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The University of the State of New York

State Museum, February 18, 1919

Dr John H. Finley

President of the University

SIR: I beg to transmit to you herewith and recommend for publication as a bulletin of the State Museum the accompanying manuscript of an "Archeological History of the State of New York" which has been prepared by Arthur C. Parker, Archeologist.

Very respectfully

JOHN M. CLARKE

Director

Approved for publication

A handwritten signature in dark ink, appearing to read "John H. Finley". The signature is written in a cursive style with a horizontal line underneath the name.

President of the University

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The University of the State of New York New York State Museum

JOHN M. CLARKE, Director

THE ARCHEOLOGICAL HISTORY OF NEW YORK

BY ARTHUR C. PARKER, ARCHEOLOGIST

Part I

FOREWORD

This bulletin is intended as a general guide to New York archeology. It has been written with a dual obligation in mind,—an obligation to science and to the interests of scientific men, and also to the much larger body of amateur archeologists and collectors. Archeology owes much to the local collector who has gathered his specimens with the best light that he had. Much more might have been accomplished if a manual of this kind had been prepared many years ago. This bulletin, therefore, is intended as a general work explaining the field of archeology as it exists in this State. It does not purport to be exhaustive or even complete in any of its parts. Almost any division and any subject herein contained and described might form the topic of a separate bulletin or an even larger treatise. Our aim is rather to afford enough light to enable both the student and the professional archeologist to understand the relation of New York archeology to American archeology in general. Without doubt there is enough to provoke further inquiry and to open up new channels of endeavor.

The bulletin is arranged in parts and subsections as follows:

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INTRODUCTION

For many years New York State has been a prolific field for students of American archeology. Indeed, large collections of aboriginal artifacts were made long before students of natural science had any adequate idea of the cultural significance of the objects they discovered. To the early collector the curious implements of the Indians were simply "relics" and no special effort was made to record anything about these "relics" except to give the name of the collector and the date of the finding, both facts relatively unimportant.

No definite scientific value was attached to examples of aboriginal art, and specimens from every locality were mixed in boxes or scattered over shelves. Large collections have become scattered and lost. The hundreds of "curious relics" found by farmers in plowing or by amateur mound explorers have been lost. Mound after mound has been dug and destroyed.

Today most collectors are better informed, and the cultural remains of the race that formerly occupied this continent, are carefully preserved, cataloged and labeled. Science has taken the lead and asks for facts. Today the pottery pipe and engraved gorget, and even the humble arrowhead are regarded as "archeological specimens." Definite scientific problems have arisen and challenge us to solve them. Every artifact left in the soil by the vanished red men may be of importance, if the associated facts are properly recorded. The position of a banner stone in a grave may unlock some secret; the presence of pottery even in the form of fragments may shed important light upon a knotty problem in archeology. A conscientious collector observes and records everything for he knows that a careless collector is a destroying vandal who merely confuses himself and others, and ruins the field of inquiry for the better informed.

New York State for a full century has been systematically hunted for relics, but only during the past twenty years has any scientific method been pursued on any considerable scale. Some early observations were made by H. R. Schoolcraft, L. H. Morgan, E. G. Squier, Franklin B. Hough, Frank H. Cushing and T. Apoleon Cheney, but most of these authorities did little more than point out the fertile field that existed within our borders. With them the all-important problem seems to have been "Who were the mound builders?"

Observers at that time had not yet recorded the fact that the Iroquois did not use or make banner stones, or that stamped patterns characterized Algonkian pottery, or that grooved axes were found only on non-Iroquoian sites. It remained for later students such as W. M. Beauchamp, M. R. Harrington, Alanson Skinner, Frederick Houghton and the present writer to differentiate types of occupation, though other observers working in other localities had perhaps cleared the way for an understanding of the New York cultural areas.

New York archeology owes much to the work of Prof. Frederic Putnam, William H. Holmes, Charles C. Abbott, Cyrus Thomas, William C. Mills and Warren K. Moorehead, and in later days to Charles C. Willoughby, Christopher Wren and Col. George E. Laidlaw, all of whom, working in the areas surrounding New York, cleared the way or contributed information for a more adequate understanding of the New York field. It was Dr William Beauchamp, however, who did most to draw attention to certain specific problems and his pioneer work has borne abundant fruit. His series of bulletins on New York archeological subjects, published by the State Museum, did much to stimulate study. Doctor Beauchamp was one of the first archeologists to point out the evidences of Eskimoan influence in New York.

Interest in the evidences of the former Indian occupation of this area has grown from a mere idle curiosity to a serious desire to preserve and to interpret the specimens that are so abundant. Through the efforts of Melvil Dewey in 1896 an appropriation of \$5000 was made for the purchase of collections. By this appropriation bill the State Museum was given an "Indian department" charged with the duty of making collections and of studying and recording the facts of Indian culture. In the fulfilment of this obligation A. G. Richmond of Canajoharie, a collector, was given the duty of making the first purchases. Later the cooperation of Doctor Beauchamp was obtained. Mrs Harriet Maxwell Converse, whose father, Hon. Thomas Maxwell, had been adopted by the Seneca tribe, became interested and donated a considerable collection of ethnological specimens. From this time on the State Museum has made every endeavor consistent with its resources and other duties to build up its archeological collections. It should not be forgotten, however, that the "Indian department" of the State Museum had its real origin in the work and collections of Lewis Henry Morgan for the Museum as early as 1849. Morgan's work was ethnological rather than archeological, but as the two sciences are interrelated and

coordinated, Morgan must be recognized as the father of New York archeological science. Certainly his researches and publications stimulated a large amount of interest not only in this State but throughout America and to an equal extent in Europe. From Morgan's study of the New York aborigines and their antiquities came the inspiration that has made anthropologists, sociologists and political economists recognize him as one of America's foremost observers, and to look to this State as a singularly important field of research and the place of valuable source material.

Students have been drawn to the New York field, some moved to research by a study of the Indians still living in our midst; others by an interest in the prehistoric remains found scattered through valleys and over terraces. Many other men and women who have no professional interest in science have yet been vitally interested in the study of various branches of sociology and anthropology through a knowledge of the cultural relics in the State. Even successful business men have benefited through pursuit of archeology as an avocation. One keen-minded young man employed by a corporation of experts in business efficiency, upon the inquiry of the executive officer as to how he developed his extraordinary powers of close observation answered, "By the experience I gained in hunting Indian relics." With much enthusiasm he confessed to the writer the secret of his rapid progress. "I owe all my success," said he, "to that first snub nose little arrow point I found when a boy. It taught me how to look for things."

Perhaps it is because the search for archeological specimens and the subsequent effort to make a correct interpretation of them so develops observation and clear thinking, that business and professional men manifest so keen an interest in such collecting. Aside from this is the zest of out-of-door exercise, bringing health as well as wisdom. There are many factors connected with the study of Indian artifacts that make American archeology an attractive science. It is a human science, it awakens the imagination along logical lines, it teaches the use of resources nearest at hand, thereby developing ingenuity; it cultivates attention to small details, thereby stimulating observation; and, as an outdoor study, it cultivates a keen appreciation of the land in which one lives. The archeologist, dealing with what early men made, whether flint points or fortifications with earthen walls, comes to have a broader, higher perspective of humanity. He is capable of understanding men better because he knows more of man's history. Dealing also with the

earth and its hidden records of early races, the archeologist develops a knowledge of geology from the human side. To the archeologist both geology and history have a special significance. The archeologist knows how primitive man literally hewed out his material culture from the rocks that the geologist knows as schist, granite, quartz and flint. Civilization grew out of man's pounding these rocks with his stone hammers. The archeologist thus builds up the foundation upon which history rests and affirms that history can not be understood aside from the knowledge afforded and the light shed by archeology.

The keen interest in the archeology of New York State has resulted in a growing demand for explanatory literature. Essential facts have been scattered through books, departmental bulletins, pamphlets and periodicals, and have not been available to the student or collector who did not possess a considerable library. For some time it has been apparent to the writer that a general handbook was needed. Indeed, the announcement that one was in course of preparation brought forth numerous requests that copies be reserved.

This volume is a response to a need expressed by many collectors and professional archeologists. It is a brief attempt to define the various cultures, to describe certain type specimens, certain important excavations, and, finally, to give a list of localities showing evidences of aboriginal occupation. We shall not here discuss the history of the tribes found at the opening of the colonial period or to describe European trade articles.

The lists of sites are probably incomplete. New places will be discovered from time to time. Certain errors no doubt will be found in the lists, for our citations have been compiled from long lists furnished by several hundred collectors, or drawn from historical works and county histories. We are deeply grateful to those who have furnished information, lists and copies of maps. Without such aid this volume would not have been possible. A partial record of names of those who assisted in the compilation of sites will be found in another part of the volume.

From the beginning great interest in the progress of this work has been manifested by the Director of the State Museum, Dr John M. Clarke. He has shown a real appreciation of the interests of students and collectors, and has not only liberally supported our efforts to acquire illustrative material but has made possible the acquisition of the thousands of archeological specimens that make up the State Museum collections. Special thanks are also due to Jacob VanDeloo,

secretary of the Museum for his painstaking labors in forwarding this publication.

In the preparation of this work special credit must be given to those who supplied extended manuscripts and unusual advantages for studying the field and in examining large collections. Among these have been Henry R. Howland, William L. Bryant, Frederick Houghton and George L. Tucker, all of Buffalo; Everett R. Burmaster and Obed Edson of Chautauqua county; M. Raymond Harrington and Alanson Skinner of New York; Alvin H. Dewey, Harrison C. Follett, E. Gordon Lee, E. D. Putnam and M. L. Baxter, all of Rochester; David R. Dorn, Adrian A. Pierson and Willard E. Yager of Otsego county; W. Max Schrabisch of Pater-son, N. J., and finally to the dean of New York archeologists, Dr William M. Beauchamp. All these persons have rendered a service that has been of conspicuous value and one expensive to themselves. With such moral and material backing it has been a pleasant though lengthy task to prepare this bulletin.

To all those who made it possible and to those who need the guidance of its pages "The Archeological History of New York" is dedicated.

I

THE ORIGIN OF MATERIAL CULTURE AND THE DISTRIBUTION OF THE VARIOUS RACES OF MAN

1 THE IMPORTANCE OF ARCHEOLOGICAL RESEARCH

Since the remote days when man appeared upon earth, he has been writing his own history. This writing has been, as it were, a tattooing of the brown skin of the earth mother, and the ages have covered the tracings with layers and obscured them. It is the archeologist who locates the precise spots where this buried history is hidden and lifts the accumulated débris of the centuries and then translates the record into the language that men of today understand. This story of ancient man and his activities is of much importance to us of today, for what man has been helps man of today understand whence he came and why he is as he is; and what man is has a most important bearing on what man may be. Without this knowledge history is without a basis, and many important branches of science are incomplete.

Primitive peoples everywhere have passed through a succession of similar cultural stages. Thus, the earthen pottery, the chipped arrow points and bone awls of the British Isles are so similar to those found in America that one can scarcely tell them from the same objects found on the sites of the Indian villages of New York State. This means that the ancient inhabitants of York, England, 2500 years ago were living in about the same way and making the same things that the ancient inhabitants of New York, made at the same time and even two thousand years later, though one race was white and the other red, and though the Atlantic intervened and the two peoples had never seen or heard of each other. This fact is so well recognized by anthropologists and historians that the study of American archeology and the study of the methods of life and organization of the American Indians—the study of American ethnology—are accorded close attention by students of human evolution and cultural history everywhere.

A study of the condition of the American aborigines led to the solution of many questions that had previously puzzled students of the natural sciences. But while much has been learned, the new world yet presents several important problems in cultural history. Among these may be mentioned the problem of the origin of man

in America, whether the race is homogenous or composite, the emigrations of stocks and tribes, the origin of the stocks, the cause of the great diversity in languages, and the relations with the people of the old world in ancient times.

We are confronted with evidences of diverse forms of development and many interesting forms of material culture. Before us we have definite problems of the influence of climate, of food, of environment and of geographical location upon large groups of mankind. Nowhere else upon so fresh and fertile a field may this record of human development be studied with such advantage as in America. Here we may learn many of the basic facts of anthropology and follow them a long way, if not to a final conclusion.

Anthropology embraces several coordinate sciences, each of which is important in itself. The student of race origin and development will find that he must be principally concerned with somatology, ethnology and archeology, though there are other important branches which must be understood, if facts are to be logically correlated.

It is to local archeology, however, that in this work our attention is directed. Through the interpretations made by archeological methods our specific task is to determine what races, stocks and tribes occupied this State; to discover what they made; what they used; how and where they lived; what of art and science they knew; and, even more boldly, to discover, perchance, what these autochthones thought and desired.

Archeology, concerning itself with man before the time of letter-written history, must find its records amid the crumbling débris of former ages. It must bring to light the evidences of human activity and translate these evidences into written records. This must be done with exceeding care for all human sciences lead back to archeology and draw data from it.

2 THE ORIGIN OF MATERIAL CULTURE AND HUMAN PROGRESS

It is because man became a user of objects external to his own hands as tools that he has risen above beasts. But so long as man only employed the natural objects about him without changing their form he was only one step in advance, though that was a long one. It was when the first groups of men learned, by direction of their own will, through the guidance of their experiences, how to shape wood, bone and stone as tools and ornaments, that the second great step was taken, and the beast world was left behind

forever. Man became a fabricator and an artisan, and progress began. With tools in his hands he could make things, and when the making of these things was difficult or impossible with the tools he had, he used his tools to make other tools with which to produce the objects he desired. With the spread of the art of making things man became the master of the beasts about him.

The first tools were sharp fragments of stones broken by natural agencies. Experience taught that the harder the stone the sharper its edge, and finally some group of primitives through the handling of flinty rocks and nodules discovered how to chip them with other stones. With sharp flints, wood and bone could be cut and worked, and thus industry began. So clear is this fact that almost every process in the development of tools from the simple sharp chip to finished stone knives can be traced, and thence, to the use of copper and bronze, and so on until the present.

Thus the germ of civilization, of material culture and of all that flows from industry, began with the chipping of sharp bits of flint and quartz. With these sharp things man was able to change the world about him to suit his needs; no longer was he the creature of circumstance; he could now overcome all circumstances with which his inventions were designed to cope.

Early in his career man made a captive of fire; he had sticks with sharpened flints at the end—the spear; and he had chopping tools made of sharpened stones, which in later times he hafted; and he had clubs. Man became bold and fought wild beasts with confidence. Man had tamed fire; but the beasts feared it. The hearth fire frightened away the prowling carnivora and at the same time cooked the hunter's food; but of equal value, it conquered the darkness and warmed his woman and his children. Little wonder the wild races worshipped fire and its symbol in the sky. It was fire that helped awaken gratitude in the heart of man for the unseen powers and that aided him to pray.

Through the agency of flint and fire man walked out of his beastdom; he walked upright "and sought out many inventions."

Once in possession of these means of conquest little bands of human creatures began to wander from the primitive home. Their inventive proclivities developed with every hardship and every change of climate.

In almost every place upon the earth where mankind can exist, there will be found implements of chipped chalcedony, jasper, quartz or flint. To some extent the character of the stone guided the shape

of the implement made from it, but even so, chipped stone blades of knives, spears and arrows found anywhere in the world bear a marked resemblance. The flint spear of prehistoric France is like that of Arkansas; the knife blade from Belgium is like that of Quebec; and the arrow points of China resemble those of Egypt.

This general similarity of chipped implements has led to two divisions of opinion among archeologists. One contends that the branches of the primitive race spreading out over the earth, independently discovered the art of chipping flint and of making spears, and, finally that each evolved the bow and its flint tipped projectile. This school of opinion lays down the doctrine that the human mind universal is constituted in such a manner that its primitive impulses react in the same way when an identical stimulus is applied. In other words, it teaches that under identical circumstances human beings of like cultural stages of development, will do the same things. Thus, primitive wanderers lost from all others of their tribe, observing the action of a bent stick, might invent a bow and finally discover its usefulness when used in conjunction with an arrow. This use might take one or it might take five thousand generations to discover, but at length the discovery would be made, and from that point the tribe would advance to other discoveries.

The second school of archeological thought says that the great basic discoveries, as the use and control of fire, the art of shaping flints and the invention of the spear, were made while the race was as yet not greatly subdivided and while it inhabited a limited area. Familiar with these inventions, man spread over the surface of the globe. When new inventions such as the bow or the use of copper, were made by one division, this school teaches that the knowledge of each invention was transmitted to others by contact.

Thus the two forms of belief stand; one arguing that all divisions of humanity have like capacity to respond to similar needs by similar methods; and the other protesting that similar arts, inventions and practices are evidence of contact. Both forms of belief are plausible so far as they go, but each makes the error of laying down a fixed doctrine and raising barriers at its extremes.

As a matter of fact, and one that may be demonstrated by evidence, both beliefs are right and both are wrong, in certain particulars. Under certain circumstances some isolated divisions of human beings might invent flint knives with notched shoulders, and these notched knives might resemble those made by another division of

the race whom they had never seen. This is entirely within range of human capacity. Again, another band of primitives might live in a locality where food and security are so assured that it would never think of making flint knives until strange humans who made and used them showed it how. This again is a possibility.

The Patent Office records in Washington show that identical inventions are frequently submitted by inventors for patent rights. Often the same invention will be sent in by men living in widely separated parts of the country, at practically the same time. Neither man had heard of the other or had known that another mortal was working along the same lines. Even poems, sentences, snatches of music and systems of philosophy all quite identical, have been produced by persons unknown to one another.

If, then, simple things easy to devise, once known, remain unknown until some individual spreads the knowledge, and if identical complex things like designs, engines and poems are produced by different persons, unknown to one another, what shall we say of human capacity and resourcefulness? Consciousness of need begets invention, arousing consciousness of necessity. Then to upset any theory as to which takes precedence, accident produces consciousness of need as often as it supplies the invention.

It would therefore seem entirely within the range of possibility that many branches of the human family learned of devices and inventions by contact with other more advanced branches; and equally possible that certain discoveries, as that of chipping flint, might have been independently evolved.

In the opinion of the writer, the ancestors of the human race lived in some restricted geographical area until such a time as certain initial usages had become fixed parts of the pan-human material culture. These were the use of fire, the use of flint knives and spears, sharp pointed bones and hafted stone hatchets. With these things man was ready to travel afar and to cope with devouring beasts and hostile elements. To the roaming bands of proto-men who departed from the motherland before the primal inventions came, one of three things happened; they became exterminated through lack of means to cope with environment, they independently discovered the primal arts, or wandering back to offshoots of the parent stock that had made the primal discoveries, they learned to make and apply them.

Endowed by the primal inventions the race progenitors wandered from one continent to another, each separate division,

stimulated both by hereditary impulses as well as by its own reasoning from cause to effect, and induced to actions by new experiences, they invented identical things, because the identical needs of peoples similarly situated require identical forms of relief. The primal inventions made others possible because they provided new things that others might handle, might experience and might think about. A right combination occurred, and a new device was born. The same combinations of need, material, reason, incentive, impulse and action were quite likely to occur to several men. One man might make the discovery in South America ten thousand years later than another man who lived in a cave in the foothills of the French Pyrenees. Yet in time the need would have been met.

It is not surprising, therefore, to find the same types of implements the world over. The wonder is at the daring of primitive man, the spirit of adventure that caused him to wander over seas and deserts and to occupy every considerable body of land on the globe; that the man-animal could adapt himself to every form of climate, and with his few inventions could fasten himself to living conditions. It may easily be believed that the permanence of the biological characteristics making up the species *man*, is due to the early discovery of tools and weapons, exterior to his own person. As a permanent memorial of this belief, the chipped flints of all the various periods of cultural development remain. Man fixed himself as man when first of his own free will he chipped out an eolith.

If mankind enlightened ever desires to pay tribute to the handiwork of the race, and by monument or inscription gratefully to record its debt to the cause of its material progress, it may fittingly raise the eolith to view and say, "All that we know of art, science, invention and industry, and even the unity of the human family, we owe to the man or men who first flaked stone to points and edges."

3 THE ORIGIN AND DISTRIBUTION OF MAN IN NORTH AMERICA

Archeologists deduce the former presence of man in any given area by the discovery of human skeletal remains and by the finding of cultural artifacts, such as chipped flints. In Europe and in Asia these things have been found under such conditions as to point out a remote antiquity. The finding of chipped stone implements, mingled with the cracked bones of extinct animals in the caves of France and Belgium proved that man had lived in the period when

the cave bear, hairy rhinoceros, mastodon and saber-toothed tiger roamed Europe. The original association of the artifacts with the animal bones can not be questioned for the deposits have never been disturbed, and are by far too large to admit any other interpretation than that man lived when these now extinct animals lived. If there is a single lingering doubt, our minds become convinced when we are shown the carvings of these extinct creatures on fragments of bone and ivory. These carvings are the work of human hands. In many instances, too, the walls of the caves are painted with representations of these ancient beasts. The location of these deposits

Fig. 1 Magdalenian painting from the cave of Altamira

and the rock paintings make their preservation possible. Had they been made in the open nearly every evidence would have been weathered away. Only by rare chance have any of the ancient deposits been preserved and discovered. Enough, however, have been examined by specialists, to demonstrate that Europe was one of the homes of mankind while it was yet in its early infancy.

In America no extensive evidences comparable to those of Europe have been found. While there have been several notable discoveries of supposed very ancient human remains in America, there is as yet not evidence that any possess characteristics differing from those of Indians today. No human remains found in America as yet approach the antiquity of European or of Asiatic discoveries. If mankind found a footing in America at the age when the caves of Northern France were inhabited by the contemporaries of the saber-toothed tiger and the hairy rhinoceros, we have not the slightest evidence of it. From a careful review of all the facts placed before

anatomists, geologists and anthropologists, the general conclusion is that America was without human occupants at the time when the old world had a considerable population.¹

Biologists take a similar stand in the conclusions they reach concerning the advent of man in America. They point out that there are no skeletal remains of the higher primates reported from either continent. From this they conclude that the proto-human ancestors of man did not develop in the new world, but that the *Hominidae* attained the human type in the old world, very likely southern Asia or the islands to the south.

The problem of the coming of man to America is thus placed before us for solution. This problem has occupied the attention of thinkers from the time America was found to be a distinct land area, and separated from the old world by vast expanses of water. Various theories have been devised, some ingenious, some utterly absurd. Writers have suggested that the peoples of the fabulous Atlantis populated America; others that the Indians are descendents of the Ten Lost tribes of Israel, or the survivors of a Welsh shipwreck. Still others, ignoring discoveries, have sought to make us believe that the original cradle of the human race was in America itself. Against these arbitrary theories we may set forth definite facts. There is no proof that Atlantis was a connecting continent or that it existed in the accepted sense; the ten "lost" tribes were not lost until a time when America had a considerable population; and the lost tribes were never actually lost but number their descendents in Asia today; a shipload of Welsh *men*, if such a shipload ever reached America, could never populate two continents, and for that matter, when Madoc was swallowed by the sea America was already occupied by men of a ruddy hue; and the belief that America was the primitive cradle has to complicate it the inquiry, why the old world then had so great a population that all the aboriginal inhabitants of the two Americas scarcely constitute a respectable fraction; also how they built transports large enough to cross the Pacific. If America was the primal cradle there would be enough to prove such a belief, but as we have indicated, geology, biology and anthropology all deny that any sufficient proofs have

¹For detailed studies of the problem of man's antiquity in America, see the publications of George Grant McCurdy, the works of W. H. Holmes (e.g., *Some Problems of the American Race*; *American Anthropologist*, 12:2), and Ales Hrdlicka (*Skeletal Remains Suggesting or Attributed to Early Man in North America*; *Bureau of Ethnology Bul.* 33).

been submitted to this end. None of the ingenious attempts to show that there was a "Garden of Eden" here from which some Adam or some Noah went forth, would stand analysis. The new world, compared with the old world, so far as the age of man is affected, is a new world indeed.

