

THE BULLETIN

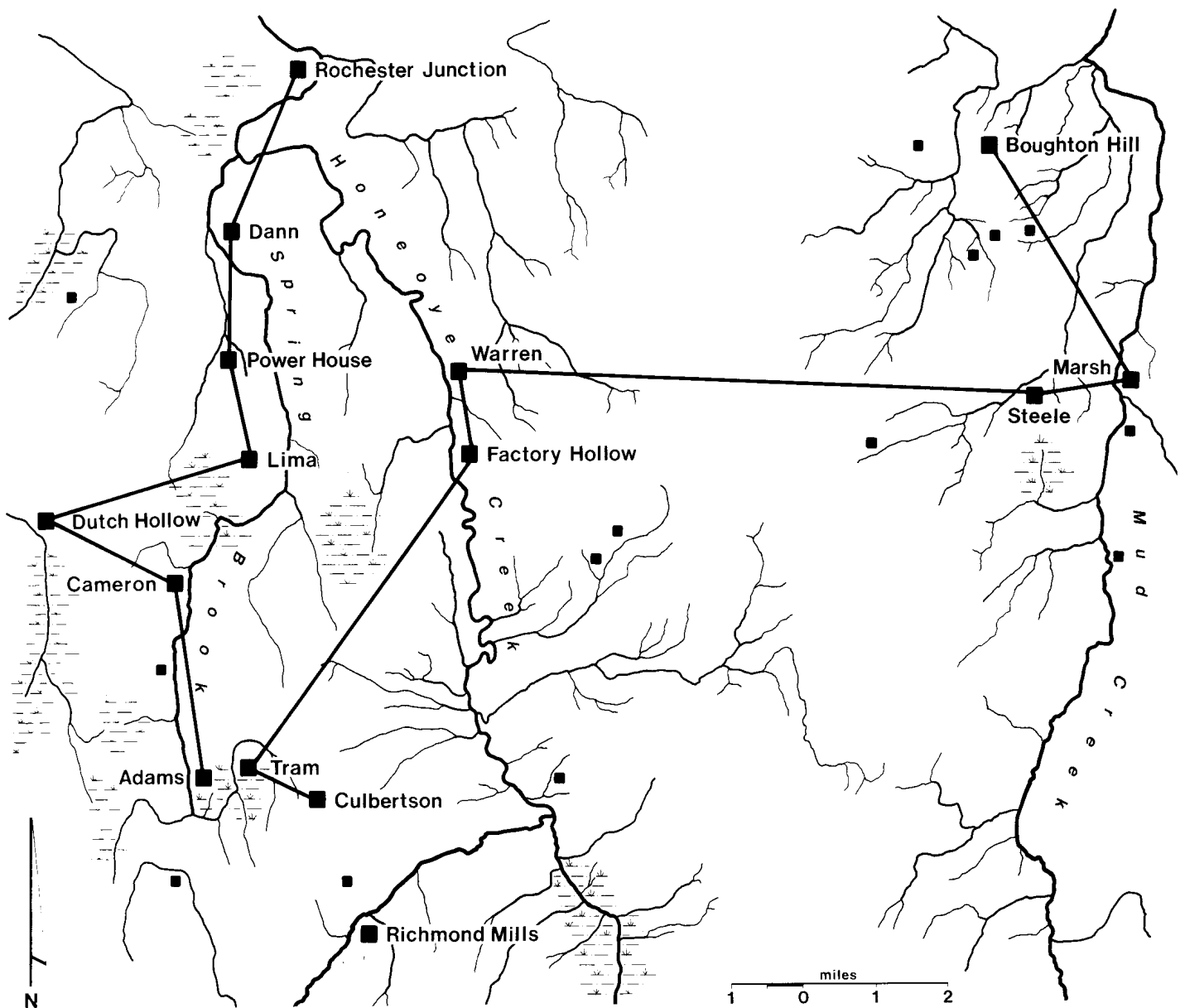
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The Bulletin

Journal of the New York State Archaeological Association



The Seneca Site Sequence A.D. 1550 - 1687

The New York State Archaeological Association

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Charles Foster Wray
1919 - 1985

Photograph taken in his office at Meadowood in the 1960s; used courtesy of Amber Wray Corbin.

This issue of *The Bulletin* is dedicated to the late Charles F. Wray, a long-time member of the Lewis H. Morgan Chapter and a past president of the New York State Archaeological Association. The papers were all written by individuals who, at one time or another, were associated with Charlie's research. On March 22, 1986, the papers were presented at a session entitled "To Know the Seneca" at the 26th Annual Meeting of the Northeastern Anthropological Association in Buffalo, New York. The Editor would like to express his appreciation to all the participants and to Dr. Mary Ann Niemczycki, who co-chaired the sessions and with Brian Nagel, Assistant Editor, originated the idea of publishing the papers under one cover.

At the 1987 NYSAA Annual Meeting in Syracuse, New York, the new format for *The Bulletin* was approved. Appreciation should be given to Gian Carlo Cervone and Patricia L. Miller for their contribution to the new electronic publication layout. It is hoped that this format will be another significant step in development of the NYSAA's publication program. Finally, financial assistance for this issue in addition to regular membership funds was provided by the Lewis H. Morgan Chapter and the Research Division of the Rochester Museum and Science Center. Charles Wray always actively supported both of these organizations in his effort to document and interpret the Iroquois.

Charles F. Hayes III

The New Bulletin Format

Several of the papers presented at the NEAA meeting to honor Charles F. Wray were accompanied by the contribution of a different type of associate - a graphic artist. Charlie's interest and involvement in documentation through graphics was rather extraordinary, extending from his personal sketch maps and endless photographs of objects, to X-ray images of artifacts and aerial photographs of sites, to the aesthetically beautiful and incredibly detailed drawings of Gene Mackay. While working with Charlie from 1982 - 1985, I had the rare opportunity of being able to help document artifacts in the collections and map excavations from notes, while also benefiting from his incredible memory and the enormous amount of information he carried in his head. His warm personality, encouragement and enthusiasm continue to be an inspiration and example to all those who worked with him.

The new format and production of *Bulletin 95* is an offshoot of Charlie's involvement in research and documentation of the Seneca Site Sequence at the Rochester Museum and Science Center; the equipment used was acquired to create Volume I of the Charles F. Wray Series in Seneca Archaeology. The actual production process, known as Desktop Publishing, is very similar in

concept to Charlie's method of creating books by writing, assembling and editing countless notes, and having them bound as reference manuals. *Bulletin 95* was produced on a Macintosh Plus with a Jasmine hard disc, using MacWrite and Write Now for word processing and editing; papers were submitted on discs, typed in, scanned in, or transferred by modem from computer to computer. Page Maker 1.2 and 2.0a were used for design and layout of copy; the resulting files were typeset on a Linotronic 300.

I would like to invite the members of the NYSAA to respond to this new format and would welcome their suggestions. I would also like to thank Editors Charles F. Hayes III and Brian Nagel for their acceptance and encouragement of the new design; Suzanne Mooney of the RMSC for typing and assistance with layout; and Jim Anderson and the Public Information Department of the RMSC for technical and moral support. Most of all, I thank Gian Carlo Cervone for his constant help and encouragement, and for his patience in teaching me how to use the Macintosh computer.

Patricia L. Miller

Charles Foster Wray 1919-1985

Charles F. Hayes III, Lewis H. Morgan Chapter, Rochester Museum and Science Center

On April 20, 1985, New York State lost one of its most dedicated and active archaeologists, Charles F. Wray. He passed away while investigating a Seneca village site near Lima in Livingston County, New York. From his first involvement on his family homestead, Meadowood, in the Genesee Valley through his post-retirement years associated with the Rochester Museum and Science Center, Charlie was able to contribute for over 50 years an unparalleled amount of artifacts, data, and interpretations related to the Northeast. His death was not only a personal tragedy for his family and associates, but also a severe blow to regional archaeology, particularly that of the Seneca Iroquois. Current and future researchers will have to attempt to fill the void and disseminate the vast quantity of data upon which he was working at the time of his death.

Charles F. Wray was born on May 12, 1919, twenty miles south of Rochester at the family's 40 acre homestead built by his father in 1912. He had two sisters and a brother. He grew up in West Rush, a location which had a profound influence on his entire life. Charlie received both his bachelor's and master's degrees in geology from the University of Rochester. After World War II service as a U.S. Army code breaker in Europe, including the landings at Normandy, he returned to Rochester to work in the family business for 10 years at the Henry Wray and Son Brass Foundry. He rose from moulder to Vice-President. In 1955 Charlie began employment in the Geology Department at Ward's Natural Science Establishment, Inc. in Rochester. He retired from there as Head of Mineralogy in 1981. In 1944 he married Alice Getzin, an anthropology student at the University of Colorado. She became a staunch supporter of his archaeological work and accompanied him on many excavations.

It is very difficult to summarize Charles Wray's diverse involvement in various archaeological projects. Actually there was very little in which he was not an active participant or a major contributor. Perhaps it is best to identify several major areas of significance which would include his work with the Rochester Museum (Rochester Museum and Science Center) his professional endeavors as a mineralogist, as a member of the New York State Archaeological Association, and his association with the Rock Foundation, Inc. The latter association facilitated a great many of his long range archaeological plans related to the Seneca Iroquois.

Charles Wray became involved in archaeology and geology at the age of seven and continued this interest as a

high school student. Through the generosity of Dr. William A. Ritchie and Dr. Arthur C. Parker at the Rochester Museum, Charlie was able to participate in many excavations with the staff, including the Works Progress Administration crews. From his association there developed a life-long relationship with Bill Ritchie and the Rochester Museum even after Ritchie left Rochester to become New York State Archaeologist. Archaeology is a field in which there are often tensions between avocational and professional pursuits. When it came to Charles Wray, these differences became less contentious and enabled him to become familiar with a variety of projects in the region. Consequently, Charlie was fortunate enough to be able to look back and review his active participation in the excavation of sites producing artifacts and information which would become diagnostic for northeastern archaeology. Charlie was able to do this with great pride. Notable among those sites later to become identified with the Archaic Stage and upon which Charlie worked were Lamoka Lake (1927), Geneva Yacht Club (1935), Brewerton (1936, 1937), and Frontenac Island (1938, 1939). Early and Middle Woodland sites included Meadowood on his family estate in Rush (1930), the Genesee Mound (1936), Sea Breeze (1939) and several significant sites along the St. Lawrence River. Finally, he was able to excavate at the Late Woodland Sackett (1934) and Castle Creek (1931, 1933) Owasco sites. In 1941 Charlie was involved in William Ritchie's absence in the Museum's move from Edgerton Park to its present location on East Avenue.

World War II interrupted Charlie's archaeological career. He returned to Genesee Country to embark on what became an intense personal pursuit, that of systematically documenting and interpreting the Seneca Iroquois villages. In this effort he was first joined by Harry Schoff and later joined by Donald Cameron in what was to become a long-term project. The goal was to investigate the prehistoric and historic Seneca village sites dating from A.D. 1550 to 1800 in the Genesee Valley and the Western Finger Lakes. Starting in the 1950s and continuing until the time of Charlie's death, excavations were conducted on such sites as Factory Hollow, Power House, Dann, Warren, Rochester Junction and Boughton Hill (Ganondagon State Historic Site) and a number of eighteenth century sites east of Canandaigua, N.Y. The work of previous excavators

was often re-evaluated and some sites even re-excavated in order to fill in the gaps in the Seneca Sequence as initially conceived in the classic publication on the subject (Wray and Schoff, 1953). With Charlie's special intuitive feelings for site locations and interpretations the Sequence became well-defined and the many collections identified and documented.

In late 1984 Charlie's extensive experience in site excavation was greatly appreciated by the RMSC during its recovery of over 300 Euroamerican skeletons from Highland Park South in Rochester, N.Y.

Charles Wray was, by profession, a geologist with a specialty in mineralogy. This training was to be of immense value to him throughout his life. At Ward's Natural Science Establishment he was able to apply his up-to-date professional involvement to the needs of archaeology. Consequently he soon became an expert on lithics used by prehistoric and historic Native Americans (Wray 1948, 1957). He also developed comprehensive flint identification kits for museums. It became routine to "ask Charlie" when preparing final reports involving lithic trade routes, sources and types.

There is a great deal of glacial geology in the Genesee Country and Charlie's knowledge of geomorphology in relation to the location of archaeological sites was another positive factor in his overall intuitive feelings for finding sites year after year. Never were archaeology and geology so well interrelated.

Charlie was a very active participant in the New York State Archaeological Association. In 1938 he became involved in the development of the NYSAA's library held by the Lewis Henry Morgan Chapter at the RMSC. He later served as Secretary (1941-1942, 1946-1947, 1956) and President (1950-1952) of the chapter, as well as a frequent member of the Executive Committee and Trustee to the NYSAA. He was eventually elected to the presidency of the NYSAA itself. During his entire life the NYSAA and its component chapters were never far from his mind for he was not only in frequent attendance at annual meetings throughout the State, but also an invited speaker at monthly chapter meetings. It was, however, the Lewis Henry Morgan Chapter in Rochester to which he was dedicated. Many members and non-members alike remember not only his enlightening presentations at formal meetings, but also his informal sessions during the August Morgan Chapter picnics, hosted so often by his wife, Alice, and the Camerons at Meadowood.

The network of individuals throughout the NYSAA, museums, and colleges who kept in communication with Charlie has provided New York State with an unusual archaeological cohesiveness not generally found in very many other state organizations. Charlie's relationships with Native Americans, especially the Seneca

was one often characterized by mutual respect. Despite increasing sensitivity over human remains and sacred objects, it should be noted that several Senecas, including Chief Corbett Sundown of the Tonawanda Reservation, were present at Charlie's memorial service. Building upon these contacts Charlie by 1985 had begun to have international contacts, particularly with scholars in the Netherlands where recent research has indicated close trade connections with the Seneca in the seventeenth century. The trip by Alice, Charlie and the writer to Amsterdam in 1983 to attend the New Netherland Studies conference has resulted in a large number of European scholars becoming interested in the research collections (Wray 1985a).

During the 1970s Charlie was urged by many of his associates, particularly U.S. Representative Barber Conable, to think about the future of his collection. Consequently in 1976 Charles Wray and Donald Cameron approached the Rochester Museum and Science Center and outlined a plan for the acquisition for the RMSC of their and other important collections related to the Seneca sites by the Rock Foundation, Inc. Along with the collections there would be long-term support for conservation, cataloging, publishing conferences and artifacts numbering in the hundreds of thousands would be available for scientific study by scholars on a world-wide basis through what was established as the Arthur C. Parker Fund for Iroquois Research. The Foundation's generous support helped Charlie fulfill many of his archaeological dreams. The Seneca research effort through the RMSC's Research Division has continued unabated since Charlie's death. Aside from the generous support from the Rock Foundation, numerous other research and program grants have been received including awards from the National Endowment for the Humanities and the National Science Foundation.

Charlie's association with the Rock Foundation was the culmination of his archaeological endeavors and one which he took full advantage of both before and after his retirement from Ward's. It afforded him unexpected and unparalleled opportunities to build on his Seneca research and to continue publishing. Unfortunately, the major publication effort will have to be borne by his successors. Many awards and recognitions were given Charlie throughout his career. In 1941 he was made a Fellow of the Rochester Museum for his outstanding achievements and at the time of his death was Honorary Curator of Anthropology. The Rochester Academy of Science awarded him a fellowship for his work in mineralogy in 1963. He was also a Fellow of the New York State Archaeological Association and the recipient of the "Archey" award from the Society for Pennsylvania Archaeology in 1961.

The Rochester Museum and Science Center featured Charles Wray in an issue of FOCUS (Vol. I No. 4, Winter 1985). Several writers interviewed him and were able to place

under one cover the essence of his research-orientated life. After his death the Lewis H. Morgan Chapter, NYSAA, published in its Iroquoian (No. 12, Spring 1986) a number of personal accounts by individuals who had known Charlie. Many of these informal, but highly personal reminiscences attest to the unusual background and influences which Charlie had on the archaeological community.

In writing this account of Charles Wray's career it was necessary to go through the many notes and handwritten accounts which he often distributed to his colleagues. Of particular interest was a piece entitled "How It All Came About." It is a personal narrative and one of many which will be very valuable to any future biographer of Charles Wray's remarkable life.

Archaeology was not just Charles Wray's concern. It was family concern and one which found the constant support of wife, Alice, and his children, Christopher Faxon Wray and Amber Wray Corbin. This continued dedication was brought to the severe test in 1983 when Charles Wray suffered his first heart attack and in late 1984 when Alice became seriously ill. Yet illness did not deter his efforts. Despite Charlie's death in April of 1985, followed a little over a month (May 28) later by Alice's death, one had the overall feeling from the family that Charlie's scientific endeavors of over fifty years should not be jeopardized. This was not an easy atmosphere to provide given the enormity of the personal crises. As a result, the *Handbook of Seneca Archaeology* upon which Charlie had been working will be published under his name along with Lorraine Saunders, Martha Sempowski, and Gian Carlo Cervone as the first volume in the *planned Charles F. Wray Series in Seneca Archaeology* (Wray, et al, 1987). Illustrations for this volume and many other publications and exhibits have and will be prepared by Patricia L. Miller and Gene Mackay. In terms of public interpretation Charlie's research and the Seneca archaeological collections will receive well-deserved exposure as part of an exhibit on the Contact Period (A.D. 1550-1800) entitled "At the Western Door." The display is planned for installation in the RMSC's Elaine Wilson Hall in 1988. The legacy from Charles Wray's long and distinguished career will be with us for a long time to come.

Major Publications by Charles F. Wray

- Witthoft, John, Harry L. Schoff, and Charles F. Wray
1953 Micmac Pipes, Vase-Shaped Pipes, and Calumets. *Pennsylvania Archaeologist*, 23(3-4):89-107.
- Wray, Charles F.
1948 Varieties and Sources of Flint Found in New York State. *Pennsylvania Archaeologist*, 18(1-2):25-45.
- 1956a Archaeological Evidence of the Mask Among the Seneca. *The Bulletin*, New York State Archaeological Association, (7):7-8.
- 1956b Seneca Tobacco Pipes. *The Bulletin*, New York State Archaeological Association (6):15-16.
- 1957 Rock and Minerals Used by the New York Indians. Museum Service, *Bulletin of the Rochester Museum of Arts and Sciences*, 30 (2):26-27.
- 1962 Boughton Hill Editorial (Fourth in a Series). *Morgan Chapter Newsletter*, 2 (7).
- 1963 Ornamental Hair Combs of the Seneca Iroquois. *Pennsylvania Archaeologist* 33(1-2):35-50.
- 1964a The Role of the Amateur Archaeologist. Museum Service, *Bulletin of the Rochester Museum of Arts and Sciences*, 37(6):90-93.
- 1964b The Bird in Seneca Archaeology. *Proceedings of the Rochester Academy of Science* 11 (1):1-56.
- 1965a The Farrell Site. *Morgan Chapter Newsletter*, Lewis H. Morgan Chapter, 5:14-17, Spring.
- 1965b An Early Woodland Site Near Cuylerville, New York. *Morgan Chapter Newsletter*; 5(Summer): 3-7, Rochester, N.Y.
- 1965c A Brick Making Pit on Boughton Hill, Victor, New York. *Morgan Chapter Newsletter*, 5 (Fall):1, 3-5, Rochester, N.Y.
- 1966 *Boughton Hill, Victor, New York*. On file, Rochester Museum and Science Center. Mimeographed.
- 1969 Stone Pipes of the New York State Indians. *Lapidary Journal*, 23(3):492-498.

- 1973 Manual for Seneca Iroquois Archaeology. Cultures Primitive, Rochester.
- 1983 Seneca Glass Trade Beads c. A.D. 1550-1820. In *Proceedings of the 1982 Glass Trade Bead Conference*, edited by Charles F. Hayes III, pp. 41-49. Research Records No. 16, Rochester Museum and Science Center, Rochester, N.Y.
- 1985a The Volume of Dutch Trade Goods Received by the Seneca Iroquois 1600-1687 A.D. *New Netherlands Studies: An Inventory of 'Current Research and Approaches*, KNOB Bulletin No. 2/3. June. Royal Dutch Antiquarian Society.
- 1985b Firearms Among the Seneca-The Archaeological Evidence (abstract). In *Proceedings of the 1984 Trade Gun Conference*, edited by Charles F. Hayes III and Jan Piet Puype, pp. 106-107. Research Records No. 18 (Part II), Rochester Museum and Science Center, Rochester, N.Y.
- Wray, Charles F., Martha Sempowski, Lorraine Saunders, and Gian C. Cervone, (illustrated by Patricia Miller).
1987 *The Adams and Culbertson Sites*. Research Records of the Rochester Museum and Science Center No. 19. Charles F. Wray Series in Seneca Archaeology, Vol. 1, Rochester, N.Y.
- Wray, Charles F. and Robert Graham
1960 New Discoveries on an Old Site: The Bunce Site. *The Bulletin*, New York State Archaeological Association, 18:1-4.
- Wray, Charles F. and Harry L. Schoff
1953 A Preliminary Report on the Seneca Sequence in Western New York 1550-1687. *Pennsylvania Archaeologist* 23(2):53-63.

Introduction

William Engelbrecht, Frederick M. Houghton Chapter, Department of Anthropology, State University College at Buffalo

The papers in this issue were first presented in 1986 at a session of the Northeastern Anthropological Association dedicated to Charles Foster Wray and entitled "To Know the Seneca." While a number of individuals have made important contributions to Seneca archaeology over the years, none have contributed more than the late Charles Wray. Thanks to his dedication and perseverance, we now have considerable data on Seneca sites and material culture from the mid-sixteenth century through the late seventeenth century, when the major Seneca villages were destroyed by the DeNonville expedition.

During his life, Charles Wray was unfailingly supportive of researchers who wished to work with material that he had gathered. In 1970, I lived with the Wray family for two months while studying Seneca ceramics, one of a number of individuals "adopted" by Charles and Alice Wray. Most of the papers presented in this issue draw on the data base which Charles Wray was instrumental in developing, and I think he would be pleased to see the diverse lines of inquiry resulting from his research. All those interested in the Seneca owe Charles Wray a debt of gratitude for the unique and valuable body of data that he amassed.

In addition to the contribution of Charles Wray to Seneca archaeology, the long term interest and involvement of the Rochester Museum and Science Center in facilitating and directing research on the Seneca should be mentioned. Charles F. Hayes III, Research Director at the museum, and Dr. Mary Ann Niemczycki organized the session of the NEAA and with Brian Na-el, Research Archaeologists at the RMSC, arranged for publication of the papers in *The Bulletin*. Much of the research represented in the paper, that follow has been partially or wholly supported by the Rochester Museum and Science Center through the Rock Foundation Inc. The RMSC serves as the major repository of archaeological collections and information pertaining to the Seneca, including the Wray collection, and has pursued an active policy of informing the general public as well as scholars and the Seneca themselves about the prehistoric and historic heritage of the Rochester area. Thus, the papers in this issue reflect both the contribution of Charles Wray and the involvement of the Rochester Museum and Science Center, an institution with which Charles Wray was long associated.

It is generally accepted that Iroquois villages periodically moved to a new location. In 1953, Wray and

Schoff published "A Preliminary Report on the Seneca Sequence in Western New York, 1550-1687" in the *Pennsylvania Archaeologist*. This article detailed the sequence of Seneca village movement during the Protohistoric and Early Historic periods and served as the base for later Seneca studies and as the model for the study of other Iroquois groups.

Currently, there is an interest in Iroquoian studies in attempting to document the variability in village movement to ascertain the duration of occupation and factors responsible for village removal. French observers of the early seventeenth century Huron cited depletion of soil and firewood in the immediate vicinity as the primary factors responsible for village removal, though the dream of a resident that a village should be moved apparently served as the catalyst. Heidenreich (1971:213-216), Sykes (1980), Starna, et al (1984) and Snow (1987) consider other factors including bird, animal, and insect pests, refuse accumulation, scarcity of game, fear of attack, destruction of structures through fire or physical deterioration, social tensions, and changed size of social units rendering old structures obsolete.

Estimates of the duration of occupation of individual Iroquois villages vary widely. While 10 to 12 years is often cited, some Onondaga and historic Mohawk villages may have been occupied for over 50 years (Starna et. al.: 1984). It is also possible that in some cases the move was accomplished gradually, with some people remaining for a time in the old village after a new one had been established. Knowing how long a particular village site was occupied is relevant to a variety of concerns, including assessment of the factors influencing removal, determining the relationship of the village to others in the area and establishing rates of stylistic change and acculturation.

Up to now, methods for determining the duration of occupation of particular village sites have met with limited success. Chronometric techniques like radiocarbon dating generally do not give precise enough results to distinguish a 10 year from a 20 year occupation. Warrick (1987) summarizes many of these attempts (use of density of material, thickness of middens) and proposes using density of post molds along the wall of a long house as an indicator of occupation, reasoning that the longer a house stood, the more posts would have to be replaced.

The first two papers address the issue of village duration.

Charles Vandrei's paper, "Observations on Seneca Settlement in the Early Historic Period" uses Carneiro's (1956) formula for estimating length of village occupation. He derives potential occupation lengths given differing village populations. Like Sykes (1980). Vandrei's calculations suggest that most villages would not have used up all available farmland as quickly as is commonly assumed. In this paper, useful data on site size, spacing, and defensibility are presented. Of particular interest is his discussion of the Western Seneca sequence linking the potential length of occupation of villages with the distance they move.

"Occupation Interval and Mortality Rate: A Methodological Approach" by Lorraine Saunders provides another approach to determining the length of occupation of a village. Using cemetery data from the Adams Site, she argues for a 10 year occupation. This approach requires a number of assumptions including:

- 1) that most of the burials have been discovered and reported,
- 2) that these burials represent most of the deaths in the village,
- 3) that we have an accurate population estimate,
- 4) that the population was relatively constant,
- 5) that the death rate was similar to comparable prehistoric populations,
- 6) that the death rate was constant.

Though any one of these assumptions may be questioned, the results of the analysis are reasonable and within the range of what one would expect. This study illustrates another methodological approach to the problem of determining village duration.

While there has been a great deal of interest in questions of village size, location, and duration, there have been relatively few attempts to investigate questions of status and role within these villages. Martha Sempowski shows how potentially important such studies can be in her article, "Differential Mortuary Treatment of Seneca Women: Some Social Inferences". Using data from six Seneca sites she finds that males consistently received a greater diversity of grave goods than females. She also found that certain artifact categories like perforated animal teeth and other tool types like flakers, points, and scrapers were almost exclusively associated with males. Sempowski concludes that during the period covered by the study women did not have an elevated status relative to men, a conclusion at odds with what is often traditionally assumed. The consistency of the observed patterning and the large number of cases make this study a convincing one.

Ceramics are typically the most common artifact type found on Iroquois village sites, and for this reason studies of Iroquois archaeology have often focused on them. Gian Carlo

Cervone, in his paper, "Seneca Pottery Analysis: Some Problems and Solutions in Refining the Potential of Attribute Analysis" argues for more precise methods of ceramic description and analysis and introduces a new index (Collar Height/ Pot Height). The fact that he is able to deal with the total height of the pot in many cases indicates the outstanding nature of many of the Seneca ceramic collections. A question in any ceramic study concerns the representativeness of the ceramic sample. Cervone notes that ceramics from many of the earlier Seneca sites come from middens while ceramics from later Seneca sites are often from burials. As Cervone suggests, analysis of sites like Dutch Hollow and Factory Hollow, which have large ceramic collections from both midden and burial contexts, should shed some light on this problem. The problem of representativeness can even influence the study of an attribute like collar height. The more striking sherds with higher collars may be over represented in some older collections, sherds with lower collars having been discarded. On the other hand, since high collars are less likely to be preserved intact than lower collars they may be under represented in other collections. The study of systematically excavated and curated collections from relatively undisturbed sites should prove helpful in this regard.

Mary Ann Niemczycki's doctoral dissertation, *The Origin and Development of the Seneca and Cayuga Tribes of New York State*, extended our understanding of prehistoric Seneca development back in time. This research also helped to clarify remaining gaps in our knowledge, such as the Owasco-Iroquois transition in the Genesee. On the advice of Charles Wray, Niemczycki conducted excavations at the Markham Pond site in order to shed light on this transitional period. Her interest in this transition ranged beyond cultural historical questions to those of culture process. Niemczycki deals in her paper, "Late Woodland Settlement in the Genesee", with the important question of tribal formation, a problem not just of interest to some northeastern archaeologists, but to anthropologists in general. Seneca archaeology, like the archaeology of any other area, has the potential for increasing our understanding of general cultural processes. The quality and quantity of data on the prehistoric Seneca that are being amassed renders the goal of understanding tribal formation in the area attainable.

This is not to say that at present there is universal agreement on the factors responsible for tribal formation. Robert Hasenstab, in "Canoes, Caches and Carrying Places: Territorial Boundaries and Tribalization in Late Woodland Western New York" argues for the importance of external factors in understanding Iroquois development. In particular, Hasenstab points to the existence of complex Mississippian societies to the southwest of the Iroquois as an important factor. While

Testing this hypothesis is difficult, this paper is important in pointing out the need for a larger geographical perspective than has heretofore been the case in most studies of Iroquois development. A fuller understanding of the evolution of Iroquois socio-political systems will no doubt require the examination of multiple lines of evidence, from potsherds and mortuary data to linguistic reconstruction and tracing of trade contacts.

Years ago, Charles Wray was one of a handful of dedicated avocational and professional researchers interested in Iroquois archaeology. Today, the field is growing rapidly and the appearance of this issue is one of a number of signs that Iroquois studies are alive and well and tackling some very interesting problems. For the last few years, Dean Snow has been directing the Mohawk Valley project which has been generating both data and theoretical contributions. Canadian archaeologists have recently excavated a number of Iroquois villages in Ontario which further add to our knowledge of the Iroquois. In May 1987, there was a session on Iroquois Settlement and Demography at the Society for American Archaeology meetings in Toronto that was very well attended and in which a number of new advances were made public. In short, the pace of Iroquoian studies appears to be quickening. Publication of these papers makes them available to what appears to be an increasingly interested profession and general public.

References Cited

Carneiro, Robert

1956 Slash and Burn Agriculture: A Close Look at Its Implications for Settlement Patterns. In *Man and Cultures, Selected Papers of the Fifth International Congress of Anthropological and Ethnological Sciences*. Edited by A.F.C. Wallace, pp. 229-234. University of Pennsylvania Press, Philadelphia.

Heidenreich, Conrad E.

1971 *Huronian: A History and Geography of the Huron Indians, 1600-50*. McClelland-Stewart Ltd. Toronto.

Snow, Dean

1968 Variables and Constants in Iroquoia; Settlement Patterns. Paper presented at the Annual Meeting of the Society for American Archaeology Toronto.

Starna, William A., George R. Hamell and William L. Butts

1984 Northern Iroquoian Horticulture and Insect Infestation: A Cause for Village Removal. *Ethnohistory* 31(3):197-207.

Sykes, Clark M.

1980 Swidden Horticulture and Iroquois Settlement. *Archaeology of Eastern North America* 8:45-52

Warrick, Gary A.

1987 Estimating Ontario Iroquoian Village Duration. Paper presented at the Annual Meeting of the Society for American Archaeology. Toronto.

Observations on Seneca Settlement in the Early Historic Period

Charles F. Vandrei, NYSAA, NYSAA, NYS Department of Environmental Conservation

Utilizing village site location, size, and estimated population in relation to soils, topography and hydrology, this paper examines Seneca settlement in the early historic period (A.D. 1500 to 1687) in an effort to understand the decision-making process involved in choosing a village location. The degree of Seneca dependence on horticultural food production and possible changes as a result of European contact is examined. The distribution (spacing) of contemporary and sequential villages is considered along with the timing and frequency of village removals.

Introduction

The purpose of this research is to examine the location, size and spacing of contemporaneous and sequential village sites associated with the historic period Seneca from c. A.D. 1550 through 1687. The Seneca villages from this period constitute an unbroken string of settlements associated with two major communities as well as a number of smaller "satellite" villages or hamlets (Wray 1973, 1983, Wray and Schoff 1953). As such, they constitute a unique and valuable source of data for examining the relationship between Iroquoian horticulturalists and the physical environment in which they lived.

A total of 25 villages have been identified from this period and are located in Livingston, Ontario and Monroe counties. Fourteen of these sites represent large village occupations, defined as sites larger than 5 acres, while the remainder consist of smaller villages and hamlets (Wray 1973, Wray and Schoff 1953). The preliminary results reported in this paper are based on a total of 19 sites: 14 large settlements and 5 small villages or hamlets dating from the mid-sixteenth through the end of the seventeenth century (Table 1). Unfortunately data collection has not been completed for the remaining 6 small sites.

The primary analytical technique applied in this study is site catchment analysis limited to the soils surrounding village locations. Catchment analysis is defined as the study of the relationships between technology and those natural resources within economic range of individual sites (Carneiro 1956; Vita-Finzi and Higgs 1969; Roper 1979). In this case, the application of catchment analysis consists of the evaluation of the horticultural potential of soils surrounding village locations. It is not an attempt to examine the full range of natural resources utilized by the Seneca.

Catchment analysis has seen only limited application in Iroquoian archaeology. In an analysis of

Huron settlements, Clark Sykes (1980: 52) found that most villages could have been occupied much longer than the generally accepted range of 10 to 30 years, if only the productivity of soils surrounding settlements was considered. In a similar analysis of late prehistoric and early historic Mohawk sites, Bond (1985) Concluded that site location strategies reflected a balancing of access to prime horticultural soils and defense factors.

The second element of this study consists of an examination of each village site location in terms of its situation with respect to distances to predecessor, successor and contemporary villages. Such factors as site setting and relative defensibility are also considered.

Assumption and Inherent Problems

The assumptions which form the basis of catchment analysis in general also apply to this study. It is assumed that the potential resources, in this case represented by soils, which are closest to a village will be more frequently and more successfully exploited than those which are at greater distances from the settlement. Generally for farming settlements it is assumed that the area within a two kilometer radius of a settlement is the area which can be most efficiently exploited for horticultural purposes. Beyond this distance, productivity falls off rapidly as more energy must be expended in resource acquisition and production than is gained from the resources obtained (Chisolm 1968). Similar parameters are assumed in this study.

This assumption carries with it several problems, particularly in the application of this technique to Iroquoians. First, although a circular catchment zone is convenient for analytical purposes it is highly likely that the actual village catchment zone was of irregular shape. Such factors as competing contemporary communities, natural obstacles/topography and areas already exploited by predecessor settlements would clearly have affected the catchment zone available to a specific village (Flannery 1976; Peebles 1978: 388-393). Like other Iroquoians the Seneca also derived only a portion of their sustenance from farming, with an unknown portion of the diet consisting of hunted and gathered foods.

The area exploited by a settlement is also related to its population. For this reason a two kilometer radius (1.2 miles) was used for sites over 5 acres (2 hectares) in size and a one

kilo meter (.62 mile) radius was used for sites less than 5 acres (2 hectares) in size. It is also assumed that Seneca horticultural methods, productivity rates and per capita maize consumption requirements are generally similar to those of other groups in the Northeast, particularly the Huron.

