm or rule. In the case of distance to water, the implied rule is obviously of an ecological variety. Further, once the rule has been isolated, it offers the capability of prediction. We should be able to discover sites in archaeologically-unknown areas by applying the rule in a systematic fashion. Thus the pattern <u>of</u> site distribution, a sign of past behavior, becomes a pattern <u>for</u> site distribution, a research model to be employed in poorly known regions.

During the summer of 1978, Swigart's model of site placement was tested in a variety of localities along the Housatonic and Shepaug Rivers. Field research was carried out by a crew from the Institute as well as by volunteers and members of several field schools. While the results of our studies will not be completed until the spring of 1979, one striking and anomalous pattern has emerged. The prehistoric archaeological record, along certain sections of the river, is virtually no record at all.

North of the Great Falls of the Housatonic River at Falls Village, a series of plowed fields were examined for indications of subsurface archaeological deposits. The fields were located along both banks of the river, in the Towns of Salisbury, North Canaan, and Canaan. After approximately three weeks of field work, only one prehistoric site of note was found, the Nelson site, adjacent to the Housatonic River. More than eighty percent of the total linear distance surveyed produced few or no artifacts.

This emerging pattern seems to contradict those expectations derived from Swigart's model. Given the horizontal expanse of the valley floor in this region and the abundant food and water resources present, we fully expected to identify many prehistoric sites. This expectation was not only a logical inference drawn from Swigart's model, but was also based upon one of those implicit rules which underlies archaeology in the Northeast. Perhaps the only rule about the past which has been "accepted" as a truth in New England is that the density of sites within a valley floor is supposed to be significantly higher than in adjacent uplands. These expectations were not met, forcing us to reevaluate the role of predictive modeling in archaeological surveys.

It is becoming apparent, based upon our preliminary study of maps, aerial photographs, and soil profiles, that the Housatonic River has been incredibly active, north of Falls Village. For hundreds of years, the river has been meandering back and forth and up and down its broad valley. Remnants of these cut-and-fill cycles continue to exist in the form of active meanders as well as older oxbow lakes and backwater sloughs.

Over several millenia, each cycle of fluvial erosion can obviously destroy or disturb surficial and subsurficial archaeological sites. Even if prehistoric populations had camped along the fluvial terraces of the Housatonic River, the remains of these activities would probably be lost. Thus, along this section of the river, the distribution of sites (non-sites) may not reflect behavioral choices but, rather, the transformation or modification of the archaeological record by subsequent events and processes. The record is not just formed by constructional or depositional activities but results from destructive agents as well.

What is most significant about this pattern is not just what it tells us about the northern Housatonic Valley but what it implies about predictive modeling in historic preservation surveys and problem oriented research. Rather than wondering whether a model is working in a particular region or asking why it does not seem to be applicable, it is possible to evaluate predictive models from a more critical perspective. What are the basic assumptions that such models need and what do these premises tell us of the way that archaeologists perceive the past?

The most dominant quality of predictive surveys is that they tend to view behavior as a natural instead of cultural object. Archaeologists have never come to the realization that people behave in the way that they do because of perception, history, tradition, and cultural meaning. The fact of water existing everywhere belongs to the world of nature. How people perceive this fact, use it, think about it, and organize it--these notions are of culture. Without knowing a culture and its historical context, there is no way of knowing the past, short of a time machine.

In summary, the Institute's summer program of field research has identified several anomalous situations which together imply that predictive models cannot work as heuristic devices for research or planning purposes. Our findings indicate that predictive models for locating prehistoric and historic sites cannot be valid outside of their region of origin. Further, we now realize that such models cannot hope to work without intensive studies of the cultural and historical (including geological) context of individual localities. The logical progression from generalized rules to detailed contextual and historic studies is implicitly a move away from predictive modeling, towards intensive and detailed studies of specific localities.

V. A Management Model for the Rivers' Corridors

by Russell G. Handsman

Introduction to Conservation

The preceding section summarized the results of our research from the dual perspectives of anthropology and critical theory. The purpose of this section is to evaluate the usefulness of our data from the perspective of historic preservation and cultural resource management.