In seeking to determine how America was populated we naturally examine the land approaches of the two hemispheres. The route from Asia over Bering strait seems to be and is the most plausible one. Here under ordinary conditions bands of primitive (the word being used in a relative sense) Asiatic tribes found their way from one continent to the other. At the time that migrations of sufficiently large numbers of human beings were a possibility in this direction, the human race must have attained a considerable cultural advance. It must have possessed language, fire, stone tools, weapons and warm clothing. If we assume that certain Asiatic groups did press northward and then eastward across the strait, we are compelled to account for the motives that impelled them. Why did they leave the warmer regions to the south? Certainly the routes of migration within the historic period have not been from the warm or the temperate regions to the inhospitable ice fields of the north. If man originated in tropical Asia it must have been a long time before any stream of humanity was pressed northward to escape the competition of others that were able to fasten themselves upon more favorable climes. Yet the possibility, and indeed the probability, that certain groups, either voluntarily or under compulsion, eventually found their way northward must be admitted. Man hunts for a food supply. The primitive food supply was drawn from the animal and the plant worlds. Desirable food was to be found only in limited quantities and, thus, when the population center in the southlands increased, wandering bands pressed out in ever widening circles that, as they were removed from the center, were deflected in streams. There were natural barriers, and there were human enemies struggling to lay hold of food areas. Man's social nature drew groups of men together and group consciousness was ever present in the individual. The man of one group to the man of another was an enemy who was liable to steal his women, to appropriate his shelter beneath the rocks, and worst of all, to come with other out-group enemies to appropriate the hunting ground or the region where edible herbs, roots and berries grew. As the north was approached competition grew keener. With these wanderings in search of feeding grounds the migratory spirit was developed.

Groups pressed upon one another from all sides. Group consciousness developed the feeling of group superiority. Groups not allied in any way believed that they had a right to kill off all other groups. Thus came the triple struggle for food, for an endurable climate and for safety from other predatory groups. As the colder regions to the north were approached there must have been an increasing resistance to the intrusions of other north and east pressing groups.

At each long stage of the northward journey great changes would take place in the life of the group. There would be new foods to find and to eat, new animals to deal with, new climatic conditions to overcome. These things would modify customs and even language itself. But the possession of flints and the mastery of fire remained. Eventually the region about the northeast coast would be reached, the coast would be explored. The food would be fish, seals, sea bird eggs, and arctic mammals. Vegetable food would be practically unknown. Clothing would be of the skins of bears, seals, reindeer and other arctic animals. There were canoes of skin in which for short distances the venturesome went out to sea or journeyed along the coast.

At some period in the history of these boreal groups would come a knowledge of more land beyond, to the farther east. This knowledge was the beginning of the migrations of small bands. There may have been a long period of passing and repassing, before attempts were made to push farther south in the new land across the strait. It may be that the hunting grounds there were immeasurably better, that there was some better food supply, or that once the mysterious region became generally known there was an impulse to go to it. Then, again there would be a pressure of tribe and group pressing the vanguards. The smaller number would always be in advance; the greater number behind, to drive the venturesome before them.

In presenting a hypothesis of this kind, it is well to remember that the first groups of men moving from a common center toward an inhospitable climate resisted as best they could every attempt to force them into what they considered an undesirable region. If they were unable to crush their foes they might attempt to escape to the west or again back to the south. Without doubt the great avenue of migration was to the west. Not until the population halted and pressed both eastward and westward would there be a progression northward, into the subarctic north. We must also believe that very many groups perished long before they were driven into north-

eastern Asia. Of even greater importance must be the understanding that the journey from the hypothetical race cradle in the south was not a deliberate journey made by one single tribe. The movements of groups to the north were by slow stages, and in entering each new northward area, the different requirements for meeting the new environment would cause a considerable change in the customs and the material culture of the group. The group that reached rigorous north would have no tradition that its remote ancestors to the south, thousands of years before, lived from the fruits of the trees and vines. It would only know that every attempt to reach the south was resisted by fighting men. In time, therefore, the group would become accustomed to its environment and believe itself the most favored of all. Then, as stronger and more southern or western bands pressed upon it, it would again give way and escape to the farther north.

By a theory similar to this anthropologists, taking full account of all that geological science says concerning the subject, point out the probable route of man into America. The subsequent distribution of the various bands of mankind throughout the continent is another question, perhaps easier to deal with, but yet fraught with many difficulties.

The wide distribution of the aboriginal American race and its fairly uniform physical characteristics indicate its essential uniformity. It is one race. The difference between the American race and the nearest true Asiatics also has much significance. The American race has developed as such in America though it took root in Asia. No longer is it Asiatic so far as trunk and branch are affected. The only possible vestiges may be the intensification of the pigmentation of the skin, giving the red-brown hue, and certain mental traits. None of the American languages is like the Asiatic, except remotely, as any language might be.

The ancient period when the distribution of the race was complete, from the icy northlands of Alaska through the Central and South American tropics to the bleak snow-covered tundras of Patagonia, was one far back in point of time, and, it may be, followed the subsidence of the last glaciation in the north. Again there must have been cradle lands in which, affected by food, climate and the changed surroundings, the descendants of the wanderers from Asia developed distinct racial traits, both mental and physical. With the increase of the populations there would be another spreading, the currents being deflected by mountain ranges, great bodies of water,

arid regions and other factors. But the distribution would take place, following lines of least resistance.

The natural course of migration would be southward along the coast of Alaska and British Columbia. Food would become more abundant as the more southern climes were approached. The entire Pacific coast has been a cradle land of various linguistic stocks of the continent and the seat of many complex cultures. There many different stocks lived, learning from experience the necessity of establishing rules for fishing, hunting and gathering nut and root foods. The Pacific coast area is narrow and hemmed in the tribes between the mountains and the ocean. The population was relatively congested. In time some of the most highly distinctive culture traits and specialized forms of carving and decoration developed in this area.

West of the Sierra Nevadas another condition is to be noted. Instead of congestion there is a wide sweeping distribution of linguistic stocks. The entire interior of Alaska and of western Canada was held by the various divisions of the Athapascan stock. Once it may have occupied the coast and later lost it to the Eskimo. But observation indicates that the Athapascan stock held the coast only about Cook inlet. Even Hudson's Bay became shut to them when the Eskimo intruded. Southward the Athapascans pushed down the Rocky mountain foothills and occupied some of the most arid and most inhospitable regions of what we now know as New Mexico, Arizona, western Texas and Chihuahua. In a few isolated spots they found small tracts along the Pacific in Oregon and northern California. Several interesting observations may be made upon the Athapascan stock. It occupied the least desired lands — the bleak rigorous north and the arid, sun blistered deserts of the south, always shut away from the coasts. In the north its culture was limited, in the south it was far more complex, as a survey of the Navaho and Apache divisions of this stock will demonstrate. The entire stock is peace loving, most industrious, fits itself to its several occupational areas and quickly assimilates the culture of any superior tribe or stock surrounding it.

While the Athapascan stock swept from the north to the south, the great Algonkian stock spread out like a triangular fan, from the Rockies to the interior of all Labrador and to the New England coast. Holding back the Eskimo and the northern Athapascans on the north it held the southwestern shores of Hudson's Bay, most of the region north of the Great Lakes, and spread down the

Atlantic coast. On the west side it occupied most of the Mississippi valley from the source to the mouth of the Ohio, being checked there by the Siouan stock, and a little eastward in Tennessee by the Muskogean.

West of the Algonkian stock and held like an island between other stocks, including the Cheyenne-Arapahoe tribes of Algonkian blood, were the tribes of the Sioux, extending from eastern Assiniboia southward into southern Arkansas. The area resembles a large headed, short winged, large tailed bird flying with its short, blunt bill, to the north-northwest. Its head and shoulders press into the Algonkian area, its right wing pushes into Minnesota and northern Iowa, and its clipped left wing between two Algonkian divisions to the west, and into the area of the great Shoshonean stock. Oddly enough in the very middle of its back along the boundaries of North and South Dakota there rests an isolated band of the Caddoan stock, but the Caddoes also push into the thunder bird from the west and nearly sever the tail, through the base of which the Missouri flows (between Iowa and Nebraska).

The Shoshonean stock occupied the Rocky mountain region, pushed across to the Sierras and thence southward into California, where in the southern end it held a strip of sea coast. A long projection pushes southward through southwestern Wyoming, all of Utah, Nevada and the western half of Colorado, into northeastern New Mexico and northwestern Texas. Still southward other traces of this stock are found until we learn from a number of authorities that the Shoshoni are related to a greater division known as the Uto-Aztekan family, which of course includes the Aztec or Nahuatl people. Thus the Shoshoni, the Paiute, the Bannock, the Comanche and the Hopi are but northern kinsmen of the Aztecs.

The Caddoan stock, we have mentioned. Its most northern location is along the borders of North and South Dakota. Pushing across the prairies we find in southern Nebraska another and larger group, then southward among the Kiowa several small groups, perhaps later comers from the north. South of the Kiowan stock between the Shoshonean stock on the west, the Muskogean on the east and the Siouan to the north is the third and largest division of the Caddo people, while south and east of them are several small stocks, the Natchesan, Tonican, Attacapan and Chittamachan.

While the Muskogean stock was east of the Caddo, these small barrier stocks above mentioned actually occupied a small strip, preventing close contact. The Muskogean people were dwellers of

the eastern south lands, occupying most of Mississippi, most of Alabama, most of Georgia, northern Florida, and, to the north, they extended like a wedge through western Tennessee into Kentucky, along the south bank of the Ohio. The Algonkian stock lay to the north. The Muskogean people were a stock of considerable intellect and a well-defined material culture. The important place they have occupied in the cultural development of the tribes to the north is perhaps underestimated.

The Iroquoian stock, which includes the Cherokee, the Wyandot-Huron, the confederated Five Nations, the Erie, the Neutral, the Tuscarora, and a number of smaller tribes, drove itself like a wedge into the very heart of the eastern Algonkians. On the north they held the St Lawrence valley, the shores north of Ontario and Erie, the southern tip of Huron, pressed into a corner of Indiana, all of northern Ohio, all of New York except the triangle running from Lake George to the Delaware, and all of Pennsylvania except a small strip on the eastern border. Then there was a hiatus, but again there was a long strip, like a wrist laid through western Virginia, broadening into the shape of a gloved hand grasping eastern Tennessee, western North Carolina and reaching over into northern Alabama and Georgia. A thumblike extension pressing southeastward into South Carolina held a small band of the Algonkin and the Uchean stock (if it was a stock) against the Muskogean. An isolated division of the Iroquois lived in eastern North Carolina and southern Virginia, where the eastern Sioux cut them off from their kinsmen over the mountains to the west.

There are other small but important stocks but these need not be specially mentioned except when they shed light on the question of distribution. In a general treatise they would need detailed attention.

A second great division of the American race is the Eskimoan. The Eskimo were and still are a circumpolar people occupying the Arctic shores wherever a foothold is provided by nature. They extend from the Aleutian islands and the very tip of Cape Prince of Wales clear across the continental expanse, holding the shores of Hudson's Bay, except a small strip held by the Cree, but still cling to the east side of the bay from the Nottaway river back to the Hudson strait and then fringe the coast of Labrador, circling it to a point about opposite the western end of Anticosti island. They occupy many of the frigid wastes of the Arctic circle, including much of the coast of Greenland. The Eskimo show a close cultural affinity to other boreal people and are a distinct division of the American race. So

far as it has been possible to enumerate them, they are less than 30,000 in number.

It must not be supposed that the areas here described as the bounds of certain linguistic stocks were fixed or even entirely agreed upon by the native peoples. In certain regions boundaries were definitely fixed and there were patrols who marched back and forth from one landmark to another to prevent any outer tribesman from trespass. In other places certain boundaries were regarded as the proper limitations of tribal hunting grounds and any foeman who ventured into these limits did so at the risk of his life and perhaps at the risk of an intertribal war. With the Iroquois each tribe occupied a definite area, the bounds of which were agreed upon in council. By these agreements one tribesman might not hunt in another's territory, and if through the chance of the chase a deer was pursued from the Onondaga country, for example, into the land of the Oneida, it might be slain but its pelt must be left hanging conspicuously near the trail and marked in such a way to show that a person without the group had killed it. The meat being more perishable might be taken away by the hunter, but not if very near a settlement, without permission.

In general, however, the boundaries between stocks were flexible and gave way to the pressure of the stronger group. Agreements and the possession of force might even permit fragments of some stocks to live surrounded by others. Stocks have ebbed and flowed. Some have grown and others, no doubt, have become entirely exterminated. Many tribes belonging to certain stocks have adopted the customs of other stocks and finally become entirely absorbed. It may be that changes in dialects to some extent came in this way.

Great stocks and highly specialized culture did not develop, as a rule, where warfare continually raged. Development came during times of peace. Peace was the result of several factors, among which may be mentioned isolation, abundance of food, satisfaction with territory, agreement with other tribes. Natural barriers had much to do with cultural development. The Pueblo peoples of the southwest were safe enough in their desert region, and during times of peace they were able to build up their fortified pueblos that afforded protection against raids.

In aboriginal times there seems to have been little extended warfare. Indians were not always fighting. Such wars as occurred, generally speaking, were more of the nature of local skirmishes in which only a few warriors were engaged. The greater wars were waged by

Plate 2

Outline map showing the distribution of the principal tribal groups in North America. (Map by The American Museum of Natural History.)

tribes that had built up their material culture during long periods of peace. Indeed, also, these peace-loving peoples, having larger stores of pelts, corn, dried food, utensils and other valuable movable property, were subject to raids by other more predatory tribes. The more peaceful and sedentary tribes, therefore, built fortifications and stockades, some of them of considerable dimensions. Probably the greatest wars of which we have any means of knowing were those in which the mound-building peoples were reduced and expelled from their country between the Ohio and the Mississippi. A later war of importance was that of the Huron-Iroquois, in which they pushed aside the Algonkian tribes and established themselves in the areas where they were found at the opening of the historic era. Wars of this kind did occur in ancient times, but it is to be doubted that the loss by killing was ever very heavy, except in rare instances. Like the European, however, the Indian was war-loving, but the Indian was equally fond of great councils in which matters of dispute were peacefully settled.

Stock and tribes thus pushed out as their needs and impulses dictated. The country was vast and there was room for many, but when the hunting grounds were depleted and food became scarce, each group, and indeed each individual, fought first for individual survival. In a measure, therefore, the tribes that developed a form of social organization suited to its environment survived. How these tribes and stocks were distributed at the opening of the colonial period we have already outlined.

In any consideration of the displacement of tribes and stocks we must give weight to the possibilities of migrations due to the encroachments of wild animals. It is quite possible that the buffalo herds or other ruminants invaded the mound-builder territory and made agriculture so precarious that it was necessary to press farther south and east. In so doing there would be an intrusion of the Muskogean and Algonkian area and subsequent wars for readjustment.

II

THE ABORIGINAL OCCUPATION OF NEW YORK

I PHYSIOGRAPHIC FEATURES INVITING OCCUPATION

The area embraced by the State of New York seems always to have been designed as a great natural empire. Its geographical position, its physical features and its natural resources have from early times been favorable and inviting to human occupation. Perhaps no other area upon the continent presents such variations in type of landscape. The soil in its different forms affords the growing bed for numerous types of vegetation, especially food plants, and the great valleys and alluvial plains are covered by heavy deposits of fertile soil, easily cultivated and capable of sustaining immense fields of vegetables and grain.

To a large extent the superiority of this region is due to the Great Lakes to the north, to the smaller interior lakes and to the numerous river systems that are fed by a vast number of secondary streams and tributaries. A large number of the streams are navigable by canoe to their very headwaters. Because of this fact it was possible for the early Indians to travel from one drainage system to another by means of short carries. The Hudson from its source affords access to a considerable area. Over the divide near Fort Edward, the Champlain drainage system could be reached. There were two general routes, one that touched Lake George and the other Lake Champlain. These points from remote times were of strategic importance. During colonial days these portages were well fortified by Fort Edward at the point of debarkation on the Hudson, by Fort Ann on Wood creek (the direct Champlain route), and by Fort William Henry at the southern point of Lake George. The Hudson-Champlain portage was 11 miles in length.

Westward along the Mohawk there was an all-water route to the Oneida portage near the present site of the city of Rome. A carry of 8 miles here brought the waters of the Finger Lakes drainage basin within range of the boatsman. Here on the divide the colonists erected Fort Stanwix to guard the route. Through Wood creek and Oneida lake all the central New York lakes could easily be reached. The Genesee country was tapped either through Irondequoit bay and the mouth of the Genesee or through tributaries of its lower

streams. Tonawanda creek, Cattaraugus creek and other mixed land and water routes brought the Niagara peninsula, the fertile Cattaraugus region and the great overland trails within reach and led the way down the Allegheny to the Ohio. Indeed, the Mohawk valley route is the great natural trail from the east to the west that led to remote wildernesses beyond.

Other important water routes were the Susquehanna and the Delaware leading to the south country. The Susquehanna through its headwaters could be reached from the Mohawk trail and afforded a convenient though tortuous trail into the Pennsylvania wildernesses and still farther on into the Chesapeake country and the southernmost portions of Virginia. A little study of the river systems and watersheds will demonstrate to the student the great bearing they have on the routes of travel.

Of almost equal importance are the natural overland trails that follow the ancient shore and beach lines of the greater lakes. These beaches or ridges afforded natural road beds over which ran the Indian trails, later the wagon roads and finally the railways. The entire region, it will be seen, is united by natural agencies, that also put it in touch with other areas, north, south, east and west. This fact is most important so far as either the native Indian was concerned or the white race today is concerned. It makes travel easy and transportation of heavy loads possible. With both the Indian and the modern American the water routes and the portages are of utmost importance and are carefully conserved. The colonists erected forts at all portages to guard them against the French and Indians. Suitable landing places and the portage forts grew into thriving towns and cities. The archeologist will find that nearly all these places are built directly over the older village sites of the Indians.

A region easily traversed might not invite settlement, if its climate and vegetation were unsuitable. Both these factors must be reckoned with in studying physiography as affecting human occupation. But here was an abundance of food. In the spring the ground was covered by succulent verdure, tempting to vast herds of ruminants from the Virginia deer to the bison. For human consumption there were numerous plants that could be cooked as "greens" and the heavy rains and stream overflows washed out plenty of edible roots. Certain springtime barks were also edible, and then, there was the sap of the maple and the birch. All these edible vegetable foods were employed with the Indians. Of the animal food there was plenty. The grazing grounds attracted the big game, the waters

teemed with fish and the forests were filled with pigeons, partridges and squirrels. The red man had only to use his arrows and snares skilfully to supply all his needs for food. From the barks of trees, as the elm and basswood, ropes and cords could be made; the bark of the elm supplied material for houses, canoes and numerous utensils for the household. There were many sweet herbs like the sassafrass, and valuable medical plants like boneset and golden seal. Beside the native plants certain vegetables were cultivated, such as maize, varieties of beans, squashes and tobacco. The summer time supplied many kinds of berries and small fruits; the autumn the cultivated plants and many kinds of nuts and seeds. By carefully preserving and drying both animal and vegetable foods, therefore, it was possible for human beings to subsist in the forests with a large degree of comfort, and at the same time to find game for animal food in case stored supplies fell short.

This area, as we have suggested, teemed with animal life. Passenger pigeons moved in mighty flocks that, according to early settlers, "flew like clouds and darkened the sun, and when they alighted broke down the branches of trees beneath their weight." The ruffed grouse, wild turkeys, a score of species of wild ducks and geese bred here or had their range over this territory. There were large numbers of bears, wolves, beaver, panthers and other large forest animals and many other varieties of four-footed creatures that were valuable for their furs. The lakes were filled with fishes and eels; in the salt water country clams and oysters were abundant. But the most valuable of all game, to the Indians, were the herds of elk, deer, moose and bison that lived and roamed in the open lands and in the timbered areas. These were the big game. To the big game the Indians, and later the early white settler, owed much. They supplied the bulk of the meat supply and their skins when tanned served for leather and clothing. Very few textile garments could be better suited for the forest dweller, either for warmth or durability, than those of elk or buckskin. Skin robes, as those of the bison, furnished warm bedding.

The big game animals bestowed upon man another important gift, and one seldom considered. In their seasonal migrations they tracked into the earth deeply worn paths. These trails up the Ohio, along the Allegheny and up the Genesee or cross country at well-chosen spots became the trails of the red men also, and we may easily believe that the Indians followed them in reaching the territories that they came to occupy. The reason is easy to find. The animals first

found the lands that would provide them with food, water and salt. Man wanted the animals for food and followed their trails, found the country without human occupants and took possession.

New York State lies in a portion of the thermal belt surrounding the globe that supports the most energetic peoples of the world. This may be due to the reaction of the wide variations between summer and winter temperatures upon the physical constitutions of the occupants. In winter there are portions of New York as cold as portions of Alaska or Labrador; in summer the temperature equals that of the Mediterranean countries and even northern Africa. Coincident with the existence of human energy is intellectual activity in this isothermal belt. What is true today of the white races occupying this zone was also true in aboriginal times. The Indians of this region at the time of the discovery were the most able mentally in all North America. Not only did they possess keen minds but they were able in many ways to match with the white invaders. This has so far been true that today New York State has within its borders more than six thousand Indians, most of them branches of the Iroquois, and living on tracts of land that they have held from very early time. Notwithstanding the severe temperature of winter here, many of the Indians of this area wore what would now be considered scanty clothing and frequently parts of their bodies were bared to the elements. One Jesuit father living among the Mohawk people states that he saw one warrior braving a storm with the upper part of his body bare and only protected by a wild cat skin through which he had thrust his arm, holding it on the windward side. The bark houses, likewise, were cold and unheated in winter, save for the floor fires that were used for cooking rather than for heat. Instead of discouraging settlement by human beings the cold winters had the contrary effect, for to acclimated individuals and groups there was a certain zest in battling with the cold, not enjoyed by the people farther south. The summers and autumns were warm, on the other hand, and provided for the food that was most sustaining to life.

The coming of the white settlers did much to modify the landscape. The first colonists, however, relied upon the same natural resources as did the Indians, using native plants and forest game for food, and wearing buckskin and furs when they did not have cloth in abundance. The colonists, coming from Europe and from another cultural horizon, understood certain facts that the native Indians did not and soon made use of these facts to enlarge their resources.