Soils Data

The soils data utilized in this study were derived from the U.S. Department of Agriculture soil Surveys for the three counties in which the Seneca village sites are located. These include Livingston County (USDA 1941), Monroe County (USDA 1973) and Ontario County (USDA 1958).

Circular templates made of transparent mylar were constructed each covered with a pattern of equally spaced points. Radii reflecting one half, one and two kilometer scales, appropriate to each county soil map, were then inscribed on each template. The appropriate template was then centered over the village location on the soil map and the area of each soil type was recorded. This was accomplished by counting the number of points falling within the various soil areas surrounding the village sites. Where site catchment zones fell into two and sometimes three counties the site was relocated on the appropriate map (or along its edge) and that portion of the remaining catchment zone was counted.

Soils data were collected at the smallest descriptive level available in the soil surveys in order to permit maximum flexibility in soil classification. Generally this consisted of soil type and slope class (e.g. Honeoye silt loam, 3 to 10 percent slope.) Although this proved to be a rather tedious task it was necessary because of the wide range of variability in scale, detail and sophistication in the soils data available for the three counties.

Following data collection, the point counts for each soil type were converted to areas in acres using a constant based on the soil map scale. The soil types associated with all villages were then compiled into a master type list for each county. Data on pertinent soil characteristics (texture, drainage, etc.) were then obtained from the appropriate county soil survey. These data were utilized to create a tripartite characterization of soil types according to the relative quality of a given soil in terms of potential maize production and suitability for digging stick horticulture.

According to Heidenreich (1971:181-182), the prime soils for Iroquoian horticulture are those that are deep and well drained with medium to coarse textures and good but not excessive water holding capabilities, most often sandy or silty loams. Soil types with these characteristics, and having less than a 20% slope were designated as Class A. Class B soils are generally similar to Class A soils but are those found to be deficient in one or more characteristics with respect to maize productivity or suitability. Soils that would otherwise be considered Class A but were located on slopes between 20% and 30% were also placed in this class. Soils with heavy

textures (clay, muck, etc.), poor drainage or extreme slopes as well as wetlands and open water were placed in Class C and considered as unusable by the Seneca for horticultural purposes. The various soil types were then placed in these categories and the relative proportions of soil classes in each catchment circle around a given village were then calculated (Table 1).

Village Population Estimates

No specific data are available concerning the populations of the early historic Seneca villages. Estimates of regional or tribal populations provided by late seventeenth century European observers (cf. Engelbrecht 1957: 14-16; Tooker 1978: 421) are unusable for a study focusing on individual settlements. It was therefore necessary to use village area as a basis for estimating village populations. Two separate methods, both based on village area and the estimated proportion of the village area covered by structures, were used for this purpose.

The "low" population estimate was derived by calculating the proportion of village area covered by structures on completely excavated (or nearly so) Iroquoian village sites in New York and Ontario. This was necessary because no Seneca village sites have been extensively excavated and an adequate sample size was desired in order to provide reliable results. The sites used in this estimation were Caughnawaga (Grassman 1969), Garoga (Ritchie and Funk 1973: 313-332), and a number of Ontario Iroquoian sites (Heidenreich 1971: 123-129). These data indicate that between 30 and 35 percent of village area was occupied by structures or considered roofed area.

Subsequently, the estimated roofed or longhouse area within the individual village was used to estimate village populations using Naroll's (1962) formula. This method estimates population using the results of a cross cultural study that indicated that ten square meters of residential space was required for each structure occupant. Thus, the village population estimates are based on one person per every ten square meters of structure area.

Because it has been demonstrated that the above method tends to underestimate population when structures less than 1000 square meters in size are being considered, a second estimate was derived (Hassan 1981: 73). This technique estimates settlement population as one sixth of the area covered by structures and was developed specifically for multifamily structures (Casselbury 1974). This method was used to develop what is considered to be a "high" estimate of population (Table 1).

Neither of these estimates is considered absolutely accurate as both are based on many unconfirmed assumptions. These methods do not take into account the use of sections of longhouses (or whole structures) for purposes other than habi-

Table 1: Site Catchment Data and Results

Site Name Chronology Site Area	Soil Class Area in Acres		Population Estimate (low)	Potential Occupation Duration in Years for High and Low Population Estimates		Population Estimate (high)	Years/Soil Class Area	
	A	B					A	B
Culbertson c. 1560-1570 area = 10 acres	1 km	471.67	1300	6.45	1.39	2200	3.81	.82
	2 km	667.75		9.13	9.17		5.40	5.42
	Total =	1139.42		Total =	26.14	Total =		15.45
Adams c. 1565-1575 area = 11.5 acres	1 km	454.00	1500	5.38	.89	2500	3.23	.53
	2 km	1214.79		14.40	3.26		8.64	1.95
	Total =	1668.79		Total =	23.93	Total =		14.36
Tram c. 1570-1590 area = 10 acres	1 km	428.13	1300	5.85	.35	2200	3.46	.21
	2 km	1504.96		20.58	2.56		12.16	1.51
	Total =	1933.09		Total =	29.34	Total =		17.34
Cameron c. 1575-1595 area = 12.5 acres	1 km	351.88	1700	3.68	1.03	2700	2.32	.65
	2 km	1028.69		10.76	4.39		6.77	2.76
	Total =	1380.57		Total =	19.86	Total =		12.50
Factory Hollow c. 1590-1610 area = 8.5 acres	1 km	129.80	1100	2.10	4.51	1900	1.21	2.61
	2 km	557.61		9.01	13.94		5.22	8.07
	Total =	687.42		Total =	29.56	Total =		17.12
Dutch Hollow c. 1595-1615 area = 12 acres	1 km	531.77	1600	5.91	.61	2700	3.50	.36
	2 km	1420.18		15.78	3.05		9.35	1.80
	Total =	1951.95		Total =	25.34	Total =		15.02
Feugle c. 1595-1615 area = 2.5 acres	1 km	455.14	330	24.52	3.21	550	14.71	1.93
	2 km	0.00		0.00	0.00		0.00	0.00
	Total =	455.14		Total =	27.73	Total =		16.64
Warren c. 1610-1630 area = 10 acres	1 km	252.69	1300	3.46	3.34	2200	2.04	1.97
	2 km	742.72		10.16	8.63		6.00	5.10
	Total =	995.41		Total =	25.58	Total =		15.12
Lima c. 1615-1635 area = 10 acres	1 km	537.20	1300	7.35	1.64	2200	4.34	.97
	2 km	1423.76		19.47	5.40		11.51	3.19
	Total =	1960.97		Total =	33.86	Total =		20.01
Cornish c. 1610-1630 area = 2 acres	1 km	264.15	270	17.39	16.07	450	10.44	9.64
	2 km	0.00		0.00	0.00		0.00	0.00
	Total =	264.15		Total =	33.46	Total =		20.08
Bosley's Mills c. 1615-1635 area = 1.8 acres	1 km	99.16	240	7.35	15.26	400	4.41	9.16
	2 km	0.00		0.00	0.00		0.00	0.00
	Total =	99.16		Total =	22.61	Total =		13.56

Site Name Chronology Site Area	Potential Occupation Duration in Years for High and Low Population Estimates								
	Soils Class Area in Acres		Population Estimate (low)	Years/Soil Class Area		Population Estimate (high)	Years/Soil Class Area		
	A	B		A	B		A	B	
Steele c. 1630-1650 area = 10 acres	1 km	345.53	364.01	1300	4.73	2.99	2200	2.79	1.76
	2 km	1075.05	819.30		14.70	6.72		8.69	3.97
	Total =	1420.58	1183.31	Total =	29.14		Total =	17.22	
Power House c. 1635-1655 area = 10 acres	1 km	233.74	422.75	1300	3.20	3.47	2200	1.89	2.05
	2 km	1109.00	964.35		15.17	7.91		8.96	4.68
	Total =	1342.74	1387.09	Total =	29.74		Total =	17.58	
Menzis c. 1635-1655 area = 1.5 acres	1 km	519.14	173.05	200	46.15	9.23	330	27.97	5.59
	2 km	0.00	0.00		0.00	0.00		0.00	0.00
	Total =	519.14	173.05	Total =	55.38		Total =	33.56	
Marsh c. 1650-1670 area = 15 acres	1 km	124.19	573.26	2000	1.10	3.06	3300	.67	1.85
	2 km	398.85	1617.39		3.55	8.63		2.15	5.23
	Total =	523.05	2190.65	Total =	16.33		Total =	9.90	
Dann c. 1655-1675 area = 12.5 acres	1 km	191.06	344.41	1700	2.00	2.16	2800	1.21	1.31
	2 km	683.14	978.93		7.14	6.14		4.34	3.73
	Total =	874.20	1323.34	Total =	17.45		Total =	10.59	
Ganondagan c. 1670-1687 area = 9 acres	1 km	337.99	355.63	1200	5.01	3.16	2000	3.00	1.90
	2 km	834.07	1089.98		12.36	9.69		7.41	5.81
	Total =	1172.06	1445.61	Total =	30.21		Total =	18.13	
Roch. Junction c. 1675-1687 area = 15 acres	1 km	406.24	177.64	2000	3.61	.95	3300	2.19	.57
	2 km	1119.90	634.74		9.95	3.39		6.03	2.05
	Total =	1526.14	812.38	Total =	17.90		Total =	10.85	
Kirkwood c. 1675-1687 area = 2.5 acres	1 km	547.78	129.61	330	29.51	4.19	550	17.71	2.51
	2 km	0.00	0.00		0.00	0.00		0.00	0.00
	Total =	547.78	129.61	Total =	33.70		Total =	20.22	

Notes: 1. Site dates are from Wray 1983.

2. Site areas are, except as noted below, Wray, personal communication 1983. These are as follows: Cornish; Hayes 1967 and personal communication, Bosley's Mills; Vandrei 1986 (1983-1984 fieldwork), Ganondagan; Dean 1984, 1985.

3. Areas for class C (non-productive soils) are not shown but can be calculated by subtracting the areas of type A and B soils from the total areas for 1 and 1 to 2 kilometer circles. These are 1 km = 776.3 acres and 1 to 2 km = 2328.9 acres.

tation. In addition, it is not known how closely the density and internal structure of Seneca villages corresponded to that known for other Iroquoians. Actual village population therefore, probably falls somewhere between the high and low figures, probably closer to the lower estimate.

Catchment Analysis

In addition to natural environmental data and population information, the application of catchment analysis also requires data on resource production methods, as well as production and consumption rates. Direct data are unavailable for the Seneca in this area; however, such information is available for other groups, notably the Huron.

Assuming that the per capita maize requirement for the Seneca was similar to that calculated by Heidenreich for the Huron, a figure of nine bushels per person per year was used in all calculations (Heidenreich 1971: 193). This assumption may overestimate Seneca maize requirements as it is likely that the Seneca enjoyed greater access to wild (hunted and collected) foodstuffs. Seneca population densities never reached the high concentrations observed for the Huron who appear to have had only limited access to hunted and collected resources, except for fish (Heidenreich 1971: 163; Engelbrecht 1987: 15-16).

The productivity rates assigned to the various soil classes are as follows: Class A - 20 bushels per acre; Class B - 12 bushels per acre; and Class C - no production. Farmable areas were assumed to have a productive life of eight years. These figures correspond to those used in other studies of northeastern farming groups (Heidenreich 1971: 189-195, Ceci 1980: 53). Seneca slash and burn (swidden) farming techniques are also assumed to have been similar to those of the Huron and are described in detail in Parker (1968: 21-29).

Maize production and per capita maize requirements were used in conjunction with the areas of Class A and Class B soils and the site population estimates to calculate the potential duration of occupation at a given site. This calculation was made using Carneiro's formula for estimating the productive life of soils subjected to swidden horticulture (Carneiro 1956: 229-234). The results of these calculations for the high and low population estimates are presented in Table 1. The right hand columns of this table contain the estimated productive life of Class A and Class B soils within one and two kilometer radii of each site, as well as the cumulative potential village occupation length for each population estimate.

Inspection of Table 1 shows that sufficient productive soils are located within two kilometers of each village to support the estimated populations for at least the ten to twenty year period assumed for Iroquoian villages. The potential duration of occupation should not be taken as an actual estimate of village occupation; rather it should be considered as a measure of the relative horticultural productivity of the area around the site. These results simply reaffirm that factors

other than soil exhaustion must be considered when searching for the causes of Iroquoian village relocation (cf. Starna et al 1984).

In most cases, Class A soils form a larger proportion of the one half and one kilometer catchment circles. Most sites appear to have been located such that access to Class A soils was maximized. At Culbertson, Adams, Cameron, Tram, Dutch Hollow, Feugle, Lima, Warren, Cornish, Menzis, Dann, Rochester Junction, Kirkwood and Boughton Hill (Ganondagan), at least 40% of the soils within one half kilometer of the site are Class A. With the exception of the Factory Hollow, Bosley's Mills, Power House, Steele, Marsh, and Kirkwood sites, the proportion of Class A soils decreases as distance from the village increases. For these sites, Class A soils either remain constant or increase slightly with increasing distance. All sites with low proportions of nearby Class A soils have relatively large proportions of Class B soils, ranging, from 54% at Power House to 93% at Marsh, within one half kilometer. For all sites but Tram and Factory Hollow the percentage of Class C, non-productive soils, increases as distance from the site increases.

Although the number of small settlements analyzed is small, there appears to be little difference between these sites and the large villages in terms of catchment zone composition. Because of their small populations these sites generally have longer potential occupation duration estimates. In general, the Small populations inhabiting these sites would have placed less stress on the immediate environment for such resources as firewood, hunted and collected foods as well as horticultural soils and conceivably could have been occupied for longer periods of time than larger villages. Paradoxically, evidence for structure repair or replacement was found at the Bosley's Mills site, which has the shortest potential occupation duration of any of the small villages analyzed (Vandrei 1986: 38, 47, 80-82).

Site Location, Defensibility and Spatial Relationships

In addition to soil fertility, defense and proximity to potable water were major factors influencing choice of settlement locations for Iroquoians (White 1963: 4) (Table 2). The Seneca villages, all had ready access to potable water (Houghton 1912: 444; Wray, personal communication). As a result, this factor will not be further considered.

Examinations of the settings of the Seneca villages provides insights into these other factors affecting choice of settlement location. Thirteen sites are located on Class A soils, with the remainder being found on well drained Class B soils. Loams and sandy loams, particularly Ontario and Honeoye soils were particularly preferred. Such soils would afford excellent conditions for village construction and habitation. Their light textures would have provided easy digging for palisade and house construction. Drainage within the village area would have been excellent as well, improving habitability

Table 2: Village Setting

Site Name	Site Size Large (L) Small (S)	Soil Type and Class	Defensive Class
Western Villages			
Adams	L	Ontario Loam - A	3
Cameron	L	Ontario Loam - A	4
Dutch Hollow	L	Palmyra Fine Sandy Loam - A	2
Feugle	S	Ontario Loam - A	4
Lima	L	Ontario Loam - A	4
Bosley's Mills	S	Schoharie Silty Clay Loam - B	4
Power House	L	Hilton Gravelly Loam - A	3
Menzis	S	Honeoye Fine Sandy Loam - A	2
Dann	L	Honeoye Silt Loam - A	1
Rochester Junction	L	Ontario Fine Sandy Loam - A	3
Kirkwood	S	Ontario Loam - A	4
Eastern Villages			
Culbertson	L	Honeoye Loam - A	4
Tram	L	Ontario Loam - A	4
Factory Hollow	L	Dunkirk Fine Sandy Loam - B	3
Warren	L	Schoharie Silty Clay Loam - B	1
Cornish	S	Schoharie Silty Clay Loam - B	3
Steele	L	Schoharie Silt Loam - A	3
Marsh	L	Schoharie Silty Clay Loam - B	3
Ganondagan	L	Honeoye Fine Sandy Loam - A	3

during wet seasons and possibly minimizing structure and palisade deterioration.

Like other Iroquoians, protection from attack was a major consideration for the Seneca in the choice of village location. The use of naturally defensible locations for settlement would have minimized the need for palisade construction or permitted the use of less substantial palisades. Relative natural defensibility was evaluated by inspection of village locations on USGS 7.5 minute quadrangle maps. For purposes of this study, defensibility was characterized by counting then number of the boundaries (using cardinal directions) occurring along steep slopes and/or stream courses. No value was assigned for natural defensibility when a site boundary occurred along an upslope, gentle down slope or level terrain (Table 2).

Fifteen of the 19 villages have three or four sides that are naturally defensible. Three large villages, Dutch Hollow, Warren and Dann are located in areas that have only one or two naturally defensible sides. Of these, Dutch Hollow has the

second largest proportion of Class A soils (78%) of any large village, within its one kilometer catchment zone. The inhabitants of Dutch Hollow may have chosen access to prime horticultural soils over defense in situating their village.

Smaller villages appear to have placed a higher priority on defense in choosing site locations. Of the five small sites included in this study only one, the Menzis site, has less than three naturally defensible sides. This site also has a very high proportion of Class A soils (84%) within its one half kilometer catchment zone.

In addition to the local natural environment, proximity to contemporary and recently inhabited sites also played a factor in village location. The presence of a nearby contemporary village would have placed greater stress on the local environment and increased the potential for conflict between communities. However, such proximity would have been beneficial in terms of mutual defense and assistance. Close proximity to a predecessor village also had mixed benefits. The potential

Table 3: Distances Between Large Villages in Kilometers

Site Name	Distance to Predecessor	Distance to Successor	Distance to Contemporary Villages:	
			Early	Late
Western Villages				
Adams	—	4.2	2.6	1.3
Cameron	4.2	3.3	3.7	6.7
Dutch Hollow	3.3	3.6	9.1	9.3
Lima	3.6	2.2	4.8	17.5
Power House	2.2	2.5	17.6	19.4
Dann	2.5	4.0	20.3	17.2
Rochester Junction	4.0	—	15.4	—
Eastern Villages				
Culbertson	—	1.8	—	2.6
Tram	1.8	8.0	1.3	3.7
Factory Hollow	8.0	2.6	6.7	9.1
Warren	2.6	12.7	9.3	4.8
Steele	12.7	2.1	17.5	17.6
Marsh	2.1	6.0	19.4	20.3
Ganondagan	6.0	—	17.2	15.4

resources of the area would already be partially exhausted; however fields that were distant from the previous settlement might be made closer as a result of village relocation. In addition, the vegetative regeneration of the old fields and abandoned village area may have provided enhanced habitats for hunted and collected resources such as deer, small game and wild plant foods.

Table 3 summarizes the data for distances used in this study. Only the larger settlements are considered here. Distances to predecessor settlements in the western and eastern village sequences are presented as well as corresponding distances to contemporary villages in each sequence. Two measurements are provided for contemporary sites in order to account for the staggering in village relocation hypothesized by Wray, (1973, 1983).

The spatial relationships that existed between the Seneca villages generally fall into the typical Iroquoian pattern (White 1963; Wray 1983: 41). The average village removal distance for the western community is 3.3 kilometers (2 miles). For the eastern village the mean is 5.5 kilometers (3.4 miles). In many cases, the catchment zone of a village overlaps with that of its predecessor, particularly for the western community.

Overlap rarely occurs in the catchment zones of contemporary large communities. The only instance of this phenomenon involves the Adams and Cameron sites

(western community) and the Culbertson and Tram sites (eastern community). Cameron and Tram are 3.7 kilometers (2.3 miles) apart, thus overlapping only slightly. The Adams site is 2.6 kilometers (1.6 miles) from the Culbertson site and only 1.3 kilometers (.81 miles) from the Tram site. Thus the assigned catchment zones of these communities overlapped considerably. One possible explanation for this phenomenon is the intervening landscape between Adams and its eastern counterparts. A number of wetland areas are present in the area between Adams and Culbertson and a large area of muck soils is present between the Adams and Tram sites. These areas are unsuitable for horticulture and probably would have been difficult to travel through, thus increasing the effective distance between the villages.

Discussion

The unique nature of the Seneca village sequence permits additional insights and conclusions to be drawn from the data presented above. Comparison between the large villages of the eastern and western sequences in terms of site catchment data, site setting and spatial relationships reveals a number of differences between the two communities.

The larger villages of the western community (Adams, Cameron, Dutch Hollow, Lima, Dann, and Rochester Junction) are consistently larger in size than their temporal equivalent in the eastern community with an average area of 11.8 acres (4.8 hectares) (Table 1). The large villages of the eastern community (Culbertson, Tram, Factory Hollow, Warren, Steele, Marsh and Boughton Hill (Ganondagon) average 8.9 acres in area. All of the western villages are located on Class A soils, whereas three of the seven eastern villages are found on Class B soils (Table 2). Both communities are similar in terms of the natural defensibility of village locations. Overall there is little difference in potential occupation duration for both communities.

For the western community, the distance associated with a village relocation is very closely related to the horticultural potential of the predecessor village (as measured by potential occupation duration; see Table 1). Western villages with high potential occupation durations consistently have shorter village relocation distances (distance to successor site). Calculation of a Pearson product moment correlation coefficient (a measure of degree of association) yields a value of $-.80$ for the "low" population estimate and a value of $-.82$ for the "high" population estimate. Thus the potential occupation duration of a predecessor site accounts for a large portion of the variability in village relocation distance.

The situation for the eastern community is entirely different. Although the average potential occupation duration for sites of this community is not significantly different from that of the western village, village relocation distances vary considerably. Correlation coefficients calculated for potential occupation duration and distance of village relocation for this community yield values of $-.20$ for the "low" population estimate and $-.19$ for the "high" population estimate. This suggests that factors other than potential occupation duration strongly influence the relocation distances of the eastern community.

Much of the variation in the village relocation distance of the eastern community is accounted for in the 12.7 kilometer (7.9 miles) relocation of the village at the Warren site eastward to the Steele site (Table 3). This relocation increases the distance between eastern and western communities from under 10 kilometers (6.2 miles) to over 17 kilometers (10.6 miles), a trend which continues until the end of the seventeenth century.

A possible explanation for the relocation distance between Warren and Steele may be found in the differences that exist in the horticultural potential of the soils surrounding the eastern villages. The earlier sites of the eastern community (Culbertson, Tram, Factory Hollow and Warren) have much smaller average areas of Class A soils (320.57 acres, 129.70 hectares) within their one kilometer catchment circle. The early aims of the western community

(Adams, Cameron, Dutch Hollow and Lima) average 468.71 acres (189.64 hectares) of Class A soils within one kilometer (Table 1). The western community is generally more effectively located with respect to Class A soils throughout the time period covered by this study.

From the mid-sixteenth through the early seventeenth century the proportion of Class A soils surrounding the western villages increases over time. During the same period the eastern communities experience a decrease in Class A soils from 471.67 acres (190.84 hectares) surrounding the Culbertson site to 252.69 acres (102.24 hectares) at the Warren site. Thus the eastern community may have been required to place a greater reliance on the less productive Class B soils or on Class A soils at greater distances from the village. In the early seventeenth century, the necessity of relying on horticultural soils at greater distances from the community would have been a disadvantage. The increased warfare and raiding occurring in this period would have made distant work parties difficult to protect (Hunt 1940). Thus the eastern community may have relocated to the area of the Steele site in order to improve access to more suitable soils. The area of Class A soils adjacent to the eastern villages increases from 252.69 (102.24 hectares) acres at the Warren site to 345.53 acres (139.80 hectares) at the Steele site (Table 1).

The relocation of the eastern community would also have decreased competition between the two villages for hunted and collected resources. For the remainder of the time period under study the average proportions of Class A soils adjacent to the villages of both communities stabilizes and remains similar. For the western villages of Power House, Dann, and Rochester Junction (Totiakton), the average is 277 acres (112.07 hectares). The eastern villages of this period, Steele, Marsh and Boughton Hill (Ganondagan) average 269.23 acres (108.93 hectares) of Class A soils within one kilometer.

Conclusion

Catchment analysis of the Seneca village sites from the mid-sixteenth through the seventeenth century indicates that all villages had ready access to sufficient farmable soils to support their estimated populations. In most cases villages could have been occupied for longer periods of time than the generally accepted ten to twenty year Iroquoian village lifespan. While the Seneca appear to have tried to maximize the quantities of highly productive soils adjacent to their villages, natural defensibility was also a consideration, particularly for small settlements. Thus the Seneca, like the Mohawk and the Huron, had plentiful soil resources available for farming but were required to balance their subsistence needs against the need to protect their villages.

References

Bond, Stanley C.

- 1985 The Relationship Between Soils and Settlement Pattern in the Mohawk Valley. In *The Mohawk Valley Project: 1982 Field Season Report*, edited by Dean R. Snow, pp. 17-40. Institute for Northeast Anthropology, Albany.

Carneiro, Robert

- 1956 Slash and Burn Agriculture: A Close Look at Its Implications for Settlement Patterns. In *Man and Cultures. Selected Papers of the Fifth International Congress of Anthropological and Ethnological Sciences*, edited by A. F. C. Wallace, pp. 229-234. University of Pennsylvania Press, Philadelphia.

Casselbury, S. E.

- 1974 Further Refinement of Formulas for Determining Population from Floor Area. *World Archaeology* 6: 117-124.

Ceci, Lynn

- 1980 Maize Cultivation in Coastal New York: The Archaeological, Agronomical and Documentary Evidence. *North American Archaeologist* 1(1): 45-74.

Chisolm, M.

- 1968 *Rural Settlement and Land Use*. Hutchinson. London.

Dean, Robert L.

- 1984 *Archaeological Investigations: Gannagaro State Historic Site, Town of Victor, Ontario County, NY, 1983-1984*. New York State Office of Parks, Recreation, and Historic Preservation, Albany.

Engelbrecht, William E.

- 1987 Factors Maintaining Low Population Density Among the Prehistoric New York Iroquois. *American Antiquity* 52 (1):13-27.

Flannery, Kent V.

- 1976 Empirical Determination of Site Catchments in Oaxaca and Tehaucan. In *The Early Mesoamerican Village*, edited by K. V. Flannery, pp. 103-117. Academic Press. New York.

Grassman, Thomas

- 1969 *The Mohawk Indians and Their Valley*. Eric Hugo Co. Schenectady, New York.

Hassan, Fakri

- 1981 *Demographic Archaeology*. Academic Press. New York.

Hayes, Charles F. III

- 1967 The Longhouse at the Cornish Site. In *Iroquois Culture, History and Prehistory, Proceedings of the 1965 Conference on Iroquois Research*, edited by Elisabeth Tooker. pp. 91-97. New York State Museum, Albany.

Heidenreich, Conrad E.

- 1971 *Huronia: A History and Geography of the Huron Indians, 1600-1650*. McClelland-Stewart Ltd., Toronto.

Houghton, Frederick M.

- 1912 The Seneca Nation from 1655 to 1687. *Bulletin of the Buffalo Society of Natural Sciences*. 10 (2): 363-464.

Hunt, George T.

- 1940 *The Wars of the Iroquois*. University of Wisconsin Press, Madison.

Naroll, Raoul

- 1962 Floor Area and Settlement Population. *American Antiquity* 27 (4): 587-589.

Parker, Arthur C.

- 1968 Iroquois Uses of Maize and Other Food Plants. In *Parker On the Iroquois*, edited by William N. Fenton, pp. 6-119. Syracuse University Press, Syracuse.

Peebles, Christopher S.

- 1978 Determinants of Settlement Size and Location in the Moundville Phase. In *Mississippian Settlement Patterns*, edited by Bruce D. Smith, pp. 388-393. Academic Press. New York.

Ritchie, William A. and Robert E. Funk

- 1973 Aboriginal Settlement Patterns in the Northeast. *New York State Museum Memoir* 20. Albany.

Roper, Donna C.

- 1979 The Method and Theory of Site Catchment Analysis: A Review. In *Advances in Archaeological Method and Theory*. Volume 2, edited by Michael B. Schiffer, pp. 119-140. Academic Press, New York.

- Starna, William A. George, R. Hamell and William L. Butts
1984 Northern Iroquoian Horticulture and Insect Infestation: A Cause for Village Removal. *Ethnohistory* 31 (3): 197-207.
- Sykes, Clark M.
1980 Swidden Horticulture and Iroquoian Settlement. *Archaeology of Eastern North America* 8: 45-52.
- Tooker, Elisabeth
1978 The League of the Iroquois: Its History, Politics and Ritual. In *Handbook of North American Indians*. Vol. 15, edited by G. Trigger, pp. 418-441. Smithsonian Institution, Washington D.C.
- U.S. Department of Agriculture, Soil Conservation Service
1941 *Soil Survey of Livingston County, New York*. Cornell University. Ithaca, New York.
1958 *Soil Survey of Ontario and Yates Counties, New York*. Cornell University, Ithaca, New York.
1973 *Soil Survey of Monroe County, New York*. Cornell University. Ithaca, New York.
- Vandrei, Charles E.
1986 A Preliminary Report on the 1983 and 1984 Excavations at Bosley's Mills, Hne 57-3, A Seventeenth Century Seneca Iroquois Community. Manuscript on file, Research Division. Rochester Museum and Science Center.
- Vita-Finzi C., and E. S. Higgs
1969 Prehistoric Economy in the Mt. Carmel Area of Palestine: Site Catchment Analysis. *Proceedings of the Prehistoric Society* 36: 1-37.
- White, Marian E.
1963 Settlement Pattern Change and the Development of Horticulture in the New York-Ontario Area. *Pennsylvania Archaeologist* 23 (1-2): 1-12.
- Wray, Charles F.
1973 *Manual for Seneca Iroquois Archaeology*. Cultures Primitive, Honeoye Falls, New York.
1983 Seneca Glass Trade Beads. C, A.D. 1550-1820. In *Proceedings of the 1982 Glass Trade Bead Conference*, edited by Charles F. Hayes III, pp 41-50. Rochester Museum and Science Center, Research Records No. 16, Rochester.
- Wray, Charles F. and Harry L. Schoff
1953 A Preliminary Report on the Seneca Sequence in Western New York, 1550-1687. *Pennsylvania Archaeologist* 23 (2): 53-63.

Occupation Interval and Mortality Rate: A Methodological Approach

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It has long been recognized that the study of human skeletal material may be an informative tool in the description of many aspects of the lives of earlier populations. This is true not only in terms of genetic affinities and health status, but, in the description of cultural traits as well. In combination with information relating to the archaeological context, burial data possesses the potential to fill in missing information concerning demographic features of the living population.

While all of the components required for the computation of mortality rate – length of site occupation, total cemetery population, and size of the living population – are seldom available, it is important to attempt this calculation where feasible. If successful, the resulting figures may be extrapolated to similar groups for which this critical information is unavailable. The Adam site, a protohistoric village in the western Seneca sequence of village sites comes the closest to satisfying the requirements for a valid study of this sort.

The residence pattern of the protohistoric and early historic Seneca Iroquois was reported in 1953 by Charles F. Wray and Harry Schoff. Based upon their years of investigation and research, the pattern defined archaeologically was found to conform to that suggested by Houghton (1912, 1922) i.e., a series of paired contemporary villages representing two sequences, with the western sequence composed of seven main sites and the eastern consisting of only six sites. The seventh site of the eastern group was discovered in 1967 by Charles Wray and Donald Cameron and reported in a subsequent publication (Wray 1973). It was estimated that the first village of each sequence was founded at some time during the decade of the 1560s (Adams in the western sequence and Culbertson in the eastern sequence), and each group apparently moved six times in the next 130 years. The sequences terminated with the destruction of the seventh villages - Totiakton (Rochester Junction) and Ganondagon (Boughton Hill by the marquis de DeNonville in A.D. 1687 (Figure 1).

Although the period of occupation for the villages was initially estimated to have averaged approximately 15 to 20 years. Charles Wray came to believe that the first villages (Adams and Culbertson) had been inhabited for a shorter time, probably for as few as ten years (Wray 1984). The limited amount of data recovery from the Culbertson site has dictated that interpretations concerning these first villages be based primarily upon the more substantial

information available from the Adams site. An allotment of only ten years of occupation is a departure from the generally accepted time span for Seneca village tenure, and therefore it was decided to attempt verification of this estimate using other archaeological data derived from this site. In fact, a ten year occupation period is quite reasonable for these two sites - if the sparseness of surface refuse is considered (Wray 1984) - and thus the purpose of this inquiry is not simply to document that particular estimate of Adams site occupation duration. Rather, the main goal is to use it as a testable hypothesis in developing a method for assessing this and other components of early native American life for which no direct evidence remains. In other words, the length of the occupation period will be used as the "X" factor in a formula in which the other information is considered as given.

The need for techniques that permit reconstruction of aspects of past cultures for which no direct evidence has survived - particularly population size and village duration - is obvious, and methods have been devised for extracting this information from the existing archaeological data. An example of the sort of methodology that has been effectively used in supplying information for one of the more intangible aspects of an archaeologically defined population deals specifically with population size. In a study of the Ontario Iroquois Uxbridge ossuary (A.D. 1490±80), Pfeiffer (1983) constructed a life table for the 457 (minimum) deceased individuals found in the ossuary burial, and with this information calculated life expectancy at birth for the population (25 years). The crude death rate of 40.0/1000 individuals was then derived, and that figure was used to estimate the living population size (Acşadi and Nemeskeri 1970) of 1188 individuals. This technique is quite valuable as a secondary method for acquiring important population data indirectly. However, just as it is in the nature of archaeologically derived evidence to require supplementation by indirect methods to "complete the picture". it is also the case that the primary information available for use in these indirect techniques varies from situation to situation.