Cultural resources, including the archaeological record, are important to the American public and the profession because of the potential information they contain which can be studied in terms of events, persons, or processes significant to the prehistory and history of the United States or of a smaller region. These considerations of potential research value are those used by conservationists and planners to evaluate properties for possible inclusion in the National Register of Historic Places. The Register was authorized primarily as a result of the National Historic Preservation Act of 1966, which declared:

> That the historic and cultural foundations of the Nation should be preserved as a living part of our community life and development in order to give a sense of orientation to the American people (National Park Service in <u>Federal Register</u> 41, No. 28, Part II:5904, February 10, 1976).

This Act, together with Executive Order 11593 (Protection and Enhancement of the Cultural Environment--May 13, 1971) and the codified procedures of the Advisory Council on Historic Preservation (36 Code of Federal Regulations Part 800, Federal Register 40, No. 24, Part II, February 4, 1975), provide a system for the protection of cultural resources. Component parts of this system include the identification of unknown resources and their assessment, including the nomination of such resources to the National Register, if qualified. Additionally, these resources can be protected from the impact of federally-assisted projects through the implementation of a detailed review process (106 review process as codified in Section 106 of the National Historic Preservation Act of 1966).

These preservationist documents, along with the National Environmental Policy Act of 1969 (relevant section is 101 (b) (4)) and the Archeological and Historic Preservation Act of 1974 (amendment to the Reservoir Salvage Act of 1960), reveal a threefold intent on the part of Congress, the profession, and federal agencies:

1. At least a portion of the entire population of cultural resources in the country should be placed on "deposit". Those resources recognized as being important for future generations of historians, archaeologists, sociocultural anthropologists, folk preservationists, and the public should be protected and conserved in localities and regions where there is little chance of destructive impact. Such deposits should be representative of the spatial and temporal variation seen among cultural resources extant in a region or area.

At least one important method of placing resources on deposit is to incorporate them on land under federal ownership as long as the relevant federal agencies live up to a management and conservationist philosophy. However, since the federal government owns very little land in the Housatonic River Drainage System, it is necessary to establish a different kind of regional resource bank where anthropological sites may be placed on deposit.

The regional river boards in Litchfield County provide this type of opportunity since plans are being developed to manage the Housatonic's and Shepaug's valley floors. Such management plans will attempt to maximize the preservation of open spaces and other scenic and cultural values which required their conservation in the first place. Since the Bureau of Outdoor Recreation (now the Heritage Recreation and Conservation Service) has found both rivers, as defined, to be eligible for inclusion in the Wild and Scenic Rivers System, it is obvious that these rivers have met a threshold determination of significance.

One result of our survey work is our ability to articulate a protective system for significant cultural resources with similar systems aimed at protecting and preserving open spaces and scenic values (see Dougherty et al. 1975). In addition, the presence of several private land trusts along the Shepaug already offer the same kind of protective atmosphere as federal ownership would.

2. In the absence of an ability to place all resources on deposit (some highways, reservoirs, stream channelization projects, power plants will have to be built), there should be a systematic methodology for retrieving information before that resource or its original context is disturbed or destroyed. Such field programs have been identified as salvage and have been funded, until now, in an irregular and haphazard manner. The Archeological and Historic Preservation Act of 1974 begins to solve the funding problem by allowing up to one percent of project funds to be employed for data retrieval prior to resource disturbance.

3. Most importantly, it seems to have been and continues to be (see the Advisory Council Report on _The National Historic Preservation Program Today_) the intent that an early warning system be developed to aid in resolving conflicts between preservationist or conservationist practices and the development of potentially destructive patterns of land use. For example, Section 106 of the National Historic Preservation Act of 1966 requires that federally licensed, assisted, or directed projects which can potentially affect National Register properties must be reviewed by the Advisory Council prior to federal agency approval of that project. The Advisory Council acts as a mediator between the cultural resources and the proposed actions and proposes mitigative procedures aimed at resource conservation. Section 2(b) of Executive Order 11593 and Title II of the Amendment of the Land and Water Conservation Act (Public Law 94-422, September 28, 1976) require federal agencies to actively locate and evaluate the potential significance of cultural resources found on lands under their jurisdiction and to submit planned activities to 106 reviews as long as resources are at least _potentially_ eligible for nomination to the National Register.