The whites had iron, copper and tin; they had glass, certain chemicals, and many manufactured articles, strange to the aborigines. But the greatest possessions of the colonists were not these things, unless we except iron; their most valuable assets were three animals—the sheep, the cow and the horse—animals not found indigenously upon the American continents.

The sheep provided durable fabric as well as food, the cow gave milk, valuable fats and furnished one of the most edible of meat staples, and the horse was an animal able to carry or draw heavy loads with greater swiftness than human beings. Speed of transportation, ability to haul raw and manufactured goods was thus placed within range of the white man. The horse promoted both industry and exploration and thus became a valuable energizing factor promoting invention and political progress. The cow, sheep, pig and domestic fowl, together with the horse, stimulated agriculture, provided the means of wealth, constituted personal property, and furnished an incentive to peaceful interchange of commodities. All these things were natural advantages or the immediate outgrowths of them, that gave the colonist great superiority over the native red man.

The white man finding this region suitable for his herds, flocks and horses, took possession of the land and held it by means of his superior tools, and his ability to transform the raw materials of the forest and the earth. With the passage of time and the continued application of labor this area has become the Empire State of a great Nation. Though one of the small states in acreage it has attracted to itself one-tenth of the population of the country and become the most flourishing agricultural, industrial and financial center.

The white man is here for the same reason that the Indian was here in former days; because of the natural physical advantages of the land. From the days of its first discovery by wandering red men until now it has afforded a homeland for all people who chose to avail themselves of its advantages.

2 THE FIELD OF ARCHEOLOGY IN NEW YORK

New York State presents an inviting field for archeological investigation. It is not the most prolific field, to be sure, but among the many areas where specific problems may be studied our field has at least an important place. In Ohio the mound culture may be studied with great advantage, in Tennessee the stone grave culture

may best be examined, but in New York State the prehistory of the Iroquois may be studied with greater advantage than in any other region we now know, not even excepting the province of Ontario.

The Iroquois were and are still the most recent aborigines to occupy this region; but they are late comers. Before them were other peoples. Our investigations show that long before the Iroquois came, the Algonkian tribes occupied at various times almost every portion of the State. There were also bands of the mound-building people, and at an earlier time, wandering tribes of people who made implements like the Eskimo.

Sources of Information

In making a systematic examination of the field, information may be expected in certain definite areas and particular places. We must go where the evidences are in order to discover our data. In pursuing investigations and in making records, the following sources should always be kept in mind:

I General areas

- 1 Inhabited areas
 - a* Village sites
 - b* Camp sites
 - c* Shell heaps
 - d* Hunting grounds
- 2 Defensive works
 - a* Fort rings
 - b* Fort hills or points
- 3 Places of industry
 - a* Workshop sites
 - b* Quarries
 - c* Garden beds
 - d* Fishing places
- 4 Places for disposing of the dead
 - a* Cemeteries or burial grounds
 - b* Ossuaries
- 5 Places of conflict
 - a* Battlefields
- 6 Routes of traffic and travel
 - a* Trails
 - b* Stream beds
 - c* Fording places

7 Occasional or rare places

- a* River gravels
- b* Drift deposits
- c* Swamps
- d* River and lake bottoms
- e* River and lake shores
- f* Ceremonial districts and areas

II Particular places

1 Sites of dwellings

- a* Lodge sites
- b* Caves and rock shelters

2 Refuse deposits

- a* Fire pits
- b* Refuse pits
- c* Refuse heaps
- d* Shell heaps
- e* Signal light ash deposits

3 Monuments

- a* Mounds
- b* Cairns
- c* Inscribed rocks
- d* Council rocks

4 Burials

- a* Graves
- b* Ossuaries

5 Places of industry

- a* Kilns
- b* Individual work shops
- c* Fish weirs
- d* Clay pits

6 Places for storing or hiding things

- a* Caches of implements finished, general
- b* Caches of raw material, general
- c* Individual caches

7 Ceremonial places

- a* Springs
- b* Spots
- c* Rocks

3 PROBLEMS IN NEW YORK ARCHEOLOGY

While great strides have been made in the study of the archeology of this geographical area, there are yet many problems to engage our attention, things to do in the way of excavation and research before we may know even a portion of what we should know about the activities and cultural conditions of the aborigines. In order that we may study with purpose and pursue our field work with intelligence, we ought to bear in mind constantly what the problems are.

1 Our first problem is to determine what people or peoples lived in this area, and what aboriginal tribes lived in it when the country was first invaded by white men. It is not enough to make a general guess, for there may have been isolated tracts held by several tribes, some of different stocks, instead of the generally known tribe mentioned in history and popular recital.

2 From what locality or region did each tribe and stock come? What direction did they take to reach this region? What did they bring with them that was distinctive?

3 Whom did they find, and did they drive out or exterminate the older occupants? Did they amalgamate with them?

4 At what date approximately did each people arrive, and for how long a time did they occupy the region?

5 What precise sites did each people occupy? What area did they cover?

6 Where are the oldest sites of each culture, where are the intermediate and where the most recent?

7 What are the characteristics of the village, camp and burial sites of each culture?

8 What are the characteristic implements of each and what are correlated?

9 Determine what each implement was used for, if possible, but do not guess. Experiment and try the implement in the several ways that suggest themselves to you, but unless you are positive, do not give a *use-name* to an implement. Until you know the use of an object, give it a descriptive name.

10 To what extent was each culture modified as time went on? Illustrate the modification.

11 What tribes of the same or other stocks surrounded them?

12 Whom do they seem to have influenced culturally?

13 By whom do they seem to have been influenced?

14 What are the salient features of each culture?

15 What finally became of each occupying tribe?

16 If living today, what do they yet retain of their native material culture, customs and language?

17 What are the physical characteristics of each occupying people? What are the skull indices, skeletal measurements?

18 How do the implements, pottery, ornaments etc. of each culture seem to have been made?

19 What documents exist describing the tribes that lived here when the country was first opened? How much may be learned from these documents and books concerning the material culture and customs of these people?

20 What persons have made collections of specimens from the various sites of aboriginal occupation, and in what condition are these collections?

Questions like these might be multiplied, but these will suffice. Others will quickly suggest themselves, according to the subject upon which light is sought.

III

EVIDENCES OF VARIOUS OCCUPATIONS

As suitable as the New York region is and in former times was for human occupancy, there is little evidence that there were any human beings here in very remote times. So far, no one has produced satisfactory proofs of man's presence during the glacial periods. We have never known of any implements from this State that may be known as paleoliths, as these things are known in Europe and elsewhere. The rock shelters and caves examined up to this time, while yielding some rude flints, do not indicate any remarkable antiquity.

We do not wish to imply that man was not here or to lay stress upon a mere theory of his recent appearance. What we do wish to state is that up to this time competent observers have not seen in the ancient gravel deposits or in the glacial till any articles that look as if indubitably made or used by human hands. It may be that some time such evidences will be found and that man in this region will be shown to have lived here during and immediately after the last glacial period. We have no sympathy with a dogmatic theory that would seek to limit in an arbitrary way the time of man's first appearance upon the earth. Man certainly was on earth fifty thousand years ago; he may have an antiquity of five hundred thousand or more than a million years, if the evidence presented by the geologists is conclusive. Our contention is that man left no traces here by which we may know of his occupation in the immediate postglacial times. Where upon this continent he was, we do not know. It is apparently true that certain Asiatic tribes in the periods following the last glaciation found their way over Bering strait and dividing and subdividing became the parent stems that later developed into the great linguistic families of the two continents. The first groups we should expect would push southward along the Pacific coast with comparative rapidity. The slower pressure would be from west to east.

Indeed all the rest of North America north of Mexico had a population in aboriginal times scarcely equal to that of the Pacific coast states. The densest Indian population followed the west coast south through the desert lands of New Mexico and Arizona into Central Mexico, Yucatan and Central America.

The pressure sent more into South America. Time, climate and food and, of equal if not primary importance, the original race color and mental impulses caused these scattered units of the race to develop along similar physical lines. But while we think of the similarity of the branches of the red race we ought not expect them to be any more similar than the various branches of the Aryan or white race.

It is quite probable that many parts of North and South America had long been settled and that there were several millions of the red race before any large number of them crossed the Rocky mountains and the great plains to begin a migration by slow stages to the Atlantic coast. The earliest comers seem to have had no habits that wrote a record into the soil. Perhaps they were nomadic and had no settlements that endured longer than a year.

The oldest evidences of man's presence seem to be on some of the upper terraces. In western New York we have found several strange sites where the artifacts were crude and all osseous matter completely absent. The presence of carbonized material in the pits, however, proved that fire had been used. Along the headwaters of the Hudson similar old sites have been found. It would be mere guessing to say how old these places are or even that they are demonstrably the oldest.

As occupation becomes more evident, through the relics one finds, it is patent that the occupation is more recent. Thus, we may trace the historic Algonkian people by their artifacts to their prehistoric sites of occupation and these back to very rude sites that fade into others that may or may not be Algonkian.

On some of the sites that may be considered old the relics are greatly weathered. Certain sites near Oneida lake and others on the upper waters of the Hudson yield many crude flints and hatchet heads of stone that have plainly been weathered for centuries. But even in this case we can only say the relics appear to be among the oldest.

To the writer the first definite occupation seems to have been by a people influenced by the Eskimo. They may have been Eskimoan, they may have been Algonkian tribes intermarried with the Eskimo, or they may have been Algonkian tribes culturally influenced by the Eskimo. The Algonkian people at length came to possess most of this area and in almost every portion of the State one may find Algonkian artifacts. For a considerable period wave after wave of Algonkian tribes came this way, one of the last being the Delaware.

The Algonkian stock at length spread from the Rocky mountains between the 55th parallel to the Atlantic coast, and occupied an irregular territory as far south as the 35th, even pushing wedges above and below these points. Their east and west range, measured in longitude, spread from the 55th parallel to the 118th parallel, giving them a palmate shaped region many times greater in extent than that occupied by any other linguistic stock in North America.

The great original stocks of this period seem to have been the Athapascan, Shoshonean, Siouan, Algonkian and the Muskogean, Caddoan and Iroquoian. It may be that the last three stocks were originally one. There were fifty other linguistic stocks, according to Powell, north of Mexico. Time and research may condense these to ten.

After the Algonkian people had established themselves along the Atlantic coast and the country back of it, some of the mound-building tribes of the Ohio region pushed into New York, and thereafter followed several waves of the Iroquois.

The Algonkian tribes left traces, especially along the coast, but within the State their traces, while distinguishable, are feeble; the mound-building people did not occupy so much of this region but where they did leave any evidence of themselves it is startlingly plain to the archeologist, but the Iroquois who came last and who lived here for the shortest period of all, have left such abundant traces, such thick refuse deposits, and so many relics of their material culture that they appear to have not only lived on the land but to have actually used it. In viewing the remains of their occupation no anthropologist would make a mistaken estimate of their mental or moral energy.

Many untrained observers have sought to identify archeological specimens found in a given locality as the products of the tribe that last lived in the locality, perhaps in historic times. In view of the several occupations we have mentioned it will be seen how mistaken this notion may be in some cases. In certain places, such as the Genesee valley, there may be as many as four types of occupation. Thus it would be highly erroneous to say that the Seneca were responsible for all the relics found. Amateur collectors must avoid such erroneous conclusions, though even certain advanced students have made them through lack of means fully to identify cultures.

It would be presumption to say that we have named all the peoples that have lived within the borders of our present Empire State. It is possible that some other tribe contemporaneous with the early

Algonkian peoples lived here, also, and that they were similar to the "red paint," people best represented in certain Maine sites. It is possible that some of the eastern Sioux have left traces here; it is possible that Muskhogean bands came up the Susquehanna and roamed the State. It is possible that several or many stocks now unknown and perhaps impossible to know left traces behind. Certainly there are many sites that are puzzling and that suggest an occupation by people the nature of which we now have no means of determining.

I THE RELATIVE FREQUENCY OF ARTIFACTS

In describing the cultural intensity of a single site, of a cultural horizon or of a large geographical area, it is useful to know how frequently certain types of artifacts occur. Relative terms have been used with great carelessness, so much so that records to a large extent are unreliable. Thus, we may never be quite sure what is meant by the term *rare*, because different persons may not have the same idea of what rarity means. The same is true of such terms as *common* or *abundant*. One observer may say that six bone combs from a site mean that they are common; another may construe this number to mean rarity. A single observer basing his estimates upon different standards, or even upon impulse, may use different comparative terms at different times, making his statements contradictory.

These loose methods of estimating are to be deplored, for they delay the emergence of archeology into a statistical science. To a large extent, also, our knowledge of the relative number of objects prevailing on sites is made difficult by the fact that collectors have seldom gathered every specimen showing the handiwork of the aborigine. Only a few observers not on museum staffs have had the forethought to do this. On the other hand, all archeologists employed for field research in New York by reputable institutions, since 1900 have been careful to collect every object, from flint chip to pottery vessel, not neglecting any complete or incomplete object of whatever nature. For this reason the expeditions of the American Museum of Natural History, the Peabody Museum of Archeology and Ethnology, the New York State Museum, the Museum of the American Indian and the Buffalo Society of Natural Sciences may be relied upon. To the lasting credit of some private collectors this course has also been pursued.

Comparative lists are valuable in that they show not only what implements were used most or least, but also what new forms arose, what changes occurred and what forms became obsolete. These are

valuable facts in the study of cultural stages, and enable us to trace and perhaps identify the factors influencing cultural growth, transformation or decadence. Lists are not difficult to tabulate if a complete collection has been made, or if a good catalog record has been kept. It is when we begin to estimate the relative frequency of material that errors are most likely to occur. This is because no system has been generally agreed upon by archeologists and collectors.

In considering methods of comparison, we find that there is one general form that may be used with advantage, for statistical information and for ascertaining percentages.

By this we enumerate all classes of articles from a site or region, and divide the total by the number of thousands or fraction of thousands. Thus we obtain a factor for determining the number of given objects that occur in a thousand of all kinds. We also do two other things: (*a*) provide the means of estimating the probabilities of finding other similar objects; (*b*) provide the means for describing the relative frequency of the article. Thus, if among 2500 artifacts found in a site there are 15 bone fishhooks, we may divide 15 by 2.5 (the number of thousands) and as a result determine that 6 fishhooks occur to every 1000 specimens found. Thus we may state that .6 per cent of all articles collected are fishhooks. On the other hand, among the 2500 specimens there may be 250 hammerstones of all classes. This would give hammerstones a frequency of 10 per cent.

As an example of how to lay out a specific site frequency table let us take a certain number of representative articles from the Richmond Mills site, where about 2500 specimens are enumerated in the census made by Mr Dewey.

OBJECT	NUMBER FOUND	PERCENT- AGE	NOTE
Triangular arrow points...	1 187	47.5	Comparisons based on 2500 objects enumerated from Richmond Mills. Prehistoric Iroquoian, probably Seneca.
Notched points.....	8	.32	
Celts.....	40	1.6	
Hammerstones.....	365	14.6	
Bone beads.....	700	28.0	
Bone draw shaves.....	10	.4	

By this means we can name an article by its specific cultural frequency and state it as 1 or 10 per cent as the facts bring out, and arbitrary terms need not be used.

So far, the artifacts of a single culture have been considered. In larger areas where there is a mixture of cultures a second plan will be to determine the relative number of artifacts found on (*A*) Algonkian sites, (*M*) mound builder sites, (*I*) Iroquois sites, (*E*) Eskimoan sites, (*U*) indeterminate sites. For the purposes of this paper we will grant that most of the articles considered are all from known sites, or that they may otherwise be identified.

Again everything is counted this time without regard to cultural origin. All specimens are massed together in one grand aggregate and then sifted for their cultural place. In a collection of 20,000 specimens¹ we should expect to find the articles falling into groups in the following way:

ARTICLE	ALGONKIAN	IROQUOIS	MOUND	ESKIMOAN	UNDETERMINED	TOTAL
• Hammerstones...	1 000	1 000	100	10	40	2 150
• Anvils.....	100	75	20	5	25	225
• Mullers.....	50	50	5	.....	5	110
• Celts.....	100	150	15	2	23	290
• Gouges.....	50	.....	5	3	25	83
• Adzes.....	60	5	20	5	10	100
• Grooved axes.....	20	.....	2	.....	.....	22
• Grooved weights..	100	20	5	5	10	140
• Net sinkers.....	800	750	25	20	5	1 600
• Sinew stones.....	14	.....	1	1	1	17
• Bannerstones.....	20	.....	15	.....	.....	35
• Bird stones.....	15	.....	5	.....	.....	20
• Gorgets.....	35	.....	15	.....	.....	50
• Plummets.....	.....	.....	.....	.....	5	5
• Other ceremonials	10	.....	5	5	5	25
• Stone pipes.....	10	25	10	.....	5	50
• Bone implements..	200	1 000	50	50	.....	1 300
• Shell beads.....	50	2 000	50	.....	.....	2 100
• Stone tubes.....	1	.....	2	.....	5	8
• Notched flints....	5 000	50	1 000	150	800	17 000
• Triangular flints..	200	2 000	50	.....	50	2 300
• Pottery vessels....	1	20	1	.....	.....	22
• Steatite vessels...	2	.....	.....	.....	.....	2
• Copper articles....	25	.....	5	1	.....	31
• Pestles.....	100	2	2	.....	1	105
• Other articles.....	800	1 000	200	10	200	2 210
	8 763	8 147	1 608	267	1 215	20 000

From a table of this kind we may estimate the degree of cultural wealth, the duration of occupation, the presence or absence of certain

¹ This tabulation is based on a careful estimate of artifacts from the heart of New York State extending from Oneida lake to the Genesee. A tabulation of the entire State or for other areas in the State would change these figures.

articles, and thus establish other tables defining culture traits. By this means, also, we may find a convenient method of stating the degree of rarity or frequency of any articles. Remembering that we have analyzed 20,000 specimens of all kinds, we can easily determine the percentage of the whole number or of the cultural number. Thus, we find that to determine the *cultural frequency* of hammerstones we divide the number by the total number of all objects of the culture enumerated and obtain these percentages:

$$\left. \begin{array}{l} \text{Hammerstones} \\ \text{Culture frequency} \end{array} \right\} A \ 11.4; I \ 12.27; M \ 6.21$$

When hammerstones as type objects are compared with all hammerstones we get another figure, that of type frequency; in other words we are able to say what percentage of hammerstones selected from a large series gathered from representative sites of all cultures, may be expected to be of any one culture. Compared with the grand total we would then read:

$$\left. \begin{array}{l} \text{Hammerstones} \\ \text{Class frequency} \end{array} \right\} A \ 46.5; I \ 46.5; M \ 4.65; E. \ 46.5; U \ 1.86$$

There is considerable difference between the general frequency of a specimen and the cultural frequency and if such tables as these are ever used care must be taken to mention the standard of comparison whether *general*, *cultural*, *specific site* or *class*. Comparing our tables we see that Iroquois hammerstones, for example, have a *general frequency* of 5, a *cultural frequency* of 11.4 and in the site named a *specific frequency* of 14.5, while the *class frequency* is 46.5.

General frequency, therefore, may not be regarded as a guide to specific frequency. As an example, the general frequency of hammerstones of the mound culture is .5 per cent. Compared with all objects from a specific mound site in New York, the percentage would probably rise to 6.25 or even more.

To clarify our comparisons by percentages let us recapitulate our hammerstone data.

1 Out of 20,000 specimens of all kinds, 2150 are hammerstones. Hammerstones therefore form 10.7 per cent of all articles found. This is the *type frequency*.

2 But these hammerstones came from various sites and we are able to sort out *A* 1000, *I* 1000, *M* 100, *E* 10, *U* 40, which gives us the means for determining the fraction of all specimens in our collection that each culture takes. Our 1000 Algonkian hammerstones are one-

twentieth of the whole 20,000 specimens. It is therefore 5 per cent of the total. Continuing we find that the *general frequency* is: *A* 5; *I* 5; *M* .5; *E* .05; *U* .2. This gives us a means of indicating the comparative rarity or frequency of any specimen.

3 We may wish to know how frequent a specimen is in a certain cultural area; that is, what per cent of all articles from a culture, a given class of object forms. We have only to determine that 8763 specimens in the 20,000 are Algonkian and by taking our 1000 hammerstones find our decimal number, which is 10.35. Going through the list we find the cultural frequency to be: *A* 11.4, *I* 12.27, *M* 6.21, *E* .04, *U* .033.

4 By taking the number of hammerstones from each culture and comparing them with all the hammerstones found in our collection, we get our *class frequency* which, to repeat, is: *A* 46.5, *I* 46.5, *M* 4.65, *E*. 465, *U* 1.86.

5 By totaling all the specimens of all kinds from one specific site, and finding out how many of each kind compose this total, we can determine what percentage of the total any group forms. This is the *specific frequency*.

2 THE ALGONKIAN OCCUPATION OF NEW YORK

Previous to the coming of the Iroquoian tribes to this region, it seems to have been largely in the control of the Algonkian tribes. It is quite possible, however, that portions were held by tribes not of this stock, but it is nevertheless true that an examination of the field shows traces of Algonkian occupation and influence from one end of the State to the other and from north to south. We may safely assert that when the Iroquois first entered this geographical area their chief opponents, if any, were some of the Algonkian bands, though it is probable, also, that there were outpost settlements of tribes of the mound builder culture.

The Algonkian occupation of New York stretches back into comparatively remote times. There must have been wave after wave of these peoples, coming in band after band to hunt over the territory or to make settlements. Very likely the inviting regions south of Lake Erie and the Ontario-St Lawrence basin were as much occupied by Algonkian tribes as was New England at the time of the discovery.

The Algonkian occupation appears to consist of several periods, each of which so merges into the other that we can not tell when or where one commences and the other leaves off. Even when we do

OUTLINE MAP
OF
THE STATE OF NEW YORK
SHOWING THE LOCATION
OF
THE AREA INFLUENCED BY THE
MATERIAL CULTURE OF THE
ALGONKIAN STOCK

distinguish differences in the cultural artifacts we find it is not always possible to say that the difference is due to the lapse of time and the change of pattern, or to the influence of another tribe that came to supplant an older tribe. Our best clues are found along the lakes and rivers where there have been fishing camps and settlements. On the St Lawrence, for example, there are sites along the banks that are deep with the refuse of the centuries and where one may find early Algonkian material near the bottom and in the body of the layer, and Iroquoian potsherds on top. As a general thing few individuals have had the time or patience to make a thorough study of the Algonkian occupation except along the sea coast. For solving the riddles of migrations and occupations, however, this difficult and perhaps unproductive work must be done. The collector who desires to get relics only and the museum that only desires to fill its display cases are both neglecting an obligation to science. Research work, alone, will solve the problem of the Algonkian occupation.

Periods of occupation. The earliest type of occupational evidence that we may assume to be Algonkian, yields crude implements, large, clumsy spears, steatite pottery, some rough and poor grade clay pottery, occasionally a polished stone implement, net sinkers, large flakes of chert or stone notched at the top for choppers, and now and then a grooved axe and celt. Only in very rare instances are any implements of bone found. Probably no graves of this period have ever been found. This period seems to have been influenced by the Eskimo.