The foundation of Pfeiffer's (1983) study was the construction of a life table. a procedure which requires fairly precise aging of all individuals, typically within a five year range. This was possible because all of the skeletal remains were recovered and available for examination. In many

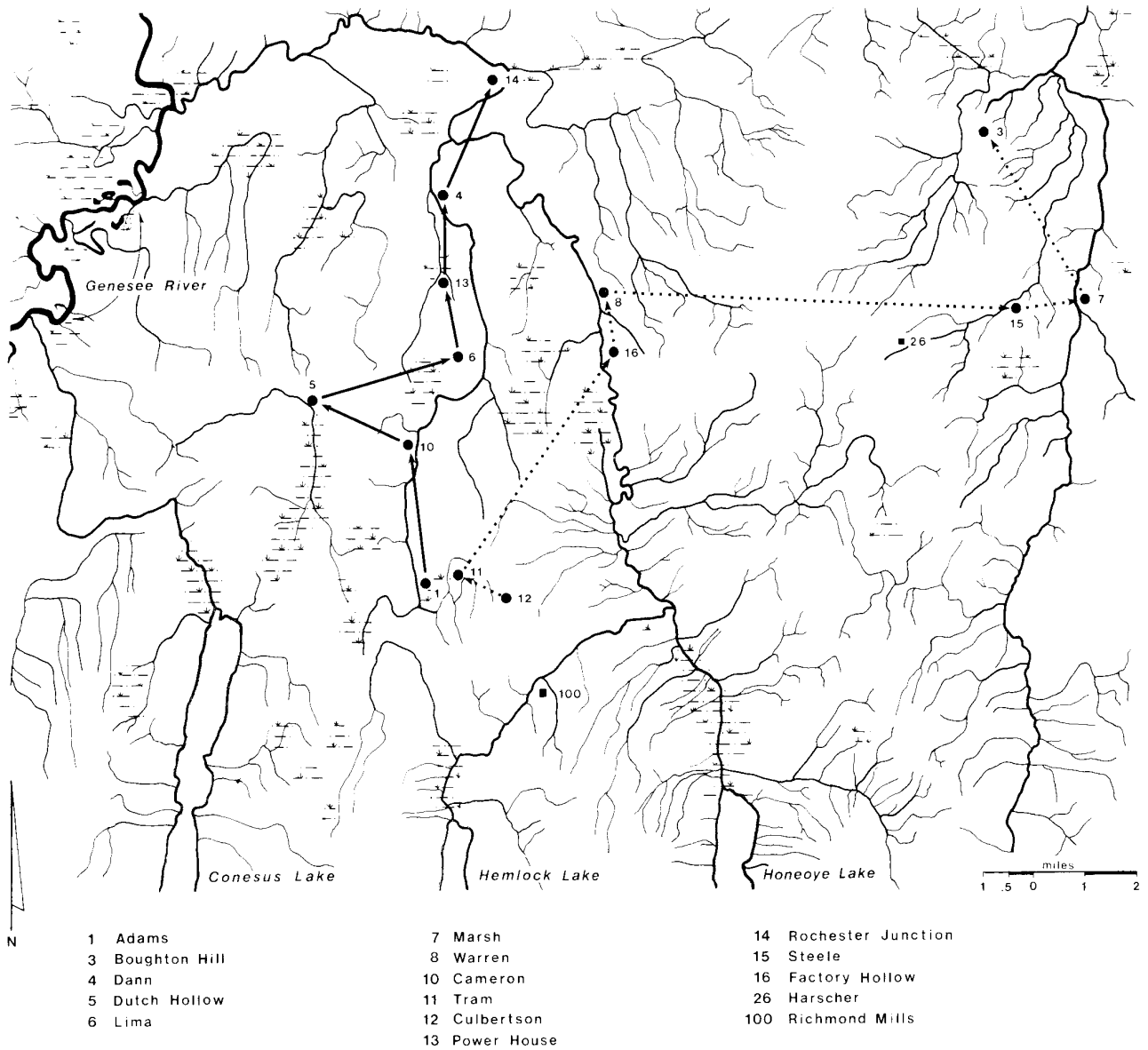


Figure I. Map of Seneca Territory show in the Eastern and Western Sequence, of Early Historic Seneca Sites. From Ph. D. Dissertation. Saunders 1980. Map by P.L. Miller.

instances, however, only a small sample of the osteological remains have been recovered, precluding the possibility of employing any method that requires precise aging and/or sexing of the complete cemetery population. The Adams site population exemplifies the latter situation in that, while the 383 individuals encountered in the cemetery excavations were aged and sexed by the excavators, ages were recorded in broad terms - such as young adult, adult, or senile adult for mature individuals and infant, child adolescent for immatures. The skeletal remains of only 39 of the 383 individuals were recovered and available for more precise aging, and thus the population size estimate

for the Adams group had to be derived from other archaeological data (Wray 1984). For studies in which the demographic data is less comprehensive than is seen for the Uxbridge population, then, another approach must be devised.

Although the demographic information for the Uxbridge site was comprehensive, as is often necessarily the case, the length of village occupation was not based upon hard evidence, but upon "...an assumption of ossuary construction every ten years" (Pfeiffer 1983:12). It was noted previously that the ten

year village occupation duration for Adams (and Culbertson) resulted from an assessment of the amount of surface refuse observed in the site area. While this estimate must be considered somewhat tentative, the premise upon which it is based is sound, particularly in instances for which comparative data is available - in this case the remaining 12 Seneca sequence sites. So, the Uxbridge and Adams site evidence differs relative to the various types of archaeological data, and thus differing indirect techniques for supplying missing or incomplete information are necessary in each case.

Since the basic purpose of this study is methodological, with the length of Adams village occupation being employed as the factor being tested, it was not necessary to suggest at the outset that the parameter that is to serve as the unknown factor in the proposed formula must indeed be completely unknown. In fact, at this experimental stage, it is more appropriate to use a component whose value is at least strongly suggested by other evidence, rather than one that is a completely unknown quantity that cannot be verified by other means. The validity of the proposed method can be more easily evaluated when its components may be assessed individually, as well as collectively. As was stated previously, length of village occupation is viewed as a testable hypothesis in this context.

Actually, the formula to be proposed as an alternate method for indirectly acquiring population data has been in use for some time, as a technique for calculating annual mortality rate. Calculation of mortality rate requires that three basic pieces of information be available:

1. the total number of deaths that occurred during the period of occupation of the village,
 2. the *number of years that the village was occupied*,
- and
3. the size of the living population of the village.

The formula for annual mortality rate (or AMR) requires simply that first

A.	1.	$\frac{\text{Total Deaths}}{\text{Number of Years}}$	=	Number of Deaths Per Year
	2.			
B.		$\frac{\text{Number of DeathsPer Year}}{\text{Total VillagePopulation}}$	=	Annual Mortality Rate
	3.			

the total number of deaths be divided by the number of years of occupation, yielding the number of deaths per year (step A). In the second step (B), that figure is divided by the total living population, resulting in **annual mortality rate** - or the percentage of the population that died, on average, each year during the period that the village was occupied. If a reasonable mortality rate can be established for the population - in light of previous studies employing a similar time frame and subsistence pattern -the "X" factor to be solved for could be

one of the three components of the formula, rather than the AMR, which would be given.

For the Adams site, it has been determined that 383 deaths occurred in the course of its existence as a village. This determination was based on the total number of individuals encountered in the excavation of the three Adams cemeteries. The area surrounding the village was thoroughly tested, and it is assumed that, with the possible exception of a few isolated or undetected graves, these 383 individuals from the three cemeteries represent the total number of deaths experienced during the occupation period. The living population average of-between 800 and 1000 individuals was proposed by Charles Wray (1984), as a result of his own research in Seneca archaeology. Variable number 2 - that specific to the number of years that the village was occupied- is the one being tested, and mortality rate was calculated for an occupation duration of 20 years; for the 10 year span suggested by Charles Wray; and for the intermediate 15 year period. Since the size of the living population is estimated as ranging from 800 to 1000 individuals, annual mortality rate was also calculated for both extremes.

Table 1: Mortality Rate: Adams

		20 year Occupation	10 year Occupation
Range of Population	800	2.4%	4.8%
	1000	1.9%	3.8%

As presented in Table 1, the annual mortality rate for Adams, based upon a 20 year occupation and a living population of 800, is 2.4%; for the same 20 year occupation and a living population of 1000, the result is a 1.9% annual mortality rate. When calculated for a ten year duration of occupation, the annual mortality rate is 4.8% for 800 inhabitants and 3.8% for 1000 inhabitants. The AMR for a 20 year occupation appears to be much too low to be considered realistic, especially at a higher population estimate. This is obvious when it is compared to the AMR for the United States in 1960, for example, reported at 1.5% (Acasadi and Nemeskeri 1970), which reflects modern medical technology and health care. While documentation is fairly complete for mortality rate estimates in recent populations, groups which more closely approximate Adams -both temporally and in terms of subsistence level-would provide more meaningful standards for comparison.

Sullivan and Katzenberg in 1981 reported on a population that was extant only slightly later in time, and whose economic base is considered to have been quite similar to the early historic Seneca. Their study dealt with the Huron ossuary - Ossossane - which was the site of a "Feast of the Dead" ceremony in A.D. 1636. Documentation of both the size of the population contributing to the ceremony and the period of time

during which those buried at Ossossane had died was provided by *The Jesuit Relations and Allied Documents* (J R 1959:281-305)

While it would obviously be convenient to have available to all sites a record written by contemporary observers, it is more essential in the case of an ossuary situation than for the Seneca sites. This is particularly true for the AMR variable relating to total living population. It is considered possible to obtain a fairly accurate estimate of this component for Seneca sites based upon the archaeological evidence for the size of the village itself, particularly if this information is supplemented with data estimating the area occupied by structures. This is not true for Huron sites represented by ossuaries, such as Ossossane. The "Feast of the Dead" consisted of the mass secondary burial of all individuals who had died since the last such ceremony, and involved not only the village sponsoring the event, but any number of outlying villages which, because of ties of friendship, loyalty, or allegiance, were invited to participate. The number of villages participating, then, could vary and it would not be possible for the archaeologist to locate and identify all of the villages which were party to a particular feast, in order to attempt an estimation of the overall population which contributed to the ossuary. The fact that this information in addition to the information relating to the number of years over which the deaths had occurred - was available for Ossossane makes it a relatively reliable source for comparison of AMRs.

It was recorded in the Jesuit Relations OR 1959:281-305) that a living population of approximately 2000 individuals was involved in the 1636 "Feast of the Dead" at Ossossane and that a period of ten years (or possibly closer to nine) had elapsed since the last such mass reburial. A total of 775 individuals were found to have died during the period since the previous ossuary burial. The annual mortality rate calculated for the Ossossane population based upon a ten year interval is 3.9%, and for a nine year period is 4.3% (Table 2). The range of annual mortality rate for Adams based upon a ten year occupation interval - even considering the latitude involved in the living population estimate - fits well with the range of AMR for Ossossane for a nine to ten year occupation. While mortality rates reported for other sites were considered for comparison with the Adams AMRs calculated for intervals of 10, 15 and 20 years, the Ossossane data seemed to provide the most reliable information for the three elements of the annual mortality rate formula. Other possible comparative populations presented problems in at least one, if not all three of these components.

For example, although the 2.5% to 3.2% AMR estimate for Adams for a 15 year occupation interval fits well with the 2.4% to 3.0% rate estimated for the Tabor Hill ossuaries (Churcher and Kenyon 1960), there was questionable information in terms of: first, the total number of deaths - the authors

Table 2: Comparative Mortality Rate

	Range		
Ossossane	3.9%	-	4.3%
Adams	3.8%	-	4.8%

concede that after the accidental discovery of the ossuaries, some of the skeletal material was pilfered by souvenir hunters and also that portions of both of the ossuaries were not salvaged. An attempt was made to correct for this deficiency by equalizing sex ratios and estimating the number of individuals in the unsalvaged portion, then adding this number to the minimum estimate which was based on the skeletal remains salvaged. For component 2 - the number of years that the village was occupied - it was simply stated that the Iroquois occupied their villages for 10 to 15 years, and this range was used. Component 3 of the formula - the size of the living population contributing to the burial area was even more problematic. Although a large village was discovered nearby, proximity was the major basis for assuming that this was the main village associated with the ossuary. Also, the problem described earlier - that the unknown satellite village populations which may have also contributed to the ossuary are not included in the estimates - is also evident. In fact, the authors did not attempt to use a formula to calculate the mortality rate reported, but based it on the Tabor Hill age-group ratios compared to those for relatively recent populations, and used the annual mortality rate for the population which most closely matched the Tabor Hill pattern - in this case France during the 1866-1877 time period. Despite its problems, the latter part of the study was commendable in its very creative attempt to elicit tenuous Population data in the only way possible - indirectly.

While the population in the above case is inappropriate comparatively, it is included here to point out the sort of information which must be evaluated before a particular mortality estimate can be used for comparison with any degree of confidence. For the purposes of this study, the Ossossane population seemed to provide the most reliable data for all three of the formula components, in addition to the similarities in time frame and subsistence pattern.

Considered together with the extremely low AMRs for the 20 year occupation interval, the relatively close fit between the Adams and Ossossane annual mortality rates would seem to support the hypothesis offered by Charles Wray, that the Adams site was occupied for a 10 year period rather than the 15 to 20 years attributed to the later sites of the Seneca sequences. Also, as was described earlier as part of the Uxbridge Ossuary study (Pfeiffer 1983), a crude death rate of 40.0/1000 individuals was calculated, which translates into a 4.0 AMR. An AMR of about 4.0% would seem, then, to be a reasonable figure for the Iroquoian agricultural peoples of the late prehistoric and early historic periods - if relatively unstressed.

It should be noted that it has recently been suggested that the living population estimate presented here for the Adams site is too low, and may have included as many as 2500 individuals. A problem with this high an estimate is that, having been based upon a formula which considers mainly village size; the number of structures that could be accommodated within the village; and the density of occupation within the structures, it does not take into account the variables which are included in the AMR formula. With only 383 deaths accounted for during the occupation of the Adams village, and an unusually short occupation of 10 years, a living population of 2500 individuals would experience an AMR of only 1.5% (if the occupation period were longer, the AMR would be even lower). Possibly, then, the village density formulae (such as Naroll 1962) which have been demonstrated to be effective for other cultures are not applicable to early Seneca groups. This may be related to the fact that Seneca village size is defined by the area enclosed by the palisade, and perhaps dwellings did not account for as much of the village space thus delineated as has been documented for other cultures.

Summary

The formula for the computation of the annual mortality rate, as used here, has a value beyond the estimation of the percentage of deaths per year for a given population. Additionally, it has the potential to supply missing information or to provide confirmation for premises which cannot be validated by any other means. This is specific to the three variables which are the components of the AMR calculation-population size, number of years of site occupation, and number of deaths experienced by the population during its occupation as a village site - but these are important demographic features and ones which are often only tentatively assessed. If reasonably good data are available for two of the three variables, the third may be supplied or refined, and comparative AMRs for various time frames and subsistence levels are available in the literature to provide the basis for estimation of the variable in question, if properly evaluated. Hopefully, as more work is done in this area, a more complete range of AMRs will be available in the future, and this method could then be more widely used - where appropriate.

References

- Acsadi, Gy. and J. Nemeskeri
1970 *History of Human Life Span and Mortality*. Akademiai Kiado, Budapest.
- Churcher, C. S. and W. A. Kenyon
1960 The Tabor Hill Ossuaries: A Study in Iroquois Demography. *Human Biology* 23 (3): 249-273.
- Houghton, F.
1912 The Seneca Nation from 1655 - 1687. *Bulletin of the Buffalo Society of Natural Sciences* X(2).
1922 *The Archaeology of the Genesee Country*. Researches and Transactions of the New York State Archaeological Association III(11):241-250.
- JR = Thwaites, Reuben G.
1959 *The Jesuit Relations and Allied Documents: Travel and Explorations of the Jesuit Missionaries in New France. 1610-1791*, 73 vols. Reprinted. Pageant, New York. Originally published 1896-1901, Burrows Brothers, Cleveland. Vol. X: 281-305.
- Naroll, Raoul
1962 Floor Area and Settlement Population. *American Antiquity* 27 (4):587-589.
- Pfeiffer, Susan
1983 Demographic Parameters of the Uxbridge Ossuary Population. *Ontario Archaeology* 40: 9-14.
- Sullivan, Norman C. and M. Anne Katzenberg
1981 An Assessment of the Application of Model Stable Populations to Paleodemographic Data. In *Biocultural Adaptation: Comprehensive Approaches to Skeletal Analysis*, edited by D. L. Martin and M. P. Bumstead, pp. 4-13. Research Reports No. 20, University of Maryland, College Park.
- Wray, Charles F.
1973 *Manual for Seneca Archaeology*. Cultures Primitive, Honeoye Falls, New York.
1984 Handbook of Seneca Archaeology. Manuscript on file at the Rochester Museum and Science Center, Rochester. New York.
- Wray, Charles F. and Harry L. Schoff
1953 A Preliminary Report on the Seneca Sequence in Western New York (1550-1687). *Pennsylvania Archaeologist* XXIII (2): 53-63.

Seneca Pottery Analysis: Some Problems and Solutions in Refining the Potential of Attribute Analysis

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An introduction is given to an ongoing Seneca pottery analysis project. Procedures used in defining and classifying attributes are discussed, along with the need for documentation of attribute definitions, and for consistency in data collection. The attribute of collar height is used as an example illustrating the nature of problems which may arise in this process, and the particular ways in which these concerns have been addressed in this project. The Collar Height/Pot Height Index (C/P Index) is introduced as an alternative to the measure of absolute collar height when segregating low-collared and high-collared vessels.

Introduction

This paper is a revision of a talk presented at the Northeastern Anthropological Association Conference in 1986, and is intended as an explanation of the orientation and procedures utilized in my ongoing analysis of historic Seneca pottery, currently underway in conjunction with the Seneca Archaeology Research Project begun by Charles F. Wray. The project is conducting a site-by-site classification and analysis of archaeological materials relating to the historic Seneca (c. A.D. 1560-1687), with the goal of producing a series of volumes illustrating, describing, and analyzing these materials. The Charles F. Wray Series in Seneca Archaeology is expected to provide a refinement of, and justification for the historic Seneca site sequence as outlined by Wray (Wray and Schoff 1953, Wray 1973). Additionally, preliminary investigations into various aspects of Seneca and Iroquoian culture such as trade, conflict, social organization and interaction, and mortuary practices, will serve as a guide to future research.

It is hoped that, in addition to its direct contribution to the publication, this study of Seneca ceramics may also result in the development of new ways to effectively interpret the evidence provided by archaeological ceramics in the investigation of social phenomena. Many past studies of Iroquoian pottery have been directed toward the chronological placement of sites within various cultural sequences, or toward identifying pottery traits or complexes of traits that are characteristic of various cultural groups. Building upon this foundation of research and knowledge, it now seems possible to use an examination of the characteristics of pottery from sites within a known sequence to investigate the ways in which social organization and interaction may be reflected in aspects of material culture (specifically pottery). It is these

issues that are to be examined in this ongoing analysis of Seneca Pottery.

Seneca ceramics provide a data set especially appropriate to these questions for several reasons. The sequence of historic Seneca village sites has been well-established and documented archaeologically by Charles F. Wray (Wray and Schoff 1953, Wray 1973, Wray 1985), and the late prehistoric sites most likely antecedent to the historic Seneca have been identified (Wray, personal communications; Wray et al. in press). Thus the tribal affiliation and chronological placement of the ceramic assemblages being studied are known at the outset, providing an excellent background for the examination of some aspects of Seneca society and culture. A preliminary examination of whole vessels from the entire historic Seneca sequence suggests that much of the variation observed in pottery attributes may be due to contact of one sort or another with various neighboring groups, a situation that is ideal for the investigation of how such traits may be transmitted from one group to another.

In addition, historical documentation of specific political events, such as the dates and results of conflict among the various Iroquois nations (e.g. Thwaites 1959), as well as descriptions of the native Iroquoian culture in general, proves helpful in interpreting the material culture of the Seneca. While these observations refer primarily to the Huron and Neutral nations, Seneca culture is presumed to be similar to these Iroquoian groups in many respects, and the historical accounts may therefore be suggestive of both general and specific social phenomena. In this way, patterning in pottery characteristics may be examined as a material reflection of certain aspects of Seneca society and behavior such as the taking and treatment of large numbers of captives and the related concept of adoption, matrilocality, craft specialization, and trading mechanisms, as well as other issues of interest in Iroquoian studies. However, this requires a more detailed model of the mechanisms by which traits considered to be specific to certain time periods or ethnic groups are passed on from one group to another, or from one person to another.

Due to the kinds of research questions being addressed, much of the analysis will involve using observed characteristics of the pottery to associate vessels with members of social groups, ranging from tribal nations to perhaps clans or local residence groups. When appropriate, variation observed in

Seneca pottery will be interpreted in terms of interaction or lack thereof between these social groups. Therefore, it is first necessary to isolate those attributes or groups of attributes which exhibit patterning pertinent to such an examination. The fact that thus far, several "microtraditions" have been identified in the Seneca ceramic sequence, which are so consistent and/or idiosyncratic as to suggest their origin in a specific group of potters, or even a single potter, suggests that such analysis should be possible. The ultimate goal of this research is to find well defined, detailed, and consistent means by which observed patterning in pottery attributes may be used to examine some of the social issues of importance to Iroquoian studies, and to document them in such a way that the results may be of use in comparative studies by other researchers.

Methodology

It is readily apparent that precise methods of data description and analysis are required to carry out the program of research intended. In order to maintain good control over individual characteristics of the pottery and the relationships among characteristics -on individual vessels, among several vessels, and among groups of vessels -observed attributes of the vessels have been the unit of analysis. Several important problems have emerged relative to the use of attributes in examining questions of the kind proposed in this research; chief among these are the need for detailed definitions and rules for classifying and measuring the attributes used, and especially the need for consistency in applying them. Several attributes are discussed here as examples of how these problems were addressed in this project.

Marian White was among the first to use the analysis of pottery attributes, in addition to types, in a major study of New York Iroquoian ceramics (White 1961), and her work has been followed by many others (including Wright 1969, Engelbrecht 1971, Tuck 1971, Ramsden 1977, LaFrance 1979, Fitzgerald 1982, Kuhn and Bamann 1987, to name just a few). Several of these researchers have published attribute lists and/or descriptions of the attribute classifications which they used, and a comparison of these indicates that there are often varying approaches to classifying similar attributes. No single existing attribute list seemed to fit all the requirements of the data I was to examine, so I developed a list which includes over 35 nominal attributes and 8 scalar ones, in addition to several indices that are calculated on the basis of scalar attribute values. These attributes represent primarily morphological and stylistic characteristics of the pottery and include collar shape; collar decoration and motifs; body decoration and motifs; body, shoulder and neck form; lip decoration; border decorations to the collar motif; and decoration techniques, among others. While most of these attributes have been widely used and are recognized indicators of variability, a few were defined experimentally in order to determine their value in investigating the questions at hand.

The process of defining the attributes to be used in the study involved several versions of the classification rules, which were progressively refined to achieve the most useful description of each attribute. So that terms may be used consistently throughout my own analysis, and so other researchers may know exactly what is meant by the data presented, I found it necessary to be very precise in defining the attributes, and in developing or adapting the terminology with which they are described. For example, in some publications the terms "notched," "nocked," and "barbed" have been used almost interchangeably, while others draw careful distinctions between them. Therefore, any and all terms used in my analysis, even common ones, will be explicitly and distinctly defined for future reference. Since it is not likely that a universal terminology will be developed and accepted by all who study Iroquoian pottery (especially since different research perspectives may require different terminology), it seems all the more important to carefully define one's terms and to use them consistently. In this way, others may understand what is being discussed, and may use the data comparatively. A full explanation of the attribute list used in my analysis is to be published as an appendix to the first volume of the *Charles F. Wray Series in Seneca Archaeology*.

The Data

The artifactual evidence available for this analysis is extensive. Relating to the entire span of the historic Seneca sequence, the RMSC collections contain approximately 350 whole vessels, about 100 fragmentary vessels, and thousands of sherds. It is unusual to have so many complete vessels available from a single sequence, and this fortunately allows (as will be demonstrated below) the investigation of several ideas that would not have been possible had the material consisted primarily of rimsherds.

The historic Seneca site sequence comprises two contemporary major villages that were relocated about every 10 to 20 years, and that were sometimes accompanied by smaller villages. Assemblages from over 25 sites are represented by the pottery being studied, covering a period of approximately 150 years extending from c. 1525 to 1687, at which time native ceramic ware is extremely rare to nonexistent in archaeological assemblages from Seneca sites. Preliminary data collection has been completed for all the whole vessels, and for many of the sherds from several sites. Final data are available on the materials from the Adams and Culbertson sites.

One methodological matter still to be resolved, however, concerns the fact that most of the complete vessels have come from mortuary contexts, while the sherds were removed from the village surface, middens, or other refuse deposits. This presents a possible problem when comparing data from the two contexts, since there may have been some conceptual distinc-

tion between utility or everyday pots and special burial or ceremonial pots. If this were true, relationships observed between samples from different contexts may be due in part to varying functions rather than to relationships among the group, producing the vessels. The problem becomes especially acute in this analysis because the collections from the earliest sites in the sequence contain little or no burial pottery, and are represented almost entirely by refuse material. On the other hand, the sites immediately following them have so far yielded primarily burial pottery, and very little from refuse. Since we cannot yet be sure what the relationship is among attributes of pottery samples from these two contexts when produced by members of the same group, or even by the same person, I do not feel it is prudent to draw conclusions about relationships among sites based on pottery samples from these different contexts without addressing the problem in some way. Fortunately, several of the middle period sites in the sequence - Factory Hollow and Dutch Hollow in particular - have large samples of pottery from both contexts, and I plan to analyze these materials in order to clarify this situation somewhat.

Attribute Examples

The procedure followed in defining the attributes used is perhaps best explained in terms of several examples, the first being the attribute of collar height. Although collar height is a relatively straightforward attribute to define, the amount of precision necessary in its measurement is indicative of the detail attempted in this analysis. Since this attribute applies only to collared vessels, an obviously related issue is the determination of which vessels should be termed collared and which should not: this decision requires, in its own set of principles which will not be discussed here. Assuming, however, that the collared vessels have been isolated, and that collar heights are to be measured to the nearest millimeter, it should be a fairly simple matter of measuring the distance from the top to the bottom of the collar. When this was attempted, however, it was found that several other factors must be considered. For instance, what should be done when this height varies considerably all around the circumference of the rim, or what if it is not clear where the collar actually begins? Several of these problems are common to the measurement of both sherds and whole vessels, and they must be resolved in the same way for each vessel or sherd, according to an established set of rules to follow for each attribute.

For example, when measuring the height of the collar on a sherd, one naturally measures parallel to the face of the collar. In the case of a whole pot, however (Figure 1a), it seems most in keeping with the concept of collar height to draw an imaginary horizontal line from the top edge of the rim and another from the bottom of the collar, and to measure the vertical distance in between. For the pot shown, this would

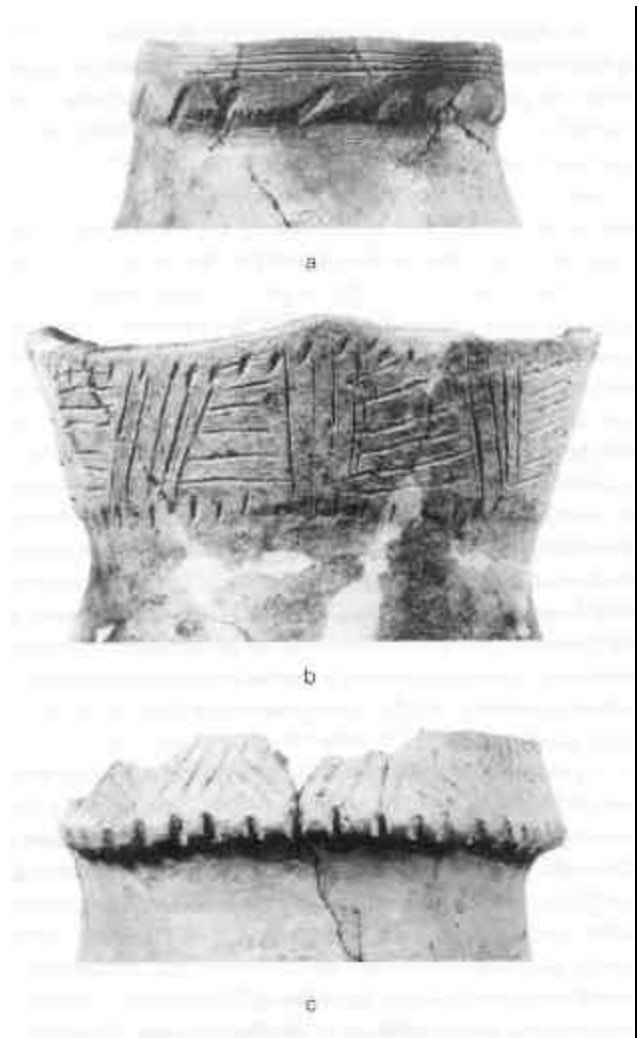


Figure 1. The effect of collar angle on file measurement of collar height. a. 1129/94: b. 6108/94: c. 265/94. Maximum rim diameter: 15.1 cm. All vessels to same scale.

result in a measure compatible with that taken for the sherds. However, there are many cases where the collar itself is not strictly vertical (Figure 1b and c). In these cases, a vertical measurement would be shorter than one taken along the plane of the collar and would thus not be comparable to the measurements taken of the collar height of equivalent rimsherds. The difference in the two measurements is certainly of significance when precision is desired to the nearest millimeter. For these reasons, a pot's collar height is always measured, in this study, parallel to the face of the collar, in the same way as it would be measured on a sherd. Since I am dealing with a mixed sample including many whole vessels, attempts are made to extend this principle to the treatment of all attributes. Whenever possible, rim or collar attributes are evaluated on whole pots in just the same manner as they are on sherds, in order that data from these materials will be comparable.

Another problem encountered, primarily when measuring whole vessels and sections of rims, is that of widely varying collar heights on a single vessel (often as much as 8 mm variation). This sometimes appears to have been created purposely and other times is due to the lack of uniformity inherent in individually-manufactured vessels. As an examination of the sherds which make up the reconstructed pots suggests, single sherds often do not provide an accurate representation of the collar height range of a single vessel because they rarely are large enough to show this variation. Therefore, everything possible has been done to measure in such a way that this error is minimized for comparison of data from pot to pot and among pots and sherds. When measuring collar heights on whole vessels, it is not necessarily a good idea to take the maximum collar height because it is unlikely that this is representative of the collar height of the pot as a whole. Therefore, provisions may be made for taking measurements at random locations or perhaps taking multiple measurements and averaging them. Since relatively few single sherds are likely to indicate the maximum collar height of the vessel they represent, a measure of a pot's typical collar height (rather than maximum collar height) also provides a better comparison with sherd data.

There are several problems in measuring collar height which are common to both sherds and vessels. Among these are castellations (Figures 1b, and 2b). Since they show an obvious extreme in collar height, rather than the typical collar height for the vessel, castellations and areas leading up to them have been avoided when measuring collar height. This is easily accomplished where whole vessels are concerned, but when measuring sherds, it is often difficult to tell whether the area in question is leading to a castellation or not. Some sherds have not been included in the sample of collar height measurements since they represent only a castellated area of the rim.

Finally, there is the question of where a collar begins and from where to be-in measuring. In many cases (Figure 2a) this is quite obvious since the collar was applied separately and it is not difficult to determine its boundaries. In other instances (Figs. 2b and c) this is progressively less obvious, and finally there are some cases (Figure 2d) in which the transition from body to collar is so gradual that it is quite difficult to find the beginning of the collar. For those vessels in which structural evidence is not definitive, I have usually been able to determine the beginning of the collar using the placement of decorative elements as a guide, but alternative methods are also possible - the final determining factor has been my original definition of the collar as a potential area for the placement of decoration. There are certainly other problems encountered in making the measurements, and of course each attribute presents its own set of dilemmas, but I have chosen these few as representative of my thinking in determining measurement rules. In the previous discussion, I have emphasized problems rather than solutions, because the solutions are often dependent on the

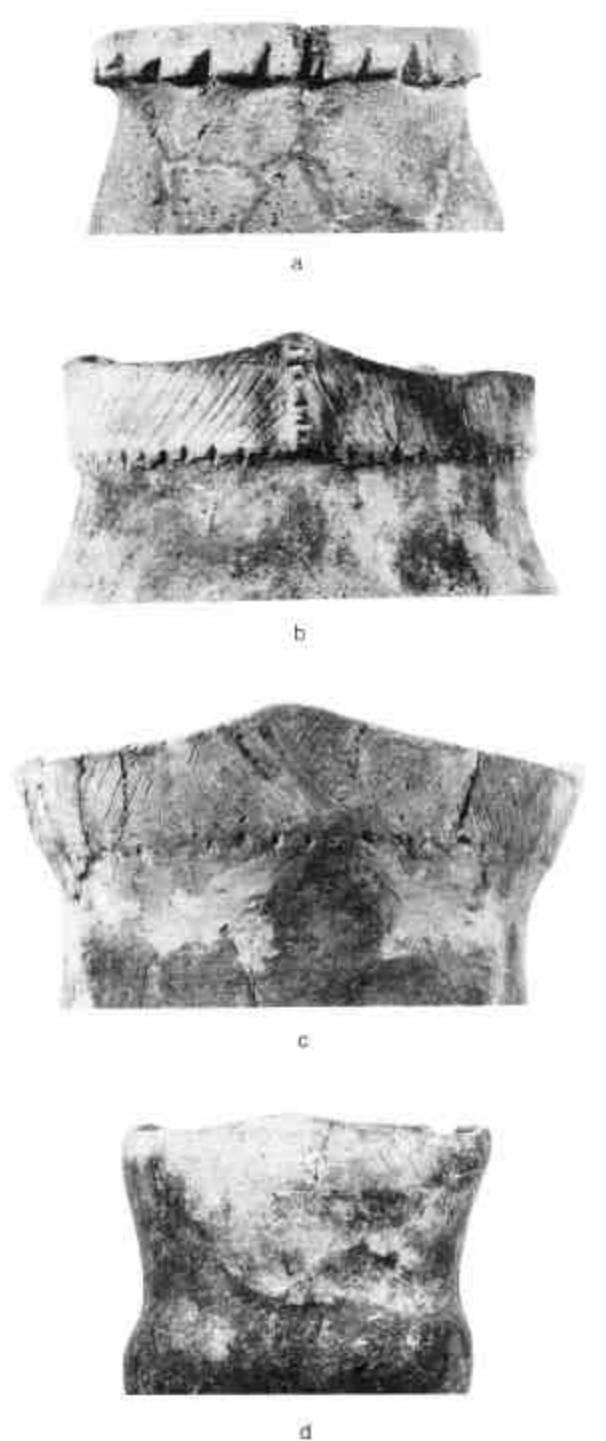


Figure 2 Variation in collar definition. A. 6107/94; b. 10710/94; c. 282/94; d. 43/134. Maximum rim diameter of c: 20.0 cm.

question, being asked of the research. While I have arrived at solutions suited to the specific types of analyses I need to use, others may find different ways to handle the same concerns. However, it is very important not only to consider these issues, but also to formally document the procedures used, and to apply them consistently. The problems I have discussed may at first seem trivial, but any one of them could affect the final result of the measurement by several or sometimes many millimeters, and since accuracy to the nearest millimeter is desired, it is extremely important to minimize these errors in measurement.

Analysis

Although I anticipate the use of multivariate techniques in the analysis of the data, it is necessary to understand the patterning of each of the attributes over the entire sequence being studied. The use of an attribute system in this study of Seneca pottery involves two components. The first is the development of a descriptive terminology with which to note the details of the material being studied, thereby providing a base of data for analysis as well as a general description of the material for comparative and documentary purposes. The second is the determination of the attributes or groups of attributes which are pertinent to the specific issues under investigation. This process involves examining the distribution of attributes singly, and in combination with one another, as well as deriving new attributes which are then also examined in the same way.

With regard to the examination of collar height, I began thinking in terms of the traditional groupings of low, high, or sometimes medium collars, based on the absolute measures of collar height. Given the large quantity of whole vessels available for study, I also hoped that a more precise formulation would be possible. It seemed that the mental impression of collar height one receives when viewing a whole vessel depends not only on the absolute height of the collar but also on the relationship between the height of the collar and the total height of the pot of which it is a part. This relationship is quantified in my definition of the Collar Height/Pot Height Index (C/P Index), which is calculated simply by dividing the absolute measurement of the collar height by the absolute measurement of the pot height (which, of course, has its own set of measurement rules) and multiplying the result by 100, where the two dimensions are measured in like units. This index represents the percentage of the pot's total height which is accounted for by the height of the collar (see Equation 1). Theoretically, this index should also take into account the width of the whole pot since this dimension also affects the perception of collar height. However, my examination of the pottery from the Adams site suggests that this factor would significantly affect the indices of only a few vessels. I have therefore decided not to include the vessel's width in

the formula for the time being, so as not to complicate the examination of the collar height variables, although I intend to investigate at a later time how the inclusion of the width variable affects the outcome of the computation of indices.