In brief, the federal government is to actively promote and maintain the historic and cultural environment of the Nation by:

1. administering cultural resources in the spirit of a protective trusteeship for future generations and

2. initiating procedures necessary to the conservation of sites, structures, and objects of historical, architectural, and archaeological significance (Section 1-Executive Order 11593).

Our research has extended the applicability of an early warning system from the federal domain to both the regional and local levels. The intent to conserve cultural resources through their preservation in "bank deposits" or through the early identification of negative impacts necessitates the completion of regional inventory and assessment programs. Ideally, if one knew the location and research significance of every resource in a region, then it would be relatively easy to schedule land uses which were compatible with extant cultural resources. Such a comprehensive list is not forthcoming from the past year's research. However, on the basis of our field and archival studies, we have produced two tables (Tables V and VI) which summarize the management data as it is now interpreted. The following section discusses these tables and how they can be used by various agencies concerned with developing management plans for the rivers' corridors.

The Model and Its Use

Tables V and VI summarize our findings from the perspective of management and planning. Both of these tables should be used as first approximations since much of the corridor has not been systematically surveyed. Studies in future years will help to increase our data base and, concurrently, our confidence in the model.

The basic management units used in the tables are kilometer-long sections of the river. These sections are numbered consecutively beginning with the Massachusetts/Connecticut border on the Housatonic and the dam for the Shepaug Reservoir on the Shepaug. The units continue until the southern limits of the corridors are reached at Lake Lillinonah. Figures 1 and 2 in Chapter II can be consulted for approximate visual locations of each section. A series of U.S.G.S. quad sheets have also been prepared with the exact locations of these sections and can be consulted at the AIAI or the Northwest Connecticut Regional Planning Agency in Warren, Connecticut.

The basic approach to management which we are suggesting is one of zoning where the potential use of each section would be planned according to that section's sensitivity, as "measured" by the presence of known or suspected prehistoric and historic sites. By using these tables, along with future ones, involved agencies and individuals can begin to determine whether a planned program or project could adversely affect cultural resources in any particular section.

The usefulness of this data is, of course, constrained by the size of the management units. If a particular tract is much smaller than one kilometer in length, there is no way of knowing whether that tract is sensitive since the table is organized on the basis of kilometers. This was done to protect the extant resources from "pot hunters and bottle collectors" and not because our data is not tract-specific. If interested agencies desire specific information about tracts, then they may consult with the Institute's Research Department.

By knowing something about a section's cultural resource sensitivity, on the basis of Tables V and VI, it should be possible for various agencies to take archaeological and historic resources into account when planning for future development. There are at least two approaches which can be used, both of which are applicable to the present-day situation along the Housatonic and Shepaug Rivers.

In the fall of 1978, planning boards for both rivers were established, consisting of members from each town. These boards are trying to develop management plans so that towns can oversee and control development of the rivers, including recreation. By utilizing these tables and similar data on natural resources, it should be possible for these boards to determine which sections need to be most protected. Additionally, if some sort of development is planned on a specific tract, the board would know whether this action could adversely affect cultural resources.

A second example of this type of management developed for specific tracts could be used by Northeast Utilities. This company is currently developing plans, as part of a licensing procedure required by the Federal Energy Regulatory Commission, to lease or develop parcels for recreation along the Housatonic and Shepaug Rivers. A number of parcels have been suggested for recreational facilities including some at Falls Village, Bulls Bridge, and 168 acres between Gaylordsville and Boardman's Bridge. Table VI should make clear that the relevant kilometer sections (011-014, 051-053, 056-063) contain either known sites or sensitive localities. There are also tracts within these sections which are not sensitive; these would be ones where development would not disturb or destroy the cultural resource base. By using these tables and other information, it should be possible for Northeast Utilities to develop plans which protect sites. In this case, such plans are required by federal preservation law.