A second or intermediate period of the Algonkian occupation is characterized by a larger number of grooved axes, roller pestles, a greater abundance of crude pottery, the surface of which is scratched or stamped with fabric or cord marks, steatite pottery, by pits filled with crumbling and almost completely disintegrated refuse and especially by the great abundance of drills, of notched arrowheads and spears of chert and other stone. Many of the finest ceremonial stones from New York belong to this intermediate period. The sites are generally along the waterways, on the banks or upon the high level fields near creeks, lakes and rivers. To some extent the early Algonkian sites are found in such places also, but most generally on the slopes and terraces far above the present river beds.

The later Algonkian occupation is more definite in character and covers almost the entire area of the State. It is characterized by numerous flints, by steatite pottery, clay pottery, notched choppers, grooved axes, celts, adzes, hoes, some copper implements, gouges,

gorgets, birdstones, banner stones, cord-marked and pattern-stamped clay pottery, mediocre clay pipes, roller pestles, numerous net sinkers, and a considerable amount of bone implements, as awls, harpoons, needles and beads. The sites are generally on lowlands near streams and lakes, none of importance being on hilltops. The later Algonkian peoples were agricultural as is proved by the numerous instances in which charred maize and beans have been found in refuse pits. The later Algonkian tribes were more sedentary than their predecessors and their settlements presumably larger. This seems to be indicated by the presence of deposits of refuse, by refuse pits and heaps and by large areas of ground filled with carbonized matter, fire-burned stone and calcined bone.

Graves of this middle period are found, the skeletons being doubled up on one side (flexed). There are seldom any artifacts in the graves, the skeletons alone remaining to tell the story. A typical burial site of this period is that on the Markham site, near Avon, excavated by Mr Harry Follett. A typical village site of this period was found on the outlet of Owasco lake, south of Auburn, and was excavated by Mr E. H. Gohl and the writer (see page 340). The Owasco lake site differs in culture, however, from that of the Markham site.

The Algonkian peoples of the tide water and Long Island present a slightly different problem, but the type of the culture is unmistakable. The most abundant traces are found in the refuse layers and shell heaps on Long Island, Staten Island, the Westchester coast and the northern end of Manhattan island. The coastal Algonkins differed only from their inland kinsmen through the immediate influence of environment. For example, they frequently stamped their pottery with the edge of a scalloped shell instead of a cord-wrapped paddle, and they used shellfish to a large extent for food.

Typical coastal Algonkian sites were found and excavated by Mr M. Raymond Harrington, at Port Jefferson, Oyster Bay, Matinicock and Shinnecock, on Long island; Throgg's Neck, Eastchester and Westchester, on the Westchester coast; and by Mr Alanson B. Skinner on Manhattan and Staten Islands.

One is led to believe that the later Algonkin copied to a large extent the material culture of a more advanced division of the race that came from the south and the west, but which after a certain time was either absorbed or unable to maintain itself in the eastern section. That the eastern Algonkin received a great cultural impetus from the intruding strangers can not be doubted. We have

some realization of this when we note the thinning out of the polished slate objects in eastern New England, southern New York, Pennsylvania and the region north of the St Lawrence basin, including the Erie-Ontario slopes, in Canada. On the contrary, these articles appear in the greatest abundance west of the Mohawk headwaters, westward into Ohio and down the Allegheny to the Ohio river and southward to Tennessee. The St Lawrence basin all along the Great Lakes also yield the "problematical" slates, but there the cultural stimulus in other ways seems to be from the north.

Definite traces of what is recognizable as an Algonkian occupation occur from the Genesee valley throughout its length in New York, Wyoming and Monroe counties containing many camp sites and a considerable number of villages of this culture. Evidences are found eastward through the Finger Lakes district, southward along the valleys of the Chemung, Susquehanna and Chenango, through various portions of Chenango, Otsego and Oneida counties. In Jefferson county to the north along the St Lawrence are also abundant traces. Southward along the Delaware river through the counties of Delaware, Ulster, Sullivan, Orange and Rockland the relics of occupation seem almost entirely Algonkian. The Hudson valley shows an Algonkian occupation as evidenced by the forms of pottery and other artifacts. In some places Algonkian articles are found directly beneath Iroquoian deposits, as at the mouth of Honeoye creek and along the shores of the St Lawrence river.

An Outline of Algonkian Cultural Artifacts

Methods of identification. In any endeavor to determine the cultural significance of any artifact there must be a certain and definite means of comparison. To fix the characteristics of a culture we must have before us the results of actual excavations and collections made in and on a site. In other words, we must reason from the known to the unknown. Once we know the characteristics of an Algonkian site we may look elsewhere and say with some degree of positiveness what is Algonkian. But to know in the beginning what is Algonkian we must find a site actually known to have been occupied by some Algonkian tribe and after examination we must find what the objects are, how they look, how they are decorated; and, what is equally important, we must determine what objects are associated. Not only must we study the ash pit and refuse heap, but the house site, the village site, the camp site and the fishing grounds.

Once we know the characteristics of a historical site, which may have within it European artifacts, we may look for older sites in

Certain types of knifelike blades, wherein the outcurved edge is thin and sharp. $\times \frac{2}{3}$. From New York Algonkian sites.

1, waxy chalcedony from Lysander; 2, ivory chalcedony, Lysander; 3, banded chert, Lysander; 4, gray chert, Rush; 5, gray chert, Jefferson co.; 6, drab chert, Seneca river; 7, dark orange Jasper, Perch lake; 8, light chert, Seneca river; 9, light chert, Seneca river.

which traces of the white man are absent. Then, when the general characteristics of the Algonkian culture are known we may say with some degree of assurance that a specimen is or is not Algonkian. If it is not Algonkian, what is it? Does it belong to the later Iroquois or does it belong to another culture altogether?

An examination of the numerous Algonkian sites in New York, and indeed elsewhere, demonstrates that the Algonkian culture was not uniform. This is not strange when we remember that the great Algonkian stock embraced many tribes and influenced this geographical area from comparatively remote times. It is natural to suppose that certain tribes varied in minor particulars from others and that in the process of time tribes may have changed some of their customs. There is an abundance of proof that this process of cultural change took place among tribes observed since the advent of the European. Changes took place, it is reasonable to suppose, in the eras before the white man came.

While it is true that our knowledge of the various occupations is incomplete, enough sites have been examined by competent observers to afford some basis for comparison and identification. The description which follows is a brief attempt to outline the characteristics of the Algonkian culture.

Chipped Points and Blades

Chipped implements. Nearly all the periods of the Algonkian occupation, where there was any considerable population, are characterized by innumerable chipped implements of chert, quartz, hornstone and other flinty rocks. The material to some extent varies with the location, the local rocks predominating, but favorite materials are not lacking; thus, even on the seashore where nearly all the chipped implements are of pebble quartz, there are to be found jasper and chert points also.

Spear points occur in abundance and vary in size from 3 inches to 10 inches with occasional specimens below and even above these measurements. Not only do these implements vary in size but in degree of workmanship, some being crude and clumsy, others revealing the skilled hand and eye of an expert. With the possible exception of some knife blades and unfinished blank forms that if necessary could have been used as spear points, all Algonkian spear points and javelin heads are notched or barbed.

Arrow points are numerous on all Algonkian village and camp sites and along trails of this occupation. Like the larger points considered as spears, Algonkian arrowheads are barbed, or at least have

Certain types of New York arrow points. $\times 7/8$. From Algonkian sites.

1, dark chert, Livingston co.; 2, chert, Livingston co.; 3, chert, Livingston co.; 4, dull chert, Seneca river; 5, marble quartz, Long Island; 6, gray chert, Seneca river; 7, slaty chert, Seneca river; 8, slaty chert, Jefferson co.; 9, serrated rotary or beveled, Seneca river; 10, dark chert, Seneca river; 11, orange, red and black jasper with white bands, Seneca river; 12, gray chert, Seneca river; 13, gray chert, Seneca river; 14, waxy chalcodony, Oneida lake; 15, light gray chert, bifurcated stem, Rush; 16, chert, Livingston co.; 17, Monroe co.

distinct necks and shoulders. No less than 40 distinct forms of these arrowheads are recognizable, and into these forms are types of variants that in some particulars resemble one form or another, or several. The sorting of a large collection of points becomes a most perplexing problem, and, for a time it seems that one is pursuing an impossible task. While many arrow points seem to be individual and without previous or similar pattern, a close examination and comparison will usually fit the specimens into one or more classes, to be determined by the shape of the neck, barbs, shoulders, point or bevel.

Frequently in sorting a large collection of arrowheads two or more may be found that are so similar in size, shape and technic as to suggest having been made by the same hands or gauged by the same pattern.

The Algonkian tribes used triangular points, popularly termed "war points," but as a general rule did not make them with the same degree of skill as the later Iroquois. In most cases, too, the Algonkian point is larger than the Iroquois. Certain Algonkian sites, as at Owasco lake and Castleton-on-the-Hudson, yield triangular points almost to the exclusion of other types, but these sites seem to have belonged to the period of Iroquoian influence.

Knives. Chipped stone knives are commonly found on Algonkian sites. Frequently knives are confused with spearheads, and, indeed, many knife blades might have been employed as spear points and vice versa. The distinguishing feature of a knife is its curved edge. Most knives are thinner than spearheads and have a more even edge, which when tried by the thumb feels sharp. A spear may have a rough or an irregular edge. Many knife blades have no notched shoulders, and many of them are small; some are oval, some round, some lanciform and some petaloid. One type of the double-pointed blade has one of the pointed tips slightly notched on either side, but on unmixed sites these are very rare and seem to be the products of another culture. Algonkian knife blades are made from better material than spearheads and arrow points. The material is better chosen and free from defective spots. Some very fine specimens of knif blades are made from jasper, chalcedony, quartz and fine grades of chert. Many are of unusual length, from 6 to 10 inches or more.

Scrapers. Scrapers are commonly found on sites of the Algonkian occupation. Several forms occur, due in some measure to the different ways in which scrapers were used, as with or without

Certain types of New York drill points. x 9/10. From Algonkian sites.

1, shouldered drill of yellow, orange and red jasper, Onondaga co.; 2, mottled chert drill, Ontario co.; 3, black chert, Livingston co.; 4, waxy black chert, Livingston co.; 5, drill pointed blade, Schoharie co.; 6, shouldered drill, Albany co.; 7, waxy light gray chert, Nunda; 8, gray chert, Monroe co.; 9, Oneida co.; 10, Monroe co.; 11, Schenectady co.; 12, Genesee co.

handles. One common form of the scraper is that having one side, the under, a smooth curved surface, and the other humped or "turtle backed." Scrapers of this kind may or may not have been employed in handles, but very few of them are notched at the handle end. A second form is chipped on both surfaces but the scraping edge is beveled one way, to give a chisel-like surface. Many of this type are stemmed and notched. A third form is made from abruptly broken arrow or spearheads. The fractured edge is simply chipped back from one side to provide the chisel edge for scraping. Scrapers are also made from flakes and many were formed from larger blades, the sides of which were used for scraping and not the ends. Some knife blades show that the upper or handle-end was used as a scraper. Of course not all scrapers were made of chipped flint, chert and similar materials. Some were made of tough slates, granites and sandstones, and ground down in the form of small adzes. These come under the head of polished stone implements.

Perforators or drills. Perforators are found on Algonkian sites but probably none have been found on Iroquoian sites that are original. Several types of perforators are found on sites of the Algonkian occupation. Among these may be mentioned the long slender shafts of flint or jasper that are of nearly uniform diameter. These may or may not have shoulders and necks. The usual type may have been fastened to a shaft so as to permit its use on a rotating spindle driven by a bow string or by the motion of a pump drill. Another type has a very rough and massive top, as if this were a handle to be used without a spindle. Not all so-called perforators were in reality drills; at least not all were constantly used as such, for both human and animal bones have been found pierced by them in such a manner as to indicate their use as arrow points.

Other chipped implements. Algonkian sites yield several chipped forms not to be classed as projectile points. Among these may be mentioned chipped hoes of shale, chipped celts, choppers, disks and sinkers.

The implements termed hoes may or may not be hoes, but the shape of the broad blade has suggested this use-name. Hoes are usually chipped into shape from layers of shale or sandstone and usually have a noticed neck and a broad chopping end chipped sharp. Very few show much evidence of having been used to such an extent that the end is polished through friction in the soil. Not many hoes are to be found in collections, perhaps for the reason that the form is unattractive to the amateur collector and farmer.

Plate 7

Certain types of New York spear points. $\times \frac{7}{8}$.

1, Seneca river; 2, weathered chert, Lysander; 3, coarse chert, Lysander;
4, dull gray chert, beveled, Lysander; 5, waxy gray chert, Seneca river;
6 coarse dull chert, Lysander.

The greater number known to and found by the writer are from the Susquehanna valley, the Chenango valley and the Genesee valley. A simple illustration (see plate 8) is sufficient for the purpose of identifying these objects.

Hoes are sometimes chipped from flat pieces of shale. They are celt-shaped and the cutting edge may or may not appear to be sharpened by rubbing and grinding. The average specimen is simply chipped.

Choppers are generally made from thin, flat, waterwashed pebbles of a size larger than an adult hand. One end is chipped acutely for the working edge. The greater portion of choppers, which may or may not be notched, come from littoral sites, either on Long, Staten, or Manhattan islands or from the Westchester coast. Some have been found along the Hudson and even on inland Algonkian sites.

Disks of various sizes have been found along the Susquehanna. A considerable number come from the Chenango and Chemung valleys but specimens from the tributaries of all these streams are to be found. As a rule these disks are chipped from flat layers of sedimentary rock, except slate, and in thickness are from one-fourth to one-half of an inch. Many have been found down the Susquehanna as far as below Wilkes-Barre. These disks are sometimes termed "pot covers" perhaps because they are round, are notched in many instances and because the larger specimens are about the size of the top of a small pottery vessel. Those who use this term, however, forget that the greater number are much too small to be pot covers, unless all pots with three inch tops have "crumbled into dust upon exposure to the air." It seems far from improbable that notched disks were simply a local form of the common net-sinker.

Stone Tools

Hammerstones. Nearly all Algonkian sites are characterized by the abundance of hammerstones. Several types are to be found, ranging from a naturally formed pebble or small cobble to an artificially formed grooved head, symmetrically shaped and polished. The commoner types are ordinary cobbles that show evidence of impact; discoidal pebbles with pits in the center on either flattened side (the ordinary pitted hammerstone); and chunks of chert and quartz that have been battered into spheroids by much use. There is nothing more distinctive in Algonkian hammerstones than these battered ball-like hand hammers (see fig. 127).

Stone chopper or hoe, from Chenango Forks

Pestles. The ordinary Algonkian pestle is cylindrical in form and long. The diameter varies from $1\frac{1}{2}$ inches to 4 inches. A few pestles are as short as 6 inches but the average form is approximately 14. Exceptional pestles have been found with lengths above 18 inches and ranging up to 24. Along the Hudson river from Catskill to Glens Falls, and along the Seneca river, pestles have been found with the effigies of animal heads at the upper or handle ends. In most cases the head bends at a slight angle. Along the Seneca river some pestles seem to be phallic. These may have been used as clubs (see plate).

Stone mortars. Stone mortars are not to be regarded as common, though one should not consider them rare. In proportion to the number of stone pestles, however, mortars are exceedingly scarce. Most of them are made from small boulders hollowed out, apparently, by a considerable expenditure of time and energy. The cavities vary from mere hollows to cups 3 to 5 inches deep. A few New York specimens are double faced.

Metates. Most of the grinding or mealing stones found in Algonkian sites are flat pieces of shale or sandstone, of convenient size and thickness. One surface usually shows that it has been depressed and smoothed by the rubbing of a muller, and the reverse generally is pitted and scarred as if used as an anvil in the breaking of chert or other hard stones. It is quite likely that earthen pigments, burned stone and other hard mineral substances were reduced in mortars and metates, and that they were not merely used in the preparation of vegetable meals and hominy.

Mullers. For cracking and grinding substances on the mealing stones, mullers were used. Mullers are fairly common on sites of this culture and may be recognized by the smooth and slightly curved underside. The more finished types are discoid and well shaped. In many instances the edges seem to have been used for hammering, and thus many of the finest specimens have a roughened circumference. Some mullers are polished on both sides and so nearly circular as to resemble quoits or game disks that might be rolled over the ice in contests of skill. For certain forms of mullers, see plate 130.

Celts. Stone hatchet heads, frequently called celts, are commonly found on Algonkian sites. There is much difference between the roughest of these specimens and the best. Some of the finest are highly polished and balanced with great nicety. The Algonkian people liked to bring out the grain of the stone and to reveal by polishing the mottling or the banded layers. Some of the best specimens are of granitic rock, many are of diabase and a few are of

Plate 9

Algonkian stone mortar and pestle. Onondaga county.

sandstone. There are very few specimens of polished flint or chert. Celts reveal all the processes of manufacture from the first rough chipping to the pitting process and the final polishing. There are some localities where celts appear to have been better made than in others. The Seneca River region is noted for its beautifully formed celts. There are more than two hundred in the Otis M. Bigelow collection.

In the ordinary symmetrical celt used by the Algonkian tribes there is little or nothing, save the site upon which it is found, to distinguish it from specimens made and used by Iroquoian or mound-building peoples. In other words, the celt is common to nearly all forms of aboriginal culture and variations are only local, unless we except extreme forms. The size of Algonkian celts varies from a length of 1 inch to 11 or 12. The average length is approximately 5 to 6 inches. (For forms see plate 115.) Consult Skinner; Coastal Algonkin.

Adzes. A celt with one side more flattened than the other may be regarded as an adz. This is easily determinable when the cutting blade is flattened on one side and beveled on the other. Some adzes have a slightly concaved underside and closely approach gouge forms. Adzes in general are finished with more care than celts. An interesting form of adz is that having beveled sides, that is to say with a cross section an approximate oblong with the upper corners ground off. Most beveled adzes are made with great care, the plain surfaces are smooth and the entire blade is well polished. It is not yet definitely established whether beveled adzes are original with the Algonkian culture or belong to the mound area in New York. They are not widely distributed and do not seem to be found on the coast.

Gouges. Gouges were made and used by the Algonkian tribes. There are several types of gouges and as many variations of types as the individual makers could produce. All have curved cutting edges and are concaved on the underside. The backs may be round, flat or beveled. The types are those having, first, a short scoop, leaving the remainder of the implement ungrooved; second, the trough or channel running the entire length of the implement; third, the type with knobs or a groove on the back for fastening the handle. Some gouges have the butt end sharpened as a chisel. Gouges when hafted were fastened much as adzes, to a **T** handle.

Many Algonkian gouges are finely formed and polished. They are not so common as celts and as specimens are considered more valuable than adzes or celts.

Fig. 2 Gouge

Fig. 3 Grooved axe

Grooved axes. The grooved axe is typical of the Algonkian culture. The Iroquois did not use it, but mound-building Indians did. In New York grooved axes are larger and heavier than any other form of hafted cutting blade, though small specimens are not wanting. So far as our knowledge goes, nearly all New York forms have the groove at right angles to the medial line of the object, that is, straight across and not slanted. New York grooved axes are not fluted like some western forms.

Grooved axes in New York may be considered rare but they have been found in nearly all parts of the State where there are Algonkian sites. Some of the largest specimens come from the valley of the Hudson, Long island, Westchester county and Staten island. (See plate 125.)

Grooved club heads. These are considered rare objects. The State Museum has a number of specimens, some of which are made from natural pebbles of granite or other hard material, and some of hard rock dressed to shape and grooved. Some club heads show no rough usage, the rounded ends being quite smooth. Others seem to have been used as mauls or hammers. Club heads are always grooved on the short diameter. (See plate 126.)

Grooved weights. In certain localities naturally formed ovate pebbles of quartz or other water-washed stone are grooved around the long diameter. The grooves are distinct and are picked or beaten in by percussion. Just what these objects are is not certain for they may have been used as bola stones, as net weights, or inclosed in rawhide envelopes as loose heads of small war clubs. They are found in western New York sparingly, along the Genesee, about Irondequoit bay, in the Mohawk valley (rarely), in the Schoharie valley, about Otsego lake and along the Hudson. Many specimens have been found on Algonkian sites near Coxsackie. Skinner illustrates some from coastal sites in New York.

Sinew stones. Sandstone pebbles are sometimes found, having the surfaces and edges abraded and worn in such a manner as to resemble large pieces of beeswax upon which cords or shoemaker's thread had been rubbed. Many of these implements are neatly made and the grooves are regular. They are commonly called sinew stones from the idea that they were used for smoothing thongs and sinew cords. This seems to be a possible use. A surprisingly large number are abruptly broken so that complete specimens are comparatively rare. Complete sinew stones are rarer than bird stones in New York. (See plate 136.)

Plummets. Stone plummets are among the rarer of the problematical objects found within the State. A number of specimens have been found along the Seneca river and near Oneida lake, others northward along Lake Champlain. Two fine specimens found by Prof. D. F. Thompson are of picked limestone. They were found at Green Island, N. Y., and are similar to specimens from Maine. Other specimens of this variety have been found along the Hoosick river which flows as a boundary between Washington and Rensselaer counties. Two specimens from Brewerton have necks less well defined with a groove running over the top. Another variety of plummets made of polished talc comes from Jefferson county. One specimen is cigar-shaped with a knob formed at the blunt end probably as a means of suspension. One from Lysander made from a natural pebble slightly worked has this same characteristic, but with the addition of tally marks on one side. A finely finished specimen is from Caughdenoy, Oswego county. None of the plummets from this area are polished. Plummets do not occur on all Algonkian sites, and indeed it is a question whether or not some of them do not belong to another culture quite different from that which we recognize as Algonkian. Ungrooved axes, gouges, wide arrow points and spears are associated with plummets. (See plate 10.)

Bola stones, "plummets" and spool-shaped stones

1, Bola stone from Patagonia; 2, North Troy; 3, Genesee co.; 4 Brewerton; 5, Brewerton; 6, Lysander; 7, 8, spool shaped stone, Coxsackie; 9, grooved spool, Coxsackie.

Spool-shaped objects. Stone spools picked from tough stone have been found along the Hudson river from Catskill to Glens Falls. They are simple cylinders concaved and are not more than 2 inches in length. The ends do not show usage. (See plate 10.)

Steatite vessels. Fragments of soapstone pottery are found in nearly all parts of New York. Complete vessels in this State are extremely rare, only two specimens being in the State Museum. The great abundance of the fragments in certain localities shows a wide and prolonged use of this type of dish. Many fragments have lugs or projecting handles and some show perforations as if cracks had been tied by cords passed through holes on either side of the fracture.

One complete specimen was found in Saratoga county. It is a thick, heavy, ellipsoidal dish with lugs, and was used as a mortar

Fig. 4 Steatite mortar found at Saratoga. The interior is encrusted with pulverized iron oxide. $\times\frac{1}{2}$

for crushing red iron oxide. The pigment thickly encrusts the interior of the vessel. A second specimen is a small thin vessel shaped like a shallow ovate bowl. Unlike the first specimen, it is smoothly finished throughout.