Equation 1

$$C/P \text{ Index} = C / P \times 100$$

P = Pot Height

C = Collar Height

P and C should be measured in like units

While this Index seemed to make sense as a possible measure of a cognitive aspect of Seneca pottery construction, it remained to be determined how well it would serve as an analytical attribute. Ideally, the most useful attributes or groups of attributes for the analysis would be the ones which were best able to sort the data into meaningful groups. Multivariate techniques may be applied to this problem as well, but at this point, it is important to determine the range and distribution of the attributes individually. When I began recording the data, I still had in mind the idea of low, medium, and high collars and had set up what seemed to be appropriate cutoff points for the three groups based on the C/P Index. It should be noted that this was a reasonable assumption, since preliminary observations of the pottery revealed some collars which seemed particularly "high" and others which seemed "low", and also because this type of classification had been used in the past. I found, however, that many of the vessels were hard to classify into one or another of the groups because their dimensions placed them too near these cutoff points, even when the cutoffs were modified in an effort to find the "true" values. I began to suspect that the low, medium, and high collar distinctions were not inherent in the data, but were rather arbitrary. This seemed true whether the collar height alone or the index was considered.

At this point it became apparent that my original assumptions needed reexamination. If the original low vs. medium vs. high collar concept was inherent in the data, I should expect to find a pattern of frequency distributions for either collar height or the C/P Index such as that shown in Figure 3. This would show three distinct modes: one each for low, medium, and high collars. It would also enable me to easily determine what the cutoff values should be for each group, and then to reapply them to the data collected in order to classify the collar heights of the vessels examined.

When the frequency distribution was plotted for the absolute measure of collar height on 316 whole, collared Seneca vessels (Figure 4), a skewed but essentially normal distribution was observed. There was a slight break around 39 mm, but no clear separation into the modes that I expected. As a comparison, measurements were taken on 79 rimsherds from the

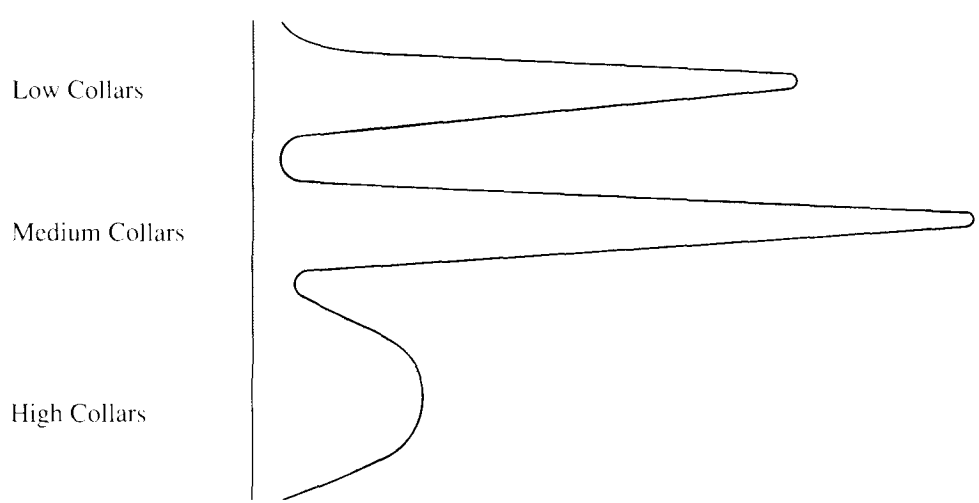


Figure 3. Hypothetical frequency distribution of C/P Index on whole, collared vessels from Seneca sites.

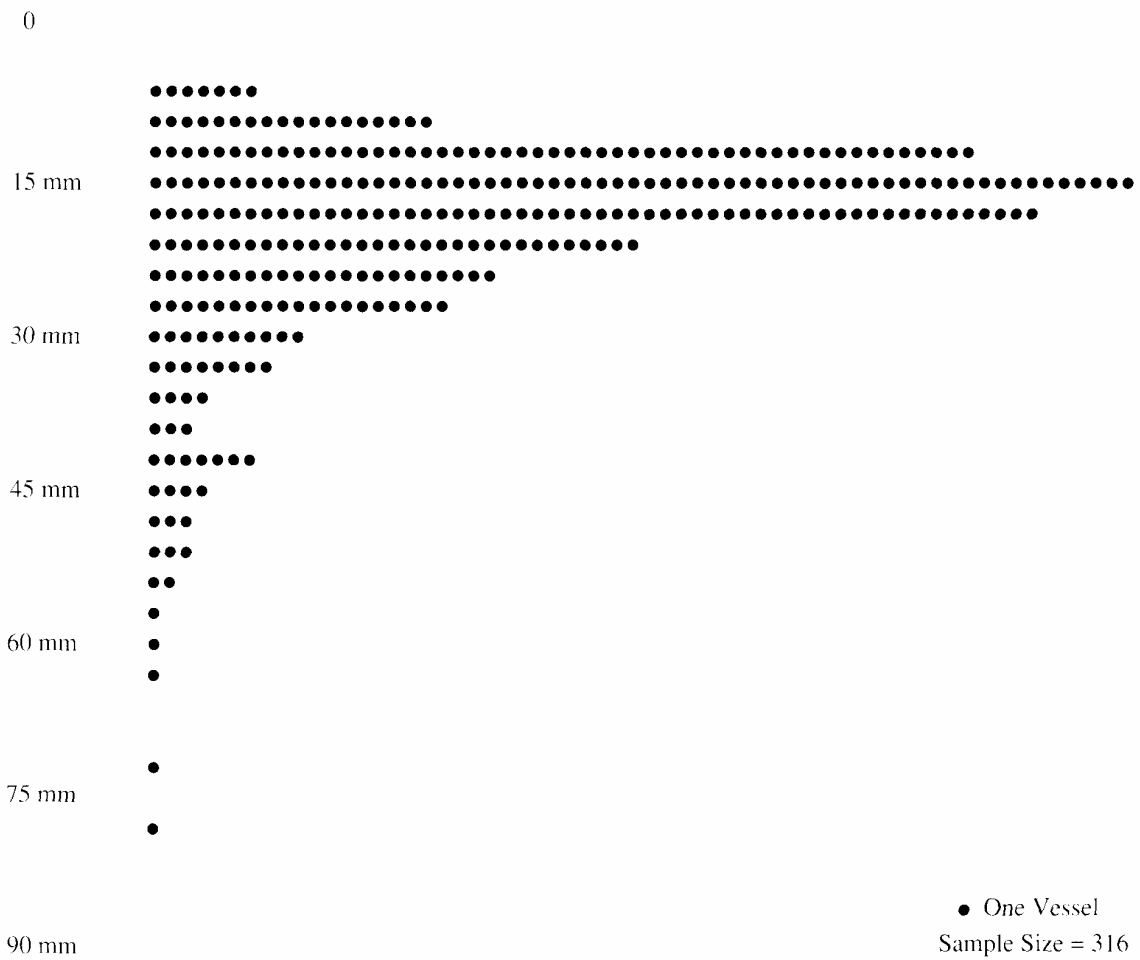


Figure 4. Frequency distribution of C/P Index on whole collared vessels from Seneca sites, A.D. 1565 - 1687.

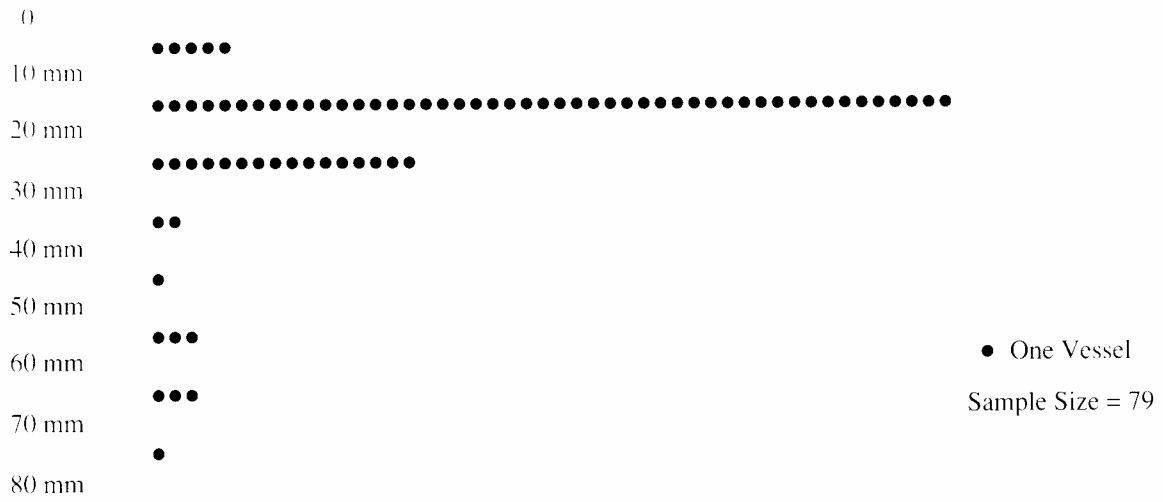


Figure 5. Frequency distribution of collar height on rimsherds from Georgian Bay sites: LaLonde and Angoutenc.

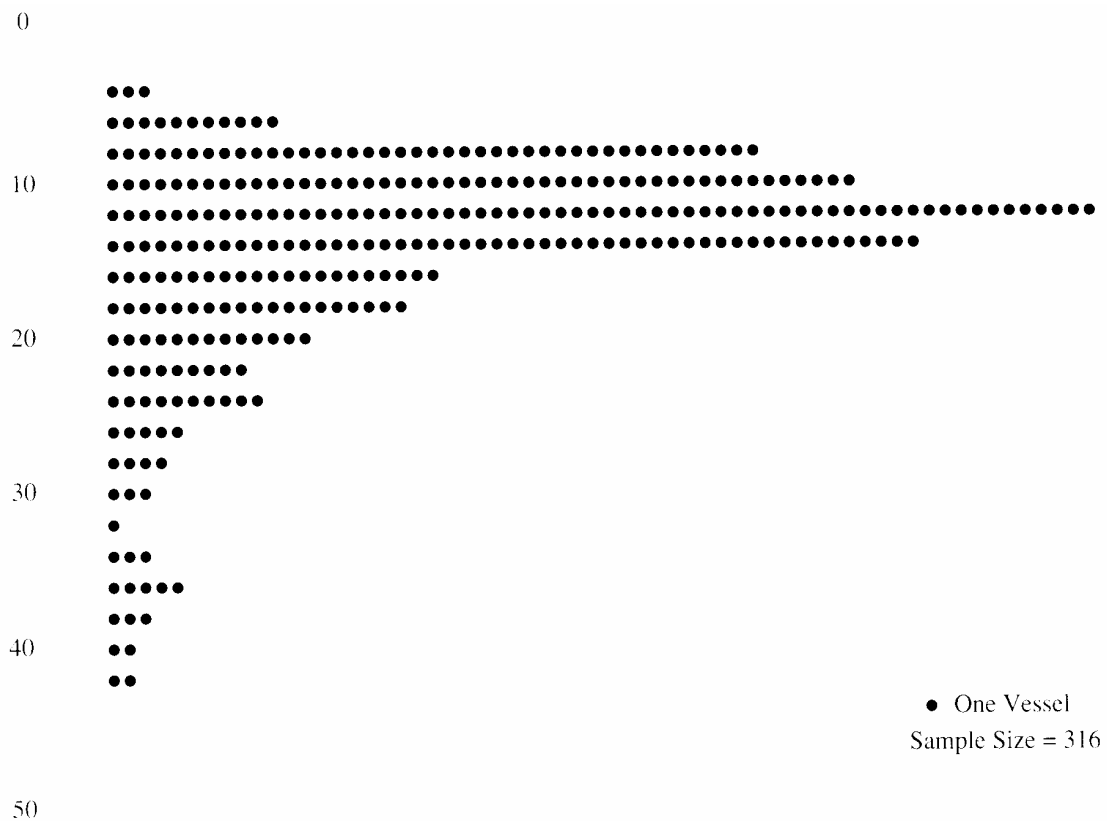


Figure 6. Frequency distribution of C/P Index on whole, collared vessels from Seneca sites. A.D. 1565 - 1687.

Angoutenc and Lalonde Sites, two historic Huron sites located on Georgian Bay. These were chosen because the Lalonde Site is known for its high-collared ware. The frequency distribution plot for these sites (Figure 5) shows a bimodal distribution with a fairly clean break around 40 mm. This could be interpreted as indicating that for these sites, all collars measuring less than 40 mm would be considered to be low collars, while high collars would measure over 40 mm. This rather high cutoff point can be compared with one of 30 mm given by Noble (1968) for the Sopher Site, and with one of 30 mm given by Albert LaFrance (1979) for Onondaga ceramics (he also considers those between 25 and 35 mm to be medium collars, while those under 25 mm. are low collars). By and large, a cutoff of around 30 mm seems to be accepted for Ontario Iroquois sites (Fitzgerald 1982, Milton J. Wright 1981, etc.), although the "high-collared" sherds are not always common. In the case of the Seneca data (Figure 4), while there are quite a few collars over 30 mm high, they do not segregate themselves into a discrete group. Thus the measure of absolute collar height does not allow a natural modal classification for the Seneca data, and any such grouping would be arbitrary. This generally holds true, incidentally, even when the data is plotted separately for individual sites, time periods, or sequences.

When the frequency distribution was plotted for the C/P Index from the Seneca data, a bimodal distribution with a relatively clear break around Index 31 was observed (Figure 6). We might therefore interpret vessels with indices lower than 31 as low-collared and those with indices over 31 as high-collared. This substantiates the initial observations which indicated that some such grouping should occur, although it shows clearly that there are no medium-collared vessels which can be identified according to this method. It does however provide much better segregation of the data than does the examination of collar height alone. In addition, we now have a cutoff value which is significant rather than arbitrary since it was provided by examining the data itself. Of course, one disadvantage of the Index is that it can be used only on samples made up of whole vessels for which the height of the vessel can be determined.

Further Research

The use of this Index has so far been applied only to the vessels from historic Seneca sites. It would be instructive to apply the same technique to material from other sequences, to determine whether the C/P Index remains useful, and whether the number or nature of the modes it reveals differ through time and/or space. William Noble (Noble, personal communication, 1986) has indicated that the cutoff value varied during the century following the occupation of Sopher. Attempts to determine whether the cutoff value changed during the historic Seneca sequence have been inconclusive; the sample is weighted somewhat toward the middle portions of the sequence, and it is difficult to determine separate cutoff points during other portions of the sequence from which comparatively small samples are available. However, the frequency distributions which have been plotted from various time periods within the sequence do not seem to indicate any significant variation over time in the cutoff point for low- and high-collared vessels.

The investigation of these attributes indicates that the C/P Index may be a valuable analytical measure. I also believe that it may prove to be useful as a predictive one as well, although this has not yet been validated. Given a large enough sample of whole vessels from a site, it may be possible to use the C/P Index in conjunction with other variables such as radius of rim curvature and pot thickness to reconstruct the *distribution* of pot size for the population of vessels represented by the sherd sample. This would, of course, only be possible once the problem of varying contexts among burial and refuse pottery has been resolved, but it will certainly bear examination in the future. The C/P Index discussed here is merely the beginning of what can be accomplished using dimensions of various sections of whole vessels. In addition, there are several other Indices dealing with the shape of the vessels, such as width/height, neck height/height, etc. as well as Emerson's 1967:150-153) collar height/collar thickness ratio, which will be examined as means by which to analyze morphological variability among Seneca pottery.

The attributes of collar height and C/P Index have been used here to illustrate an analytical approach to the definition and examination of many morphological attributes of Seneca pottery. The same concern for precise and consistent measurement has been sought for the total range of attributes, because accurate measurements of variability are critical to the validity of the results of the analysis, and also enhance the ability of other researchers to use the data comparatively. Univariate and multivariate analyses will be performed using this data in an attempt to devise reliable procedures by which pottery may be interpreted along with the historical record and other sources of information, with reference to specific social and cultural phenomena of interest to Iroquoian studies.

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References

- Emerson, J. Norman
 1967 The Payne Site: An Iroquoian Manifestation in Prince Edward County, Ontario. *Contributions to Anthropology V Bulletin 206*. National Museum of Canada. Ottawa.
- Engelbrecht, William E.
 1971 *A Stylistic Analysis of New York Iroquois Pottery*. Ph.D. Dissertation, University of Michigan.
- Fitzgerald, William R.
 1982 *Lest the Beaver Run Loose: the Early 17th Century Christianson Site and Trends in Historic Neutral*. Archaeology. National Museum of Man Mercury Series, No. 111, Ottawa.
- Kuhn, Robert D. and Susan E. Bamann
 1987 A Preliminary Report on the Attribute Analysis of Mohawk Ceramics. *The Bulletin and Journal of Archaeology for New York State*. No. 94, NYSAA.
- LaFrance, Albert D.
 1979 Onondaga Chance Phase Ceramic Trends-An Attribute Approach, in *Proceedings of the 1979 Iroquois Pottery Conference*, edited by Charles F. Hayes III, pp. 51-63. Rochester Museum and Science Center Research Records No. 13, Rochester, N.Y.
- Noble, William C.
 1968 *Iroquois Archaeology and the Development of Iroquois Social Organization (1000-1650 A.D.)*. Unpublished Ph.D. dissertation, University of Calgary.
- Ramsden, Peter G.
 1977 *A Refinement of Some Aspects of Huron Ceramic Analysis*. National Museum of Man, Mercury Series, No. 63, Ottawa.
- Thwaites, R.G. (ed.)
 1959 *The Jesuit Relations and Allied Documents: Travel and Explorations of the Jesuit Missionaries in New France, 1610-1791*, 73 volumes. Reprinted, Pageant, New York. Originally published 1896-1901, Burrows Brothers, Cleveland.
- Tuck, James A.
 1971 *Onondaga Iroquois Prehistory. A Study In Settlement Archaeology*. Syracuse University Press, Syracuse, N.Y.
- White, Marian E.
 1961 Iroquois Culture History in the Niagara Frontier Area of New York State. *Museum of Anthropology, Anthropological Papers 16*, University of Michigan, Ann Arbor.
- Wray, Charles F.
 1984 *Handbook of Seneca Archaeology, Vol. 1*. Rochester Museum and Science Center, Rochester, N.Y.
 1973 *Manual for Seneca Iroquois Archaeology*. Cultures Primitive, Rochester, N.Y.
- Wray, Charles F. and Harry L. Schoff
 1953 A Preliminary Report on the Seneca Sequence in Western New York 1550-1687. *Pennsylvania Archaeologist 23(2):53-63*.
- Wright, James V.
 1969 *The Ontario Iroquois Tradition*. National Museum of Canada, Bulletin 210, Ottawa.
- Wright, Milton J.
 1981 *The Walker Site*. National Museum of Man Mercury Series No. 103. Ottawa.

Late Woodland Settlement in the Genesee

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The traditional view that Iroquois tribes developed in situ as a result of maize horticulture, population growth and warfare does not adequately explain the process of tribalization. Analysis of archaeological data from west-central New York reveals that changes in settlement patterning associated with the evolution of Seneca Iroquois tribal society are preceded by the movement of all Ontario Iroquois population into this region. It is suggested that Seneca tribalization represents the development of an effective adaptive strategy for mitigating the effects of increased risk due to the uncertainty of a cultural environment that included an unrelated and powerful new population.

The region occupied by the historic Seneca in west-central New York State (Figure 1) offers an optimum situation for the study of tribalization in the Northeast. We know that the Seneca Iroquois who occupied this region during the historic period had a "classic" tribal organization resulting in a stable, well-defined political unit of which certain aspects survive to this day. However, until recently, the prehistoric sequence of Seneca development was unknown and appeared to be untraceable.

Systematic analyses of available data on settlement and ceramic trends within west-central New York conducted from 1980 to 1982 (Niemczycki 1984) revealed that the Seneca tribe was the result of the culmination of a gradual consolidation of local and immigrating population groups, and the development of new cultural adaptations as the result of both diffusion and local innovation. At least two sequences, one originating in the Cayuga Lake region and the other to the west of Canandaigua Lake, as well as individual sites belonging to sequences which could not be delineated, were identified as ancestral to the Seneca. Although this investigation was successful in identifying sites which had been occupied by the antecedents of the historic Seneca, certain problems remained.

The sequence of Seneca development could not be traced back any earlier than A.D. 1300 and there were still many sites which could not be placed in the local cultural sequence. No developmental sequences could be delineated in the Genesee Valley which has traditionally been considered to be a center of Iroquois development out of Owasco culture and a major source of Seneca population. Therefore it was not possible to demonstrate a link between the Owasco-Early Iroquois populations in the Genesee and the Seneca sequences in the western Finger Lakes region. In

addition, there was evidence of Ontario Iroquois occupation in the Genesee Valley and thus the cultural identity of the Iroquois population in this area was uncertain.

In an effort to resolve these problems, a second phase of investigation into Seneca origins and development, focusing on the Owasco-Iroquois transition in the Genesee, was initiated by the Research Division of the Rochester Museum and Science Center in 1982. The primary purpose of this project was to excavate selected sites in the Genesee Valley and systematically examine settlement and ceramic data from existing collections and records in order to ascertain the cultural identity of known sites and establish a preliminary cultural sequence in the valley. Long-range goals included the delineation of specific developmental sequences which could be linked to proto-Seneca sequences to the east, and the determination of the extent of Ontario Iroquois influence in the Genesee and its effect on Seneca development.

To date, this investigation has led to the chronological placement and cultural identification of several Middle Owasco-Transitional Iroquois sites (A.D. 1200 - 1350) in the Genesee region and the delineation of a general developmental sequence which overlaps the proto-Seneca sequence in the Mud Creek drainage west of Canandaigua Lake (Niemczycki 1986). Preliminary findings have shed new light on the problem of Seneca origins and the process of tribalization in west-central New York. In addition, changes in ceramic style and settlement patterning observed during the period A.D. 1250-1450 represent a departure from those expected on the basis of current views on in situ Iroquois development and suggest new hypotheses explaining the origin of tribal organization in west-central New York.

On the recommendation of Charles F. Wray, it was decided to begin the search for links between the Genesee Owasco and the Seneca Iroquois with the excavation of the Markham Pond site (see Figure 2). This was a large site covering an area of over six acres of the Genesee floodplain on the east side of the river just north of the village of Avon. Sites such as this have often been identified as Owasco villages but, typical of many other Owasco sites in the Genesee, Markham Pond appeared to represent a multi-component site occupied over several temporal phases. An existing ceramic collection recovered by Charles Wray from pits on the eastern edge of the site contained both Middle Owasco, Sackett Corded ceramics and a smaller number of Early Iroquois style incised collared



Figure 1. The Seneca Territory in west-central New York c. A.D. I-150 - 1700.

forms. In addition, Markham Pond was one of a complex of sites reported from the Avon-Scottsville vicinity and it was possible that these sites represented a sequence related to Seneca development in spite of the fact that one of these sites, Farrell Farm, had been identified as a Middle Ontario Iroquois occupation.

During the 1982 and 1983 field seasons we tried to determine if Markham Pond actually represented a single occupation or village, or a series of occupational episodes. It was hoped that systematic excavation would reveal separate loci representing discrete occupations. It was expected that pits and other sub-surface features would provide data relating to separate Owasco and Iroquois occupations. This investigation did reveal that the Markham Pond site was composed of three separate occupational loci, but Owasco and Iroquois ceramics were present at each of these.

Field work concentrated on Locus II at the western edge of the site. Excavation showed that it had been the site of a recurrent base camp or semi-sedentary hamlet of approximately one half acre. The well defined boundaries of this locus encompassed the postmold pattern of an oblong/rectangular structure and several large storage pits containing charred corn and nutshell fragments. A large hearth within the structure produced fresh water mollusk shell and a quantity of bone (deer, elk, raccoon, bear, turtle and possible turkey). This site seems to have been occupied recurrently or continually from late spring into winter over a period of several years by a band or extended family practicing a mixed horticultural-foraging subsistence strategy.

Although the majority of ceramics recovered at Markham Pond, Locus II were clearly Middle Owasco, a large portion of the ceramic assemblage represented cord-impressed, linear

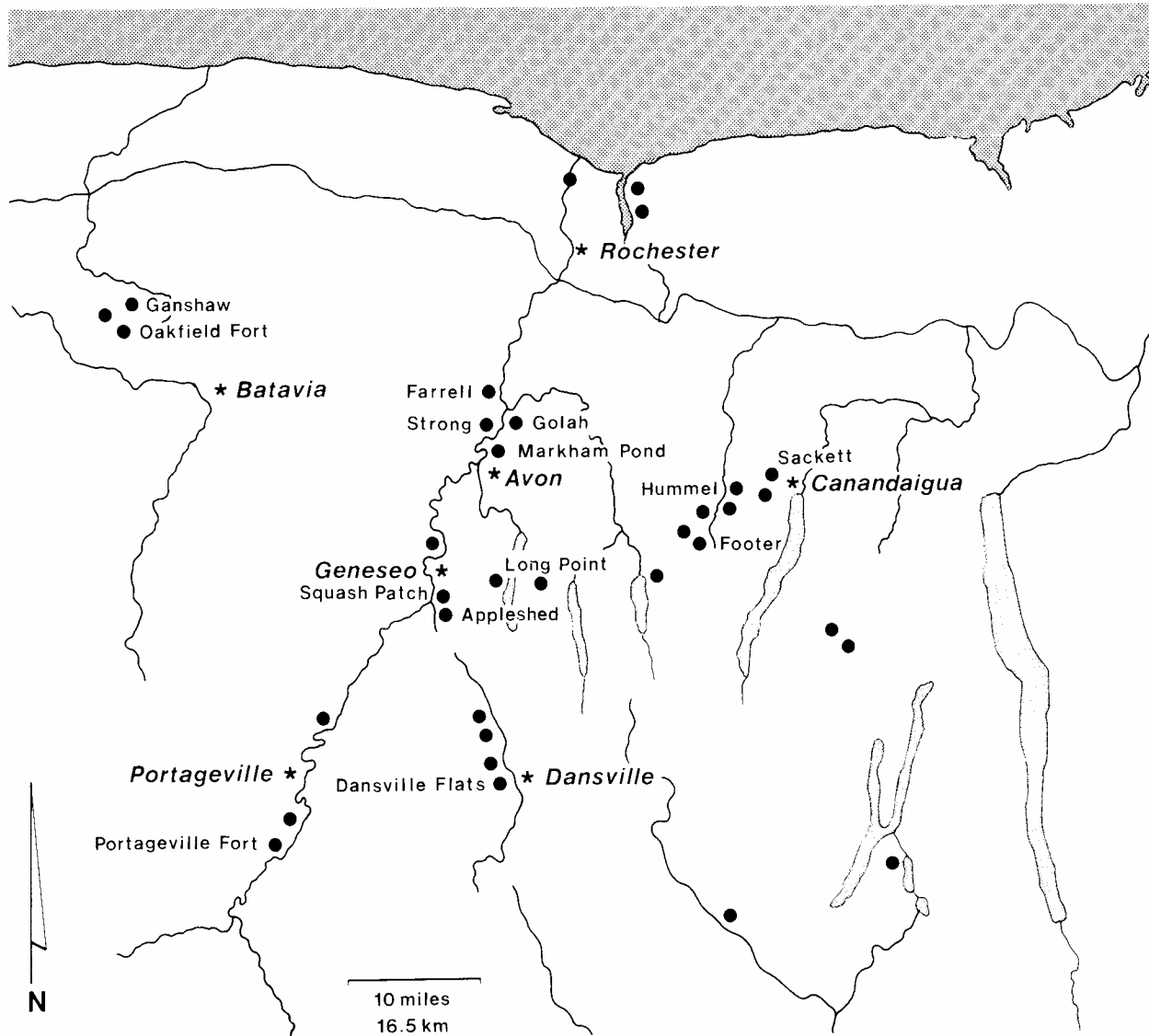


Figure 2. Sites in and adjacent to the Genesee region c. A.D. 1000 - 1450

stamped and incised collared sherds generally associated with Transitional Iroquois/Oak Hill and Early Iroquois phase occupations. While collared vessels bearing cord-wrapped-stick or linear stamp impressions might be expected to appear as early as A.D. 1150-1200, incised collared ceramics on an Owasco site seemed to be intrusive. It is because of this that many Owasco sites in the Genesee have been dismissed from study as mixed components. However, incised ceramics at Locus II were found in the same proportions over the entire locus and together with Owasco sherds in the same subsurface features. This suggested that both Owasco corded and Iroquois incised ceramics were in simultaneous use at this site.

Reexamination of ceramic collections from other Owasco-Transitional Iroquois sites in west-central New York

occupied A.D. 1200-1350 set the stage for a refinement of the ceramic sequence in this region. The combination of ceramic styles found at Markham Pond was also present at the sites of Dansville Flats on Canaseraga Creek, Appleshed and Squash Patch on the east bank of the Genesee near Geneseo, and at Hummel to the west of Canandaigua Lake. In fact, at Squash Patch, Owasco Horizontal, Kelso Corded and Ontario Horizontal sherds were found in the same pit associated with charcoal dating to A.D. 1305+/-80 (see Niemczycki 1986:36).

It was apparent that the ceramic sequence in west-central New York was quite different from that described for the eastern part of the state. There is no observable Castle Creek manifestation in this region: rather, Middle Owasco Canandaigua types persist here until c. A.D. 1250 when a pattern

similar to the western variant early Oak Hill horizon described by Lenig (1965) emerged marking the end of the Owasco stage and the beginning of the Transitional Iroquois phase. Transitional Iroquois sites are characterized by the presence of Kelso Corded, Iroquois Linear and Ontario Horizontal, and any of these types might be expected to appear in combination with Sackett Corded types during the final expression of the Owasco stage in west-central New York. Markham Pond apparently represents a terminal Owasco site dating c. A.D. 1250.

Once the significance of this ceramic pattern was understood, it was possible to seriate sites in the Genesee region with those proto-Seneca sequences to the east to create a general chronological sequence of Owasco-Iroquois development. This sequence indicated that cultural developments in the Genesee are related to Seneca development. The high degree of ceramic similarity among sites east of the Genesee and in the western Finger Lakes indicates that they represent related populations sharing common cultural adaptations and traditions. On the other hand, sites to the west of the Genesee, while superficially similar in ceramics, exhibit differences in ceramic style and settlement after A.D. 1250 which seem to link them to the Ontario Iroquois further west rather than the Seneca.

Incised and linear motifs on vessel collars are probably introduced in the Genesee c. A.D. 1250 as the result of contact with Ontario Iroquois Populations. In Ontario, interrupted linear decor is common and incising is present on vessel collars by A.D. 1250 (see Wright 1966:40-52). These traits seem to appear in the Genesee at approximately the same time and coincidentally with the appearance of an Ontario Iroquois population in the Oak Orchard Creek drainage less than 30 miles west of the Genesee. Therefore, Ontario Iroquois ceramics are at an early date associated with populations which appear to be ancestral to the historic Seneca, and the predominance of Ontario Iroquois ceramics on proto-Seneca sites such as Footer suggests that Ontario Iroquois influence on Seneca Iroquois development was great. But whether the Ontario Iroquois and the Genesee population follow separate lines of development or merge into one cultural group was not clear. It was hoped that the excavation of the Strong (Leatherstitch) site located directly across the river from Markham Pond would provide data useful in making this determination (see Figure 2).

The Strong site appeared to be similar in size and location to Markham Pond but located on the west side of the river south of the "Ontario Iroquois" site of Farrell Farm. It was reportedly a mixed component producing both Iroquois and Owasco ceramics. We wanted to determine if occupation of this site preceded or followed that at Markham Pond and if the sites of Markham Pond, Strong and Farrell Farm could represent successive occupations of the same population group.

Investigation of the Strong site indicated that ceramic and settlement patterning here differed from that at Markham

Pond, surface collections produced both Early-Middle Owasco and Early Iroquois ceramics but no collared cord-impressed or linear stamped sherds. Data recovered from excavations of two loci conducted in 1984 and 1985 suggested that the major occupations at this site had been earlier and more transient than those at Markham Pond. Locus I covered an area of approximately .10 acre about 50 feet from the present river bank. Subsurface features included a few small pits and a pattern of post molds crossing at right angles which may represent a small structure. No hearths or deep storage pits were encountered. Chert debris was abundant and by comparison the amount of ceramic material was small. Locus II, located 300 feet further east, away from the river, covered an area of at least one quarter acre. Only a few possible shallow features and occasional scattered post molds were encountered at this locus. However, a buried topsoil layer containing a large concentration of pottery was discovered below the plowzone in the eastern portion of Locus II. This was probably a natural depression where cultural refuse collected and which was covered over by subsequent flooding and plowing of the area.

Differences in the distribution of incised and cord-impressed ceramics at this site suggest that they represent separate occupations. Incised ceramics occurred sporadically over the entire surface and in the plowzone at Locus I. Only a few incised sherds were recovered from the plowzone in Locus II. However, all of the ceramics recovered from Level II, the base of the plowzone, and from subsurface features were assignable to Owasco types. The pottery found below the plowzone in Locus II consisted mainly of types associated with Early Owasco or the early part of the Middle Owasco phase: Carpenter Brook Cord-on-cord, Levanna Cord-on-cord, and Levanna/Jack's Reef Corded Collar. Charred nutshell and a few charred corn fragments were found in association with this deposit.

Apparently Strong was the site of several temporary camps occupied by Early-Middle Owasco bands engaged in hunting and gathering activities. Although maize was known it does not appear to have been important at this site relative to wild resources. Incised ceramics similar to Ontario Oblique, Ontario Horizontal and Lawson Incised/Opposed types, in the absence of cord-impressed or linear stamped collared Transitional Iroquois sherds, appear to have been associated with a later Early Iroquois or Middle Ontario Iroquois Occupation (A.D. 1300-1450). The presence of an early Iroquois style trumpet pipe bowl in the surface collection supports a later date for the Iroquois ceramics at this site.