Thus our research is not only significant for what it tells us of the past and history, but also for what it can offer as far as future conservation is concerned. Next year will be spent in increasing the quality and coverage of the planning inventory in hopes of being able to preserve a portion of Litchfield County's past.

Table V. Management Data for the Shepaug Corridor

Kilometer	Town	Unknown		Known		Sensitive		No Sensitivity	
		E	W	E	W	E	W	E	W
001	74							X	X
002	74					H	H		
003	150					H	H		
004	150	X	X						
005	150	X	X						
006	150	X	X						
007	150					P	HP		
008	150	X	X						
009	150	X	X						
010	150							X	X
011	150	X					P		
012	150						P	X	
013	150			P			H		
014	150					P	PH		
015	150						H	X	
016	150					PH			X
017	150		X			P			
018	150					H			X
019	150							X	X
020	150							X	X
021	150		X					X	
022	120		X					X	
023	120		X					X	
024	120		X			P			
025	120		X			H			
026	120		P			P	H		
027	120		P			H	H		
028	120	X					H		
029	120	X	X						
030	120		X					X	
031	120		X					X	
032	120		X			P			
033	120		X			P			
034	120							X	X
035	120							X	X

Key:

P=Prehistoric
H=Historic
E=East Bank
W=West Bank

Washington: 150
Roxbury: 120
Litchfield: 74

Table VI. Management Data for the Housatonic Corridor

Kilometer	Town E	Town W	Unknown E	Unknown W	Known E	Known W	Sensitive E	Sensitive W	No Sensitivity E	No Sensitivity W
001	100	122					H	H	P	P
002	100	122	X					H		P
003	100	122	X							X
004	100	122	X					P		
005	100	122	X	X						
006	100	122	X	X						
007	21	122	X							P
008	21	122	X							X
009	21	122	X							X
010	21	122							X	X
011	21	122							X	X
012	21	122				H	H			
013	21	122				H	H			
014	21	122	X	X						
015	21	122			P	P				
016	21	122			P	P				
017	21	122		X					X	
018	21	122	X	X						
019	31	125	X	X						
020	31	125	X	X						
021	31	125							X	X
022	31	125			H		P	H		
023	31	125	X			H				
024	31	125	X							X
025	31	125	X							X
026	31	125				H		H	X	
027	31	125			P		H	H		
028	31	125						H	X	
029	31	125			P	H				
030	31	125			P					X
031	31	125					H		P	P
032	31	125				H			X	
033	31	125			H	H				
034	31	125	X	X						
035	31	125	X	X						
036	31	68	X			H				
037	68	68		X			P			
038	68	68	X					H		
039	68	68		X			P			
040	68	68	X	X						
041	68	68	X	X						
042	68	68	X			H				
043	68	68				H	P			
044	68	68	X	X						
045	68	68	X							X
046	68	68	X					P		
047	68	68		X					X	
048	68	68		X					X	

Table VI. Management Data for the Housatonic Corridor (cont.)

Kilometer	Town		Unknown		Known		Sensitive		No Sensitivity	
	E	W	E	W	E	W	E	W	E	W
049	68	68							X	X
050	68	68							X	X
051	68	68					H			X
052	68	68					H			X
053	96	127	X			P				
054	96	127					P			X
055	96	127							X	X
056	96	96	X			PH				
057	96	96	X					P		
058	96	96	X	X						
059	96	96	X							X
060	96	96							X	X
061	96	96					H			X
062	96	96							X	X
063	96	96							X	X

Key:

P=Prehistoric
H=Historic
E=East Bank
W=West Bank

Canaan: 21
Cornwall: 31
Kent: 68
New Milford: 96
North Canaan: 100
Salisbury: 122
Sharon: 125
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