The Iroquois did not use steatite dishes, and fragments are found only on Algonkian and on Eskimo-like sites. A few fragments have been found in the Genesee valley associated with bell pestles.

Faces or heads of stone. On certain Algonkian sites, particularly those influenced by the Delaware, effigies of human faces or heads are found. At least two such faces from the State are good pieces of aboriginal sculpture. The human features on these specimens are well modeled. Other specimens are more or less grotesque or

Stone human face effigies. 1 Chemung valley; 2 Mohawk valley. $\times \frac{7}{8}$.

conventionalized. Some are merely indicated by incised lines and others by dots or drilled depressions. The Delaware used faces of stone or wood in their ceremonies. (See plate II.)

Pipes. Stone pipes have been found on Algonkian sites, but they are not numerous. There are several forms, ranging from rude bowls to beautifully formed platform monitors. One typical form is that having a tubular bowl bent at a slight angle from a flattened or beveled stem. This form is sometimes copied in clay, though the stem is thicker and the bowl shorter. The material of the stone pipes is usually steatite, or some allied substance.

Micmac pipes, so-called, have a barrel-like bowl resting upon a rather slender short stem which sets upon a flattened rectangular

Fig. 5 Micmac pipes found in central New York

projection. This may be decorated with incised lines and have a hole drilled through it. Micmacs are found in northern New York but may be considered fairly modern, some showing the marks of steel tools. They are the most ornamental forms of Algonkian stone pipes, some having animals carved in relief on the bowl. (See figure 5.)

Polished stone articles. On most Algonkian sites one or several forms of polished slate articles are found. Among these are banner stones, boat stones, bird stones, bar amulets and gorgets. Other minor forms are found, as pendants and perforated discoids. That these articles were used by the Algonkian tribes is proved by finding them in process of manufacture on village sites and in "workshops."

Such specimens are usually made of local stone, but finished articles may be and frequently are of extralimital materials, as Huronian slate. The polished slate culture is described in the chapter on the mound-building people (see page 83).

Fig. 6 Horned banner stone of striped or "Huronian" slate, from the Seneca river near Baldwinsville. $\times \frac{2}{3}$

Fig. 7 One holed gorget from Baldwinsville. $\times \frac{3}{4}$

It may be well to keep in mind that none of the polished slate "problematical forms" seems to be complete in itself, but appears rather to be parts of other and more complex objects. This makes the problem of determining their use all the more difficult. It is

significant that polished slates were used by both Algonkian and by the mound-building tribes. The Iroquois did not use them.

Pottery. Algonkian pottery in its fully developed form is distinctive, and an experienced collector soon learns to recognize it at a glance. Its characteristic features include both form and decoration, though in a measure the texture of the clay may also serve as a guide. Many Algonkian vessels are ovoid, with the small end down and the large end open for the mouth of the jar. There is considerable variation as the accompanying illustration shows. The Iroquois exercised a considerable influence upon the Algonkian potters and it may be readily believed that the Algonkian people acquired

Fig. 8 Algonkian pots. 1 from Shinnecock Hills, L. I. 2 from Susquehanna valley. Shows Iroquoian influence. $\times \frac{1}{4}$.

by trade or otherwise many Iroquois pots. In numerous instances potsherds and even completed vessels show how the Algonkian potter endeavored to imitate Iroquois decoration, but in most cases Algonkian technic betrays itself. (See plate 12.) The Iroquois made bold free strokes and his patterns were striking; the Algonkian imitator made fine uncertain lines and his attempts at patterns were "fussy." In its external markings, however, the true Algonkian pottery was of three general sorts: (1) cord marked, as if the entire surface of the plastic clay had been wrapped in a coarse bag made of loosely woven fabric, or had been patted over by pads of coarse fabric; (2) stamped with wooden dies or impressed with notched or checkered sticks; (3) marked over the body by natural objects

Plate 12

Types of coastal Algonkian pottery, Alanson Skinner, collector. Nos. 1 and 2, Old Place; 3, 4, 10, Tottenville; 5, 6, 7, 8, 9, Wachogue. Only the first four sherds are true to type, all others show Iroquois influence, except possibly 10.

Plate 13

Algonkian clay vessel from Chenango Valley. Otis M. Bigelow collection, State Museum. $\times\frac{1}{3}$.

such as sea shells, as by the edge of a scallop shell, bark reed, fingernail etc. Nearly all true Algonkian forms show impressed patterns, as opposed to the general Iroquois method of drawn patterns that dug into the clay and left the markings.

As a rule Algonkian pots not influenced by the Iroquois have no overhanging rims, and no collars. A vast number of Algonkian pots-herds show that the decoration was carried over the rim and down into the neck of the pot.

Complete Algonkian vessels are not common and few museums have more than three or four specimens. Some found in fragments have been restored.

Fig. 9 Pottery vessel of Algonkian type from Ouaquaga. Yager collection. $\times\frac{1}{5}$

Pottery pipes. Algonkian pottery pipes in New York seldom approach the beauty of form or finish of either their own stone pipes or of Iroquois clay pipes. The earlier Algonkian clay pipes are crude, some being almost childish in modeling. In later sites there is considerable improvement until in some inland sites pipes have arrived at a definite form and are well made. Decoration is

Plate 14

1

2

3

4

5

6

7

8

9

10

Pipe fragments of pottery from Staten island localities. Staten Island Arts and Science Association collection. 1, 2, 4, 5, 8, 9, 10, from Mariners Harbor; 3, 7, Watchogue; 6, Tottenville.

Plate 15

TYPES OF ALGONKIAN PIPES FROM NEW YORK

1 and 2 are from a single grave in Madison county
3 and 4 are typical Cayuga county Algonkian forms

both by modeling and by impressed designs. Modeled ornamentation seems late and the result of external influence. (See plates 14, 15.)

In shape, the Algonkian pipe takes several forms: (1) the long, straight, conical tube with the bowl but slightly expanded, decorated and undecorated; (2) the bent tube, with the bowl having a slight upward turn; (3) the flat or thin beveled stem having a bowl at a slight angle, imitating stone forms; (4) the bowl at nearly right angles, the stem either round or slightly flattened, the whole resembling a bent human arm, the stem being the arm to the wrist and the bowl a portion of the upper arm. The elbow bend and the tip are copied in most instances. The real prototype may have been a bark tube or cornucopia with one end bent slightly upward for the bowl and the longer portion flattened out as a stem that could be conveniently held in the mouth. A little experimentation with a piece of birch bark will demonstrate the possibility of this.

Copper implements. Articles of native copper are sometimes found on Algonkian sites; indeed, wherever polished slates are found copper objects may be expected. These include spearheads and arrowheads, gouges, chisels and adzes, small hatchets, mattocks, awls, fishhooks and bead ear ornaments. Copper articles are among the rarest of New York specimens. Most have been found on the surface but a number have been taken from mounds and from graves. Not all are Algonkian by any means; indeed it is doubtful if the New York Algonkins ever made copper implements. Those that they had were probably acquired from extralimital sources through trade or otherwise. They are probably of mound culture origin, the material coming either from Virginia or from the Lake Superior region. No native copper implements are tempered, the hardness that they do possess being due to the hammering and annealing process.

Bone and antler implements. Algonkian bone implements in New York may be considered relatively numerous and some sites, especially on the coast, along the St Lawrence and about Oneida lake, have yielded several thousand good specimens and many more fragments. These articles include awls, beads, blades, harpoon heads, tubes, perforated teeth, arrowheads, antler punches, needles, shuttles, turtle shell cups, etc. Articles of walrus ivory are sometimes found along the St Lawrence and pieces of cut whalebone have been found on Long island.

Village sites and fortifications. Coastal Algonkian sites cover fairly large areas and are characterized by more or less extensive

Plate 16

Implements of bone and ivory from Jefferson county. Many of the specimens in the R. W. Amidon collection (State Museum), from which these objects are selected, show a marked similarity to those of the Eskimo.

Plate 17

Implements of walrus ivory and bone from the R. W. Amidon collection
(State Museum), Jefferson county, N. Y.

refuse deposits of marine shells intermingled with animal bones and other waste material and occasional specimens of ornaments and implements. Some of these shell heaps are as deep as 8 or 10 feet, though most have a depth of 4 feet and less. Some coastal sites have good occupational layers with refuse pits and fire holes. Central New York village sites are near lakes or large streams and spread out over a considerable acreage, as if the village or camp was either not compact or that it was moved about in the same general spot. Very few sites away from the coast have the thick deposits of solid refuse found in places of Iroquois occupation, which may have resulted from the Algonkian custom of throwing refuse on the surface, to be destroyed by rodents and the elements, and thus preventing the accumulation of intrusive *débris* in the ground.

There were several Algonkian sites near Plattsburg on Lake Champlain, others near Coxsackie and at Croton point on the Hudson; in Central New York, at Owasco and Oneida lakes. Coastal sites have been described by Skinner and Harrington in American Museum publications, and in this work, pages 340-48.

The Algonkins built their villages on the flat land near navigable streams, and while they did have fortified refuges in the form of stockades, the remains of these are few and not impressive.

3 THE ESKIMO-LIKE CULTURE

In various localities throughout the State there are sites that seem to have been occupied at a very early period. The implements found are few and crude, with now and then the anomaly of some wonderfully fine specimen. The fire pits show little refuse and almost no bone, save fragments calcined by heat. In some of these sites fire-cracked stones are abundant. Graves are shallow and show no trace of osseous substance.

So far we have described nothing especially characteristic, but when we discover on sites like these semilunar knives of slate and rubbed slate double-edged knives and projectile points, we have something as a guide (see plate 18). Associated with these objects are found fragments of soapstone pottery. Chert arrowheads are broad, large, and have sloping shoulders. Some are almost lozenge-shaped and many have thick, wide necks as if used as lance or harpoon heads. Celts and polished stone scrapers are found on these sites as also are chert scrapers and perforators. On a few of these sites bone harpoons have been found in ashy deposits (see plate 17). Dr O. C. Auringer found a beautiful walrus ivory dirk

Slate knives and semilunar chopper from central New York sites. $\times \frac{3}{5}$
 1, 2, VanBuren, Onondaga co.; 3, Lysander; 4, Brewerton; 5, Glens Falls;
 6, Hudson.

in a fire pit near Troy and associated with it on the site crude and much weathered flints. In some sites of this general cultural horizon will be found gouges, hemispheres of hematite, figurines, ornaments of unusual shapes, and many other unfamiliar artifacts.

It is evident that sites of this character are not Iroquoian, that they are not of the clay pot using Algonkian tribes, and that there is little distinctive in them resembling the mound-building people, except for an occasional bird stone. A study leads to the conclusion that sites of this character were once occupied by a people influenced by the Eskimo, if not actually by the Eskimo themselves. Our investigation points out that the influence came from the north, especially the northeast.

It would be difficult to indicate any special center in this State from which this culture radiated. The area showing traces of this Eskimoan influence are: (1) the St Lawrence basin to Clayton; (2) the east and south shore of Lake Ontario from Clayton to Irondequoit Bay; (3) the Genesee valley; (4) the Finger Lakes region, including the entire drainage basin; (5) the Champlain valley; (6) the Hudson valley to Albany. Scattered relics are found in Western New York and in the valleys of the Susquehanna and Delaware with their tributaries. The culture thins out as it ranges south, but it may be expected to appear in Vermont on the east and even in Massachusetts. Not much may be expected in either Pennsylvania or Ohio.

Many of these so-called Eskimoan sites appear to be of great antiquity, while others seem closely to approach the period of the middle Algonkian tribes. Indeed certain Algonkian sites that date to the opening of the colonial period seem in some ways to have been influenced by this northern culture. It is quite likely, therefore, that the period of influence was a lengthy one. We may even be permitted to ask several questions concerning the people who left these evidences, these questions to constitute the problem set forth for solution by students of archeology. First, we may ask were the people characterized by this culture Eskimoan? Second, if they were not of Eskimo stock, who were they? Were they Boethuck or Algonkin? Third, did not some undetermined people copy certain features of Eskimoan culture? Fourth, were these people exterminated, driven back to the north, or were they absorbed by later comers to perpetuate some of their arts?

It is possible that some time a painstaking student may discover and open up a site that will answer some if not all of these inquiries.

Until then we may only point out the differences that we observe between these sites and others and cautiously state that culturally they resemble those of the Eskimo.

4 THE MOUND-BUILDER OCCUPATION OF NEW YORK

There was a time when western New York was regarded as peculiarly the domain of a mysterious Preindian race known as the "mound builders."

Observers, astonished by the existence of earthworks and other prehistoric tumuli, have written elaborate descriptions and devoted considerable space to more or less melancholy speculation. The term "mound builder" became quite as romantically wonderful in the new world as that of Druid did in the old.

The mounds and earthworks of Ohio early attracted interest, and especially as the colonists pushed westward and cleared new land for settlement or agriculture. Thus we find such early authorities as Thomas Jefferson, Benjamin Franklin, President Ezra Stiles of Yale and Noah Webster advancing theories about the builders of the mounds. The first extended discussion of the subject was written by Dr Benjamin S. Barton, who in 1797 published his work on "New Views on the Origin of the Tribes in America." In this work he advanced the theory that the mounds were not built by Indians but by "A people of higher cultivation, with established law and order and a well-disciplined police." Doctor Barton seems to have been the first writer to advance the notion of a "lost race."

Soon after Doctor Barton's book appeared two other writers discussed the subject, Bishop Madison of Virginia and the Rev. T. M. Harris of Massachusetts. Mr Harris thought the mounds proved their builders possessed superior skill and were of higher civilization, but Doctor Madison, who had traveled widely and studied the mounds and their antiquities, saw nothing in the evidence to convince him that the mounds were not the product of the Indians. Each of these observers was a pioneer of different schools of belief, but for more than half a century those who believed in "a lost race of civilized men whom the Indians displaced or annihilated" controlled public opinion on the subject. Even today there are many who puzzle over the "mysterious race now departed." J. P. McLean, for example, who in 1879 published his book on "The Mound Builders" commenced his first chapter thus: "An ancient race, entirely distinct from the Indian, possessing a certain degree of

civilization, once inhabited the central portion of the United States." In his preface he sums up the popular idea in the following: "The mystery surrounding these lost people creates a fascination which is greatly increased in the mind of the student of nature as he lingers among the ruins which invite his attention and rivet his eye. Standing upon one of the monuments the lover of the mysterious will lose himself in meditation. . . ."

Beside the many local antiquarians and historians in New York such men as Henry Schoolcraft, E. G. Squier and Dr F. H. Davis, Franklin B. Hough, T. Apoleon Cheney and Dr Frederick Larkin,¹ described, surveyed and speculated upon the earthworks of New York.

Wonderful things are ascribed to this ancient race, which is described by the early writers as highly civilized, as making implements better than the Indians possibly could and as erecting earthworks that proved them quite familiar with geometry. One writer even pretends to have discovered how the mounds were erected. He claimed to have found a copper tablet having engraved upon it a mastodon in harness.¹ This is said to have been sent to the Smithsonian Institution but it seems never to have reached that place.

Archeologists who have spent many years in excavating mounds and who have studied the problem of the mounds and the builders of the mounds have discovered many facts that prove the fallacy of the old fancies concerning them. Among those who have explored, observed and written in the modern methodological way are Cyrus Thomas of the Smithsonian Institution, Dr William H. Holmes, Prof. Lucien Carr, Prof. F. W. Putnam of Harvard, Prof. William O. Mills of Ohio State University, Prof. Warren K. Moorehead of Andover and Dr Clarence B. Moore. Many other investigators have studied the question in the field and after extended scientific observations and by careful comparison have drawn their conclusions. From a lengthy consideration of a wide range of facts we now are warranted in believing the following facts fully established:

- 1 The builders of the mounds were Indians of certain tribes whose descendants still live.

- 2 The aboriginal artifacts found in the mounds were made by Indians and no native object found in the mounds differs from objects that Indians at the time of the discovery, made or were able to make.

- 3 Many true mounds of considerable size are not very old, but

¹ Larkin, Frederick, in "Ancient Man in America," Randolph, N. Y., 1888.

contain in inclusive deposits objects acquired after the coming of the Europeans but such objects are not found in New York State.

4 Early explorers saw mounds in the course of erection. They have preserved accounts taken from the Indians explaining why and how the mounds were erected.

5 The mounds were not all erected by the same tribe, but by different tribes according to locality.

6 The links connecting the Indians with the mound builders are so firmly established by historic and archeologic evidence that archeologists now know them to have been one and the same people.

7 All these conclusions with others are sustained by the explorations conducted by trained observers employed by scientific institutions. The best summary of results is contained in the Twelfth Annual Report of the Bureau of Ethnology, a department of the Smithsonian Institution.

The earthworks of aboriginal origin in New York are broadly divisible into two classes: (1) walled and trenched inclosures, (2) mounds.

With very few exceptions all the fortifications or walled inclosures in New York may be ascribed to the Iroquoian tribes. These earthworks outline retreats or strongholds, and the earthen walls were the bases for stockades. In no sense are these banks and earth walls to be regarded as mounds. None of them was erected by mound builders unless we include the Iroquoian tribes as mound-building Indians, since the Iroquois did occasionally build low mounds.

In New York the mound-builder culture is not always coincident with the presence of mounds. Scattered relics of this culture in the form of monitor pipes, gorgets, banner stones, stone tubes and even isolated burials and stone graves indicate the one-time presence or cultural influence of the "mound-building" Indians.

For the purposes of our analysis it is our intention to treat the mounds of New York as one phase of an ethnic culture. We are enabled by this method to treat other evidences of that culture without necessarily confining our descriptions and facts to an immediate association with mounds, though we take our datum from them.

It is not easy to define the boundaries of this culture because the implements and ornaments that it produced are in many respects similar to some of those made by both the Algonkian and Iroquoian peoples in New York and the adjacent territory, but an examination of the mounds in the western portion of the State gives us certain facts upon which to base our observations. Even in a larger way the Ohio mounds afford us a basis for comparison.

New York mounds and the occupied sites contiguous to them, particularly those in Cattaraugus, Chautauqua, Erie and Livingston counties, indicate that the people of the mound culture used (1) platform pipes, (2) grooved axes, (3) celts, (4) adzes, (5) gouges, (6) gorgets, (7) banner stones, (8) boat stones, (9) bird stones, (10) stone tubes of several varieties, (11) native copper implements and ornaments such as chisels, celts, spearheads and arrowheads, beads, ear ornaments, etc., (12) numerous flint drills or perforators, (13) shell beads, (14) pearl beads, (15) mica ornaments, (16) bone and antler implements, (17) notched and triangular arrowheads and spearheads, (18) hematite articles, (19) pottery, (20) discoid stones, (21) concaved disks, (22) cylindrical and bell pestles, (23) were a village-dwelling people, (24) that they buried in small mounds, (25) cultivated corn and other vegetable foods and tobacco, (26) made woven fabrics.

The evidences of the mound culture are more numerous in extreme western New York than east of the Genesee river. The culture seems to have entered the State along the shores of Lake Erie and up from the Allegheny river. Chautauqua, Erie and Cattaraugus counties thus contain a larger number of mounds than do other portions of the State, though certain other sections, as the Genesee valley, have yielded relics in abundance.

The regions showing the greatest evidence of the mound culture are: (1) the south shore of Lake Erie from Westfield to the mouth of Cattaraugus creek, (2) the valley and terraces of the Cattaraugus to Gowanda, (3) the Allegheny valley, (4) the valley of Chautauqua lake and the Chadekoin river, (5) the Connewango valley, (6) the Cassadaga valley, (7) Clear Creek valley, (8) the valley of Buffalo creek, (9) the valley of Tonawanda creek eastward to the overland trails to the Genesee, (10) eastward along the Allegheny valley from Bradford northward along the tributaries, thence overland to the Genesee valley, (11) the Genesee valley from Portageville to the mouth of the river, (12) Irondequoit creek, (13) Canandaigua Lake valley, (14) the region of the Finger Lakes, to the Seneca river, (15) the valley of the Seneca river, (16) southward and about the southern shores of Oneida lake, (17) scattering relics along the Oswego river, (18) Jefferson county along the shores of Ontario and the lower waters of the neighboring creeks, (19) the St Lawrence valley, (20) south of the Finger Lakes, especially along the headstreams of the Susquehanna and of the Delaware are scattering relics, (21) portions of the Hudson valley, as near Athens.

Mound-culture Sites

Mounds in New York have had no systematic examinations despite the large amount of work done by amateurs in excavating them. It is safe to say that the possibility of making a methodical examination is now reduced by two-thirds, through the vandalism of inexperienced relic hunters. Many mounds have been scraped down merely to level the ground and others have been scraped into by spade and horse scraper to find what "valuables" they might contain. Few records have been kept and not all that have been made are reliable. An examination of the most reliable records available makes possible the descriptions of the typical mound-culture sites given below:

1 Mound on a terrace above the Conewango valley at Poland Center, Chautauqua county. This mound was first described by T. Apoleon Cheney in the 18th Report of the New York State Cabinet of National History for 1860.

When examined in 1905 the mound appeared to have been considerably demolished by excavations, but in size it still remained one of the two highest of which we have any knowledge within the State. It stands several rods back from the edge of the terrace and amid the gloom of a thick forest growth. It's still 9 or 10 feet in height and with a diameter of about 64 feet. There seem to be the remains of an outer wall and trench surrounding the mound, but the débris from excavations, the deep leaf mold and fallen trees make this difficult to determine. Some fragments of notched flints are to be found in the soil about the mound and it seems to lie in what was once a village site but on account of the character of the ground this is not easy to establish. Certain it is, however, that the flat land immediately below the terrace shows signs of occupation. Numerous celts, notched spears, soapstone pipe fragments, a beautifully formed stone tube and several gorgets have been found. The culture represented seems similar to that of the Ohio mound area. It is interesting to note that Cheney claims that eight skeletons buried in a sitting posture were excavated from this mound. Cheney's plan is shown in plate 20. Many of his speculations are specious.

Cheney's report on this site is as follows:

The tumulus, represented upon plate III, from the peculiar construction of the work and the character of its remains, appears to belong to a class of mounds different from any others embraced in this exploration. It is located upon the brow of a hill, still covered by the ancient forest, and overlooking the valley of the Conewango. This work has some appearance of being constructed with the ditch and vallum outside of the mound, as

CONEWANGO TP.

LOT 45 R. IX.

Cattaraugus Co. N.Y.