It was concluded that the Owasco occupation at Strong represented by the assemblage from Level II preceded that at Markham Pond and that a movement of this population east was indicated. No other possible successors of Markham Pond could be identified to the west of the Genesee. In fact, all known sites exhibiting the Transitional Iroquois ceramic pattern outlined above are located in the eastern Genesee and western Finger Lakes regions. This led to the preliminary

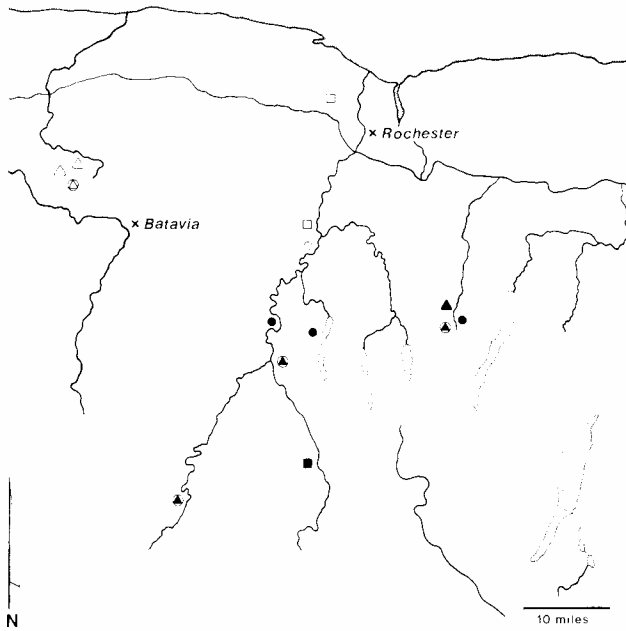


Figure 3. Sites in west-central New York A. D. 1000 - 1250

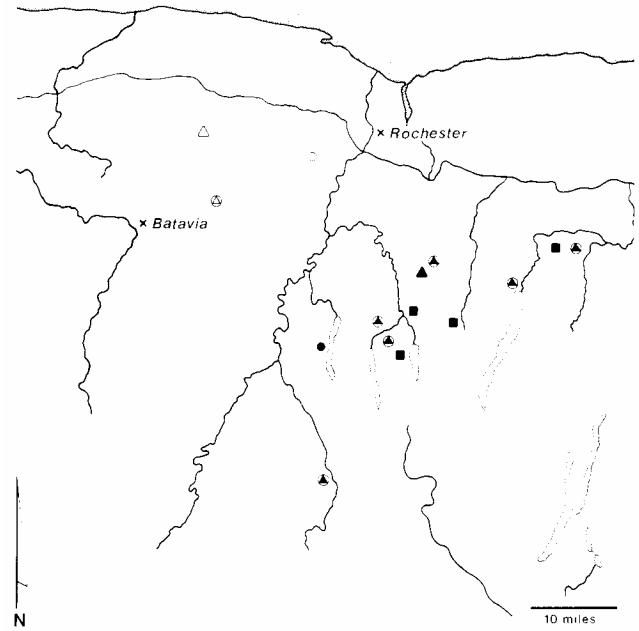


Figure 4. Sites in west-central New York A. D. 1250 - 1300

conclusion that contact with the Ontario Iroquois was followed by the removal of the local Owasco population to the east of the river.

Data from Markham Pond and Strong, when compared to data on settlement: size, character and distribution of sites; within the Genesee region suggest a hypothetical reconstruction of the process of Seneca tribal development. An examination of the changing distribution and complexity of Iroquoian sites in west-central New York from A.D. 1000 to A.D. 1600 points out the significance of the role played by the Ontario Iroquois in Seneca development. Although Ontario Iroquois influence in this region has already been recognized and discussed by archaeologists such as Lenig (1965) and Hamell (1979), it now appears that the Ontario Iroquois presence to the west of the Genesee was of much greater importance than was previously imagined.

From A.D. 1000 to A.D. 1250 the Owasco in the Genesee occupied recurrent camp sites on both sides of the river (Figure 3). They had a basically hunting and gathering economy and presumably a band level social organization. Few storage pits have been located at these sites, and there is little evidence of horticultural activity. Likewise, evidence of permanent structures is lacking. The single exception to this is the Sackett site at the north end of Canandaigua Lake approximately 25 miles (40 kilometers) east of the river. This three acre site appears to represent a short-lived consolidation of population which at present cannot be linked to the processes at work in the Genesee during this period (Niemczycki 1984:91-92).

By c. A.D. 1250 incised and linear stamped collared ceramics appear at Markham Pond along with evidence of horticulture and semi-sedentary settlement. It is at this same time that the Ganshaw site was occupied along the Oak Orchard Creek drainage to the west. Ganshaw is the initial site of the Oakfield complex described by Vanderlaan (1980). (Oakfield Fort, the major site in this complex has been associated with Middle Ontario Iroquois, Uren culture dating to A.D. 1300-1350.) Ganshaw was a three acre village site surrounded by an oval earthwork. Floral and faunal remains from this site indicate that it was occupied year-round by a population with a mixed horticultural-foraging economy. Ceramics from this site included Early-Middle Ontario Iroquois types as well as a small number of Middle Owasco type sherds which indicate that there was contact with the Owasco population in the Genesee. Following evidence of this initial contact, all known Transitional Iroquois sites are located to the east of the Genesee (Figure 4).

The Oakfield complex population appears to increase and expand, and c. A.D. 1300-1350 there is evidence of Ontario Iroquois occupation at Farrell Farm on the west side of the Genesee (Hayes & Prisch 1973, Engelbrecht 1981). At this time the indigenous Transitional Iroquois population seems to withdraw further south and east and palisaded villages appear in the southern Genesee and western Finger Lakes soon after (Figure 5). By A.D. 1450 settlement along the Genesee River is abandoned. Evidence of violent confrontation and increasing concern with defense in site selection and fortification

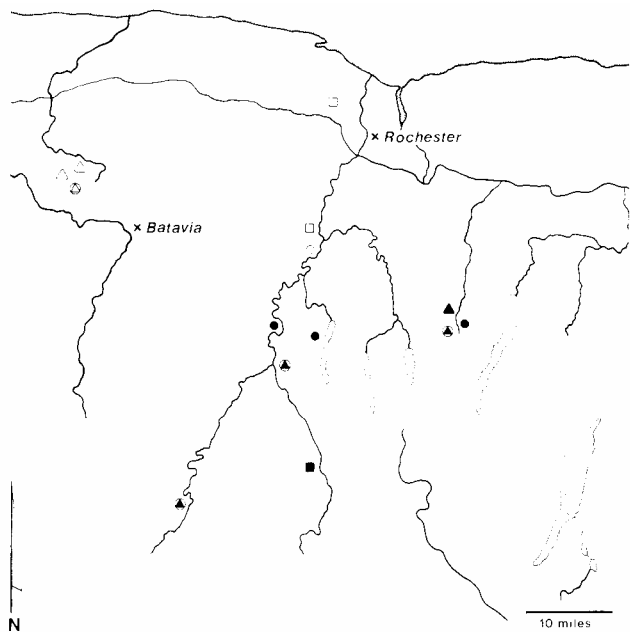


Figure 5. Sites in west-central New York A. D. 1300 - 1400.

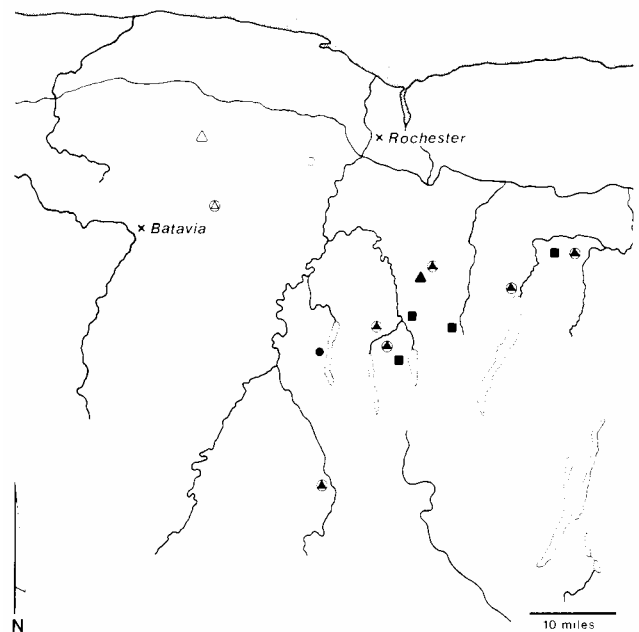


Figure 6. Sites in west-central New York A. D. 1450 - 1550.

suggest that Ontario Iroquois encroachment ultimately led to hostility and the withdrawal of both populations into separate cultural enclaves. The consolidation of Early Iroquois/proto-Seneca populations into palisaded villages along creeks and outlets draining the western Finger Lakes may represent the emergence of tribal integrative networks (Figure 6). By A.D. 1550 this population has completed its consolidation into the paired villages of the Seneca tribe described by Wray and Schoff (1953) (Figure 7). The Ontario Iroquois are gone, either absorbed or driven out by the Seneca.

The villages occupied by the Oakfield community A.D. 1250-1350 were considerably larger and more permanent than the contemporary Transitional Iroquois settlements immediately to the east. This suggests that the Oakfield population also had a more complex form of socio-political organization. The appearance of this population with typically Iroquois traits such as incised pottery, a horticultural subsistence base and large palisaded villages c. A.D. 1250 seems to be causally linked to Seneca Iroquois tribal development. This event could have precipitated cultural change through the introduction of new ideas or by creating a need for the dispersed indigenous population to develop new subsistence, settlement and sociopolitical strategies in order to successfully compete with the well-organized population of the Oakfield complex.

The results of recent investigations in the Genesee indicate that the process of tribal evolution among the ancestors of the Seneca was initiated and stimulated by the appearance of this intrusive population and the resulting change in the degree of local environmental unpredictability (see Braun & Plog

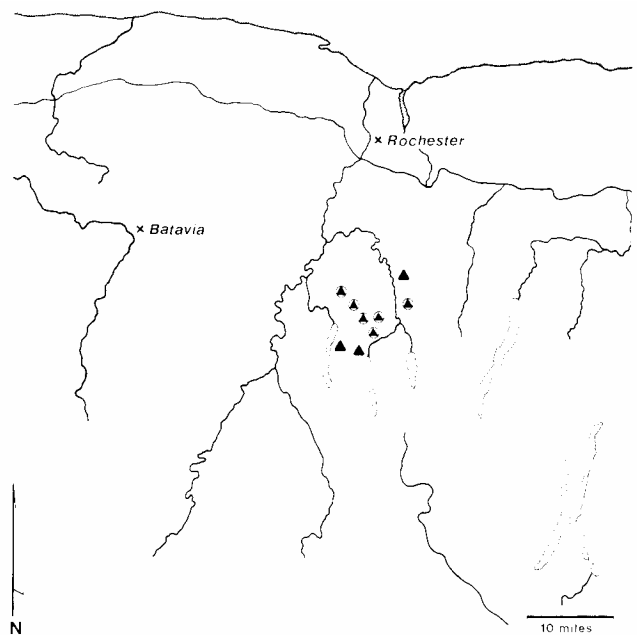


Figure 7. Sites in west-central New York A. D. 1550- 1600

1982). This new population not only introduced new stylistic traditions and more advanced patterns of subsistence, settlement and socio-political organization, it created a situation of increased risk by increasing population density and competition for available territory and resources, thus threatening the security and survival of the indigenous population.

The emergence of Seneca tribal society seems to be the result of the adoption of suitable Ontario Iroquois traits and strategies as well as local innovation and invention. Tribalization may be seen as an adaptive response which allowed local populations to mitigate increasing risk. Increasing risk due to the uncertainty of a cultural environment which included an unrelated and powerful new population competing for the same resources could have been an important factor triggering sociocultural evolution. It is therefore hypothesized that the development of the Seneca tribe was the result of changes in subsistence strategy, settlement pattern and socio-political organization which mitigated the effects of increasing risk associated with external and internal demographic pressures created by the immigration of the Oakfield population into the region to the west of the Genesee c. A.D. 1250. Tribal organization provided a more effective means of managing resources and population and spelled adaptive success for the indigenous population who became the Seneca.

References

- Braun, David P. and Stephen Plog
1982 Evolution of "Tribal" Social Networks: Theory and Prehistoric North American Evidence. *American Antiquity* 47 (3):504-525.
- Engelbrecht, William E.
1981 Comments on Ceramics from the Footer and Farrell Farm Sites, Ms. on file, Rochester Museum and Science Center, Rochester, New York.
- Hamell, George R.
1979 Letter to Mr. M. William Wyckoff, June 16, 1979, on file at the Rochester Museum and Science Center, Rochester, New York.
- Hayes, Charles F., III and Betty Prisch
1973 A Prehistoric Iroquois Site on the Farrell Farm, *The Bulletin*, New York State Archaeological Association, 59:19-20.
- Lenig, Donald
1965 *The Oak Hill Horizon and Its Relation to the Development of the Five Nations Iroquois Culture*. Researches and Transactions of the New York State Archeological Association XV(1), Buffalo.
- Niemczycki, Mary Ann Palmer
1984 *The Origin and Development of the Seneca and Cayuga Tribes of New York State*, Research Records No. 17, Rochester Museum and Science Center, Rochester, New York.
- 1986 The Genesee Connection: The Origins of Iroquois Culture in West-Central New York. *North American Archaeologist*, 7(1):15-44.
- Wright, James V.
1966 *The Ontario Iroquois Tradition*, Bulletin of the National Museum of Canada 210, Anthropological Series, 75, Queen's Printer and Controller of Atationery. Ottawa.
- Vanderlaan, Stanley
1980 The Oakfield Phase - Western New York State, In *Proceedings of the 1979 Iroquois Pottery Conference*, edited by Charles F. Hayes III, pp. 95-98. Research Records No. 13, Rochester Museum and Science Center, Rochester, New York.

Canoes, Caches, and Carrying Places: Territorial Boundaries and Tribalization in Late Woodland Western New York

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The evolution of Iroquoian culture coincided with the development of warfare, tribalization, and maize agriculture during the Late Woodland Period in the Northeast. Implicit in the currently held In Situ Hypothesis is the assumption that these processes occurred endogenously, i.e. as local developments throughout the Iroquoian homeland, arising spontaneously from the adoption of maize horticulture. All alternative explanation for Iroquoian social change is explored here, namely, that change was induced exogenously from pressures generated from the interior of the continent, imposed on Iroquoian from the Ohio/Allegheny river drainage and the Lower Great Lakes Basin to the south and west. These hypotheses will be tested by examining prehistoric Iroquoian site distributions in Western New York - in particular, settlement responses to external influences.

Introduction

One of the key problems of Iroquoian research at present is that of explaining the development of intensive agriculture, tribalization, and warfare in the Northeast during the Late Woodland period. Early explanations for Iroquoian culture in the Northeast were based on migration; these were later replaced by the In Situ Hypothesis. Most supporters of the In Situ Hypothesis assume that maize horticulture was the driving variable in culture change, i.e., that social change was the outcome of economic change at a local scale. Factors outside the tribal territory are generally not addressed, perhaps because of the vast distances involved. Ritchie recognized this limitation over quarter century ago when he stated: "we still have Iroquoian prehistory as seen from Toronto, Ottawa, Rochester, Albany, and Harrisburg, or some other center of regional concentration, rather than an overall perspective ..." (1961:27). This paper examines the New York Iroquois territory (hereafter referred to as Iroquoia) with a regional perspective, in order to observe large-scale social process during the Late Woodland period.

The Regional Context of Iroquoia During the Late Woodland Period

The geography and chronology of the Lower Great Lakes basin and Ohio River drainage during the Late Woodland period have been reviewed by the author elsewhere (Hasenstab 1986). The prehistoric geography of the region is summarized here in Figure 1.

Surrounding the major waterways which interlink the region were a number of cultures similar in form to the New York Iroquois, viz., populations practicing intensive maize horticulture and warfare. The Lake Erie basin was occupied by the Whittlesey peoples, various Western Basin populations, and the Ontario Iroquois Tradition groups, including the early Glen Meyer culture. Situated between Lake Erie and the headwaters of the Allegheny River were the Chautauqua Phase populations of southwestern New York. The lower Allegheny valley was occupied by Monongahela groups. The Ohio Valley was occupied by the Fort Ancient people and contained a series of temple-mound sites that are interpreted here as regional centers. These increase in size downstream, and include: the lesser mound site of McKees Rock Village in Pittsburgh; the Marietta site at the mouth of the Muskingum River; the 82-acre Angel site; the Caborn-Welborn complex of centers at the mouth of the Wabash River; the 150-acre Kincaid site near the mouths of the Tennessee and Cumberland Rivers; and the Cairo Lowland sites at the confluence of the Ohio and Mississippi Rivers.

Roughly 100 miles (161 kilometers) north of the latter sites was Cahokia - a six-square-mile urban center including 100 burial mounds and the Monks Mound - covering 15 acres and standing 100 feet (30 meters) high. Cahokia exhibited ranked society and specialization in production of lithics, ceramics, and ornaments of metal and shell. Cahokia was certainly a center of regional exchange, and is thought by some to represent an emergent state.

The chronology of the region appears to have been influenced by happenings at Cahokia. While Cahokia was being established during the Emergent Mississippian period (A.D. 800-1000), maize was spreading into the Northeast and had reached Ontario by A.D. 900 (Noble 1975). By the end of the Emergent period, Angel and Kincaid were established and

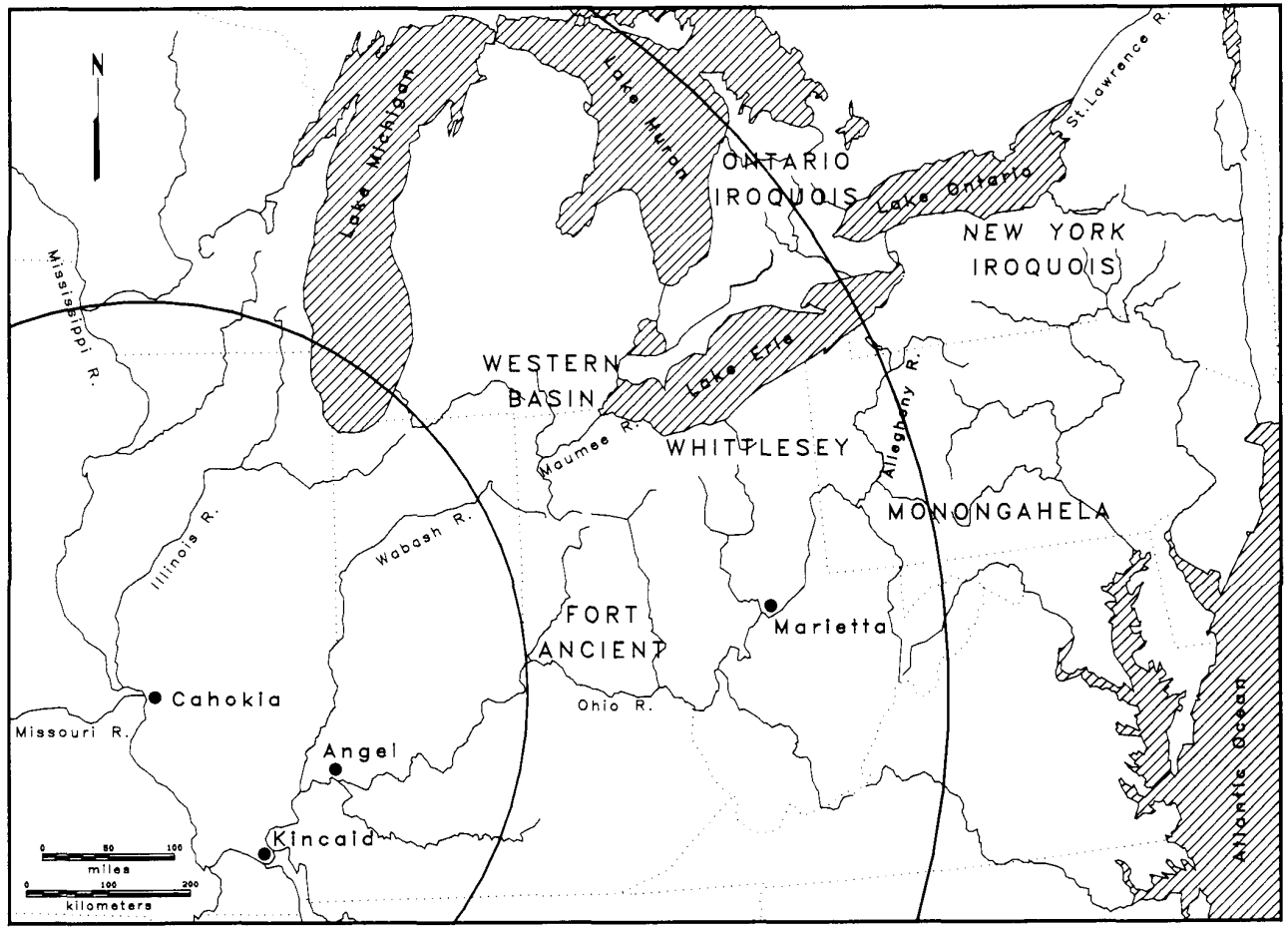


Figure 1. The Upper Mississippi and Great Lakes basins during the late prehistoric period. Shown are major waterways and the locations of key archaeological as discussed in the text. Average canoe-travel times toward the interior of the continent are indicated by concentric rim – each representing 15 to 20 days travel (from Little [1987]).

palisaded settlements appeared in the upper Allegheny valley and throughout the Lake Erie basin, including Glen Meyer territory in Ontario and Owasco territory in New York. During the peak of Cahokia's development - the Stirling and Moorehead phases (A.D. 1000-1250) - Kincaid and Angel flourished and palisades were erected around them. At the same time, evidence of hostility is implied by settlement changes on the fringes of the Lake Erie basin and Ohio drainage: villages moved northward in the Western Basin, Glen Meyer settlements moved away from the Thames River, and Owasco and Monongahela villages moved into the uplands. Following the collapse of Cahokia during the Sand Prairie Phase (A.D. 1250-1400), a number of very large centers emerged in the lower Ohio Valley - the Cairo Lowland and the Caborn-Welborn sites. Marietta developed as a major center in the upper Ohio Valley. Mississippian cultural intrusions appeared in the Maumee River valley. Peripheral areas were vacated, such as the Western Basin and the Allegheny valley around Pittsburgh.

Intense hostility and pronounced village nucleation is apparent at this time - in Ontario during the Middleport horizon and in the New York during the Oak Hill horizon.

A Model of Culture Change

The sequence of events just outlined suggests a time-transgressive process generated from the continental interior outward. A core-periphery model to explain this process has been proposed by Dincauze and Hasenstab (1987). It holds that the Fort Ancient centers on the Ohio River would have generated demand for resources obtainable further up river. Such resources may have been obtained through exchange or by direct acquisition, or may have been consumed by intermediary groups to provision warriors or pay tribute. Evidence that exchange was occurring between Ohio Valley centers and the margins of the drainage is shown by the presence of foreign lithic and ceramic materials at the Marietta site, for example

(Clay 1976; Essenpreiss 1978), and the presence of Fort Ancient materials in the Allegheny drainage and Lake Erie basin, such as Ohio Valley cherts (Lennox 1982; Noble 1975; Reid 1975), Fort Ancient ceramics (Guthe 1958: 43, 46, 48), and ornaments of the Gulf-coast conch shell. *Busycon*, which were probably ultimately produced at Cahokia-(Fox 1976; George 1978:21; Guthe 1958:49; Keenlyside 1976; McKenzie and Blank 1976:316-317; Stothers 1977; Wintemberg 1928).

The New York Iroquois groups were apparently not involved in this interaction with the interior, as indicated by a general lack of exotic materials, especially during the peak period of warfare and tribalization - the Oak Hill horizon. It appears, instead, that Iroquoia was being threatened by groups to the west and south who were interacting with the interior - such as the Ontario Iroquois and the Chautauqua Phase people. Niemczycki (1986) argues that the Ontario Iroquois were expanding into western New York, and others observe Monongahela shell-tempered ceramics reaching the limits of the Allegheny drainage from the southwest (Dragoo 1976:85-86; Guthe 1958; Schock 1974:2). Ritchie noted these changes half a century ago and suggested that western New York was colonized by Huron-Neutral groups from Ontario, who were then displaced by proto-Erie groups from the southwest in the early fourteenth century (1930:62).

It is hypothesized here that groups to the west and southwest of Iroquoia were expanding their territories on the margins of the lower Great Lakes basin and Allegheny drainage, respectively. The colonizers would have sought to exploit resource, that were otherwise depleted in their home territories, as a result of interaction with the more complex societies to the southwest. It is further hypothesized that the resources extracted would have been high value, bulk commodities which were acquired by long-distance procurement over water transport routes.

The Significance of Water Transport to Long-Distance Resource Extraction

Brose has argued - strictly on grounds of energetics - that prehistoric transport of bulk commodities would have been restricted to water routes (1986). Aboriginal water craft were designed to transport bulk cargo. Megapolensis reported that Mohawk dugout canoes could "easily carry two hundred schepels of wheat," or 150 bushels (1909:176). Sagard described the birch bark canoes used by the Huron on the Great Lakes:

Their canoe, are from eight to nine paces in length and about a pace or a pace and a half wide at the middle.... they are so light that a man can easily carry one on his head or on his shoulder. Each can support the weight of a hoghead, more or less according to it, size. Every day as a rule when they are in a hurry they do twenty-five or thirty leagues in these canoes [1939:100-101].

James Smith described birch bark canoes used in Ohio during his captivity with the Indians:

This vessel was about four feet wide, and three feet deep, and about five and thirty feet long: and though it could carry a heavy burden, it was so artfully and curiously constructed that four men could carry it several miles, or from one landing place to another, or from the waters of the Lake [Erie] to the waters of the Ohio [1808:166-167].

Kandare (1986) reviews accounts of Mississippian canoes and reports typical fleets of 100 to 200 craft, each of which was capable of holding 75 passengers and could travel "at the speed of a running horse on land."

Long distance transport by canoe could have been scheduled into annual seasonal rounds. Little (1987) reviews ethnohistoric accounts of canoe transport throughout the Great Lakes Basin and Mississippi drainage; her research is summarized here in Figure 1. In the continental interior, exchange between the Fort Ancient peoples and the Mississippians would have been feasible; from the middle Ohio River valley, Cahokia could be reached in 15 to 20 days. Likewise, transport from the fringes of the Ohio valley to the Fort Ancient centers could have been feasible. Little reports average travel times of nine days down the Allegheny from its headwaters in New York to its confluence with the Monongahela River at Pittsburgh. From Pittsburgh, an additional four days travel time down the Ohio are required to reach Marietta, and another 13 are required to reach the Cabom-Welborn centers at the mouth of the Wabash.

Commodities transported would have been high-value resources, such as hides, dried meat, oils, or maple sugar. Major John Norton described the trade of the Seneca from the Allegany Reservation in 1809:

These people have an advantageous situation; although their Reserve is only half a mile on each side of the river... it takes in the most valuable kind of land, and that ... adjoining to it, being rough and broken ... forms the most valuable hunting ground of any possessed by the Five Nations. They can conveniently take skins, meat, and timber to Pittsburg where they generally get a good price for these articles; the distance is only about 150 miles, and when the water is high, they can descend with canoes or boats in two or three days [1970:9].

James Smith described the procurement expeditions of Ohio Indians to provision warriors in Lake Erie towns in the mid-eighteenth century (1808:184-186). Every winter small bands canoed up feeder streams of Lake Erie and camped at the "carrying places" crossing over into the Ohio drainage - usually at falls near the stream's headwaters. There they buried their canoes in pits and set up a winter lodge nearby (1808: 168, 195, 223). Smith describes such a carrying place:

When we came to the fall, of Sandusky- we buried our birch bark canoes as usual at a large burying place for that purpose, a little below the falls [1808:223].

This place is in the plains betwixt a creek that empties into the Sandusky, and one that run, into Sciota: and at the time of high water, or in the spring season, there is but about one half mile of portage [1808:224].

During the winter, hunters searched for hibernating bears in hollow trees. The bears were killed and their fat was boiled down and stored in deer-hide pouches, each of which "would hold about four or five gallons" (1808: 172-175, 177). Sometimes the Indians would conduct communal deer drives, or "ring hunts" (1808:223). In early spring, they gathered maple sap and boiled it down in bark vats "that would hold about one hundred gallons"; they would "keep them boiling during the whole sugar season" (1808:176). In some seasons they would collect "two hundred weight of sugar" (1808:178).

Each spring the bands assembled their goods at the carrying places, retrieved their buried canoes, and constructed new canoes to carry their surplus goods downstream to their towns (1808:178, 213). Smith reported that each spring "the Indians on their return from their winter hunt bring in with them large quantities of bears' oil, sugar, dried venison, etc." (1808:184). As noted above, these goods were used to provision war parties engaged in foreign wars.

If the Norton and Smith accounts are valid models for prehistory, then it is possible that Ontario Iroquois and Monongahela groups extracted resources at the margins of the lower Great Lakes basin and Allegheny drainage. If the demand for resources were great enough, then the resource capacity of the extraction territory would become depleted, and the territory would have to be expanded. A supporting argument is presented by Gramly for deer hide exploitation in the Northeast (1977). He argues that deer hides would have been a scarce and easily-depleted resource and that a demand for them could have led to conflicts over hunting territories. Resource depletion and territorial expansion along the headwaters of the lower Great Lakes basin and Allegheny drainage could have led to the intergroup hostility observed in western New York during the Late Woodland period.

The geographic position that gave the Iroquois access to furs from mid-continent during the historic fur trade could have had the reverse effect in prehistory, viz., it could have rendered Iroquoia vulnerable to encroachment from the continental interior. The core-periphery model would imply the occurrence of "carrying place" sites - on the borders of Iroquoia - associated with long-distance resource extraction from the interior. These sites could be expected to occur at break points in the water transport network, such as at falls along rivers or portages between drainages. In addition, such sites could be expected to exhibit evidence of bulk-breaking activities, such as cache pits.

To test this model, inventories of Late Woodland sites maintained at the Rochester Museum and Science Center

and SUNY Buffalo were examined (Hasenstab 1981). Site locations were compared against the distribution of canoe-navigable waterways and drainage divides, which are indicated in Figure 2. Precise stream locations were taken from U.S.G.S. 1:250,000-scale topographical maps, except in cases where stream courses were disturbed by the Erie Canal. In such cases, pre-Erie Canal (i.e., pre-1817) stream routes were reconstructed from Morgan's map of the Five-Nations homeland in 1720 (1972: Appendix I), and from interpretation of 1:24,000-scale U.S.G.S. topographical quadrangles.

The stream courses shown in Figure 2 are only those that are known to be canoe navigable, based on a survey of canoeable streams in New York State (Grinnell 1956). This distribution is conservative for three reasons. First, Grinnell does not systematically account for every stream in the region. Second, Grinnell reports canoeable stretches beginning at convenient embarkment points; stretches upstream from these points could also be navigable. Finally, there is evidence that the water table has been lowered throughout the region in historic times (Heidenreich 1971:63-66; White 1961:56). In sum, it is possible that some stretches of stream not indicated in Figure 2 were canoe-navigable in Late Woodland times, especially during the spring melt season.

Implications and Tests of the Model

Lewis Henry Morgan was the first to note the geographic significance of the Iroquoian homeland:

Situated upon the head-waters of ... the Ohio ... they held within their jurisdiction ... the gates of the country, and could, through them, descend at will upon any point the lakes and streams, which in so remarkable a manner interacted every part of the Long House, and whose head-waters were separated only by short portages ... offered them every facility for the most rapid intercommunication [1972:40-41].

An Examination of "Carrying-Place" Sites in Western New York

From Lake Ontario, access to Iroquoia is possible by passing over the Niagara Escarpment. The escarpment in western New York is cut by three major streams: the Genesee River, Oak Orchard Creek, and the Niagara River. Impassable falls occur along each of these streams at the escarpment. From Lake Erie or the Niagara Peninsula, Iroquoia could be reached via Tonawanda Creek, Buffalo Creek, Cattaraugus Creek, or else indirectly via the Allegheny drainage from Chautauqua Lake, Conewango Creek, or French Creek. From the Allegheny drainage, access to Iroquoia may be made directly from the upper Genesee drainage. From the headwaters of the Allegheny, passage northeast into Iroquoia is relatively easy, as noted by Guthe:

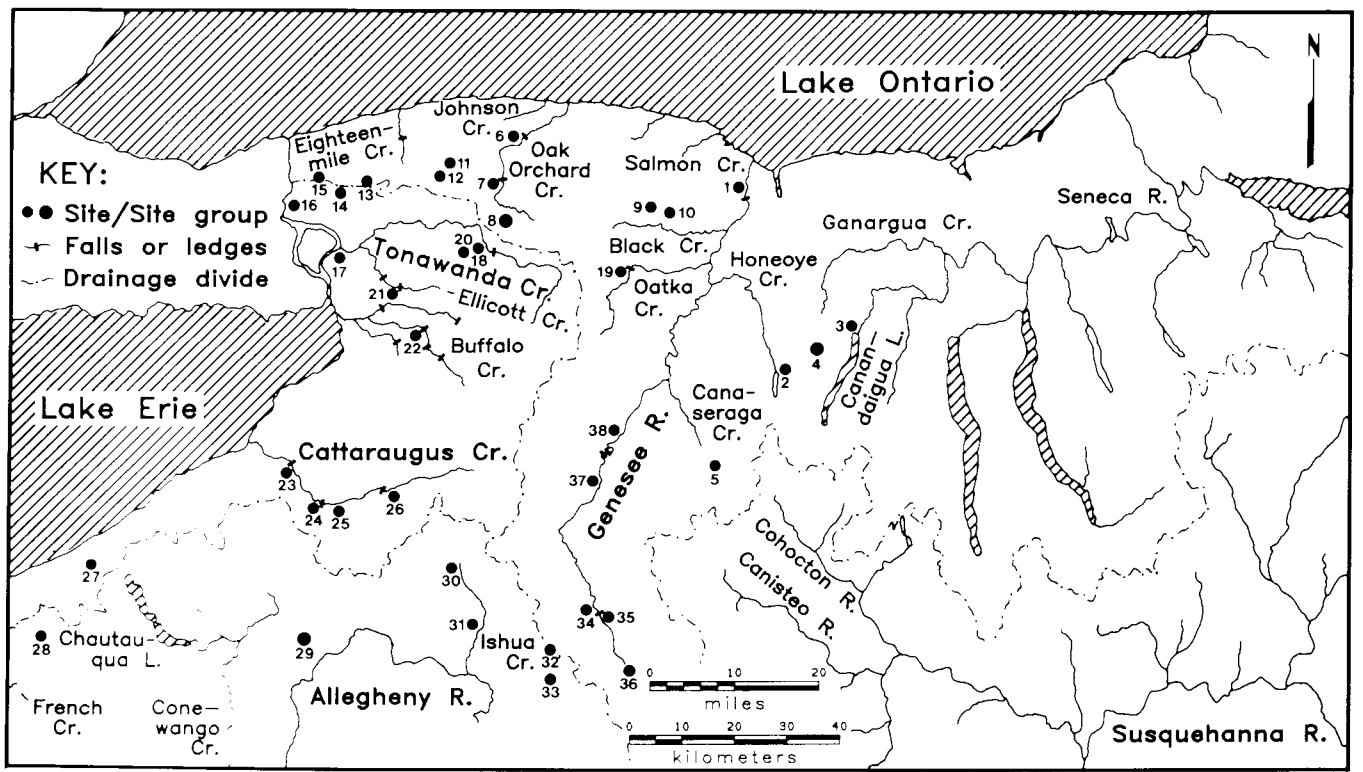


Figure 2. The distribution of canoeable waterways and postulated Late Woodland “carrying place” sites in western New York. Sites indicated are: 1. Hanford’s Landing; 2. Morrow; 3. Sackett and Canandaigua Fort; 4. Bristol Hills group; 5. Dansville Fort; 6. Fording Place; 7. Shelby Fort; 8. Oakfield group; 9. Alhart; 10. Fuierer; 11. Fort Pearce; 12. Orangeport Ossuary; 13. Gould; 14. Pekin; 15. Kienuka; 16. Portage; 17. Buffalo P; 18. Indian Falls; 19. Fort Hill, Le Roy; 20. Akron Falls; 21. Bowmansville Nursery; 22. Bullis Road and Lancaster earthworks; 23. Double Wall Fort; 24. Peter Point Fort; 25. Zoar Fort; 26. Buttermilk Falls Earthwork; 27. Westfield; 28. Vouch; 29. Randolph group; 30. Cadiz Earthwork; 31. Hinsdale; 32. Wirt Earthwork; 33. Bolivar; 34. Belvidere Group; 35. Belmont group; 36. Wellsville; 37. Portageville Fort; 38. St. Helena.

The geographic importance of this land feature [the Allegheny plateau in southwestern New York] is that it separates the watershed of the Ohio River from that of the Great Lakes system. However, this divide includes a number of low tracts by which it may be crossed with relative ease. In fact, the sources of streams flowing into the Great Lakes often occupy depressions in the escarpment which lie nearly in line with the headwaters of streams flowing southward into the Allegheny River and ultimately into the Ohio River [1958:5].

Niagara Escarpment Sites

Beginning with the access from Lake Ontario, one will find Late Woodland palisaded sites associated with nearly all strategic nodes in the canoe-transport network. Along the Genesee River, the first falls occur at the Niagara Escarpment in Rochester, where an earthwork once stood at Hanford’s Landing (Figure 2, site no. 1; Parker 1922:613; Squier 1851:58). Further up the Genesee drainage, at Honeoye Lake, a portage probably existed to the Seneca River drainage of central New York, via either

Canandaigua Lake or else Mud Creek, which flowed into Ganargua Creek prior to the construction of the Erie Canal (Morgan 1972: Appendix t; Macedon sheet, U.S.G.S. 7 1/2-minute topographical quadrangle series). The Morrow site, located at the outlet of Honeoye Lake, was an Owasco village surrounded by a ditch, and presumably a palisade, (Figure 2, site no. 2; White 1957). A clay and grass-lined storage pit nine feet in diameter was found at Morrow (White 1957). Near the outlet of Canandaigua Lake (Figure 2, site group 3), were situated the Sackett site - an early Owasco palisaded village (Ritchie 1937) - and Canandaigua Fort - a prehistoric hilltop palisaded village (Niemczyk 1984:215; Squier 1851:55). Sackett contained *Busycon* ornaments (Ritchie 1937:74-75), which suggests indirect contact with the continental interior. White noted the significance of the Morrow and Sackett sites:

These two sites are the only Owasco villages known to have ditches enclosing them. There are other Owasco sites located in valleys, but there is no record of a ditch being associated with them. The existence of a ditch at the Morrow Site thus poses an interesting problem [1957:25].

Both Sackett and Morrow were situated near key points in what was later to become the historic fur trade route, namely a portage between the Seneca and Genesee drainages (Colden 1855:730). Along this portage is a group of early Late Woodland sites known as the Bristol Hills group (Figure 2, site group 4), consisting of Andrews, Fletcher, Can 29-3, Hummel, and Rogers (Hayes 1963; Niemczycki 1984).

Further up the Genesee valley there is evidence suggesting traffic to the Susquehanna drainage. The Dansville Fort site (Figure 2, site no. 5) is a prehistoric fortified village atop a hill above the upper reaches of Canaseraga Creek (Niemczycki 1984:216). This site probably marked the limit of canoe-navigability up the latter creek before entering the drainages of either the Canisoto or Cohocton Rivers.

West of the Genesee River, the next passage over the Niagara Escarpment from Lake Ontario is via Oak Orchard Creek. This is the only other stream that is canoe-navigable above the Niagara Escarpment, namely, into Oak Orchard Swamp. Because Oak Orchard Creek flows through a marshy area, it is full of water year-round, and hence canoe navigable, while most other streams in the area decrease in volume during the summer (Grinnell 1956:162-163). Two falls occur along Oak Orchard Creek - one at Waterport Station and one at Shelby along the Niagara Escarpment; both falls are the locus of Late Woodland sites. Fording Place was an Owasco village at the lower falls (Figure 2, site no. 6; Vanderlaan, personal communication 1984). The Shelby/Neuter Fort was a double-palisaded Late Woodland village situated at the escarpment (Figure 2, site no. 7; Parker 1922:665). Its outer embankment measured eight feet from ditch-bottom to bank-top (Parker 1922:559-560). Shelby Fort contained subsurface storage pits (White 1961:56-58), was associated with an ossuary (Parker 1922:666; Squier 185 1:72; SUNY Buffalo site files; UB 1030), and contained *Busycon* ornaments (Parker 1922:666; Rochester Museum and Science Center collections). Access to the Shelby Fort by canoe is suggested by its location with respect to a marsh adjoining Oak Orchard Creek, which White suggests may have been a lake at the time of occupation (1961:56). Squier relates Burroughs's descriptions of the marsh:

Adjoining this fortification on the South is a swamp, about one mile in width and two in length; which was once, if not a lake, an impassable morass. There is a passage-way through the line' of the entrenchment toward the swamp, and this is the sole gateway discoverable [1851:71].

Along the upper reaches of Oak Orchard Creek is a series of Late Woodland villages marking the area referred to by the Seneca as "The Place of Many Trenches" (Morgan 1972:467): Oakfield, Woeller, Ganshaw, and NOK (Figure 2, site group 8; White 1961; Vanderlaan 1980). The Oakfield site contains a high concentration of grass-lined storage pits (Vanderlaan, personal communication, 1984). It is situated along the upper reaches of Oak Orchard Creek; a portage of

exactly four miles (6.5 kilometers) separates Oakfield Fort from Tonawanda Creek to the south (Oakfield sheet, U.S.G.S. 7 1/2-minute topographical quadrangle series). This represents perhaps the shortest portage around the Niagara Escarpment.

Both the Shelby Fort and the Oakfield site group represent intrusions of Ontario Iroquois groups into Western New York at c. A.D. 1400 (Niemczycki 1986). Probably associated with Shelby and Oakfield is a series of sites that occur along the Niagara Escarpment and appear to be Ontario intrusions, as indicated by their linear incised ceramics and the presence of ossuary burials. Though some of these sites are only burial or ossuary findspots, they could represent parts of larger, village sites. Nearly all of these sites are located atop the escarpment at the source of canoe-navigable feeder streams of Lake Ontario. It is suggested here that these escarpment sites represent attempts by prehistoric Ontario Iroquois groups to expand into Iroquoia from Lake Ontario. Initially this expansion could have taken the form suggested by the model proposed above, viz., groups could have occupied the escarpment on a seasonal basis - extracting resources during the winter, caching them, and floating them downstream during the spring runoff.

Just west of the Genesee River, on a sandy knoll near the source of Salmon Creek, lies the Alhart site (Figure 2, site no. 9). It is situated along what could have been a portage between Salmon Creek, two miles to the north, and Black Creek, two and a half miles to the south. When Ritchie tested the site, he encountered a high density of cache pits, each four to six feet in diameter, lined with grass and bark and containing bark barrels of maize and beans (Ritchie 1930). Hamell later discovered evidence that the village had been burned, its men slaughtered and its women and children taken captive (Hamell 1982). The radiocarbon date of A.D. 1451+/-57 places the site in the Oak Hill horizon. Just east of Alhart is the Fuierer site, a prehistoric Iroquois burial (Figure 2, site no. 10; Rochester Museum and Science Center site files: Ban 36-2). Like Alhart, Fuierer is situated on a sandy knoll three miles (5 kilometers) north of Black Creek, at the source of Spring Creek, a fork of the upper Salmon.

West of Oak Orchard Creek, along the Niagara Escarpment at the headwaters of Johnson Creek, is the Fort Pearce prehistoric village site (Figure 2, site no. 11; SUNY Buffalo site files; UB 321). The Orangeport ossuary is located at a falls along the East Branch of Eighteenmile Creek, above the Niagara Escarpment (Figure 2, site no. 12; Houghton 1912). The Gould site is a palisaded village with an ossuary, situated above the Escarpment at the headwaters of the East Branch of Twelvemile Creek (Figure 2, site no. 13; Houghton 1909:321; Parker 1922:632). The Pekin site is another ossuary situated above the Escarpment at the source of the latter stream (Figure 2, site no. 14; SUNY Buffalo site files; UB 1010). Finally, atop the Escarpment, at the source the West Branch of Twelvemile Creek, is the Kienuka site (Figure 2, site no. 15). It contained

an early Late Woodland component (in addition to an historic) and yielded several ossuaries of varying age (White 1961: 54-55). Evidence of a palisade was reported (Houghton 1909: 321), and roughly one hundred storage pits were excavated (Rochester Museum and Science Center site files: Twa 1-1).

Niagara Frontier Sites

An alternative access to Iroquoia above the Niagara Escarpment is around Niagara Falls. In the town of Lewiston is situated the Portage site (Figure 2, site no. 16; White 1976:115-117). It contains deep middens and its occupation spans from early Late Woodland through prehistoric Iroquois. A radiocarbon date of A.D. 1000 was obtained from this site (White 1976:116). White noted the significance of Portage:

The situation of the Portage Site relates to its location to the portage rather than to any natural resource. The portage is the only easy access to the river and marks the beginning of the long carry around Niagara Falls [1976:116].

From Niagara Falls, Iroquoia may be entered via Tonawanda Creek. From the headwaters of Tonawanda Creek, the Genesee valley may be reached via portage to the headwaters of Oatka Creek. This same route, in the reverse direction, is presumably that used by the historic Seneca to reach Fort Niagara. Oatka Creek was referred to as "canoe trip starts here" (Grinnell 1956:163). At the mouth of Tonawanda Creek, it would have been necessary to begin a portage to the north, as canoe travel along the middle stretch of the Niagara River - between Tonawanda and Lewiston - is prohibited by treacherous rapids (Grinnell 1956:160). The mouth of Tonawanda Creek was referred to by the Seneca as "taking canoe out" (Morgan 1972:469), and marks the location of the prehistoric Iroquoian site Buffalo P (Figure 2, site no. 17; Houghton 1909:312; SUNY Buffalo site files; UB 181). Along Tonawanda Creek a major falls with rapids upstream and down occurs at the town of Indian Falls (Figure 2, site no. 18). Parker places a reported earthing in the area below the falls and rapids (1922:561). Along Oatka Creek, at LeRoy, occur "unnavigable cataracts over vertical ledges, during the creek's descent off a plateau-(Grinnell 1956:164). Here is situated the prehistoric Iroquoian village of Fort Hill, LeRoy (Figure 2, site no. 19; Niemczycki 1984:217). Squier reported the site being defended by an embankment 1500 feet (457 meters) long with a ditch "from 8 to 10 feet deep and as many wide" (1851:69-70).

Traffic between the Lake Erie basin and the interior portion of the Niagara Frontier is implied by fort sites at falls along major tributaries. Such a tributary is Murder Creek in the Tonawanda drainage. Although Grinnell does not mention this stream, it was probably canoe-navigable along its lower reaches. The first falls occur at Akron, the location of the Akron Falls fort

(Figure 2, site no. 20). This site is surrounded by an oval earthwork four hundred by six hundred feet (one hundred twenty two by one hundred eighty three meters) in extent, its bank measuring five feet (one and one half meters) in height and its ditch five feet (one and one half meters) in depth: the site contained caches (Houghton 1909:317, 336; Parker 1922:552; Squier 1851:80; SUNY Buffalo site files: UB301). Along Ellicott Creek - the largest tributary of Tonawanda Creek- there are "impassable ledges at Bowmansville" (Grinnell 1956:100), where is located the Bowmansville Nursery site - a prehistoric Iroquois village with a cemetery (Figure 2, site no. 21; SUNY Buffalo site files: UB231).

Further south, along Buffalo Creek, two fort sites exist at the first set of ledges and rapids (Figure 2, site group 22; Grinnell 1956:59). The prehistoric Bullis Road Earthwork (Houghton 1909:336; Squier 1851:77) is presumably associated with the adjacent Brokehurst burials (SUNY Buffalo site files: UB860). Nearby is the Lancaster Earthwork, which contained cache pits (Squier 1851:77; SUNY Buffalo site files: UB282).

South of Buffalo Creek, Cattaraugus Creek provides the next major access into interior western New York (Grinnell 1956:68-72). The first impassable ledges are encountered one mile downstream from Versailles. At this location was situated Double Wall Fort, affiliated with the Chautauqua Phase Culture (Figure 2, site no. 23; Guthe 1958:48-50; Schock 1974:190-192). The site was surrounded by an embankment, measuring five to six feet (1.5 to 1.8 meters) from the ditch bottom, and contained an unknown number of pits (Harrington 1922; Parker 1922:499). Upstream from here, fort sites are located at either end of canyons that contain impassable ledges, implying portages around the canyons. The Zoar Valley canyon is eight miles long (13 kilometers) and contains impassable ledges at the South Branch confluence - besides being generally, treacherous. At the downstream terminus of the canyon is situated Peter Point Fort, which exhibited an embankment four feet 91.2 meters) high and six feet (1.8 meters) wide (Figure 2, site no. 24; Parker 1922:496; Rochester Museum and Science Center site files: Ctgl-1; SUNY Buffalo site files: UB 152). At the upstream terminus of the canyon was situated Zoar Fort (Figure 2, site no. 25; SUNY Buffalo site files: UB 150). Further upstream, a falls exists at the beginning of a two-mile (three kilometer) canyon passing under Route 219. Near the upstream terminus of this canyon is the Buttermilk Falls Earthwork - a palisaded village at the mouth of Buttermilk Creek (Figure 2, site no. 26; SUNY Buffalo site files: UB 664).

Allegheny Drainage Sites

South of Cattaraugus Creek, traffic between Lake Erie and the Allegheny River valley is implied by several sites that may be interpreted as portage sites. Passage from Lake Erie to the Allegheny valley could be made by portaging to either French Creek or to Chautauqua Lake - both of which ultimately lead to the Allegheny. The Westfield Site is located on Chautauqua

Creek atop a bluff overlooking Lake Erie along the historic Portage Trail leading from Lake Erie to Chautauqua Lake (Figure 2, site no. 27; Guthe 1958; Schock 1974:209). Westfield was palisaded and associated with some 300 subsurface storage pits (Guthe 1958). Regional traffic through the site is indicated by the variety of ceramics recovered, including Ontario and Monongahela/Fort Ancient styles (Guthe 1958).

Between the source of Chautauqua Creek and the west branch of French Creek, at Findley Lake, is situated the Vouch site - a prehistoric fortification (Figure 2, site no. 28; Houghton 1927:247-248; Schock 1974:209). This site was situated "on a high hill above Findley Lake" and contained "black refuse pits" (Houghton 1927). Schock states that "the Vouch site is not near any other known Late Woodland sites and poses considerably more problems of interpretation than answers. It is suggested here that Vouch was strategically located along a prehistoric portage from the Ripley and Westfield sites down slope, to the west branch of French Creek atop the Allegheny Plateau.

A high concentration of palisaded sites is reported along the Little Conewango Creek around Randolph - a probable portage linking the Conewango Creek/Chautauqua Lake drainage with the Allegheny valley via Cold Spring Creek (Figure 2, site group 29). Several of these sites contained "caches," or storage pits, one site revealing over 30 (Parker 1922:496-498).

From the Allegheny valley, portages to the northeast lead to the upper Genesee valley and ultimately to Iroquoia. Houghton reported a series of earthworks along the Allegheny Genesee drainage divide:

West of Wellsville ... a long series of Iroquoian hilltop tom begins, and continues westward across the hills of Allegheny, Cattaraugus, and Chautauqua counties. Nearly every one of these is a well persevered embankment. Every one crowns a high hill. Every one has marked Iroquoian characteristics in sharp contrast to the innumerable sites near them which are markedly Algonkian [1922:46-47].

Houghton defines the dichotomy between "Algonkian" and "Iroquois" on the basis of projectile point form, viz., notched versus triangular (1927:249). Schock, however, argues that the sites in question are of Monongahela affiliation, based on the presence of shell-tempered ceramic wares (1974). At the northeast edge of the Allegheny drainage, two sites occur on Ishua Creek - the closest canoe-navigable Allegheny tributary to the Genesee drainage. One is a hilltop earthing at Cadiz (Figure 2, site no. 30; Schock 1974:216), and the other an unidentified site at Hinsdale (Figure 2, site no. 31; Schock 1974: Figure 1, site

no. 75). Two of the "long series" of sites Houghton referred to occur at the eastern headwaters of the Allegheny. One is an earthwork near the town of Wirt, on the Allegheny/Genesee watershed divide (Figure 2, site no. 32; Houghton 1927:246; Parker 1922:488). The other is a poorly known site in the town of Bolivar (Figure 2, site no. 33; Houghton 1927:246). Both these sites are along passes which lead to Van Campen Creek - a tributary which empties into the Genesee at Belvidere. At Belvidere there is a concentration of Late Woodland palisaded sites (Figure 2, site group 34; Houghton 1922:46; Parker 1922:486-488; SUNY Buffalo site files: UB 20, UB47, and UB1012). Two miles upstream from Belvidere, at Belmont, is a dam with rapids (Grinnell 1956:116-117). Here are located four prehistoric fortifications (Figure 2, site group 35; Houghton 1927:46; Parker 1922: 486-488; SUNY Buffalo site files: sites UB 2A-UB 2B). Further upstream, at Wellsville - the limit of canoe travel (Grinnell 1956:116) - Houghton investigated a Late Woodland village atop a high hill (Figure 2, site no. 36; Houghton 1922:46). These upper Genesee valley sites are situated at strategic canoe-transport nodes and are presumed to reflect traffic up the river-possibly originating from the Allegheny drainage to the west.

Downstream from Belvidere along the Genesee are impassable falls at the present Letchworth Park. Two miles (3.2 kilometers) above the Upper Falls lies Portageville Fort - a Late Owasco period fortification. It occupies a commanding hilltop rising within the floodplain (Figure 2, site no. 37; Barber 1965; Houghton 1927:246). Two miles (3.2 kilometers) downstream from the Lower Falls is situated the St. Helena site (Figure 2, site no. 38): it is believed to date to the early Owasco period (Ritchie 1944:74-75). This location corresponds to the settlement of Gardeau Flats occupied prior to the American Revolution by the Seneca, who controlled the upper Genesee and Allegheny valleys at that time. Two miles (3.2 kilometers) above the Upper Falls, Grinnell describes a portage around the falls extending roughly from the Portageville site to St. Helena (1956:117-118). For downstream travel, he recommends taking out "at a bridge two miles above Route 245 bridge at Portageville, for a shallow rift approaches the latter bridge." He states that "the Lower Falls are followed by steep, dangerous rapids." and recommends putting in at "the ghost town of St. Helena [1956:118]." Hence, the St. Helena and Portageville sites could have been associated with portages around the falls and gorge -similar to the sites along Cattaraugus Creek. Portageville is significant in representing the northeastern-most intrusion of shell-tempered pottery into Iroquois territory - containing 23% shell-tempered sherds (Schock 1974:217). It is interpreted here as representing an intrusion of Chautauqua Phase groups into prehistoric Seneca territory from the southwest.

Conclusion

In sum, an association is suggested between Late Woodland palisaded settlements and key nodes in the long distance water transport network of Western New York State. Many of these sites exhibit concentrations of storage pits, intrusions of non-local ceramic wares, and occurrence of exotic trade items such as *Busycon* shell ornaments. It is suggested here that such sites served as accumulation points in a long distance resource extraction system. It is further suggested that the expansion of neighboring groups into Iroquois territory was a significant factor promoting hostility during the Late Woodland period.

The chief problem with this model at present is the lack of convincing evidence for long-distance resource extraction. If commodities such as meat and hides were being transported prehistorically, as they were historically among native groups, then it may be very difficult to observe this process archaeologically. It will require a well-planned, intensive, and long-term research effort, directed at a variety of lines of independent evaluation. Site distributions with respect to transport networks and other environmental variables need to be examined more critically. Ceramic typologies need to be fine-tuned, supported by radiocarbon dates, and compared over broad regions. Evidence for extraction of resources for surplus accumulation should be sought, such as evidence for intensive hunting, hide processing, meat curing, or use of salt. Evidence of perishable commodities could be sought, such as middens submerged in bogs or old stream channels.

In sum, the testing, of a core-periphery model for Iroquoian development will require a great deal of imagination and innovation. The model cannot legitimately be rejected on the basis of negative evidence alone.

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References

- Barber, Daniel M.
1965 Portageville Site: Cultural and Temporal Significance. Museum Service, *Bulletin of the Rochester Museum of Arts and Sciences* 38(7-8):65-71.
- Brose, David S.
1986 Logs and Logistics. Paper presented at the 51st Annual Meeting of the Society for American Archaeology, New Orleans.
- Clay, R. Berle
1976 Tactics, Strategy, and Operations: The Mississippian System Responds to its Environment. *Mid-Continental Journal of Archaeology* 1:137-162.
- Colden, Cadwallander
1855 Mr. Colden's Memoir on the Fur Trade. In *Documents Relative to the Colonial History of the State of New York*, edited by E.B. O'Callaghan, vol. 5, pp. 726-733. Weed Parsons, Albany.
- Dincauze, Dena F., and Robert J. Hasenstab
1987 Explaining the Iroquois: Tribalization on a Prehistoric Periphery. In *Comparative Studies in the Development of Complex Societies*, vol. 3, edited by T. C. Champion. Proceedings of the World Archaeological Congress, September 1986, Southampton. England, Part 4: Centre-Periphery Relations. Allen and Unwin, Boston and London.
- Dragoo, Donald W.
1976 Prehistoric Iroquoian Culture in the Upper Ohio Valley. In *The Late Prehistory of the Lake Erie Drainage Basin*, edited by David S. Brose, pp. 768-88. Cleveland Museum of Natural History, Cleveland.
- Essenpreis, Patricia S.
1978 Fort Ancient Settlement: Differential Response at a Mississippian-Late Woodland Interface. In *Mississippian Settlement Patterns*, edited by Bruce D. Smith. pp. 141-168. Academic Press, New York.
- Fox, William A.
1976 The Central North Erie Shore. In *The Late Prehistory of the Lake Erie Drainage Basin*, edited by David S. Brose, pp. 162-192. Cleveland Museum of Natural History, Cleveland.

- George, Richard L.
1978 Monongahela Artifacts from the Ryan Site. *Pennsylvania Archaeologist* 48(3):20-36.
- Gramly, Richard Michael
1977 Deerskins and Hunting Territories: Competition for a Scarce Resource of the Northeastern Woodlands. *American Antiquity* 42(4):601-605.
- Grinnell, Lawrence I.
1956 *Canoeable Waterways of New York State and Vicinity*. First edition. Pageant Press, New York.
- Guthe, Alfred Kidder
1958 *Late Prehistoric Occupation in Southwestern New York: An Interpretive Analysis*. New York State Archaeological Association Researches and Transactions, Vol. 14, no. 1. Albany.
- Hamell, George R.
1982 Seneca-Wenro Relations: An Archaeological Perspective. Paper presented at the Conference on Iroquois Research, Rensselaerville, New York, October 1982.
- Harrington, M. Raymond
1922 Double Wall Fort. In *The Archaeological History of New York*, Part I, edited by Arthur C. Parker. New York State Museum Bulletin Nos. 235, 236. pp. 207-237. Albany.
- Hasenstab, Robert J.
1981 An Environmental Analysis of Iroquois Settlement in Central and Western New York State. Research proposal on file at the Rochester Museum and Science Center.
1986 Late Woodland Settlement Change in the Ho-de-no-sau-nee-ga, or Land of the People of the Long House. Paper presented at the 26th Annual Meeting of the Northeast Anthropological Association, Buffalo.
- Hayes, Charles F. III
1963 Prehistoric Iroquois Studies in the Bristol Hills, New York: A Summary. *Pennsylvania Archaeologist* 33(1-2):29-34.
- Heidenreich, Conrad E.
1971 *Huronian-A History and Geography of the Huron Indians, 1600-1650*. McClelland and Stewart. Toronto.
- Houghton, Frederick
1909 *Indian Village, Camp, and Burial Sites on the Niagara Frontier*. Buffalo Society for Natural Science Bulletin 9(3), Buffalo.
1912 Report on Ossuary at Orangeport. Buffalo Society for Natural Science Bulletin 10:471-476.
1922 *The Archaeology of the Genesee Country*. New York State Archaeological Association Researches and Transactions. Vol. 3, no. 2. Lewis H. Morgan Chapter. Rochester.
1927 The Migrations of the Seneca. *American Anthropologist*, n.s., 29(2):241-250.
- Kandare, Richard P.
1986 Early Protohistoric Mississippian Dugout Canoeists in the Lower Mississippi Valley. Paper presented at the 51st Annual Meeting of the Society for American Archaeology, New Orleans.
- Keenlyside, David L.
1976 The Point Pelee Region. In *The Late Prehistory of the Lake Erie Drainage Basin*, edited by David S. Brose, pp. 193-213. Cleveland Museum of Natural History, Cleveland.
- Lennox, Paul A.
1982 *The Bruner-Colasanti Site: An Early Late Woodland Component, Essex County, Ontario*. Archaeological Survey of Canada, no. 110. National Museums of Canada. Ottawa.
- Little, Elizabeth A.
1987 Inland Waterways in the Northeast. *Midcontinental Journal of Archaeology*. In Press.
- McKenzie, Douglas H., and John E. Blank
1976 The Eiden Site: Late Woodland from the South-Central Lake Erie Region. In *The Late Prehistory of the Lake Erie Drainage Basin*, edited by David S. Brose, pp. 305-326. Cleveland Museum of Natural History, Cleveland.
- Megapolensis, Reverend Johannes Jr.
1909 A Short Account of the Mohawk Indians. In *Narratives of New Netherland*, edited by J. Franklin Jameson, pp. 163-180. Charles Scribners, Sons, New York.
- Morgan, Lewis Henry
1972 *League of the Iroquois*. Reprint from 1851 Sage, Rochester original. Citadel, Secaucus, New Jersey.

- Niemczycki, Mary Ann
 1984 *The Origin and Development of the Seneca and Cayuga Tribes of New York State* Ph.D. Dissertation. State University of New York, Buffalo. University Microfilms International, Ann Arbor.
- 1986 The Genesee Connection: The Origins of Iroquois Culture in West-Central New York. *North American Archaeologist* 7(1):15-44.
- Noble, William C.
 1975 *Van Beisen: A study in Glen Meyer Development*. Ontario Archaeology 24:3-95.
- Norton, Major John
 1970 *The Journal of Major John Norton 1816*. Edited by Carl F. Klink and James J. Tolman. Champlain Society, Toronto.
- Parker, Arthur C.
 1922 *The Archaeological History of New York*. New York State Museum Bulletins 235-238. Albany.
- Reid, C.S. Paddy
 1975 Early Ontario Iroquois Tradition. *Ontario Archaeology* 25:7-20.
- Ritchie, William A.
 1930 *Early Huron-Neutral Sand Knoll Sites in Western New York*. New York State Archaeological Association Researches and Transactions, Vol. 7, no. 3. Lewis H. Morgan Chapter, Rochester.
- 1937 *A Prehistoric Fortified Village Site at Canandaigua Ontario County, New York*. New York State Archaeological Association Researches and Transactions. Vol. 8, no. 2. Lewis Henry Morgan Chapter, Rochester.
- 1944 *The Pre-Iroquois Occupations of New York State*. Rochester Museum Memoir 1, Rochester.
- 1961 Iroquois Archaeology and Settlement Patterns. In *Symposium on Cherokee and Iroquois Culture*, edited by William N. Fenton, pp. 25-38. Smithsonian Institution, Bureau of American Ethnology, Bulletin 180. Washington, D.C.
- Sagard, Father Gabriel
 1939 *The Long Journey to the Country of the Hurons*. Edited by G.M. Wrong, translated by H. H. Langton. The Champlain Society. Toronto.
- Schock, Jack Michael
 1974 *The Chautauqua Phase and Other Late Woodland Sites in Southwestern New York*. Ph.D. Dissertation, State University of New York, Buffalo. University Microfilms International. Ann Arbor.
- Smith, James
 1808 An Account of the Remarkable Occurrences in the Life and Travels of Colonel James Smith During his Captivity with the Indians in the Years 1755, 1756, 1757, 1758, and 1759. In *A Selection of Some of the Most Interesting Narratives of Outrages, Committed, by the Indians, in their Wars with the White People*, edited by Archibald Loudon, vol. 1, pp. 143-296. A. Loudon, Carlisle, Pennsylvania.
- Squier, E.G.
 1851 *Antiquities of the State of New York*. George H. Derby, Buffalo.
- Stothers, David M.
 1977 *The Princess Point Complex*. Archaeological Survey of Canada. Mercury Series, no. 58. National Museum of Man, Ottawa.
- Vanderlaan, Stanley
 1980 The Oakfield Phase: Western New York State. In *Proceedings of the 1979 Iroquois Pottery Conference*, edited by Charles F. Hayes III. Research Records, No. 13. Rochester Museum and Science Center, Rochester.
- White, Marian E.
 1957 A Salvage Dig at Honeoye Lake. *Museum Service*, October issue: 24-25. Rochester Museum. Rochester.
- 1961 *Iroquois Culture History in the Niagara Frontier Area of New York State*. University of Michigan Museum of Anthropology, Anthropological Papers no. 16. Ann Arbor.
- 1976 Late Woodland Archaeology in the Niagara Frontier of New York and Ontario. In *The Late Prehistory of the Lake Erie Drainage Basin*. edited by David S. Brose. pp. 110-136. Cleveland Museum of Natural History, Cleveland.
- Wintemberg, W.J.
 1928 *The Uren Prehistoric Village Site, Oxford County, Ontario*. National Museum of Canada Bulletin 51. Ottawa.

Differential Mortuary Treatment of Seneca Women: Some Social Inferences

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Mortuary data relating to six Seneca Iroquois sites occupied between A.D. 1565 and 1687 are examined regarding the question of differences in the artifacts associated with the burials of adult males and females. Results indicate far less diversity in the offerings associated with females, as well as differences in the particular kinds of artifacts that were included in them. These results are discussed in terms of their implications concerning the relative status of women in traditional Iroquois society, and the effect of European contact on that position.

The Problem

One of the most widely held and often repeated beliefs about the Iroquois is that before contact with Europeans, Iroquois women enjoyed a position of unusually high status and social prestige. Yet, in a recently published article, Elisabeth Tooker points to many contradictions in the historical evidence on this subject. She contends that the issue of women's position in Iroquois society remains one that is poorly understood (Tooker 1984:109).

Most early commentators on the subject seem to have been in agreement that Iroquois women did exercise a considerable degree of power and authority in the domestic, political, and economic affairs of their people. Lafitau, writing in 1724, tells us that

nothing is more real than the superiority of women [Lafitau 1977:1:69].

Lucien Carr reports that

the rule of the women was one of the most ingeniously contrived despotisms that could possibly have been devised [Carr 1887:223].

Beauchamp reports that certain privileged Mohawk women were

so greatly respected that no significant decisions are made without their advice [Beauchamp 1900:85].

Hewitt characterizes the position of the Iroquois woman as one of supremacy in which

she possessed and exercised all civil and political power and authority [Hewitt 1933:487].

Summing it up, Murdock states:

Indeed of all the people of the earth, the Iroquois approach most closely to that hypothetical form of society known as the matriarchate Murdock [1934:302].

We also have the words of 18th and 19th century Iroquois asserting that women have the right to speak with authority, particularly in matters pertaining

to war and land treaties. Further, they maintain that, at times, they have the right to override decisions made by the all male councils. For example, Beauchamp quotes an Oneida chief at a 1788 council in Albany:

our ancestors consider it a great offense to reject the counsel of their women [quoted in Beauchamp 1900:87].

An Iroquois woman is reported to have said the following at a council in 1791:

You ought to hear and listen to what we, women shall speak, as well as the sachems; for we are the owners of the land and it is ours [quoted in Carr 1887:217].

In yet another case, Cornplanter, apparently acting under direction from the women, reopened a closed council and negotiated a land sale that had been turned down by the men.

Nevertheless, some conflicting, or at least partially contradictory, interpretations are also recorded. Charlevoix, writing early in the 18th century, tells us that the power of Iroquois women was more nominal than real (Charlevoix 1966:11:25-26). And Lewis Henry Morgan observed in the 19th century that:

The Indian regarded woman as the inferior, the dependant, the servant of man [Morgan 1962:338].

In addition, accounts of the way in which the Iroquois stripped the defeated Delaware of power by "making women of them" seems to suggest the symbolic significance of the position of women in 18th century Iroquoian thought. Morgan reports that:

Having reprov'd them for their want of faith, they forbade them from ever after going to war, divested them of all civil powers and declared that they should henceforth be as women. This degradation they signified in the figurative way of putting upon them the Ga-ka'-ah or skirt of the female, and laying in their hands a corn pounder, thus showing that their business ever after should be that of women [Morgan 1962:338].

And later in chastising the Deleware for having sold land in 1742, the Iroquois are reported to have said:

How came you to take upon you to sell at all? We conquered you; we made women of you; you know you are women and can no more sell land than women [Colden 1750, as quoted in Morgan 1962:338].

Some have tried to explain these inconsistencies by saying that the importance of Iroquois women was significantly altered by the events of the years following contact with Europeans. Hewitt (1933) and Wallace (1971) maintain that the power of women had been drastically reduced during this time. On the other hand, Cara Richards proposes quite the opposite, that the decision-making power of Iroquois women actually grew during the years following contact with white society (Richards 1957).

For the most part, however, there has been a tendency in recent years to ignore these apparent contradictions and to accept the historical evidence of the political power of Iroquois women as confirmation of the unusually high social position of women in traditional Iroquois society (Brown 1979; Bonvillain 1980). Tooker argues convincingly, however, that political and economic control cannot be assumed to be indices of the elevated status or social position of women without understanding the meaning of the underlying sociopolitical principles in that society (Tooker 1984:121).

The problem, then is -what was the position or status of women in traditional Iroquois society? And how was it affected by European contact and the events of the following two centuries?

The Archaeological Evidence

Presented here are the preliminary results of an analysis of mortuary practice, at six Seneca sites occupied during the period of initial contact -A.D. 1565-1687. I suggest that this study is highly relevant to these questions concerning the status of Iroquois women, in that it focuses on differences in the way adult males and females were treated at death at these sites. Studies by Saxe (1970) and Binford (1971) support the assumption that variations in burial treatment reflect the significant social distinctions made in a society. Binford's work shows further that social rank or status is one of the four dimensions of the "social persona" expressed in burial treatment, and that most likely to be reflected in the associated grave goods or offering (Binford 1971:22).