Scale
250 ft. to an inch

in the Druid Barrows, but perhaps more accurately belongs to the class composed of several stages, as the Trocalli of the valley of Anahuac. The form of the tumulus is of intermediate character between an ellipse and the parallelogram; the interior mound, at its base, has a major axis of 65 feet, while the minor axis is 61 feet, with an altitude above the first platform or embankment of 10 feet, or an entire elevation of some 13 feet. This embankment, with an entrance or gateway upon the east side 30 feet in width, has an entire circumference of 170 feet. As previously remarked, the work itself, as well as the eminence which it commands, and the ravine upon either side, are overshadowed by the dense forest. The remains of a fallen tree, imbedded in the surface of the mound and nearly decomposed, and which from appearance, had grown upon the apex, measured nearly 3 feet in diameter, and heavy timber was growing above the rich mold it had formed. Thus we had some indicia of the age of this work. The mound indeed, from the peculiar form of its construction, as well as from the character of its contents, has much resemblance to the Barrows of the earliest Celtic origin, in the Old World. In making an excavation, eight skeletons, buried in a sitting position and at regular intervals of space, so as to form a circle within the mound, were disinterred. Some slight appearance yet existed, to show that framework had inclosed the dead at the time of interment. These osteological remains were of very large size, but were so much decomposed that they mostly crumbled to dust. The relics of art here disclosed were also of a peculiar and interesting character — amulets, chisels &c., of elaborate workmanship, resembling the Mexican and Peruvian antiquities.

2 Burial mound on the south bank of the Cattaraugus creek in Chautauqua county, near Little Indian creek. This is just above the Gold diggings in Indian Mill gulf. The mound is one of the largest in the State but not more than 8 or 9 feet in height, though it shows evidence of having been plowed considerably.

It is about 30 feet in diameter. The fields about the mound show evidence of early occupancy, notched points of flint and chalcedony have been found. Several skeletons have been taken from the mound and E. R. Burmaster in 1914 sent the State Museum a fine skull from it. Accompanying relics are recorded to be four notched spears or knives, a copper chisel and a knobbed end lunate banner stone. The pottery is cord marked. During a visit to this mound with G. L. Tucker and E. R. Burmaster, the latter found half of a fish effigy.

The mound stands on the edge of the bluff and a portion has fallen over. Almost exactly north and across the Cattaraugus on the opposite and corresponding terrace are two other mounds. They are reached from the horseshoe bend of the Irving road by taking the road up the hill at this point. Doctor Benedict of Buffalo made some excavations here during 1901. The ground about the mound is strewn with flint chippings, and a number of arrow points, celts

and a pestle have been found. The excavation from which the earth was taken for building the mound is still visible to the north.

3 Near the mouth of the Cattaraugus on the north side are several large sites each covering from 50 to 100 acres. Several occupations are apparent, but the influence of the mound culture is plainly evident. On the site nearest the mouth of the creek was a mound since removed by the local sand company. Skeletons and portions of a buffalo skull were found by E. R. Burmaster in 1914.

(George L. Tucker, photo).

Fig. 10 View of the mound on the south side of the Cattaraugus, near gold mill gulf

The adjacent village site has yielded innumerable notched sinkers, several bird stones, banner stones, celts, gouges, grooved and notched axes. Several broken monitor pipes, one complete form and one clay pipe and several fragments of thick cord-stamped pottery were found by Mr Burmaster. Chipped flints are numerous. The forms are notched arrow points of several types, scrapers, drills, spears and knives. Long flakes of chalcedony and jasper are also found.

4 A mound on a hilltop near Napoli, Cattaraugus county, had within it a stoned-up vault. Some of the flat stones yet remain but the mound has been nearly destroyed. Several gorgets, spears and celts were found within the vault by Dr Frederick Larkin early in the seventies of the last century. Doctor Larkin described the mound to me in 1905. He found human remains in the vault.

5 A mound burial near Tonawanda creek excavated by Jacob Doctor contained a banner stone, a bird stone, a bar amulet and two

Plate 21

Tubes and pipes from Mound Builder sites in New York

gorgets. The mound is about 4 feet high, 25 feet in diameter and situated on a gentle slope on the Tonawanda reservation, near Indian Falls, Genesee county. The neighboring fields yield numerous notched flint spearheads and arrow points.

6 An isolated burial near Athens, Greene county, and near the Hudson, contained a pendant gorget, more than one hundred native copper beads, globular shell beads and pendant columella. Burials here have yielded banner stones.

7 On the John F. White estate at Squawkie hill, Mount Morris, are three low mounds. All contained graves, boxed by stone slabs, the upper edges of which projected above the surface of the ground. These graves contained two highly polished and finely formed monitor pipes, many perforated pearls, two copper chisels, a copper double cymbal ear ornament held by hollow copper rivets, two gorgets, two celts and several finely chipped notched spears or knives. In the fields about the mounds have been found numerous flints, many celts and several grooved axes, cylindrical and bell pestles, notched choppers, broken and complete monitor pipes, and one stone pipe bowl. There are numerous other objects, as broken implements, hammerstones, anvils and notched sinkers.

8 Several graves have been found in a gravel bank near Vine Valley on Canandaigua lake. None of the graves was opened by experts and hence there was no opportunity for close observation. The specimens found in the graves, however, are of exceptional interest. From one grave was taken a large tablet gorget (see plate 22), a copper chisel blade, a segment of a mastodon ivory dagger, an antler awl, a pendant gorget of bone, a bar amulet, a broken bar amulet and two stone tubes (see plate 24). From another grave was taken a stone tube, two long strings of shell beads, and a chipped knife, 10 inches in length. Fragments of a large cord-marked pottery jar were found similar to the Irving pottery found by Mr Burmaster.

Most of the objects above described are in the New York State Museum collections, though Mr John F. White has most of the Mount Morris material. Unfortunately the finding of the skeletons in mounds and on mound sites in New York is usually done by those who fail to observe the relation of the specimens to the skeleton. At other times the skeleton is far too greatly decayed to permit any knowledge of the relative position of the object, and therefore a proper conjecture as to the use of the so-called problematical forms.

We are able to state, however, that some of these burials would be considered ordinary in Ohio. The pottery resembles Ohio mound

Plate 22

Articles from the Middlesex site. Bone pendant, antler awl, slate gorget, copper chisel and portion of ivory dagger blade.

pottery, though no complete vessels have been found. The culture is plainly derived from the Ohio region and southward. Numerous sites along the central Finger Lakes and along the Seneca river have yielded an abundance of polished slates similar to Ohio, Indiana, Michigan and other areas in the mound area. The region about Oneida lake is especially rich. One site near Brewerton has yielded more than twenty copper objects, many gorgets and several banner stones. The Bigelow collection in the State Museum, embracing more than ten thousand articles, has numerous polished slates from this vicinity.

If we were to trace the route taken by the people of the mound culture we should follow both the lake shore of Erie and the valley of the Allegheny. Perhaps the north shore of Lake Erie was also a route for we find abundance of polished slates in the sites upon which the Huron and the Neutral and the Iroquois later intruded. The southernmost division in New York, we would say, dwelt about Chautauqua lake and the valley of the Allegheny, with its tributaries. We thus find true mounds in Chautauqua, Cattaraugus and Erie counties. The southern bands along the Allegheny and the Cattaraugus perhaps found a portage or a short overland trail to the upper waters of the Genesee, and the more northerly along the Tonawanda creek to the lower Genesee. The Genesee valley throughout most of its length is rich in artifacts of this culture, and the routes we have pointed out pass over and through sites where such objects have been found.

Apparently the presence of mounds and the artifacts of the mound culture represent the expansion of the parent culture beyond the limits of its home. Whether this was due to simple migratory movements, to exploring bands, to expatriated tribesmen or the pressure of warring enemies it is difficult to state. Perhaps all these factors contributed to the expansion of the mound culture.

European articles have not been found in undisturbed mounds or sites of this culture in New York. There are, it is true, occasional intrusive burials in these sites, but all of them appear to be precolonial and pre-Iroquoian. Whether some of them were contemporaneous with an Algonkian culture is another problem. The weight of evidence seems to be that this is the case. Certainly the material culture of the eastern Algonkins seems to have been considerably modified by this culture, just as the later New England tribes were modified by the Iroquois. It is quite possible, therefore, that the mound culture people intruded into the hunting grounds of certain Algonkian bands and established themselves.

Plate 23

String of shell beads, elk teeth and shell disk from a site in Middlesex
on Canandaigua lake

The accompanying map (plate 19) indicates the area occupied or influenced by the mound culture. It may be well to compare it with the map of the Algonkian occupation.

The mound-building people seem to have disappeared from New York at or before the time of the coming of the Iroquois into their recognized area of occupation. We can not be entirely sure, however, that all were driven out or exterminated. A survey of the earliest Iroquoian sites, especially in western New York, leads us to believe that the earliest Iroquoian immigrants were measurably influenced by the mound-building culture. This is so appreciable that one is led to consider three propositions as within the bounds of possibility: first, that the Iroquois were originally a part of the mound-building peoples who had separated themselves from the main cultural body; second, that the Iroquois in entering this region absorbed large numbers of the mound people and adopted certain of their culture traits and rejected others; third, that the early Iroquois were merely influenced at their early entrance by the mound culture.

Our present knowledge would lead us to conjecture that the Iroquoian hordes pushing up the Ohio came into conflict with the mound people and finally overcame them. We may then inquire whether or not the Catawba, Tutelo and Saponi do not represent the survivors of the vanquished peoples. We also pause to compare certain artifacts of the Muskhogean and early Cherokee with such mound objects, as the platform pipe. The earlier Iroquois sites frequently yield, especially in the graves, objects similar to those found in the mounds, but not gorgets, bird stones or related forms. To be explicit, the points of similarity between certain Iroquois forms and mound area forms, as between those of Ripley, N. Y., and Madisonville, Ohio, are certain pipes and certain pottery vessels. A prehistoric Iroquois site at Richmond Mills, N. Y., known as "The Old Indian Fort," has yielded metapodal scrapers, similar in every way to those found in Ohio mound sites. From these facts and from an examination of the entire field of the earlier Iroquoian occupation in New York and Ontario, we are led to believe that the Huron-Iroquois were the immediate successors of the mound-building people in this area. Our belief is confirmed by the abundance of polished slates in Ontario in close proximity to the later Huron-Neutral sites. This fact has confused some archeologists, and led to the statement that the polished slates are Huron or Neutral artifacts, but the graves of the two peoples tell different stories.

Plate 24

Articles from Middlesex site. Stone tubes, broken amulet, crude clay pipe, bar amulet, stone tube.

The Iroquois once established culturally, did not copy mound artifacts. Indeed, they seem to have deliberately avoided the use of the distinguishing badges of their vanquished foes. Just as the conquerors of the first mound people of Ohio beat up the mica ornaments and hammered into shapeless masses the copper tools and gorgets of their despised victims, so did the Iroquois taboo or avoid with deliberateness, the banner stone and the gorget and similar artifacts of polished slate.

Thus we may account for the difference between the pottery, decorative art, implements and earthworks of the Iroquois and their predecessors. This difference likewise makes it possible for us to define the polished slate area and at the same time to fix the limits of the Iroquoian.

One final observation remains to be made about the mound builders as a people. We are induced to believe that the period during which they occupied this region was a longer one than generally estimated. It appears as characteristic of a certain cultural development and then totally disappears.

5 THE IROQUOIS OCCUPATION OF NEW YORK

The origin of Iroquoian material culture is a subject of pertinent interest to every student of aboriginal American archeology. This particular racial stock, characterized by so many striking features, has long held the attention of historians and archeologists, but hitherto no one has attempted an analytical study of Iroquoian archeology or sought to correlate its salient facts. Much remains to be discovered, it is true, but we believe that we may now safely attempt to define the material culture of the Iroquois, so far as we may know it through archeology, and to make some intelligent inquiry into the origin of the culture as well as of the stock itself. By making this start, however faulty it may be, we hope to suggest lines of inquiry that may lead others to the discovery of facts that will point out a full solution.

Most writers have observed that there are few places where Iroquoian artifacts are found unmixed with evidence of contact with the European. The few early sites, of precolonial occupation, therefore are most instructive to the investigator, but, as a matter of fact, the purely aboriginal material found in such sites differs but slightly from those of later date, except those of a very recent

¹ From the author's article in *The American Anthropologist*, v. 18, no. 4, Oct.—Dec. 1916.

period. The archeology of the Ouendat or Huron is apparently quite similar to that of the confederate Iroquois.

In pursuing our inquiry it is soon discovered that there are definite centers in which material known to be, or termed, Iroquoian may be found. In scattered spots edging these centers are isolated Iroquoian specimens, as on Manhattan island. But the fact remains that Iroquoian artifacts are found in numbers only within certain definite centralized localities, and that these objects are not seemingly more than 500 or 600 years old. Many sites show an age of less than 150 years. At most, let us say tentatively, that within the well-recognized areas, objects recognized as Iroquoian seem only to indicate a period of cultural fixedness of less than 600 years.

The centers of prehistoric Iroquoian occupation, recognized as such by the objects known to archeologists as Iroquoian, are: (1) the St Lawrence basin with Montreal as a center, (2) the region between Georgian bay and Ontario with Lake Simcoe as a center, (3) the Niagara peninsula in Ontario following the Grand river, (4) the Genesee river-Finger Lakes region, (5) Chautauqua county, stretching across the Pennsylvania neck into Ohio, (6) the highlands east of Lake Ontario in Jefferson county, (7) Oneida, Madison and Onondaga counties, (8) the Susquehanna about Elmira, (9) the Mohawk valley and highlands to the north, and (10) Niagara, Erie, Chautauqua and Genesee counties. Circles of various circumference may be drawn from these centers, and intercept smaller centers. This plan of approximating the areas is only a scheme to fix the localities in our minds, and no attempt is made to make them independent localities with definite boundaries. The contour of the land, streams, lakes, lines of travel and danger from enemies largely determined the early limitations.

We wish now to inquire which of these centers are the oldest and if there is any possible means of determining the causes that made Iroquoian material culture differ from the surrounding Algonkian. We wish to inquire, as others have before us, whence the Iroquois stock came into these centers and what clue may be found showing a migration from earlier centers. We wish to inquire just how definitely valuable Iroquoian objects, as they are now recognized, are in determining a migration from other regions.

Perhaps, then, we ought first to inquire just how permanent any form of material culture is and whether there have been any revolutions, not to say modification, in the material culture of a stock. We ought to consider that there are Algonkian tribes, for example, that are Siouan in culture and Siouan tribes that are Algonkian, as the Blackfeet and Winnebago respectively.

Types of shell objects from New York

1, tubular beads, Honeoye Falls, Dann site; 2, shell pins, Dann site; 3, runtee, Onondaga co.; 4, perforated disk, 5, runtee, West Bloomfield; 6, pendant, Dann site; 7, 8, 9, ornaments, Dann site; 10, triangle, West Bloomfield, Warren site; 11, discoid beads, Young farm site, Ripley; 12, heavy bead, Dann site; 13, crescent; 14, spherical bead; 15, ornamented disk, Seneca river; 16, disk from Ithaca.

The writer at one time showed some of the Lafitau drawings of Iroquoian villages to Edward Cornplanter, a Seneca Indian, who was a tribal authority on the modern religious ceremonies of his tribe. "Our people never lived that way," he said. In this it is seen that the Iroquois of today have totally forgotten their early fortifications and architecture, though Cusick in 1825 wrote of "forts." Of another native authority the writer asked the date when the Iroquois confederacy originated; "With the teachings of our great ancestor, Handsome Lake, I think," he said. Then he added after hesitation, "No, it was before that, I remember now it was in the time of Dekanawida."

In these answers, incorrect or uncertain as they are, may be found material for serious consideration. They point out two men with whose names are linked two distinct periods of cultural revolution. Each blotted out the memory of a former period. The people of each period systematically forgot the history of the preceding periods. Today the Iroquois of New York base nearly all of their tribal ceremonies on the doctrines of Handsome Lake, who flourished between 1800 and 1816. So great was the influence of his teaching that he practically created and crystallized a new system of tribal thought and a new plan of action. His earlier predecessor was Dekanawida to whom, with the aid of Hiawatha, is ascribed the origin of the Iroquois confederacy. Dekanawida so crystallized the things of the older period with his own devices, teachings and admonitions that the methods, beliefs and thought-ways of the preceding period lost their identity in the minds of the Iroquois people. All civic and much of the religious thought centered in Dekanawida. That which preceded was either blotted out or swallowed up. The Iroquois took on a new mantle. Now it does not seem impossible that before the time of Dekanawida and Hiawatha, other seers had risen to change or revolutionize the thought-ways of this stock.

The inquiry comes quite naturally, therefore, as to whether a like revolution could not come in the material culture of a people. Might not the older systems of decorative art have been gradually abandoned and new ones taken on? Preceding the period beginning about 600 or 650 years ago, might not Iroquois art and artifacts have been different? Or if there were no Iroquois in this region then might not they have had differently decorated pottery, for example, when they came than that later developed and now known as Iroquoian? This is a question archeology may some day answer. Our present knowledge gives us only the Iroquois potsherd and does not tell us why it is as it is.

Plate 27

Clay vessel from Theresa, Jefferson county. Found in a rock crevice by Percy Purdy.

There are certain Iroquoian traditions that seem to have good foundation, relating that at a certain period all the Iroquois were one people, living together and speaking the same tongue. Indeed so positive were the Iroquois of this that they could point out a certain woman and say that she represented the lineal descendent of the first Iroquoian family. Yet the confederate Iroquois knew that she did not belong in the five tribes. She was a Neuter woman. "When the bands divided," the tradition runs, "it was found that the family of Djigonsase (Fat Face or Wild Cat) fell to the Neuter Nation." She was called Ye-gowane, The Great Woman, and she was "the mother of the nations." In the Dekanawida-Hiawatha tradition, a woman with this title is represented as being constantly consulted by both Hiawatha and Dekanawida. The latter was a Wyandot (Ouendat) from the Bay of Quinte, at the head of Lake Ontario. This points to an early recognition of blood relationship and a recollection of the time when the Erie, Neuter, Huron, Seneca and Mohawk-Onondaga were of one common tribe, a fact that archeology and philology, of course, definitely prove.

In this original tribe any culture revolution would definitely influence the various subdivisions and be carried by each as it separated eventually from the parent body. Constant intercourse would serve to preserve the culture until it became fixed. Now, assuming for the sake of argument that there was an "original tribe" and that a revolution did take place in the decorative art of the Huron-Iroquois, whence did that tribe come and when did its arts change? Traditions, again, point to a migration from the "south-west. Ethnologists are familiar with the Delaware Walum Olum, but few are familiar with Iroquois migration myths for the reason that they are few and those brief and difficult to recognize as such.¹ So many of the Iroquois (confederated) myths point to the south-west country, however, that we must pause to consider just why they have been handed down. We must ask why the "tree of the long swordlike leaves," is mentioned so often in the Dekanawida epic, and why so learned an Iroquois as Dr Peter Wilson called it a "palm tree." We must consider why so many Iroquois expeditions were directed against enemies down the Ohio and on the Mississippi. We must consider, too, a certain alleged grammatical resemblance between the Caddoan languages and the Iroquoian. Perhaps all these considerations will be termed fanciful and lacking serious

¹ We place no credence in the Cusick account as embraced in his "Sketches of the Ancient History of the Six Nations."

Plate 28

THE SACANDAGA VALLEY POT

Iroquoian pottery vessel from the Sacandaga valley. Found in a rock shelter. Size: $10\frac{1}{2}$ inches high. An interesting feature is the presence of three raised points instead of the four usually found on Iroquois pottery.

value, but even if this is admitted they do have the certain virtue of stimulating inquiry.

The older theory that the Iroquois originated or had their early home along the St Lawrence, about Montreal, is not entirely without serious flaws. I believe from archeological evidence that certain Iroquoian tribes never came from the St Lawrence region; for example, the Seneca. The Seneca and Erie divisions seem to have been as closely allied in western New York as the Onondaga and Mohawk were in northern and eastern New York. The Mohawk (or Laurentian Iroquois) never agreed with the Senecan division and there indeed seems to have been a long period of separation that made these two dialects more unlike than all the others of the five. It would seem that the early band of Iroquois had divided at the Detroit or the Niagara rivers, one passing over and coursing the northern shores and the other continuing on the southern shores of Erie and Ontario; and that the northern branch became the Huron and Mohawk-Onondaga; that those who coursed south of these lakes became the Seneca-Erie, the Conestoga (Andaste) and the Susquehannock. It also appears that the Cherokee and Tuscarora separated earlier than the Seneca and Huron-Mohawk divisions and perhaps absorbed other non-Iroquoian bands, still further modifying their vocabularies.

In the analysis that follows we shall briefly consider the material culture of the Iroquois. In the topical discussion we have repeated certain facts mentioned elsewhere, not for the sake of emphasis only but to obtain another view of the same facts, when differently correlated.

An Outline of Iroquoian Material Culture, Based on Archeological Evidence

In considering the origin of the Iroquois, their migration and their connection with and similarity to other tribes or stocks, it is of importance to know just what is typically Iroquoian; that is to say, what implements or ornaments may be regarded as distinctive.

Arrowheads. The first object which a field investigator learns to know, as the sign of Iroquoian occupation, is the thin, triangular arrowhead of chert. Nearly all Iroquois arrow points seem to have been of this type. On village, on camp site, or in graves the delicately chipped triangle is found almost to the exclusion of all other forms. It may not be regarded, therefore,

as only a "war point" but also as a hunting point. Plenty of knives are found on Iroquoian village sites, but only a few chipped implements that may be regarded as spearheads. Very few flint drills are found in comparison with other occupations. The same remark is also true of scrapers, although these are found occasionally. The Iroquois were not flint workers as were their predecessors in this region; they used other material in place of flint wherever possible.

Polished stone implements. The celt, better termed the ungrooved axe and the flat-bellied adz, were used by the Iroquois who seem never to have used the grooved axe. Their ungrooved axes, however, are well made and both types are, in many instances, carefully polished. The small celts and adzes are common and seem to have been used as chisels and scrapers rather than as axes. In many instances these are simply waterwashed stones suitably shaped by nature and rubbed to a cutting edge. The Iroquois seem never, or rarely, to have used gouges. They had perforated polished stone beads but no gorgets, stone tubes, bird stones or banner stones. This is so common an observation on the part of the archeologist that it may be safely said that no ancient polished stone implement with a hole drilled straight through it is Iroquoian. There were, indeed, polished stone pipes but no straight pipes. We except also stone beads and occasional small stone faces.

Stone tools. The Iroquois along the Susquehanna may have used stone hoes but the various overlapping occupations render this doubtful. It is certain, however, that the Iroquois did not generally use the long cylindrical roller pestle, but some have been found on early sites. They did use a flattened muller and a shallow, flattened mortar or meal stone, and these are common on nearly all Iroquoian sites (see plate 8).

Notched sinkers are very common and generally were made of a flattened water-washed stone, about the size and shape of the palm of the hand, though various sizes larger or smaller are found.

Pitted stones are abundant. Some appear to have been hammers, judging from the battered edges, but others are pitted on either side and show no battering on the edges. Some of the pits are neatly and symmetrically drilled, others roughly picked in as if a flint had been pounded against the stone. This is especially noticeable in the softer stones. Other hammers are of diabase, granite or other hard rock and have no pits. Their battered sides, some in flattened planes or faces, others rounded, give evidence of hard and prolonged usage.

Anvils, that is flat stones upon which stone was hammered, are fairly common. Now and then an arrow shaft rubber is found and plenty of scratched stones, or "awl sharpeners," are in evidence and an occasional "sinew stone" comes to light.