Sources of Data

The data used in this study were based primarily on information collected and recorded by the late Charles F. Wray, but also include that of numerous other excavators such as William Ritchie, Harry Schoff, Donald Cameron, Albert

Hoffman and many others. Consequently, there are inconsistencies in the nature and completeness of the information recorded for each burial. Therefore, in this initial phase of analysis, in order to maximize the samples of males and females, the study was restricted to that category of information which had been most consistently recorded - the nature of the grave goods associated with the burials.

A fairly secure sex identification by the excavator provided the first criterion for selection of the burials to be studied. Immatures were excluded because sex identification was so seldom available. The second criterion was a reasonably complete record of an associated offering - either that associated with the single burial of an individual or that clearly linked to a particular individual in a multiple grave. On these bases, 179 males and 175 females from six sites were selected for study.

The sites - Adams, Cameron, Dutch Hollow, Power House, Dann, and Rochester Junction are currently thought to have been sequentially occupied villages in the western sequence of Seneca sites (Wray and Schoff 1953; Wray 1973). They cover the time span from approximately A.D. 1565 to 1687. Unfortunately, there is a lack of data on the period from about A.D. 1620 to 1635 during which the Lima site is thought to have been occupied.

Method

First, in an attempt to identify evidence for differential treatment of males and females, data was compiled on the presence or absence of specific kinds of artifacts associated with each individual. To facilitate description, artifacts were organized into one of four more or less functional categories:

- 1) Foods or Food Related Containers - seeds or other organic material, unworked faunal remains, clam shells, pots, kettles, ladles, spoons, and other eating tools.
- 2) Ornamental Objects - glass beads, brass beads, shell beads, brass pendants, shell pendants, bracelets, combs, ear ornaments, gorgets, finger rings, perforated animal teeth, mirrors, etc.
- 3) Tools and Weapons - awls, flakers, points, scrapers, stone axes, celts, hammerstones, grinding stones, flint knives, flint blocks, fish hooks, harpoons, beaver teeth chisels, netsinkers, iron axes or celts, iron knives, scissors, strike-a-lights, guns or gun accessories, iron chisels, whetstones, etc.
- 4) Ceremonial Objects - maskettes, pipes, rattles, dice, animal jaws, paws and skulls, whole animal skeletons, mineral pigments, mirror boxes, snuff boxes, fossils, claw cores, pouches, unperforated animal teeth, jew's harps, etc.

These broad categories and the specific objects within them were then analyzed as to the frequency of their occurrence in the graves of males and females.

One obvious limitation of the data collection process is that only surviving or non-perishable artifacts could be taken into account, a fundamental bias in any archaeological study of material remains. However, in the absence of any real evidence that individuals of either sex consistently received more perishable goods than the other, it will not be considered significant at this time.

A second body of data assessed was that concerning the relative diversity or variety in the offerings associated with individual adult males and females. Diversity was defined, for the purposes of this study, as the number of different kinds of things represented in a grave offering. Differences were not finely cut, but involved a general level of distinction between different kinds of things. For example, a grave that included an axe, two knives, six glass buttons and two flint points would receive a diversity count of four.

Support for the significance of grave offering diversity is found in a study by Robert Mainfort of a mid 18th century Native American cemetery at the Fletcher Site in Michigan. This study showed that the number of different kinds of grave inclusions provided a meaningful basis for partitioning graves (Mainfort 1985:560). Further, this partitioning discriminated between relatively high and low status burials as inferred from other bases.

The rationale behind using the diversity index is that the variety represented in an offering is one important dimension of its complexity, and therefore, of the overall complexity of the burial treatment afforded an individual. The assumption that within a given society, relatively greater complexity in burial treatment reflects the relatively higher status of the deceased is one with a long history of usage in archaeology. And in recent years, I believe that it has been given implicit if not explicit acceptance in a number of studies of mortuary behavior (Haviland 1970:103; Gruber 1971:74; Larson 1971:66; Peebles 1971:75; Tainter 1975:2; Rothschild 1979:666; Mainfort 1985:560).

Clearly, it is recognized that diversity is not the only measure of the complexity of an offering or of overall burial treatment. I suggest only that it is a significant component of it. The quantity and quality of the associated artifacts are two other dimensions of obvious importance. However, the data were not as consistently available for either and there were some methodological problems in their use. Future phases of this analysis will attempt to overcome those problems in order to deal more comprehensively with the concept of offering complexity. It is intended that this study be viewed as the first stage in a more thorough investigation of the questions.

Quite simply, then, diversity was used as a measure by which to compare the relative complexity of different offerings. To repeat, it was defined as the number of different kinds of artifacts in an offering. This allowed a diversity count to be given to the offering associated with each of the burials studied. The mean, median range, and distribution of scores for males and females were then compared for each of the six chronological periods (sites) studied.

Results of Analysis of Diversity Scores

There is clear evidence of differential treatment of males and females in the diversity of the artifactual offerings associated with each. Furthermore, the pattern of differentiation seems consistent throughout the entire period under study.

Figure 1 shows the differences between the mean diversity scores for male and female graves at each of the six sites. The pattern clearly indicates that the mean scores of males are consistently higher at all six sites, that is, from the mid 16th to the late 17th century, as indicated by the approximate midpoint occupation dates for each site. Note that the last three periods have been shaded to indicate the high incidence of ancient grave looting that occurred at these sites. The looting is presumed to have obscured what would have been much higher average diversity scores for both sexes. However, at present, there is no good reason to think that the graves of either sex were more thoroughly or systematically looted than those of the other.

Figure 2 shows the differences between the median scores for male and female burials from each of the six time periods. The pattern is remarkably similar to that for mean scores: again male scores are consistently higher. So, regardless of whether we use mean or median, male scores are higher.

Figure 3 shows the distribution of diversity scores for males and females. The distribution tends to negate the possible objection that a few females, clan matrons for example, might have received very diverse offerings relative to those of a comparable number of males, while the majority of female graves were responsible for producing the lower mean and median scores. Clearly, this does not seem to be the case, as the male scores show a much greater range and degree of variability.

Results of Artifact Analysis

Some interesting patterns also emerged from the analysis of the specific kinds of artifacts associated with the burials of each sex. These patterns lend further support and elaboration to the observation that male grave offerings were typically more varied or diverse than those with females.

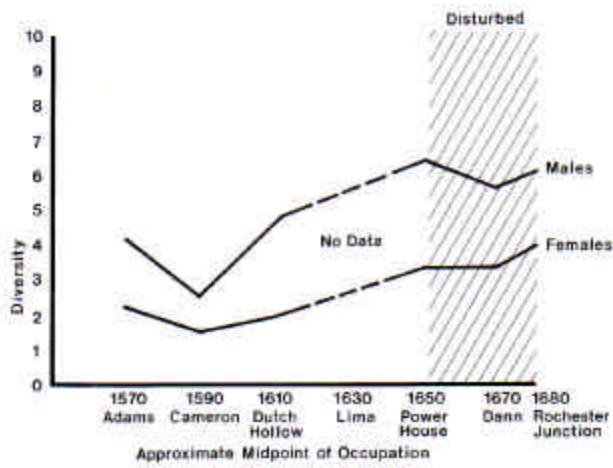


Figure 1. Mean diversity scores for male and female burials in Seneca sites (A.D. 1565 - 1687)

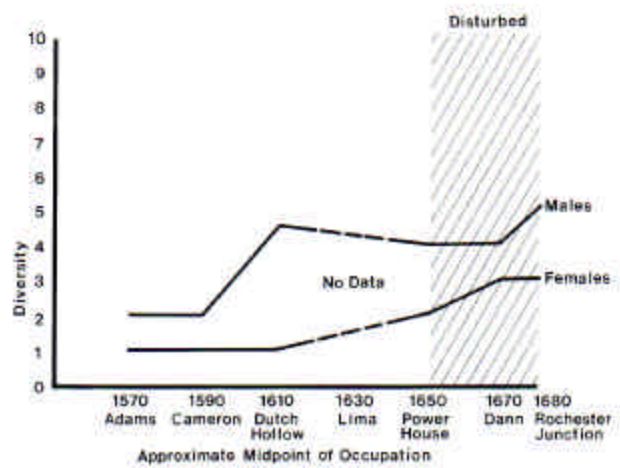


Figure 2. Median diversity scores for male and female burials in Seneca sites (A.D. 1565 - 1687)

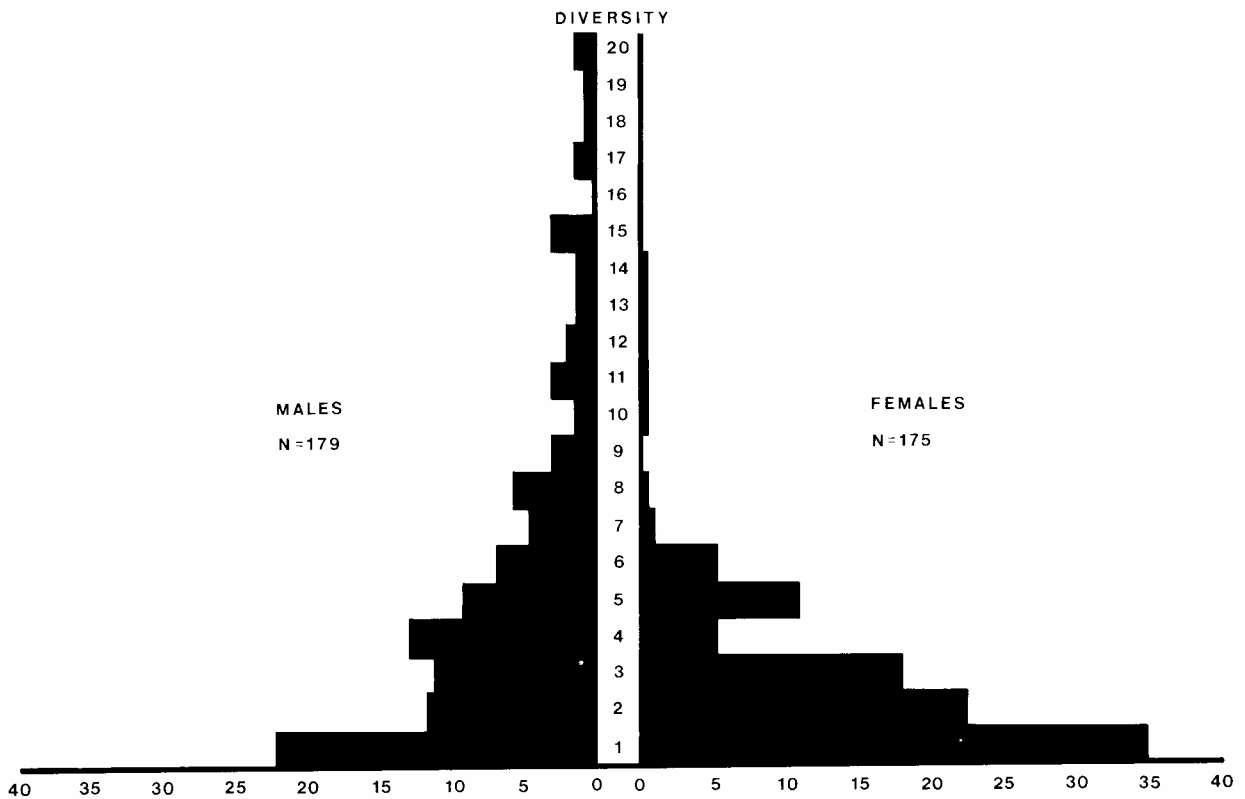


Figure 3. Distribution of offering diversity scores for male and female burials in Seneca sites (A.D. 1565 - 1687).

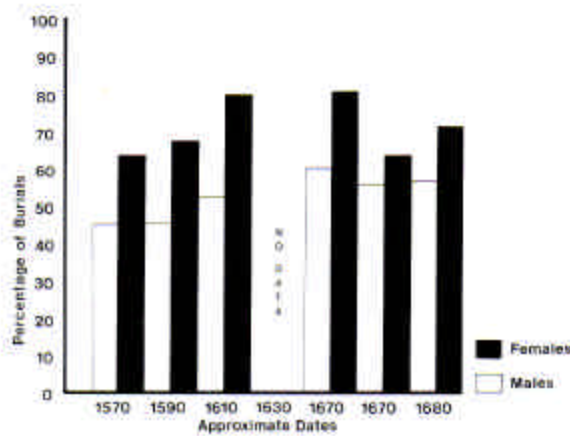


Figure 4. Percentages of male and female burials with foods and/or food related containers in Seneca sites (A.D. 1565 - 1687)

1) Foods/Food Related Containers

The only one of the four organizational categories from which females graves more frequently had artifacts was that defined as Foods or Food Related Containers (see Figure 4). This is largely due to the incidence of native made pottery in women's graves. However, there is a time factor operating here, in that the discrepancy is most apparent in the earliest sites in which few males were buried with pots. By about 1610, about half as many males as females were being buried with pots, and by 1650, about two thirds as many. Then, in the later sites, as brass kettles began to replace the native food containers in graves, females continued to receive them more frequently, but only slightly more so. Food remains, such as berry seeds, and unworked faunal materials seem to have occurred with about the same frequency in the graves of both sexes.

2) Ornamental Objects

No consistent gender-related pattern could be determined with regard to the general category classified as ornamental (see Figure 5). In other words, during some periods of time (i.e. 1650-1670), more male graves contained ornamental objects, while during others (i.e. about 1570, and again about 1680), more females were buried with ornamental objects. However, it should be noted that perforated animal teeth seem to have been almost exclusively associated with men at all of the sites. Shell beads, particularly wampum belts, also seem to be somewhat more common with males. Glass beads, on the other hand, were slightly more frequently associated with females, although this difference is only really impressive at one of the latest sites studied, the Rochester Junction site.

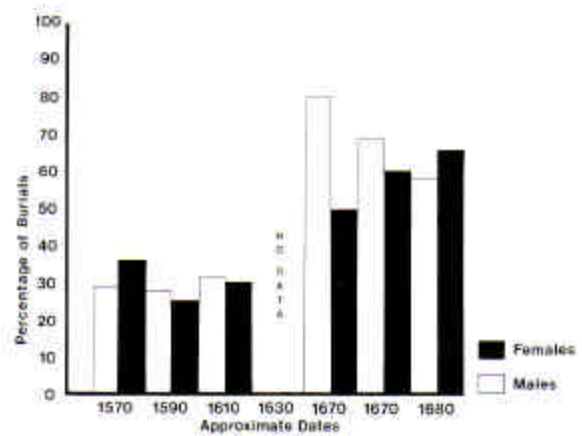


Figure 5 Percentages of male and female burials with ornamental object, in Seneca sites (A.D. 1565 - 1687)

3) Tools and Weapons

The most striking evidence of differentiation between male and female artifact associations comes from the Tools and Weapons category (see Figure 6). During all periods except one, men were far more frequently buried with these types of objects than were women. Some types of objects, namely flakers, points, scrapers, chisels, scissors, whetstones, strike-a-lights, guns and gun accessories were almost exclusively associated with males, at least in the burials studied. Only grinding stones and iron axes occurred more frequently with females than with males. Bone awls and iron knives, two types of tools that occurred quite commonly with both sexes, were nevertheless, more common with men during all periods. Finally, it seems worth noting that, in general, through time, there was an increase in the frequency of utilitarian objects in female graves.

4) Ceremonial Objects

The last category, the one classified as Ceremonial, is as always, the most problematic due to the subjectivity of what should be included in it. However, in terms of the kinds of artifacts included here (see above, Page 5), male graves were more likely in every period to include these types of objects (see Figure 7). Only rattles were more frequently associated with females. The remainder, but particularly pipes and mineral pigments, were far more frequently associated with men. However, none of these Ceremonial objects seems to be exclusive to males, as were so many types of artifacts included in the Tools and Weapons category. Finally, the incidence of this class of artifacts in female graves does not appear to show a general increase through time as do each of the other categories.

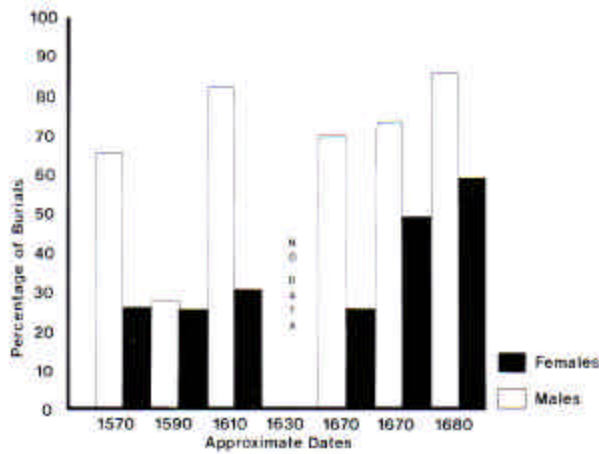


Figure 6. Percentages of male and female burials with tools and weapon, in Seneca sites (A.D. 1565 - 1687)

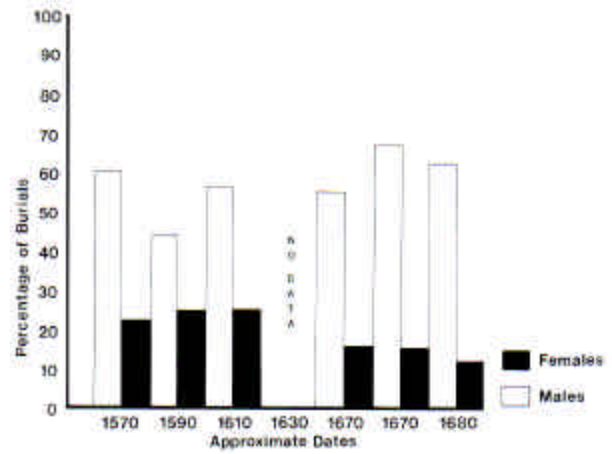


Figure 7. Percentages of male and female burials with ceremonial objects in Seneca sites (A.D. 1565 – 1687)

Summary of Results

To summarize, artifactual offerings associated with Seneca burials, in general, became more varied, more complex, during this period of early contact and trade with Europeans. But offerings associated with males tended, on average, to be more diverse than those with females. Furthermore, this gap between the relative diversity of grave offerings associated with males and females held consistently throughout the entire period from about A.D. 1565 to 1687. In short, there appears to be no evidence of a substantial increase in the diversity of female grave offerings relative to those of men during the period under study.

Implications

What is implied by these results? What possible inferences might they allow about the position of women in traditional Seneca society, and how it was affected by the events of the early contact period?

Drawing behavioral and social inferences from archaeological mortuary evidence such as this is certainly far from simple and direct. One might, for example, raise an objection to the theoretical relationship between the complexity of an offering buried with an individual and that person's relative social status. One might also question whether diversity adequately reflects overall offering complexity. Or at an even more fundamental level, one might ask whether relative social status is a concept applicable to a comparison between Iroquois men and women.

However, if the concept of the relative status of males and females is meaningful to a discussion of Iroquois society; if we accept the theoretical relationship between grave

offering complexity and relative social position; and if we accept diversity as at least one of the significant dimensions of the complexity of an offering, then this study does not appear to support the belief or contention that women held a position of elevated status relative to that of men in traditional Seneca society (i.e. during the first 120 years following Euroamerican contact).

As qualified and tentative as this conclusion is, I maintain that it and the archaeological evidence on which it is based must, at least, be considered in future discussions of the traditional position of women in Iroquois society. This is because, first, this study represents the application of a fresh body of data to the question. Secondly, it is because it pertains to a period of time for which we have virtually no written commentary on this issue. Therefore, as imperfect and problematic as the archaeological study of this kind of question is, it represents a necessary and valuable adjunct to observations and traditions recorded 100 - 200 years later than the period in question.

Nevertheless, the fact that the preliminary conclusions stand in conflict with assertions by the Iroquois, themselves, on the position of women, suggests the need for more intensive study of the question. Subsequent phases of my own analysis of existing archaeological data will focus on at least two other dimensions of relative grave offering complexity-the quantity and quality of the goods included in the graves. In addition, we must attempt to refine our definitions of the critical terms being used here-status, power, relative social importance and their possible relationship to treatment at death. Finally, it may ultimately be useful, I think, to explore the possibility that there may be structural principles underlying an apparent discrepancy between what the Iroquois traditionally asserted about the position of women, and what may have been the reality of that position.

Acknowledgements

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References Cited

- Beauchamp, W.M.
1900 Iroquois Women. *The Journal of American Folklore* VXIII, (XLIX) 81-91.
- Binford, L.R.
1971 Mortuary Practices: Their Study and Potential. In *Approaches to the Social Dimensions of Mortuary Practices*, edited by James Brown, *Memoirs of the Society for American Archaeology*, No. 25. 6-29. Washington, DC.
- Bonvillain, Nancy
1980 Iroquoian Women. In *Studies in Iroquoian Culture*, edited by Nancy Bonvillain, Occasional Publications in Northeastern Anthropology No. 6, Department of Anthropology, Franklin Pierce College, New Hampshire.
- Brown, Judith
1979 Economic Organization and the Position of Women Among the Iroquois. In *Women and Society: An Anthropological Reader*, edited by Sharon W. Tiffany, Montreal: Eden Press Women's Publications.
- Carr, Lucien
1887 On the Social and Political Position of Women Among the Huron-Iroquois Tribes. *Annual Report of the Trustees of the Peabody Museum of American Archaeology and Ethnology*, 3:207-232.
- de Charlevoix, Pierre
1966 *Journal of a Voyage to North America* (London 1761) Two Volumes, Readex Microprint.
- Gruber, Jacob W.
1971 Patterning, in *Death in a Late Prehistoric Village in Pennsylvania*. *American Antiquity*, 36:64-76.
- Haviland, W.A.
1970 Entombment, Authority and Descent at Altar de Sacrificios, Guatemala. *American Antiquity*, 36 (1):102-105.
- Hewett, J.N.B.
1933 Status of Women in Iroquois Polity Before 1784. *Smithsonian Report for 1933*, Pub. No. 3210:475-488.
- Lafitau, Rev. J.F.
1977 *Customs of the American Indians Compared with Customs of Primitive Times* (1724), edited and translated by W.N. Fenton and E.L. Moore, Two Volumes, Toronto: The Champlain Society.
- Larson, L.H.
1971 Archaeological Implications of Social Stratification at the Etowah Site. Georgia. In *Approaches to the Social Dimensions of Mortuary Practices*, edited by James Brown, pp. 58-67. *Memoirs of the Society for American Archaeology* No. 25. Washington, DC.
- Mainfort, Robert
1985 Wealth, Space and Status in a Historic Indian Cemetery. *American Antiquity*, 50 (3):555-579.
- Morgan, Lewis H.
1962 *League of the Iroquois* (1851). New York: Corinth Books.
- Murdock, George P.
1934 *Our Primitive Contemporaries*. New York: Macmillan.
- Peebles, Christopher
1971 Moundville and Surrounding Sites: Some Structural Considerations of Mortuary Practices II. In, *Approaches to the Social Dimensions of Mortuary Practices*, edited by James Brown. pp. 68-91. *Memoirs of the Society for American Archaeology*, No. 25. Washington, DC.
- Ritchie, William
1954 *Dutch Hollow, An Early Historic Period Seneca Site in Livingston County, New York*. Research Records of the Rochester Museum of Arts and Sciences No. 10. Rochester.

- Richards, Cara
 1957 Matriarchy or Mistake: The Role of Iroquois Women Through Time. In *Proceedings of the Annual Meeting of the American Ethnological Society*, edited by Verne F. Ray, pp. 36-45. University of Washington, Seattle.
- Rothschild, Nan A.
 1979 Mortuary Behavior and Social Organization at Indian Knoll and Dickson Mounds. *American Antiquity*, 44 (4): 658-675.
- Saxe, Arthur
 1970 *Social Dimensions of Mortuary Practices*. Ph.D. Dissertation, University of Michigan. Ann Arbor: University Microfilms.
- Sempowski, Martha L.
 1983 Mortuary Practices at Teotihuacan, Mexico: Their Implications for Social Status. Ph.D. Dissertation, University of Rochester. Ann Arbor: University Microfilms.
- Tainter, Joseph A.
 1975 Social Inference and Mortuary Practices: An Experiment in Numerical Classification. *World Archaeology*, 7, (1):1-15.
- Tooker, Elizabeth
 1984 Women in Iroquois Society. In *Extending the Rafters Interdisciplinary Approaches to Iroquoian Studies*. edited by M.K. Foster, J. Campisi, and M. Mithun. Pp. 109-123. State University of New York Press. Albany.
- Wallace, Anthony
 1971 Handsome Lake and the Decline of the European Matriarchate. In *Kinship and Culture*, edited by Francis L.K. Hsu, pp. 367-376. Chicago: Aldine.
- Wray, C.F.
 1973 *Manual for Seneca Iroquois Archaeology*. Cultures Primitive, Honeoye Falls, New York.
- Wray, C.F. and H.L. Schoff
 1953 A Preliminary Report on the Seneca Sequence in Western New York, 1550-1687. *Pennsylvania Archaeologist*, 23:(2): 53-63.
 n.d. The Adams Site (David Farm). Unpublished field notes on file at the Rochester Museum and Science Center.
- Wray, C.F., H. L. Schoff and D.G. Cameron
 n.d. The Cameron Site. Unpublished field notes on file at the Rochester Museum and Science Center.
 n.d. The Power House Site. Unpublished field notes on file at the Rochester Museum and Science Center.
 n.d. The Dann Site, Honeoye Falls, New York. Unpublished field notes on file at the Rochester Museum and Science Center.

Some Thoughts on Directions for Future Research

James Bradley, Massachusetts Historical Commission

When asked to comment on prospects for future research on the Iroquois in general, and the Seneca in particular. I was reminded of a conversation I recently overheard at a meeting. The gist of it was that the Iroquois have been studied to death, especially the Seneca. After all, the site sequence is known, a tremendous amount of material has been excavated, and, frankly, what more was there to do? Oddly enough, I'd once asked Charlie Wray the same question.

I first learned about Charlie in 1966 when, as an undergraduate at Allegheny College, I did an independent study on a large collection of Native American artifacts bequeathed to the school by an alumnus from Rochester. Much of the material was reputedly from historic Seneca sites and I quickly learned that Charles Wray was the man to contact. Not only was he interested in my project, he was positively enthusiastic about it, and I began what would become a long series of weekend visits to West Rush. By the summer of 1973, I was a graduate student at Syracuse University and just beginning to work on the historic Onondaga. Since SU did not have an archaeologist on the faculty at that time, I often found myself looking to Charlie for suggestions and advice. He was an inexhaustible source of information and was both patient and generous in sharing it. After arriving one Friday evening and being, once again, overwhelmed by the range of his knowledge, I asked him rather naively if there really was anything left to discover; he spent the rest of the weekend explaining how much more there was to do.

Few things would have pleased Charlie more than to see research on the Seneca not simply continue but branch out in new directions. These papers suggest some of the ways in which further study might proceed. Using them as a starting point, let me briefly sketch out three broad directions for future work.

The first is material culture studies. One of Charlie's legacies is an enormous body of artifactual data. This includes not only the objects recovered during his own extensive excavations but material collected by his contemporaries and even predecessors. Combined with the RMSC's own collections, this may be the largest and best documented archaeological assemblage available for any Native American group in the Northeast. Given the depth of this database, material culture studies which concentrate on one class or type of artifact, can be a powerful tool for understanding particular aspects of the Seneca and their culture. Gian Cervone's paper provides a good example. Even though many studies on Iroquoian ceramics have been done, new techniques of

analysis or even ways of measuring can produce different and significant results.

While the variety of research projects which could be undertaken: on material culture topics is almost unlimited, let me suggest two ways we might proceed. One is the technical study of a particular material. Whether it be an indigenous one such as lithics, wood, or clay, or European metal or glass, many techniques are now available which allow a material to be characterized in detail. This information can be used in several ways, for example, identifying the material's source - where was a particular chert quarried, or where in Europe was a certain style of glass bead made? In addition, analytical testing can tell us a great deal about the technology of the people who made and used the artifacts - at what temperatures did they fire their pottery, did they know how to anneal or temper metals? With this kind of technical understanding, we know much more not only about the artifacts themselves, but the people who made and used them.

Another approach to the study of material culture is the identification of those artifact classes which function as chronological or cultural markers. This is precisely what Wray and Schoff did in their 1953 article, trace the occurrence of particular (and dateable) artifacts and use that information as the basis for organizing the historic Seneca sites into a Sequence and chronology. This approach has also been used in the Research Conferences sponsored by the Rochester Museum and Science Center. Over the past eight years, the RMSC has hosted a series of conferences, each with a particular material culture focus. These have included native pottery, glass beads, firearms, and shell. The results, which have been of value to both avocational and professional archaeologists, provide some indication of how much research potential there still is in Seneca related collections. Indeed, because the collections are so large and so much is already known about the Seneca, it is possible to ask much more precise and interesting questions. In terms of specific topics for further research, they are endless: virtually every artifact category and material class could be studied further. The only real limitation is our ability to ask good questions.

A second broad direction for future research is to examine the Seneca in the context of their environmental setting. By looking more carefully at the patterns of both settlement and subsistence, we can better understand not just how the Seneca sheltered, fed, and protected themselves but how the environment in which they lived shaped the development of Seneca Culture. Several of the papers address issues in this area. Vandrei examines the historic period sites and how they cluster

according to key environmental traits such as soil type. Hasenstab looks at the proximity of village sites to navigable water and fall lines as part of his thesis of Seneca origins. Locational analysis is also central to Niemczycki's arguments on the evolution of the Seneca.

I would suggest three areas for additional research. The first is quite simple. While many sites are known, it is certain that many more remain undiscovered. This is especially the case for the Late Woodland Stage, a period about which our knowledge about the Seneca and their antecedents remains frustratingly incomplete. Even for the better documented protohistoric and historic periods, it is likely that more sites exist than are currently recorded. What makes site recording so urgent is the rapid pace of development south of Rochester on both sides of the Genesee River. If we don't make the effort to discover and record new sites, we risk losing the opportunity to learn from them. Once the sites are destroyed, the information they contained is gone forever. Ideally, reporting should include mapping and limited testing so that the site's size and major attributes, such as the presence of a palisade or number of houses, can be recorded. This is the minimum we must do if we ever hope to resolve key questions such as Seneca origins.

Where circumstances and funding allow for site excavation, another level of inquiry is possible. Just as new analytical techniques have revolutionized the study of artifacts, many new approaches are also available for reconstructing and examining a site's environmental context. While most of these techniques do require controlled excavation, sampling, and laboratory processing, they can provide extremely valuable information. For example, chemical analysis of soils can be used to reconstruct the different activity areas of the site. Recovery of seeds and pollen can provide information not only on dietary patterns but what the environmental setting was before, during, and after the site's occupation. Faunal remains can tell us more than just what was eaten; they also can indicate where particular species were taken and at what times of the year. In sum, these techniques allow us to reconstruct a much more detailed picture of how people at a certain site lived. Research in this area does not necessarily require new excavation either. For instance, analysis of the large faunal and floral assemblages already out of the ground would add a very different dimension to our current understanding of the Seneca.

A third area for environmentally oriented research is larger scale reconstructions. Much of the work which has been done is site specific, that is it helps explain what occurred at a particular location at a particular point in time. While this is itself valuable, it is also important to put this information into a broader context for interpretation. For example, faunal remains from one site tells us something about what people eat; analysis of faunal remains from a series of sites can tell us about the pattern of resource exploitation and how it changed (or stayed the same) over time. A particular topic where large scale reconstruction would be useful is the pattern of climatic change in northeastern

North America during the Late Woodland. If we are to understand the cultural changes, such as population movement and tribalization, which occurred during this period then we must know more about the environmental factors which were largely responsible for causing them.

A final direction for research is behavioral studies which focus not, just on who the Seneca, or any group of people, were but how they acted and why. Examining behavior is not easy and often requires a synthetic approach which employs a wide range of archaeological and historical techniques. Saunders' study provides an example of the use of demographic data in correlating the size of an ancient population and the length of a village occupation. Sempowski uses both historical accounts and artifactual evidence to focus on sex roles and differential treatment. It is a measure of these papers' quality that all address behavioral issues to some degree.

Here again, there are many more topics for research than I could - or would want to list. Instead, let me summarize three which are of particular interest. The first concerns the origins of the Seneca. While several of the papers deal with this subject, they also reveal how much there still is to learn. When do the Seneca' actually come into being' What constitutes the definition of being Seneca? How does this definition change over time? These questions also apply to each of the other tribal groups which comprised the Five Nations. A second area for research focuses less on the Seneca themselves and more on their relationships with neighboring groups. During the sixteenth century, there are strong indications that the Seneca were closely linked not only with the Cayuga but the Susquehannocks as well. Was this a continuation of Late Woodland patterns, or was it a reflection of the new dynamics of both trade and warfare that followed European contact? Similar questions can be asked about the Seneca and the Ontario Iroquois, particularly the so-called Neutral people of southern Ontario and western New York. A final topic which could be addressed is the broad issue of cultural stability and instability. Because both the archaeological and historical records for the Seneca are so rich and detailed, the Seneca serve as an excellent case study for examining how a culture has dealt with radically changing circumstances. How have external pressures, whether environmental, economic, or political, been handled? How have internal pressures, stresses, and factions been treated and with what result? At a time when our own culture is feeling the strain of external events and internal divisions, I believe there is much we can learn from a culture that has shown a remarkable ability to survive.

Let me conclude as Charlie might have. In terms of future research, there's lots to do, and something for everyone, amateur and professional, novice or old timer. The main thing is to see the research continue, to bring new people and interests into the field, and to have a little fun at the same time. This is the way Charlie worked, and there is no better way we can honor him than to make our memorial a living and dynamic one.

NYSAA Notes

Windage and FF Powder:
A Comment on Ammunition Identification

Neal L. Trubowitz, *Indiana University at Indianapolis*

Michael Sheehan's (1986) system for identifying caliber of deformed lead ammunition is a valued addition to the as yet limited experimental research that has been carried out for the interpretation of historical archaeological data. I offer two points of clarification to those who wish to build upon this work, regarding the standard caliber of eighteenth century military firearms and the grade of powder used during that era, both of which should be taken into account in replication experiments and data interpretation.

Sheehan and earlier researchers continue to overlook the fact that black powder weapons were usually not loaded with bullets the same diameter as the weapon's barrel. This was due to the nature of black powder:

Fired black powder leaves a sticky residue on the weapon which accumulates with each discharge, making it increasingly difficult to ram down successive rounds unless the shooter cleans out the barrel, a nicety usually not possible while on the battlefield or hunting. Hunters compensated by carrying several rounds of successively smaller caliber. Soldiers were issued bullets just slightly smaller than the bore of their weapons, a practice that was well established for British and French arms by the time of the American Revolution [Trubowitz 1985: 91].

This difference between the bore and the bullet size was termed "windage". By the last quarter of the eighteenth century, the standard bullet for a French .69 caliber musket was a .63 caliber ball (weight just under an ounce): the British issued a .69 caliber ball (weight just over an ounce) for their .75 caliber infantry muskets; and rifles, though unstandardized, were mostly .50 to .60 caliber (Peterson 1968: 60). Thus, the distribution of bullet calibers from Fort Michilimackinac in a uni-model curve with a peak at .57 is closer to the documentary expectations than even Sheehan expected (1986: 44).

Also fairly standard in the eighteenth century military was the use of different grades of black powder for different types of weapons. Cannons were generally fired with the coarsest grade of powder, today termed as "F", while muskets and rifles were generally loaded with one grade finer. "FF"

powder. The finer grade of powder, "FFF", was carried in special priming powder horns used to fill the flintlock flash pan, or to replenish the charge in the pan if the pan powder ignited but failed to set off the main charge in the barrel. Hunters may have carried such horns frequently, but in the military they were generally carried only by noncommissioned officers, and sometimes officers in light infantry or ranger/rifle units where firearms replaced the espontoons carried by line and grenadier company infantry officers; enlisted men loaded both the pan and barrel with FF powder from a premeasured charge in a paper cartridge that also contained the ammunition ball. For a British Brown Bess musket the cartridge would contain 100 grains of powder, with 10 for the pan and 90 for the barrel.

Those wishing to replicate eighteenth century firearms conditions in experiments should select the proper grade of powder for the era and weapons being tested. The grade of powder should be specified in reporting the experiments as in an earlier example (Trubowitz 1985: 92), which also outlines the use of living history for understanding firearms archaeology.

References

- Peterson, Harold
1968 *The Book of the Continental Soldier*. The Stackpole Company, Harrisburg, PA.
- Sheehan, Michael S.
1986 A Manual for the Identification of Small Arms Ordnance Material. *The Bulletin and Journal of Archaeology for New York State* 93:27-50.
- Trubowitz, Neal L.
1985 Cracked Flints and Singed Fingers: Lessons from Living History for Firearms Archaeology. In *Proceedings of the 1984 Trade Gun Conference, Part II, Selected Papers*, edited by Charles F. Hayes III, pp. 89-99. Rochester Museum and Science Center, Research Records 18.

Minutes of the 71st Annual Meeting New York State Archaeological Association for 1987

Holiday Inn, East Syracuse, NY 13057
April 10, 11, 12, 1987

Executive Committee Meeting

The meeting of the Executive Committee of the New York State Archaeological Association was held on Friday, April 10, 1987, at the Holiday Inn in East Syracuse, New York. President John R. Lee called the meeting to order at 8:15 p.m. After a brief opening address, the Secretary was directed to call the roll. The following voting members, including NYSAA officers, chapter presidents and secretaries, or their alternates were present:

President: John R. Lee
Vice-President: Richard McCracken
Secretary: John H. McCashion
Treasurer: Carolyn O. Weatherwax

Auringer-Seeley Chapter:
President: Virginia Stiles (alternate)
Secretary: Louise Basa (alternate)

William Beauchamp Chapter:
President: Al LaFrance
Secretary: Helen Tanner (alternate)

Chenango Chapter:
President: Richard Bennett (alternate)
Secretary: Monte Bennett (alternate)

Frederick M. Houghton Chapter:
President: John D. Holland
Secretary: William Engelbrecht (alternate)

Incorporated Long Island Chapter:
President: David Elliston (alternate)
Secretary: Absent

Incorporated Orange County Chapter:
President: J. Thomson Fuller
Secretary: William Ehlers

Lewis Henry Morgan Chapter.
President: Charles F. Hayes III
Secretary: Annette Nohe

Louis A. Brennan Lower Hudson Chapter:
President: Stuart Fiedel
Secretary: Peter C. Rosskopf

Metropolitan Chapter:
President: Roger Moeller (alternate)
Secretary: Absent

Mid-Hudson Chapter:
President: Al Wanzer (alternate)
Secretary: Clem Angstrom (alternate)

Triple Cities Chapter.
President: Richard Jackson
Secretary: Dolores Elliott

Incorporated Upper Susquehanna Chapter:
President: Helen Gutierrez
Secretary: Ruth Wakeman

Van Epps-Hartley Chapter:
President: Kingston Lamer
Secretary: Donald Rumrill (alternate)

Committee Chairpersons

1. Awards and Fellowships: Peter P. Pratt
2. Chapters and Memberships: John H. McCashion (alternate)
3. Constitution: No report
4. Finance: Carolyn Weatherwax (alternate)
5. Legislative: Paul R. Huey
6. Nominating: Richard Bennett
7. NYSAA/NYAC Liaison: Dolores Elliott
8. Public Archaeology: J. Dolores Elliott
9. Publications: John R. Lee
10. NYSAA Editor: Charles F. Hayes III
11. ESAF Representative: Roberta Wingerson

Roll call having been taken and the required quorum (11) being present, the next order of business called for the reading of the Executive Committee minutes from the 1986 NYSAA Annual Meeting at Middletown, New York. Since these have been previously printed and mailed to the executive committee between July 11 and 14, 1986, Dolores Elliott made the motion to suspend the reading of the minutes and accept them as printed. Richard Jackson seconded the motion which went to the floor and was accepted unanimously. The Executive Committee then proceeded to the next order of business.

Report of the Officers

President

President Lee began the meeting by thanking those who had elected him. Although it was a successful year, there were some problems necessary to resolve. One particular communication problem was the change in the telephone numbers at St. John Fisher College. The new numbers are. St. John Fisher (716) 385-8210, or their switchboard upon which a message can be left: (716) 385-8000. Home phone is (716) 586-8766.

Four major areas of concern were discussed in logical sequence with some overlapping. These were:

1. General Archaeological Concerns

The NYSAA is a happy blend of professional and avocational as noted from past experience. Since Father Lee's election last year, he attended two meetings of NYAC and was accepted as a member. This was done to establish a formal link, in spirit at least, with one another. Two projects have taken up some of his time. The endangered sites of Bare Hill and Totiakton (Rochester Junction), required attendance of many public meetings and hearings. Also the Iroquois Pipeline problem will be addressed later as will the human remains issue.

2. Important Areas of Publications and Allied Subjects

A most important area concerns *The Bulletin*. Quality and excellence in the field is most important to the reports that appear in print. The rest of the country judges the NYSAA the only way it can—from *The Bulletin*. Also, there is a need for a semi-annual newsletter run by a committee. Father Lee acknowledged the good work of several chapters on their newsletters and sending them to him. He urged the other non-newsletter chapters to number their notices that are sent to each respective membership and send them to him. This would be a start in the right direction. Father Lee urged that the long delayed *Festschrift* in honor of Lou Brennan be expedited. Also, it might be feasible to revitalize the finance committee to give us a report on Roger Moeller's costs to see if they are feasible or not.

3. External Relations

Contracts with people and organizations were made outside the NYSAA. Richard McCracken was appointed by the President last year to organize a liaison group made up of state and provincial representatives. Also, he acted as a roving ambassador-at-large attending various chapter meetings and Father Lee thanked him for it. Father Lee also attended Treaty Day at Canandaigua on November 11, this time as President of NYSAA. Since many of the New York and Ontario Iroquois attend this annual meeting, it would be appropriate of others in the area take some concern and attend.

4. Special Requests of Correspondence

Once again William Engelbrecht requested special assistance from the chapters concerning his Institutional Collections Inventory. While he has a good start on it, it is still incomplete. He is requesting a report on both ethnological and archaeological collections which are housed in small institutions. Father Lee also remarked that he had received a request from the Madison County Department of Highways in regards to excavations on a certain site which would be investigated later.

Vice-President

This year has been a very quiet one for this off-ice in terms of change, challenge, adjudication or judgment. There were no constitutional questions brought to the attention of the office. The By-Laws seem secure in their present state. In accordance with the President's stated desire to establish formal points of contact with contiguous states and provinces, some effort to make such contact was put forth. The following have agreed to act between this Association and their respective state organizations:

Contiguous States

New Jersey:	Dr. Herbert Kraft
Pennsylvania:	Richard McCracken
Connecticut:	Dr. Roger Moeller
Massachusetts:	Dr. James Bradley

Contiguous Provinces of Canada

Ontario:	Dr. John Reid
Quebec:	No contact

Adjacent States

Delaware:	Dr. Jay Custer
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These contacts were made by personal confrontation. Furthermore, it is suggested that one person representing the ESAF-affiliated state archaeological organization, and one person involved in either government or an organization, such

as NYAC be approached. This might prove beneficial in terms of amateur/professional relationships or for matters involving both Federal and State legislation. During this past year, visits were made to two chapters of the Association. Both the Chenango Chapter and the Orange County chapter were recognized for special achievements and other chapters should at least attempt to model themselves along these lines.

Secretary

As in the past, the Association wishes to welcome several new chapter secretaries to NYSAA: Margot Lavoire, William M. Beauchamp chapter, Ann Loden, Frederick M. Houghton chapter, Peter C. Roskopf, Louis A. Brennan Lower Hudson chapter, and Philip A. Perazio resuming secretarial duties in the Metropolitan chapter.

The NYSAA also thanks Cathy Bair, William M. Beauchamp chapter: Dr. Elaine Herold, Frederick M. Houghton chapter, Margarete Sepenoski, Incorporated Long Island chapter, Ben Dubose, Metropolitan chapter and Suzanne Henry. Louis A. Brennan Lower Hudson chapter, for their much appreciated services.

Fiscal year 1986 was a busy one for this office. Many changes were implemented and much work remains to be accomplished.

Enclosed in the chapter packets is a copy of the evening's proposed agenda, the 1986 membership totals, officers' reports, four copies of volume 19 of the Informational Handbook with several important changes, the Annual Reports of the chapters, and our latest offering from the U.S. Postal Service.

There are extra membership cards and forms should these be needed.

The first substantial mailing for the fiscal year began with the membership lists sent to Roger Moeller to coordinate his distribution activities. Thereafter coordinating efforts were handled by telephone with the membership forms being sent as received.

The better parts of May and June were taken up preparing the minutes from the successful Middletown meeting. Since it was the election year, the Informational Handbook had to be prepared as well. And, since the Executive Committee voted to put the "A" back in archaeology, it was incumbent upon the Secretary to have new stamps made up and distributed to Rochester and Roger Moeller and the printer. Fortunately, the Secretary had just run out of stationery and envelopes at the same time.

The first large mailing commenced July 11, 1986, through July 14 and consisted of the Secretary's newsletter, PMT's, LOGOS, four copies of the Informational Handbook, the minutes from the Middletown meeting and three interesting newspaper articles.

From then on correspondence never ceased. Many commented on the newspaper articles. The Secretary also inherited the membership-at-large from Rochester. Through Roger Moeller's solicitations many individual memberships began to pour in. Each individual at-large member was sent a membership card to acknowledge receipt. This was done in lieu of a biannual newsletter which the NYSAA does not have, but should start. This, of course, increased the postage.

From February 4, 1987, through 10th, the final large mailing took place. This consisted of the informational newsletter to secretaries, the white membership cards and the 1987 Annual Meeting registrations forms which were Xeroxed in bulk.

Concerning membership in the Association, 1986 concluded with 646 memberships and 789 total members; down 14 and 7 respectively. The totals were taken from submitted chapter membership lists on file with this office. Members-at-large totals must be considered variable until the lists are stabilized according to the fiscal year and verified by Roger Moeller.

Treasurer

Carolyn Weatherwax gave the Treasurer's report. The two copies pointed out that although the membership had stabilized, the cost of printing The Bulletin as well as the postage had increased. Although the NYSAA had to pay for three bulletins this year, this was only a small portion of the cost increase. Also, Roger's services cost \$890 and the NYSAA may have taken a loss on that as well. It was necessary to go into the \$12,000 account that had been saved for special events or emergencies. \$2,500.00 was deducted to meet the above expenses. Therefore, the present dues structure is low compared to other associations and some categories should at least be doubled in order to survive. Also, the Secretary and the Treasurer would look into the matter of re-investing our funds at a higher rate and after some discussion no vote was required to accomplish this. However, Richard McCracken made the motion to accept the Treasurer's report and Herb Kraft seconded it.

Committee Reports

Publications

At 9:00 p.m., Father John Lee, chairman of the Publications Committee reported that there had been one meeting and deferred to Charles Hayes for the detailed report. Charles reported that Bulletins Nos. 92 and 93 had been published consisting of 110 pages. Bulletin No. 94 was at the printer and ought to be out by early summer. No. 95, the Charles Wray volume, was scheduled for late 1987. For the future, No. 96 was already in progress. It was proposed that the printing of

Report of the Treasurer April 6, 1987

Adirondack Trust Co.

<u>4/08/86</u>		<u>4/03/87</u>		
MMDA #7922385	\$12,198.46	MMDA Int. 4/30/86 - 3/31/87	\$688.31	\$12,886.77
NOW Acct. #2945406	4,322.21	(@6.5 - 5/15%)		
		2/27 - \$2,500 to NOW Acct. Bal. 4/3		10,386.77
		NOW Acct. Int. 4/30/86 - 2/27/87	\$102.87	1,754.52
		TOTAL ASSETS		\$12,141.29

Cash Receipts 1986 - 1987

Dues	\$ 4,732.00
Publication Sales	404.67
Int. Now Acct. #2745406	102.87
TOTAL	\$5,239.54

Disbursements 1986 - 1987

1986 ESAF dues (632 membership)	138.00
Bulletin #91	3,069.88
Bulletin #92	2,493.18
Bulletin #93	3,056.09
Storage Negative Flats	144.00
Secretarial Expenses	450.00
Drawing Bulletin #92	40.00
Archaeological Services	886.82
Late Charges B-B	29.26
TOTAL	\$10,307.23

TOTAL RECEIPTS	\$5,239.54
Bal. Ck. Acct. (4/8/86)	4,322.21
Transfer of Funds	2,500.00
TOTAL	12,061.75
Disbursements ('86 - '87)	10,307.23

Balance NOW Acct. (4/06/87) \$1,754.52

Comparison of Receipts vs. Expenses 1984 - 1986

Year	Revenues			Expenses		
	Dues	Membership	Publication Sales	Storage of Neg. Flats	Sec. expenses	
1983	\$4,761.50	734	\$338.08	\$ 66.00	\$275.00	
1984	4,151.50	-	370.98	93.00	360.00	
1985	4,639.08	646	667.53	\$110.00	300.00	
1986	4,732.00	632	404.67	144.00	450.00	
					890.00*	

Bulletins	Costs	No. Pages
#85	\$1,395.00	32
#86	1,622.00	36
#87	2,336.00	60
#88	1,818.00	32
#89	2,927.00	64
#90	2,770.00	60
#91	3,070.00	68
#92	2,500.00	48
#93	3,100.00	50

* (Archaeological Services)

The Bulletin be changed to Rochester with a potential savings. Also, Mr. Hayes proposed several changes in the format of *The Bulletin*. These changes were designed to upgrade and update the quality. Change in the title, change to double column on inside, adjustment of the title to the left, logo moved to the back, were the changes proposed. The new method would employ the use of a Macintosh computer. Patricia Miller volunteered to set up the proposed layout. Billing for *The Bulletin* would be twice a year. Dr. Moeller then commented on the advantages of using the desk-top printer. A problem came up concerning missing pages. Mr. Hayes stated that he would be glad to replace those issues with missing pages. He highly praised Brian Nagel and Patricia Miller for their generosity.

Public Archaeology

Dolores Elliott reported that she had done everything possible to get the traveling exhibit in motion but through a series of unfortunate circumstances, it was time to place the project on permanent hold. Folding panels were suggested. Father Lee offered to look into this.

NYAC/NYSAA Liaison

Having little to report, Dolores Elliott deterred to Bill Engelbrecht who gave the report on the survey folders he had distributed. While his survey was partially finished it was far from complete. Many of the items in private and public collections still had not been recorded. Mention was made of the Cornell report listing Native American resources and a number of historical societies which have holdings. Robert Gorall offered to send Dr. Engelbrecht a copy. There was no further discussion.

Legislative Report

At 9:28 p.m., Paul Huey gave his legislative report. Father Lee asked if a response was needed from the NYSAA and Mr. Huey suggested we respond in writing. Louise Basa stated NYAC's position on certain issues. The human remains issue evoked much discussion with the final conclusion being that a report be given next year.

Because of the proposed length of the Executive Committee meeting, Ty Tanner made a motion for temporary adjournment for the wine and cheese party. This motion was seconded by Carolyn Weatherwax, and the Executive Committee temporarily adjourned from 9:55 p.m. to 10:28 p.m.

Finance

There was no report from this committee.

ESAF Representative

Roberta Wingerson discussed the current situation in the ESAF. Membership cost in the ESAF was \$12.50 now and shortly to be raised to \$20.00. Notice was made of the ESAF Computer network, an information system created by Jack Hranicky. The Secretary stated that he had written to Mr. Hranicky for information which would benefit the Association but received no reply. There was a discussion over non-receipt of the ESAF newsletter. Most of the monies collected by ESAF go into publications and the Annual Meeting. This keeps the cost down. A motion was made to investigate why the information was not forthcoming to the Association. This motion could not be voted on until new business came to the floor.

Constitution

Father Lee reported that he had been contacted by J. Thomson Fuller and William Ehlers of the Orange County chapter who had their chapter constitution revised in 1980 and inquired if it had been approved by the Association. A motion was proposed to accept their constitution, but again it was redirected to new business.

Chapters and Memberships

There was no report due to the absence of Gloria Miller.

Awards and Fellowships

Dr. Pratt urged the chapter awards committee to do their utmost to investigate and nominate those they felt worthy of receiving awards. Awards presentations were deferred to the dinner meeting on Saturday.

Report on Legislation:

New York State Archaeological Association

April 10, 1987

Paul R. Huey, Van Epps-Hartley Chapter

Federal

A new shipwreck preservation bill has been introduced to the United States House of Representatives by Representative Charles Bennett. The bill is number H.R. 74. Many archaeologists are in support of this bill and are raising funds for a strong lobbying effort. This effort is being coordinated by the Society for Historical Archaeology. Contributions and/or comments can be sent to Helen Hooper, SHA Washington Representative. 3357 Runnymede Place, N.W. Washington, D.C. 20015.

The SHA has allocated \$4,500 for a lobbyist but still needs to raise \$5,500.

The bill would remove historic wrecks in State waters from any jurisdiction under Federal admiralty courts, which are oriented toward commercial profit-oriented activity, and would allow states to manage these wrecks in the public interest. There are a few possible problems with the bill, however, which perhaps the lobbyists could encourage to be amended. One possible concern is that states would be required to "guarantee recreational exploration of shipwreck sites." What is meant by "recreational exploration? Another concern is that title to shipwrecks would be transferred to states without requiring that a state have adequate legal protection of its own for these resources.

Another bill of importance is the Native American Cultural Preservation Act, now in the Senate (S. 187), introduced by Senator John Melcher. This bill would establish a Native American Museum Advisory Board to mediate claims by Indian tribes to human remains and "sacred artifacts" currently in possession of museums and other institutions. Failure by a museum or institution to carry out decisions of the Board would result in loss of Federal aid or benefits for a two-year period. The bill would also establish a Native American Center in the Library of Congress to conduct an inventory of museum collections of sacred artifacts, human remains, and other artifacts relating to Native American history or culture which have been collected with Federal assistance or funding. The Center would also promote the establishment of "model museums" as well as archaeological activities and publishing in a manner that is sensitive to the culture of Native Americans.

The Federal Advisory Council on Historic Preservation regulations were approved without the objectionable wording that would have weakened requirements for the preservation of sites. The regulations were altered in other ways, but without adverse consequences.

The Federal budget submitted to Congress once again a zero request for historic preservation, but Congressional support for preservation programs is nevertheless anticipated.

State

The Environmental Quality Bond Act was strongly supported and passed in November. This law opens many opportunities for the funding of management, development, and interpretation of archaeological sites. Regulations for implementation of the Act have been developed by the Department of Environmental Conservation and the Office of Parks, Recreation and Historic Preservation. Careful attention has been given to making archaeological sites eligible for funding on an equal basis with historic structures above ground. The Act provides for matching grants to municipal governments and to not-for-profit organizations. Sites must be listed on the State or National Registers. The fifty percent match cannot be

matched with any other Federal grant money or State Council on the Arts money: however, the value of donated labor, materials, or other resources can be used to match the funding. Application forms will soon be available. Each proposal will be rated on a point system based on significance, quality of planning, ability and resources of the applicant to perform, appropriateness of preservation methods or technology, and other criteria.

The bill providing two hundred thousand dollars for reimbursement of municipal or private organizations that undertake cultural resource surveys is still alive. The new bill numbers are S. 1912 and A. 2706.

The Museum Education Services Aid bill is in both houses of the Legislature and needs support. The bill would reimburse agencies such as museums or other qualified institutions for educational services provided to school groups. The bill numbers are S. 1336 and A. 4328. It is presently in the Education Committee of the Senate and in the Tourism Committee of the Assembly. Museums, historical societies, zoos, aquaria, arboreta, botanical gardens, and nature centers would qualify to receive funds; perhaps archaeological societies would qualify as historical societies.

Old Business

At 10:48 p.m., the Executive Committee began "old business." The first order was the publication of the volume in tribute to Lou Brennan. Geary Zern reported that he was making excellent progress in this undertaking. Father Lee asked if this would be brought up next year, and the general consensus was that it would. Mr. Zern discussed the library at MALFA and the disposition of some of the excess historical volumes. Several proposals were discussed. Father Lee then asked if chapters could find out what books or materials were available in the MALFA library. Mr. Zern stated in a general sense, yes. There were still some cataloging problems. There were no further discussions.

The second order of "old business" was Roger Moeller's report. He opened by stating that there was a major policy decision to be made concerning the NYSAA mailings. One of the issues was whether or not to send The Bulletin by bulk rate. He specifically referred to *Bulletin* No. 93, which was mailed out on March 9. He asked the Executive Committee if and when they received them, and most replied within two weeks. Some were surprised at receiving more than one, and several complaints arose as a result, which surprised Dr. Moeller. Some returned theirs, and some kept them. Some members are members of several chapters. To alleviate this, there should be some consideration given to a centralized renewal mailing to that everyone who is currently a chapter member or member-at-large will receive them simultaneously. Chapter participation is most important. Most important was the lack of new people both in NYSAA and the Pennsylvania Associations.

Without them, the organization will wither and die. In contradiction to the Secretary's totals of members-at-large, there are now 212. The contradiction comes from gifts and exchanges which the Secretary's figures would not reflect. From the point of view of *Bulletin* distribution we are closer to 900. Another problem concerned incomplete addresses. Complete addresses include zip codes. Richard McCracken proposed a cutoff date for current yearly membership. Robert Gorall entertained the motion to make the cut-off date for membership September 1. Richard Jackson seconded it, and the floor passed it unanimously. The next problem to arise under Roger Moeller's report was the distribution of the three free copies to each chapter for their libraries. Roger did not know that he was responsible for that but he would take care of this problem. To better inform the Association of his operation, Dr. Moeller stated that the bulletins are mailed one week after their arrival from the printer. The cost of \$890.00 includes the cost of each bulletin at \$.22, (\$.96 to Canada and Foreign countries). This includes envelopes and labels. The entire cost is about 51.00 per member. Dr. Moeller nominated Mr. McCashion to generate the paperwork for application of non-profit status. This status could possibly achieve a savings of about one hundred dollars a year. Historically, for the record, *Bulletin* No. 88 is out of print. One thousand copies of *Bulletin* No. 93 were printed. Eight hundred were sent out, so 150 copies are available. Father Lee brought up the position of greatly reducing the 100 exchange copies sent out with each mailing. Old Business ended with the problem of solving whether or not the entire Association benefited from the 100 exchanges.

New Business

"New Business" began at 11:38 p.m. The first order of new business" began with a concise description of the Iroquois Pipeline, a gas line running from Watertown crossing the Hudson River at King's Road, entering Connecticut at the northwest corner, going through western Connecticut via Washington and Bethlehem, and ending in Long Island. This is a 355 mile right-of-way, 1.5 miles wide. The maps were published with 1,000 foot circles listing all the known and non-recorded historic and prehistoric sites with an index and a key indicating which category into which the site fit. Other important data, citations, bibliographic and otherwise made this set of maps the pothunter's guide to New York State and Connecticut. The report was published and distributed to 1,000 individuals. This included all of the State government facilities, town libraries, etc. along the route. Dr. Moeller then investigated as to the source of this outrage. After a long climb up the administrative ladder, the final opinion from the National Park Service was that it was too bad that it happened and hopefully it wouldn't happen again. Dr. Moeller undertook, with great effort, to solve the problem. Dr. Moeller and the

Secretary went as far as The New York Times. There was no positive feedback as to what could be definitely done. Louise Basa and Richard McCracken continued the discussion. No particular motion was forthcoming, but the matter would continue to be investigated.

The next order of "new business" was an open discussion of the proposed dues raise. Suggestions were made to double and triple the dues, but which categories to be affected were not decided. Projected losses as a result of raising the dues would be about ten percent. Geary Zern suggested that each of the chapters be solicited. The Secretary said he would take that under advisement. Richard McCracken volunteered to send letters to each of the chapters to find out how much of a dues raise would be acceptable. Finally, after much, much discussion Annette Nohe made the motion to start the process to raise the dues. Dolores Elliott seconded. The motion was unanimously accepted.

The third order of "new business" concerned the hosting of the 75th Annual Meeting presumably at Rochester. Rochester was selected as the "grandfather" of the Association since the NYSAA founder, Arthur C. Parker, founded it there in 1916. The 75th would be the "diamond jubilee" and Father Lee suggested that those on the committee get started. Bill Ehlers, a committee member, wanted to know who would steer the committee. This was not solved. There was no further discussion.

The fourth order of "new business" was RESOLUTION 87-1, whereas, the William Beauchamp Chapter is hosting this, the 71st Annual Meeting of the New York State Archaeological Association, and, whereas, Al LaFrance, Vicky Jayne, Robert De Orio, Barbara Minor, Barbara Speciale, and Roberta Theabault have worked long and diligent hours to provide our membership with these amenities and programs, be it therefore RESOLVED, that the Association express its most profound appreciation to the William M. Beauchamp Chapter, and to those named above, we say, "Well done!" The motion was initiated by Richard McCracken, seconded by Bill Ehlers and Dolores Elliott, and there was a unanimous round of applause.

Fifth on the order of "new business" was the hosting of the 72nd NYSAA Annual Meeting. Van Epps-Hartley had volunteered to host the 72nd, however, due to the lateness of the hour, Father Lee deferred the final commitment until the morning business meeting.

The sixth order of "new business" was in the form of a motion made by J. Thomson Fuller to recognize the 1980 change in the by-laws of their constitution by the Association as it was determined to be well within the guidelines of the Association. It was immediately seconded by Annette Nohe and passed by a majority vote.

Peter Pratt requested that the no smoking rule be enforced during the presentation of the papers. Father Lee ordered this to be in effect.

Finally, at 12:40 a.m., Helen Gutierrez made the motion to adjourn which was seconded by Richard Jackson and one of the longest Executive Committee meetings on record came to a conclusion.

General Business Meeting

The General Business Meeting of the New York State Archaeological Association was called to order by President John R. Lee at 9:02 a.m., April 11, 1987. After a brief welcoming address, the Secretary was directed to encapsulate the major points of last evening's meeting. All reports from the President's report through committee reports were covered. Paul Huey went into detail with the legislative report. Roger Moeller presented his position regarding the disposition of the bulletins and the necessity of raising the dues to meet increasing costs. Carolyn Weatherwax presented the Current financial status. The motion to cut off dues payment in September for the current year was made by Dolores Elliott and seconded by Richard Jackson. There was no opposition. There was a motion to begin to raise the dues. Annette Nohe made the motion. Richard Bennett seconded it and there was no opposition from the floor. Richard McCracken, Vice-President, spoke on these proposals, on a possible constitutional amendment and the true analysis of the situation. He then brought up RESOLUTION 87-1, thanking the William M. Beauchamp chapter for its superb handling of the 71st NYSAA Annual Meeting. William Ehlers made the motion and Herb Kraft seconded it. There was a round of applause denoting acceptance. With no further business pending, Richard Jackson made the motion to adjourn which was seconded by Al LaFrance and the General Business Meeting of the NYSAA concluded at 9:43 a.m.

Awards

Deferred until the NYSAA Annual Banquet. Chairman Peter P. Pratt announced and presented the awards in the evening.

William M. Beauchamp Chapter

Fellow: Dr. James Bradley
 Meritorious Service: Gordon C. DeAngelo

Chenango Chapter

Fellow: Richard E. Hosbach
 Meritorious Service: Daniel Weiskotten

Metropolitan Chapter

Fellow: Lucianne Lavin
 Merit: Joan H. Geismar
 Annette Silver
 Stanley Wisniewski
 Meritorious Service: Michael Cohn

Lewis H. Morgan Chapter

Merit: Robert J. Gorall
 Brian L. Nagel

Incorporated Orange County Chapter

Merit: Edward J. Lenik

Triple Cities Chapter

Meritorious Service: Richard Jackson
 Murray Shapiro

Incorporated Upper Susquehanna Chapter

Meritorious Service: Richard T. Wakeman
 Ruth P. Wakeman

Van Epps-Hartley Chapter

Merit: John Ferguson

Royal Order of the Pot:

Al LaFrance

Program

Seventy-First Annual Meeting

New York State Archaeological Association

April 10, 11, 12, 1987
 Holiday Inn - Carrier Circle
 Syracuse, New York

Host: William M. Beauchamp Chapter

Friday, April 10, 1987

9:30 A.M.	NYAC Committee Meetings	10:10 A.M.	Coffee Break
1:00-2:00 P.M.	NYAC Business Meetings	10:25 A.M.	<i>Stone Piles: Who Built Them and Why?</i> Dolores N. Elliott, Triple Cities Chapter, NYSAA
2:30 P.M.	NYAC General Meeting (Guests Welcome) Archaeological Opportunities in the New York State Environmental Quality Bond Act	11:00 A.M.	<i>Remote Sensing at the Fortified Owasco Village at Canandaigua, N. Y.</i> Robert Hiler, Lewis H. Morgan Chapter, NYSAA
	Julia Stokes, Deputy Commissioner of Parks, Recreation & Historic Preservation	11:30 A.M.	<i>Art Form or Artifact Type?</i> Donald A. Rumrill, Van Epps-Hartley Chapter, NYSAA
4:00-6:00 P.M.	NYSAA Registration	12:00-1:30 P.M.	Lunch (Place of your choice)
7:00 P.M.	NYSAA Standing Committee Meetings		
8:00 P.M.	NYSAA Executive Committee Meetings		
10:00 P.M.	Wine and Cheese Party		

Saturday, April 11, 1987

8:00 A.M.	NYSAA Registration	Afternoon Session	
8:50 A.M.	Welcoming Address Albert D. LaFrance, President, William M. Beauchamp Chapter, NYSAA	Chair-Tyree Tanner, Treasurer, William M. Beauchamp Chapter, NYSAA	
9:00 A.M.	Business Meeting, Reverend John R. Lee, NYSAA President	1:30 P.M.	Recent Research on Eastern New York Caves and Rockshelters. Robert E. Funk, New York State Museum
Morning Session		2:00 P.M.	The Black Birch Site Co x 46-River Phase-1800 Tom Weinman, William M. Beauchamp Chapter, NYSAA, and Fellow, NYSAA
Chair-Barbara Harris, Charter Member William M. Beauchamp Chapter, NYSAA		2:20 P.M.	Detecting Longhouse Construction on Mohawk Sites. Dean R. Snow, SUNY University at Albany, Van Epps-Hartley Chapter, NYSAA
9:30 A.M.	<i>Cortland County Archaeology along the Otselic: 1986 Field Season.</i> Ellis E. McDowell-Louden, SUNY College at Cortland, William M. Beauchamp & Triple Cities Chapters, NYSAA	2:45-3:00 P.M.	Afternoon Break
9:50 A.M.	<i>Soil Associations of the 1986 Cortland Field Survey</i> Richard Harris, Anthropology Major, SUNY College at Cortland		

3:00 P.M.	<i>Wall Trenches on Two Ontario Iroquois Sites.</i> Robert Burgar, Project Archaeologist, Metropolitan Toronto Region Conservation Authority	Sunday, April 12, 1987 9:30-9:45 A.M. Coffee Morning Session Chair, Vicky Jayne, Charter Member, William M. Beauchamp Chapter, NYSAA
3:30 P.M.	Recent Archaeological Investigations at the Lamb Paleo-Indian Site, Town of Darien, Genesee County, N.Y. Richard Gramly, Buffalo Museum of Science	9:45 A.M. <i>A Future for- the Past: The Renovation of Ste. Marie Gannentaha.</i> Dennis Connors, Curator of Museums & Historic Sites, Onondaga County Parks & Recreation, William M. Beauchamp Chapter, NYSAA
6:00 P.M.	Cocktail Hour (cash bar)	
7:00 P.M.	Annual Dinner Presentation of Awards: Peter P. Pratt Keynote Address: Archaeology in Alaska's NPRA: Two Views. James Bradley, Ph.D., Massachusetts Historical Commission Dick Ping Hsu, North Atlantic Region, National Park Service	10:15 A.M. <i>The Crego Site: An Early Onondaga Iroquois Village near Baldwinsville, N.Y.</i> Marjorie Pratt. William M. Beauchamp & Chenango Chapters. NYSAA 10:45 A.M. <i>Shell Ornaments among the Five Nations Iroquois.</i> Peter P. Pratt, William M. Beauchamp & Chenango Chapters, NYSAA 11:15 A.M. Parting Words Albert D. LaFrance. President, William M. Beauchamp Chapter, NYSAA

The Achievement Award

Charles M. Knoll (1958)
Louis A. Brennan (1960)
William A. Ritchie (1962)
Donald M. Lenig (1963)

Thomas Grassman O.M.F. (1970)
Paul L. Weinman (1971)
Robert E. Funk (1977)
Peter P. Pratt (1980)

Fellows of the Association

Monte Bennett
James Bradley
Louis A. Brennan
William S. Cornwell
Dolores Elliott
William Engelbrecht
Robert E. Funk
Thomas Grassman O.F.M.
Alfred K. Guthe
Gilbert Haggerty
Charles F. Hayes
Franklin Hesse

Richard E. Hosbach
Paul Huey
R. Arthur Johnson
Edward J. Kaeser
Herbert C. Kraft
Roy Latham
Lucienne Lavin
Donald M. Lenig
Julius Lopez
Richard McCarthy
Peter P. Pratt
Robert Ricklis
William A. Ritchie

Bruce Rippeteau
Donald A. Rumrill
Bert Salwen
Audrey Sublett
James A. Tuck
Stanley Vanderlaan
Paul Weinman
Thomas Weinman
Marion E. White
Theodore Whitney
Charles F. Wray
Gordon K. Wright

Certificate of Merit

Roger Ashton
Monte Bennett
Daniel M. Barber
James Bradley
Gordon De Angelo
Elizabeth Dumont
Lewis Dumont
William F. Ehlers
Dolores N. Elliott
John Ferguson
Joan H. Geismar
Stanford J. Gibson

Gwyneth Gillette
Robert J. Gorall
R. Michael Gramly
George R. Hamell
Franklin J. Hesse
Richard E. Hosbach
Albert D. La France
Edward J. Lenik
William D. Lipe
John H. McCashion
Brian Nagel

Marjorie Pratt
Peter P. Pratt
Harold Secor
Annette Silver
Marilyn C. Stewart
Neal Trubowitz
Charles Vandrei
James Walsh
George R. Walters
Beth Wellman
Henry Wemple
Stanley H. Wisniewski