Shell ornaments. The later Iroquois loved shell ornaments, such as beads, perforated shells, runtees and disks, masketts and variously

Fig. 11 Pitted hammerstone and small anvil

formed effigies, but they did not have them in any abundance until the coming of the white man. Shell beads of spherical shape, cylindrical, or even discoidal appear on early sites, most of them made from the columella of the conch. Perforated periwinkles also were used but only a few beads small enough to be similar to the wampum of the colonial period have been found, compared with

Plate 29

Types of pottery vessels from the Erie burial site at Ripley, Chautauqua county

the abundance that later appeared. Large conch shells have been found on certain Neuter sites, especially in Erie and Genesee counties. Now and then a clam shell is found used possibly as a potter's tool. The fresh-water *Unio* valve was frequently employed for this purpose and they are sometimes found in pits filled with clay scraped in shaping a pot.

Pottery. The most strikingly characteristic product of Iroquoian manufacture is pottery. Both in form and decoration, generally speaking, Huron-Iroquois pottery differs from that found in other regions. At the same time we must qualify a statement of an absolute difference from all others, for on certain sites pottery is found that resembles, in many respects, the pottery of the Ohio village sites, and even certain pottery of Tennessee, but this is the exception and not the rule.

Typical Iroquoian pottery is known both by its shape and by its decoration. The typical pot has a globular body which as it turns inward toward the top, turns upward and outward into a constricted neck, and a flaring or overhanging collar. The width of the neck at its base is about one-sixth of the circumstance of the body and it rises as if from the top of an imaginary hexagon drawn inside the globe. From the top of the neck, which turns outward like the bell of a trumpet, rises a collar, sometimes round but as often four-sided and having an upward turn at each corner. This collar is nearly always decorated by a series of triangles within which have been drawn lines close together and parallel with one side of the triangle. These triangles contrast with one another as the parallel lines slant obliquely, either right or left, in the adjacent space. At the corners pentagonal figures are often drawn having three round dots punched in to make a conventional human face (eyes and mouth). In a few instances the face stands out in effigy or an entire human figure more or less conventionalized is drawn. (See plate 27.) There are instances where these triangular parallel lines are absent and where the overhanging collar is rare. Certain of the earlier forms of Iroquois pottery have very little of this lined decoration, as in the case of the Ripley site. In other cases, as at Burning Springs, the Gerry village and at the Reed fort, the incised lines appear but they run in wider patterns and far down the wide neck, which is not so constricted as in the Mohawk valley forms. Another variation is that of a globular squatty bowl with a short neck that turns outward in a rim that is notched, indented,

POTTERY VESSELS FROM THE DANN SITE, MONROE COUNTY

The handles on these pots are similar to lower Ohio forms. There are two explanations for this occurrence, one that the vessels were found during an excursion, and second, that they were made by captives. It does not seem probable that pots of this form were made by the Seneca who occupied the Dann site, circa 1660-90.

Plate 31

Animal effigy pipes from the Dann collection, Honeoye Falls. The two larger pipes at the top have brass or copper eyes.

knobbed or scalloped. This type is found on the Silverheels site, the Gus Warren site and at White Haven, Pennsylvania. A few Iroquois pots had pitcher noses. Some of these have been found near Buffalo, at Ripley and in Jefferson county near Watertown. The pitcher nose may or may not be a development from one of the four corners of the square-topped type (see plate 27). Other pots have small handles that unite the collar with the neck or body of the vessel. Such have been found on certain sites near Buffalo, at Ripley and in Jefferson county. More have been found in the last place than elsewhere. Now and then seemingly aberrant forms are found. At Ripley bowls were found that differed in no way from those in the mound-builder villages of Ohio. They bear no resemblance to any known Iroquois type but have a rather long oval body with a wide flaring mouth. Some are low and like a modern bowl. The surface was scratched and roughened in pseudo-fabric lines or scratched with a twig brush. Two or three peculiar bowls were found on the Dann site that approximate certain Missouri forms. The bowls are squat and a wide flaring mouth rises from just above half the diameter. Three or four flattened handles unite the underside of the lip with the body of the vessel. The flattened handle is unique on this site, which, however, yields European objects. (Plate 30.)

Pottery pipes. Equally, if not more striking than the pottery vessel, are clay pipes. These are usually gracefully modeled and have stems from 3 to 10 inches in length. The general base line of these pipes is one that follows the line formed by the forefinger and thumb when the thumb is extended at right angles to the hand and the ball turned back. This is the lower line of the trumpet pipe. Iroquois pipes sometimes have bowls imitating the tops of pots. In other instances the bowls imitate the bodies or heads of birds, animals or snakes. Many have the chevron pattern of parallel lines arranged in triangles about the bowl top. Some of the patterns widely found throughout the Iroquoian area are the trumpet form, the square-topped flaring bowl, the cylindrical bowl having a wide collar decorated with parallel rings, the bird body, with the bowl in the bird's back, the effigy of a man with his hands to his mouth blowing through his lips, animal heads, as of the bear, racoon or fox, and pipes having a human head modeled on the bowl. Certain types are shown in plates 31 and 32.

Plate 32

Types of effigy pipes from the Dann collection, Honeoye Falls

Pipes of stone sometimes have stems carved with the bowl, but these form the minority in collections. Some resemble the outlines of simple clay pipes, others do not.

Some bowls are oval, some are vase or urn-shaped. More elaborate forms resemble bird bodies, as the owl, or represent a lizard or other creature crawling over an oval or bowl. None of the Iroquios stone pipes are tubular and none have the monitor base, common in the mound-builder region. Many are so unlike their clay pipes that they bear no suggestion of having been made by the same people. The outline, decoration, modeling and size differ, even though found in the same grave or village site with clay pipes. Stone pipes of all the forms mentioned are found in pre-historic Iroquoian sites as well as those of the late colonial period so that their form and use may be regarded as stable and widely known.

Bone implements. Among the most common bone articles are bone awls and awl forms and cylindrical bone heads. The latter are usually made of hollow bird bones and many are beautifully polished. There were bone needles and shuttles. Bone phlanges, cut or ground on one side, or shaped as cone-pendants, are found in abundance. The canine teeth or tusks of bears and wolves perforated for suspension seem to have been favorite decorations, and the much prized elk tooth is found. Bear teeth were ground sharp for knives or scrapers, and beaver teeth were shaped for scrapers. The molars of the bear were ground down and with one root cut off, were shaped like a human foot. Perforated disks cut from the human skull were also used, but aside from this human bones were seldom employed.

In certain early sites, as on the Reed farm, near Richmond Mills, bone scrapers or beaming tools are found made from metapodial bones of deer or elk. These are similar in every way to those found in certain Ohio sites not Iroquoian.

Bone implements are commonly found in Iroquoian village sites, especially in ash and refuse heaps or pits. The ashes seem to have acted as a special preservative.

Miscellaneous bone objects. Among the more striking implements of bone are bone combs, the earlier forms resembling a modern fork and having only three or four large teeth, perhaps one-sixteenth of an inch in diameter or more. The tops are usually plain, although in a few instances there is a simple perforation. As the colonial period is approached the combs become wider and have

CERTAIN BONE ARTICLES FROM NEW YORK. X 7-10

1, notched end punch, Watertown; 2, perforated awl, Watertown; 3, antler punch or plug, Jefferson co.; 4, bone spear head, Rutland, Jefferson co.; 5, antler cylinder, Monroe co.; 6, bone whistle, Seneca river; 7, fish-hook, Watertown; 8, raccoon bone worked as an awl, Jefferson co.; 9, notched end bead, Richmond Mills; 10, typical bone bead, Jefferson co.

more teeth. Decoration at the top is at first simple and generally quite lacking. With the coming of cutting implements of steel, combs take on an entirely new form, resembling in general motive a lady's back comb of modern times. These have from fifteen to forty teeth, generally 2 inches long, above which rises a decorative top or handle upon which are fretted out the effigies of various birds or the human figure. Combs of this character are found in many of the sites of the middle colonial period.

Small effigies of animals were sometimes cut out of flat bone and larger effigies of the human figure were carved from heavier bone. Some of these are apparently precolonial. The modern Seneca say that their ancestors carved small images of the human figure to represent a witch and by placing them in a bag or other receptacle were able to prevent the evil influence of the witch after which the effigies were named (see figure 12).

The carapace of the tortoise or box turtle is commonly found in graves and fragments are sometimes found in refuse pits. Sometimes the shell is perforated with seven or eight holes.

Fig. 12 Antler image from Factory Hollow

Fig. 13. Tortoise rattle from Silverheels site

These may have been used either as knee rattles or as hand rattles carried in some of the ceremonies (see figure 13).

It is not uncommon to find arrowheads of both bone and antler and it is quite likely that the Iroquois used projectile tips of this material wherever possible. It is said by the modern Seneca that

Certain forms of precontact antler combs. Iroquoian. x 1/1
 1, Atwell site, Madison co.; 2, Elbridge, Onondaga co.; 3, Pompey; 4, McArthur farm, Le Roy. All are Iroquoian.

some of their arrows were headed only with a sharp point formed directly on the shaft and hardened by semicharring. Harpoons were made of bone and sometimes there are several barbs, quite unlike, however, the barbs in the European spear.

Fishhooks were of the simple hook type without a barb and resemble in every way the fish hooks found in the Ohio village sites,

Fig. 14 Types of bone fishhooks from Richmond Mills, Ontario County. Dewey coll. State Museum. $\times 1$.

Fig. 15 Beaver tooth with bone handle found by C. B. Moore, Kentucky. This suggests how worked beaver teeth found in New York may have been employed. $\times 7/8$

as at Madisonville (see figure 14). Occasionally bone whistles are found made from the long leg bone of some bird or the wing bone of a wild turkey (see plate 33).

Earthworks. No adequate idea of the prehistoric Iroquois can be had without some description or mention of their earthworks. Scattered through the western and northern portion of the State of New York are more than 100 earth embankments, ditches and circular inclosures. Most of these were probably not erected in any sense

as earthworks but simply as the bases for a stockaded wall. Tree trunks from 15 to 20 feet high were trimmed off and placed from 6 inches to a foot in a shallow ditch in the top of the wall and the earth was packed in about them. The tops were further secured by being tied together with bark ropes and withes. There are good historic descriptions of these palisaded inclosures. The area within them ranges from one-eighth of an acre to more than 7 or 8 or even 16 and it is supposed that they contained fortified villages or were places of refuge against both human and beast enemies. They do not differ in any way from the stockaded inclosures of the province of Ontario, in the Huron-Iroquois area. In some instances they do not materially differ from the earth inclosures found throughout Ohio. It may be said, however, that none of them are so extensive in size as such works as Fort Ancient, nor are the embankments more than 3 or 4 feet high, except in rare instances.

There are three general forms of the stockaded inclosure, the first being the hilltop stronghold which was naturally fortified on all sides and the narrow neck that connected the out-jutting hill with the general terrace of which it formed a part shut off with a palisaded wall. Deep ravines on either side brought natural protection from the sudden onslaught of enemies and the places were rendered further secure by having the neck protected by a stockaded wall and perhaps an outer ditch. The ditch served two purposes. It afforded the material out of which the wall was erected and it made it more difficult for the enemy to climb the stockade or to set fire to its base. Typical hilltop strongholds are those at Ellington, Chautauqua county, the Reed fort near Richmond Mills, Ontario county, the fort near Portage in Wyoming county and the prehistoric Mohawk site at Garoga.

A second form of protected inclosure is irregular in form and follows somewhat the natural line of the ground. It may or may not be upon a hilltop. Examples of this form are found on Indian hill near Ellington, the stockade near Livonia, Livingston county, known as the Tram site, and near Macomb, St Lawrence county, on the farm of William Houghton, near Birch creek, and Fort hill, Auburn.

A third form is in inclosure more or less circular in form with a low wall and shallow outer ditch. Examples of these are such inclosures as are found at Oakfield, Genesee county;¹ at Elbridge, Onondaga county, where there is a circular inclosure covering about

¹ These inclose about 10 acres of land and were described by Squier, figure 8, in his plate.

Plate 35

Antler combs. Later Iroquois types, from the Dann site, Honeoye Falls.

3 acres of ground; or the circular fort on the Lawrence farm in the Clear creek valley, near Ellington.

Usually within these inclosures pits are found in which refuse had been deposited or corn stored. The soil shows more or less trace of occupation and occasionally graves are found in one portion. Besides the choice of the spot as a natural defense there were other considerations, such as proximity to good agricultural land which, for primitive people with inadequate tools, must be a light sandy loam; a plentiful supply of water, nearness to the proper kind of timber and a location near a trail or stream navigable for canoes. It is not easy to determine, however, why some localities were chosen, for they are overlooked by hills from which the enemy could assail the fortification or are situated in swamp lands. There were probably many considerations that attracted the Indians to these spots that have been obliterated with the destruction of the forests.

The earlier sites of this character in the Iroquois district in New York were upon the hilly lands south of the Great Lakes. It does not appear that the Iroquois came down from their hilltop strongholds except in few remote localities until about the beginning of the historic period when they began to build their towns on the lowlands nearer the shores of Lakes Erie and Ontario. This observation is especially true in western and central New York but does not fully apply to the Iroquoian area in Jefferson county. It is quite likely that the Iroquois did not drive out all their enemies or take full possession of this territory until a short period before the opening of the colonial epoch. An example of village sites or earthworks upon or near the lake shores is that found at Ripley, Chautauqua county. Most villages, however, were from 2 to 20 miles back from the shores of Lakes Erie or Ontario.

Mortuary customs. There seems to have been several mortuary customs. Many human remains are found buried beneath the ground, indicating that the body was intact when interred. Traditions and historical evidence point out also the custom of placing the body wrapped in blankets or skins in the branches of large trees, and there are preserved in the Seneca tongue the various terms employed to describe the details of this type of burial. Burial houses were also erected in which the bodies of the dead were placed until decay had reduced them to bones. For the disposal of these bones research shows that they were gathered up and buried in bundles in separate graves. Sometimes several skeletons are found in bundles

CERTAIN FORMS OF WORKED TEETH FROM EARLY IROQUOIAN SITES IN ONTARIO AND JEFFERSON COUNTIES. $\times \frac{7}{8}$

1, bear teeth, Richmond Mills; 2, bear tusks neatly cut, Brewerton; 3, various canine teeth; 4, Morse farm, Watertown; 5, elk teeth, Richmond Mills; 6, imitation elk tooth, Richmond Mills; 7, worked bear molars, the last being carved to resemble a human foot; 8, split and edged beaver incisors, Rodman, Jefferson co.

in a single grave, with or without accompanying relics, as pots, flints, pipes etc.

The Iroquois, especially the Neuter nation, the Huron and perhaps the Erie, also had ossuaries in which from ten to fifty or one hundred remains were placed. Few relics are ever found in ossuaries of the earlier period. In the individual burial, where the body was placed intact in the grave, the position of the remains is almost invariably on one side with the knees drawn toward the face and the hands placed near the face, this fixed position being that assumed by a sleeping person, drawn up to keep warm (see plate 38).

In the earlier graves there are few material objects, but as the time ranged into the colonial period more durable relics are found, showing the gradual growth of prosperity, and a greater abundance of material property. The burial objects that have survived the elements, are clay pots, clay and stone pipes, flint objects, as knives, triangular points, celts, bone objects, shell objects, etc. These are usually found near the chest, hands or head. Among the hundreds of Iroquois graves and skeletons found by the writer not one has been found "sitting up" and among the thousands or more of all cultures discovered, none was sitting up nor did the bones "crumble upon exposure to the air." The Iroquois had no definite orientation for the grave, no special side; the only general rule being the flexed position reclining on one side.

The predecessors of the Iroquois had also this rule though the makers of the stone graves sometimes placed their dead lying straight and on the back.

Miscellaneous observations. The Iroquois did not use vessels of steatite, but their carved wooden bowls of the longer type were fashioned like them in the sense of having handles or lugs at each end.

Iroquois textiles have never received a careful study, for they are little known, but the people wore nets, bags, belts and even shoes. Their corn-husk sandals differ a little from the sandals or moccasins found in the caves of Missouri. Small fragments of cloth and woolen bags prove that they early understood weaving and basketry.

The Iroquois carved wood and indeed the confederate Iroquois law required that the national feast bowl should represent a beaver. The idea of making receptacles resembling animals with their backs or heads hollowed out was common. Their wooden spoons had bowls shaped like clam shells and at the top of the handle was

Plate 37

Antler combs. Later Iroquois type. Dann site, Honeoye Falls.

Plate 38

Typical flexed burial in the Silverheels site. There is a pottery vessel and a pipe before the face.

Cache of charred acorns found at the Silverheels site. Below this pit were found the scattered bones of a disturbed burial.

carved a bird or animal strikingly like those they modeled on pipes (see figure 16).

The Iroquois were an agricultural people of village dwellers. Early Iroquois villages were on hills overlooking valleys and were stockaded. The early villages had earth rings about them and sometimes an outer ditch. Upon the ring or wall of earth the palisades were erected. Later villages were in the valleys beside lakes and

Fig. 16 Wooden spoon from Belvidere. Found by George L. Tucker in a Seneca grave.

streams and were not stockaded. The Iroquois towns of the sixteenth and seventeenth centuries were increasingly without such a wall. The Iroquois did not build mounds, of the character known throughout Ohio or Wisconsin, at least when they used the pottery and pipes we have described.

Iroquois houses were of bark and there were large communal dwellings. Many of them held from five to twelve families or more.

BONE ARROWHEADS AND WORKED PHALANGES. X 9-10

1, 2, flat projectile points, Jefferson co.; 3, 5, hollow bone points; 4, 6, antler points; 7, 11, worked phalanges; 12, 15, worked phalanges perforated at smaller end; 16, inscribed phalangeal bone, Onondaga co.

They had either a rounded or pitched roof with openings at the top, as vents for each fire beneath. The Iroquois did not ordinarily employ the conical skin tepee.

The permanency of their village life is indicated in a measure by their vast fields of corn and other vegetables. Agriculture exercised an immense influence over their national life and it was pursued with method and on a large scale. There are accounts of expeditions sent out to procure new seeds and vegetable foods. Corn pits are often found in village sites.

Iroquois consanguinity was matriarchal. There were various clans, having animal symbols and names. The women nominated the civil sachems and could veto the acts of the tribal council.

The Iroquois cosmogony relates that a pregnant woman fell from the heaven world. She fell upon the back of a great turtle and gave birth to a female child. This child grew quickly to maturity and gave birth to two sons, good minded and evil minded, or more properly, Light one and Dark one. The Light or shiny one molded man after seeing his own reflection in the water. He found his father dwelling on the top of a mountain that rose from the sea "to the east" and begged certain gifts from him, which were given, tied up in bags. Reaching his homeland again, the Light one opened them and found animals and birds of all kinds, trees and plants. The mother of the two boys died in giving them birth, killed by Dark one or the Warty (Flinty), who insisted in emerging through her armpit. The grandmother nursed the boys and bade them watch their mother's grave. The food plants and tobacco sprang from her grave. The sun and moon in other versions were made from her face, eyes and limbs.

Nearly all Iroquois legends relate to incidents of the southwest. Many expeditions are told about, that relate to the country down the Ohio river. Few stories of the north are related. The north was only the land of great terrors and savage giants.

Comparison of the Iroquoian Culture With That of Surrounding Tribes

As has been seen in the foregoing description, outlining the material culture of the Iroquois, there are certain definite things which characterize their handiwork. The Algonkian tribes, in some instances, erected earthworks or stockaded inclosures but apparently far less in extent than the Iroquois. In this respect the Iroquois more greatly resemble the Indians of Ohio and the southern states. With the exception of the size and height of the walls their earthen wall inclosure do not greatly depart from certain Ohio forms. The

Garoga site looking north. Springs and clay beds in the valley to the right. Site excavated by M. R. Harrington for Peabody Museum.

Iroquois, however, in no sense erected mounds of the character found in Ohio, neither does it appear that they were numerous enough to require, or to be able to erect, such extensive earthworks. A greater number of these inclosures are found in New York, west of the Finger Lakes district and on the hilly regions of Chautauqua, Cattaraugus, Erie, Wyoming, Genesee, Livingston and Ontario counties. A few are found eastward, as in Jefferson county, but a great majority are in the localities we have mentioned.

The Iroquois were an agricultural people like those of the south, as of Virginia and Georgia or in the mound district in Ohio and the Ohio valley. Corn cobs and other vegetables are frequently found in ash pits and refuse heaps in Iroquois village sites and the use of tobacco may be deduced from the prevalence of numerous smoking pipes.

Unlike the Indians of Ohio, who built the mounds and fortifications, or the southern Indians, as those of Georgia and Alabama, or the Algonkins east and north of them, the Iroquois did not use implements or ornaments of copper or mica, nor did they use ornaments of polished slate as gorgets, stone tubes, bird stones, boat stones, and banner stones. They did not use the bell-pestle or cylindrical pestle nor as a rule did they ornament their pottery with fabric marks, notwithstanding the fact that they wove fabrics similar to the impressions found on baked pottery in the Algonkian area. They did not use the grooved axe, common among all the peoples about them, nor did they have the monitor pipe commonly found in Ohio, Kentucky, the southern states and throughout New England. Only in rare instances did they use flints having barbs and stemmed necks. The absence of these forms of implements is significant and is the result of something more than mere accident. The Iroquois had every opportunity for knowing of such objects and they were fully capable of making them had they so desired. It appears from these facts that the Iroquois deliberately choose not to use these things and tabooed them from being employed in any way. Apparently there was a direct attempt to banish such articles beyond the pale of their culture. On the other hand, the Iroquois did use stone tomahawks or celts and apparently mounted them in the same manner as contiguous nations. They did use the ball-headed wooden war club such as is widely found throughout the continent and their shallow mortars and mullers did not greatly differ from those used by the Algonkins.

Their dwellings were houses of bark formed much like an arbor, some with round and some with pitched roofs. Under normal conditions these houses were communal dwellings and large in size.

A comparison of the Iroquoian and Algonkian pottery vessels. This is one of the comparative exhibits outlining the differences between the several cultural types.

There were no permanent dwellings circular in form, and mud huts or hogans were not used. It is quite apparent that from the earliest times they were an agricultural people, and neither archeology nor the testimony of early explorers or travelers indicates any wide difference in their village life from that of the Indians of Virginia and the Carolinas, for example. They relied very largely upon vegetable foods for their sustenance and the cultivation of the ground was regulated by certain customs. It appears that the Iroquois were far more like these Indians of the middle south in their village life than the Indians of the north, the Micmac or the Malecite.

Of considerable importance in the study of comparative archeology, and we believe in the study of the origin of the Iroquois, is testimony of implements of pottery and smoking pipes. Iroquois pottery is perhaps the most durable and striking material found on their village sites or in their graves, and in both decoration and form is distinctive from most forms of pottery used by Algonkins. Before discussing this subject further it may be well to state there are two general forms of Iroquois pottery, that is to say, there are two archeologic districts which yield pottery, which may be compared. The first and westernmost is the Huron-Erie area and embraces the Iroquoian sites on the Niagara peninsula in Ontario and the adjacent land to the west of it and north of Lake Erie, including also the territory in New York along the southern border of Lake Erie to the hilly land south of it. The second area is the Mohawk-Onondaga, and takes in the region of the St Lawrence basin, the east shore of Lake Ontario, the south shore of the Oswego river, southward along the Seneca river, southward through the Susquehanna valley and eastward through the Mohawk valley. In the first district the outline of the pot does not show the high collar projecting so far from the neck as is common in the second district. In many cases the collar is a very narrow band and ornamented by parallel lines or by simple oblique lines or none at all. In another variety the lines are formed in chevron patterns but in larger plats. In this form the collar does not project very much from the body of the pot and the decoration is carried down well on to the neck (see figure 34). There are instances where the triangular patterns and short lines follow a line of oblique lines drawn around the body of the pot below the rise of the neck. Such patterns are found on the vessels from Ontario and figured by Doctor Boyle, and by myself from Ripley, Chautauqua county. In the second district the wide overhanging collar becomes almost a fixed characteristic. Here it reaches the highest form of its special development and archeologists usually describe one of these pots for their ideal Iroquoian

Plate 43

1

2

3

4

5

6

Erie pottery similar to Ohioan. Figures 1, 2 and 3 are of cord-marked pottery vessels. The surface of the pot shown in figure 4 seems to have been marked with a brush of twigs. Figures 5 and 6 are of plain pottery.

OUTLINE MAP
OF
THE STATE OF NEW YORK
SHOWING THE LOCATION
OF
THE IROQUOIS AND THEIR NEIGHBORS
IN EARLY COLONIAL TIMES

form. The pots in the first-named district usually have the more squat body and bulging sides. A careful comparison between the pottery vessels found by the writer at Ripley, N. Y., and those pictured by David Boyle as having been found by the Laidlaw brothers, in the sites along Balsam lake, Ontario, Canada, will show that while a general outline and form of the body is similar to the pottery of the Mohawk-Onondaga area, there are differences enough to warrant placing each district in a place by itself.

Certain forms of the Iroquoian pottery, as in western New York, does not greatly differ from those discovered in the mounds of Ohio, especially certain pottery forms described by Professor Mills of Ohio State University (see plate 43). The forms to which we refer are those having a globular body and short neck and a wide flaring mouth, the entire surface of the body being decorated with the marks of a paddle wrapped with grass stems or brushed while still plastic with the same material. Large fragments of such pottery were found by the writer in the prehistoric site at Burning Springs where they were intermixed with sherds of more conventional Iroquoian types. Some of this pottery does not differ materially from certain forms of Algonkian pottery except in the matter of shape. None of the pointed bottoms is found in the Iroquoian district in New York. Many Iroquoian vessels are small, containing not more than two quarts, while others are larger and have a capacity of several gallons. Complete vessels of the larger type are very rare but many hundreds of sherds of large vessels are found throughout Jefferson, Ontario, Erie, Montgomery and Chautauqua counties.

In the study of the design found on the typically Mohawk pottery it seems apparent that the parallel lines arranged in triangles represent porcupine quill work such as is found on the rims of bark baskets. There are certain other features of Iroquoian pottery that lead one to believe that potters in making their vessels had in mind bark baskets. The square-topped collar is not dissimilar in form to the square top of the bark basket and the dots placed around the upper edge seem to imitate the binding of the wooden rim of the basket. Oftentimes dots around the center of the body, at the beginning of the neck, seem like the stitch marks seen on bark basketry. This idea was first advanced by Frank Cushing, who gives a figure of an Iroquois basket which he says was copied in clay by potters. We believe that the idea is correct but the Iroquois of historic times did not use bark baskets or vessels of this character. All their baskets that we have seen have had flat bottoms and in outline were more or less oval at the top.

Grave and pottery vessel. Silverheels site.

Other pottery patterns, such as those found throughout the Seneca district and western New York, have a narrow rim, on the lower side of which is a series of notches or projecting teeth. Sometimes this rim is devoid of these projections and has oblique parallel lines drawn at distances to the edge of the rim. This form is similar to the ordinary bark basket simply bound with an ash splint and an elm bark tape. It is of value to note for comparative purposes that the quilled or chevron pattern is far more prevalent in the Mohawk-Onondaga district than it is in Western New York or in the Seneca-Erie region.

It is of great importance to note that Iroquois pottery never has a circular or scroll-like design such as is found upon the pots of the south and upon certain Ohio village sites. The absence of any curved decorations or scroll designs is significant and is one of the things which points out a deliberate attempt to avoid the distinctive art of certain other tribes.

Fig. 17. Rare Iroquois pottery design, Jefferson county

Fig. 18 Effigy of seated human figure, terra cotta pipe from Jefferson county, probably near Watertown. Collected by W. L. Stone. $\times \frac{7}{8}$

All Iroquoian pottery seems to have been built by the coil process, that is to say, it was formed by coiling ropes of clay upon a base and then worked into the desired shape by continuing the coiling process. Very few pots were blackened by pitch smoke although some pipes were treated with this process.

Plate 46

Decorative motifs from Iroquois pot rims

Smoking pipes. Smoking pipes of both stone and clay are numerous in the Huron-Iroquois area. There are several general forms but all bear striking resemblance to one another.

Iroquois pipes seem much different from those found in any other archeological area, and it does not appear at first thought that they were derived from any other forms except perhaps the small tubular form with its end bent upward at an angle. There are certain features, however, of Iroquois pipes that remind one of pipes of contiguous tribes. It will be noted that the monitor pipe of the mound-builder region has a bowl which resembles an oval vase with a flaring rim. The bowl is set down into the platform, the whole pipe of course being monolithic. The Iroquois did not use the platform pipe, as we have previously remarked, but they did employ every form of the stone bowl used on platform pipes. The

Fig. 19 Monitor pipe of stone, showing the resemblance to a vaselike bowl sunken in a stemmed base

bowl, however, was built in all its lines much like the monitor type but submerged into the platform stem. The same remark applies to certain forms of effigy pipes where the bowl has an animal head projecting from it. Certain forms of Iroquois clay pipes have similar bowls but with a stem of the same material projecting from it. The Iroquois did not have anything identical with the mound types with beautifully formed effigies of complete birds, toads, frogs and small mammals, such as are featured by Squier and Davis.¹

¹ It must not be forgotten that Iroquois effigy pipes were mostly of modeled clay and the mound effigy pipes of carved stone. Compare the effigies of these pipes, one with the other, and it will be seen how startlingly similar they are, where the same life forms have been imitated.

Plate 47

1

2

3

4

Typical collar decorations on Jefferson county Iroquoian, (Onondaga) pottery. The faces on 2, 3, 4 are at the upturned corners.

There is just one important exception to this statement, and it is that relating to the cruder form of effigies found on platform stems. On early Iroquois sites effigies of this kind are found in the so-called

Fig. 20 Diagram showing how a pipe bowl might be sunken in a stemmed base, thus becoming the prototype of the monolithic monitor pipe

lizard or panther pipes. The platform, however, has disappeared and the bowl and the effigy have a different orientation. The effigy seems to have clung to a narrow strip of the platform which appears in the shape of a small stem, and the stem hole is drilled in the back of the effigy, the bowl of the pipe being drilled down through the top of the shoulders into the body of the effigy. The drilling shows in most cases a large conical or beveled hole. Other effigy forms show no traces of the platform or rod, as in the case of the lizard pipes which perch upon their own tails, but are conventionalized forms of birds, generally an owl, having the body at the shoulders drilled for a bowl and the stem hole drilled in the lower part of the back (see plate 48). Oftentimes in the front of the pipe a conventionalized projection is made to resemble the feet. These bear a perforation from which, no doubt, were suspended ornaments.

Fig. 21 Typical lizard or otter pipe with vaselike bowl. From an Iroquoian site. $\times \frac{7}{8}$

Other forms of mound pipes used by the Iroquois without any alteration are those from the Erie region resembling animal claws and those modeled along cubical lines with a short stem base for the insertion of a reed. Iroquois and mound pipes interpreted and compared in the light of these observations show in general concept a remarkable similarity. They are more alike than are the pipes from the southern states or the Atlantic seaboard.

Fig. 22 Iroquoian slate pipe from Otsego county.
W. E. Yager collection.

The stone owl pipe and the lizard pipe, which have been described best by Col. George E. Laidlaw of the Provincial Museum of Ontario, are found in the early Iroquois sites in New York and undoubtedly sites in the same period throughout the entire Iroquois area. The Province of Ontario has yielded many, numbers of them.

Owl or bird pipe of stone. x $\frac{4}{5}$

have been found in New York, still others have been found through Maryland, Virginia and the Carolinas. Others have been found elsewhere, but only occasionally.

These effigy pipes of the Iroquois in some ways remind one of the Cherokee pipes which have the effigy standing on the front part of the stem. In the Iroquois pipe, however, the stem has been abandoned and the effigy has either sprung upon or grasped the bowl or made it a part of itself. It is not difficult to conceive that this type might have been derived from either the Cherokee or mound pipes. A single dream of an old woman of the early tribe widely recounted among the people as a necessary provision demanded by the spirits might cause a modification in any line of material culture. We have only to examine the history of the modern drum dance of Ojibway and middle plains tribe to discover how a dream can institute a custom that becomes widely known and followed.

Pottery pipes. Iroquois pottery pipes are among the most interesting forms of their ceramic art and some of the best modeling is

Fig. 23 The "blowing mask" pipe. This is a typical Seneca pipe. Found in Silverheels site. Similar pipes come from Ontario county, N. Y. and from Brant county, Ont.

found in them. They bear upon their bowls the effigies of birds and mammals, animal heads, human heads, and representations of earthen pots and other objects. They are far more complex and made with greater care than are the Algonkian pipes (see plate 54).

A series of vase-shaped stone pipe bowls from early Iroquoian sites. These bowls are frequently flattened, as in the cases of 6 and 7. Other forms have animal effigies grasping the bowl as in 5, or the back of the animal forms the bowl, as in 1. A conspicuous characteristic is the large countersunk stem hole.

Iroquois clay pipes in fact are the most carefully made and best modeled clay pipes made by the aborigines of North America north of Mexico. There are certain features about them that give a hint of the customs and costumes of the people who made them; for example, they show that the skin robe with the animal head still upon it was worn as a blanket and headpiece; they give an idea of facial decoration; they represent masked figures with their hands to their lips blowing, (see figure 23) as in the false face ceremony, or they reveal their totemic animals. Some of them have numerous human faces modeled upon the stem and bowl and both the form of the face and the concept is still carried out by some of the Iroquois today, especially the Cayuga, who carved these faces upon gnarled roots as charms against witches.

The most common type of pipe among the Mohawk-Onondaga group is that having a flaring trumpet mouth. The Seneca-Erie, on the other hand, including the Hurons of the north, commonly used pipes having a cylindrical bowl upon which was a long collar decorated by parallel rings (see figure 24).

Fig. 24 Three typical Iroquoian pipe bowls. 1, the trumpet bowl; 2, the raised point square top; 3, the ringed bowl. The last appeared more recently than the other two.

Early types of both clay and stone pipes made by the Iroquois show a type of decoration made by rectangular slots arranged in series. These slots, it has been suggested, were inlaid with pieces of colored wood or shell. None so arranged, has yet been found, so far as we are able to state. This slotting is a characteristic feature in certain early pipes. (Compare 9 in plate 50 and 1 and 2 in plate 48.)

Certain forms of pipes show how widely prevalent certain concepts prevailed among the Huron-Iroquois. Briefly, there are the owl-faced pipe, the blowing pipe with the human face, the ring collar pipe, the square top pipe with the flaring collar, the trumpet bowled pipe and others. It appears that Iroquois pipes are a unique

Plate 50

CERTAIN HUMAN FACE EFFIGY PIPES FROM EARLY IROQUOIAN SITES. $\times \frac{2}{3}$
 1, 3, Stull site, mouth of Honeoye; 2, 4, 6, 7, 8, 9, Richmond Mills;
 5, a two-faced pipe from Belmont, (G. L. Tucker coll.) Note that 6 has
 no eyes. A. H. Dewey found specimens from Richmond Mills with scars
 showing the remnants of shell eyes.

Plate 51

1

2

3

4

5

6

7

8

9

Fragments of pipes showing various forms of effigies of the human face. Onondaga area. $\times \frac{3}{4}$

part of their culture. Further description of these is given elsewhere in this bulletin.

It is interesting to note the methods by which the stem holes of Iroquois pipes were produced. Probably the majority have had the hole punched through the stem while the clay was yet plastic but there are many specimens that show that the clay was rolled or modeled over a small reed, straw or a wisp of twisted grass. When the clay was burned the reed or grass burned out and left the stem hole. Hundreds of broken and split specimens from western and central New York reveal this ingenious method of making the hole. Very likely this usage added to the strength of the modeled form and prevented the danger of cracking the stem by punching, and insured an unobstructed passage to the bowl.

Plate 52

Typical Iroquoian clay pipes from New York. 1. Trumpet-shaped pipe, common to early Onondaga and Erie sites; 2. Moon pipe, prehistoric Onondaga; 3. Seneca pipe with bird head effigy; 4. Face from an Oneida pipe; 5. Animal effigy pipe, broken stem, Ontario county; 6. Effigy pipe, Leroy, typical prehistoric Seneca of the Genesee valley; 7. Typical early colonial Seneca and Neutral pipe, Erie county.

Plate 53

CLAY PIPES, IROQUOIAN, FROM CENTRAL AND NORTHERN NEW YORK

1, Pompey; 2, Jefferson co.; 3, Cicero; 4, Lima; 5, Pompey; 6, Jefferson co.; 7, Oneida co.; 8, Dann site, Monroe co.; 9, Ellisburg, Jefferson co. 7 appears to be of obdured clay and the carving resembles certain Ross co., O. mound pipes.

Plate 54

Iroquoian clay pipes from Jefferson county. Loveland collection, State Museum.

Iroquois Migration Hypothesis

For the sake of a working hypothesis and for the benefit of future discussion, we wish to advance a theory explaining the presence of the Iroquois in this particular area.

Let us suppose that the one, two or more related tribes of early Huron-Iroquois lived in a portion of a region embraced within a circle having a radius of 200 miles and with its center at the mouth of the Ohio river. ere they were in contact with the Caddo, the Muskogee, the Sioux and some of the Algonkin. They were more or less agricultural and sedentary and familiar with village life. They knew how to erect stockades and build earthen walls for their inclosures.

Some movement of intruding immigrants or other influence caused them as a body to push northward up the Ohio river. Some went eastward into the Carolinas, but the main body migrated in a north-easterly direction. The tribes of the Cherokee were the first to lead the way and crowded upon the mound-building Indians of Ohio, whom they fought for a long period of time. They finally overcame the Mound Builders¹ and absorbed a large number into their own tribal divisions, and possessed themselves of the Mound-Builder country. Very likely they were assisted in this conquest by bands of Choctaw, Algonkins and by some of their own cognate kinsmen.

They then took upon themselves some of the characteristics of the Mound Builders, but endeavored to blot out some of their arts, to the extent of mutilating objects they regarded as symbolic of their former enemies.

Other Iroquoian tribes then pushed northward and endeavored to pass through the Cherokee Mound-Builder country. Jealousies arose and the newcomers with the Delaware began a general war against them, finally driving them southward and across the Appalachian ranges. This estranged the two branches and led to wars up to well into the historic period.

The beauty and fertility of the country attracted settlement, but the Cherokee constantly raided their villages. Bands then began to

¹ We use this term only as a convenient expression to describe the Indian tribes of the region under discussion.

cross the Detroit river and push their way into the peninsula between Lakes Huron, Erie and Ontario. A band now known as the Huron established themselves near and southward of Lake Simcoe. An allied tribe, the Attiwandaronk or Neuter, possessed the region south and east of them, taking the Grand River country and pushing eastward across the Niagara. Still other bands pushed over the northern shores of Lakes Erie and Ontario and fought their way to the mouth of the St Lawrence.

Powerful bands established themselves about the St Lawrence, with the site of Montreal as a center. They were the Mohawk-Onondaga, though the Onondaga soon pushed southward to the hilly region east of the foot of Lake Ontario, in the present Jefferson county.

Certain bands continued on the south shores of the lakes and pushed their way eastward. One division, the Erie, claimed nearly the entire southern shore of Lake Erie while the Seneca, pushing eastward laid hold of the country from the Genesee river to Canandaigua lake.

The Conestoga or Andaste took northern Pennsylvania, especially the region embraced by the two branches of the Susquehanna, including the Chemung river and southward, perhaps as far as Harrisburg. From thence to the headwaters of the Chesapeake the Susquehannock claimed dominion. Still southward but east of the Cherokee pushed the Tuscarora and it is possible that bands of them earlier lived there.

There was constant intercourse between the various tribes who were well aware of the seats of one another. Often the various bands were at war and often there were loose alliances, as of the Tuscarora with the northern Iroquois. The Cherokee and Iroquois, especially the Seneca, were constantly at war. To the north the chief enemies of the Iroquois were the Adirondack, who later allied themselves with the Huron.

The Huron-Iroquois pushed the eastern Algonkin to a narrow strip along the coast and so separated them from their western kinsmen that they exercised a dominant influence over their material culture and to some extent their social organization. The Delaware, who were closely associated with the Iroquois, were always more or less friendly with them, and indeed in the historic period at least acknowledged the supreme authority of the confederated Iroquois over them.

Fragments of Iroquoian pottery from an Iroquoian site near South Bend, Ind. $\times \frac{2}{3}$ Ernest Young collector.

The raids of the Adirondack or Abenaki of the north, and the hostility of the southern Iroquois at length compelled the Laurentian Iroquois, the Mohawk, Onondaga and Oneida tribes, to form a compact which later took in the Cayuga and then the Seneca.

The Onondaga early had pushed farther south, leaving their east Ontario (Jefferson county) strongholds and occupying the hilly country south of Onondaga lake, in the present Onondaga county. The incursions of the Abenaki made this necessary. The Mohawk soon followed owing to disagreements with the Laurentian Huron. In their southern migration they came upon the Mohawk valley country where they established themselves first on the highlands north of the river, in the present Fulton and Montgomery counties, and later on the southern side of the river. The Oneida band, long a separate body, moved westward into the highlands of Madison county. Still west and on the hills near Limestone creek were the Onondaga and beyond them the Cayuga living along the Seneca river and southward about Cayuga lake.

Between these divisions of Iroquois in spite of a common origin and common stock dialects there were frequent feuds and much jealousy. In general their southern neighbors gave them too much trouble to leave much time for war between themselves. The Mohawk sent war parties north to harass their foes, the Huron and Abenaki and even the Micmac, but in turn were disturbed by the Conestoga or Andaste, whose Chemung valley settlements made war on the Cayuga also. The Seneca and Erie tribes in the Genesee country and along Lake Erie were in constant intercourse and perhaps allied for defensive purposes. The westernmost Seneca settlements were especially friendly with the Erie. On both sides of the Niagara river were the villages of the Attiwandaronk or Neutral, considered an old and parent body of all the Huron-Iroquois. Within one of their villages near the Niagara lived Ji-gon-sa-seh, "The Mother of Nations," a woman who was a lineal descendant of "the first woman of earth."

The Neutral had a series of eastern settlements occupied by a band calling themselves the Wenro.

The pressure of the eastern Iroquois and the additional power their friendship would give, made the idea of a confederacy to the Seneca an inviting one and a large portion of the nation subscribed to it. The Erie were not kindly disposed to the idea and the southern Iroquois were not at all attracted by it. The Neutral saw no need of entering the league since they made no local war and since

both their Huron and Iroquois kinsmen respected their ancient authority and the prestige given them by the "Mother of Nations." Thus, the Iroquois Confederacy or Long House came to embrace only the Mohawk, Oneida, Onondaga, Cayuga and Seneca. The fact that some of their kinsmen would not join the confederacy was displeasing to the Five Nations, who though dedicating their league to the establishment of peace saw grave danger in their neighbors who refused to subscribe to the articles of friendship. The new confederacy was soon beset with enemies on all sides who saw in its rising influence a general danger. But the confederacy developed certain mental qualities within its leaders who were not to be overwhelmed. They became astute statesmen as well as ferocious warriors. They learned the advantage of concerted action, of compromise among themselves and of organizing mass onslaughts. Thus nation after nation fell before them,—the Erie, the Neutral, the Huron, the Wenro, and the Conestoga. The Cherokee were too far away to reach effectively. Although the Five Nations lost thousands of warriors their foes lost more and the surviving enemy were made captives, led into the Iroquois villages and adopted. This swelled their ranks enormously and virtually united by blood mixture all the Iroquois.

The triumph did not come to them, however, until the middle of the colonial period, and with this triumph came the golden age of the Five Nations. This was from about 1650 to 1755. Before the earlier date their foes had been Indians; after that date they battled with the white man, it is true, but they lost no power. By 1755, however, the colonists had come in such numbers that the Five Nations saw the end of their ascendancy as a dictatory power. They had come, they had conquered and now they became engulfed in a complex of cultural elements of which their ancestors had never dreamed.

When one considers how many captives were taken by the Iroquois tribes, and how extensive their trade and their raids were, it seems little short of marvelous that so few non-Iroquoian articles are found on the sites of their former habitation. Nearly everything we find is unmistakably Iroquois, as if among all the tribes that they met and conquered nothing that they made was worth taking or copying by the Iroquois. They even rejected certain objects, as we have already seen, that ordinarily must have been attractive to them. It is true that some non-Iroquoian articles may have been found, but these are very few and may have been lost

by the wandering enemy or concealed by captives. We are thus compelled to believe, since the preponderance of evidence supports it, that the Iroquois held their material culture a crystallized thing, a possession that must not be adulterated or violated. They must have deliberately stripped their captives of everything distinctively non-Iroquoian and prevented them from making distinctive objects of other tribes. Historically we know that the Iroquois removed the moccasins of their captives and placed upon their feet those of the Iroquois pattern. In all this there is an interesting suggestion for the study of American Indian folk belief.

With the coming of the European many of these older beliefs began to crumble. The white man's goods were desirable to a degree that broke down all resistance. They were filled with the potent magic of the white man and gave power and speed to those who used them. Thus on all Iroquois sites that were occupied when the European traders tracked their way through the forests, European articles may be found. The number of implements of the white man's manufacture found on sites increases as time goes on, until in midcolonial times the sites of Iroquois towns, as at Bough-ton Hill and Rochester Junction, are strewn with scraps of brass and bits of iron. Even the graves contain guns, scissors, copper and brass kettles, and glass beads are shoveled up by the quart. In late colonial sites European articles predominate and as the nineteenth century advanced, distinctively Indian things all but disappear.

Only in a few places today do the Iroquois tribes make any durable thing that is similar to their old manufactures, though they do have a few ceremonial articles of bark, wood, husk and skin. They make nothing more of stone, clay or flint. They still make — at least some non-Christian Iroquois do — turtle shell rattles. Their early belief told how the earth rested on the back of a turtle. It was the first permanent thing; likewise the shell of the turtle, empty save for a few kernels of corn or small pebbles, is the last characteristic thing of their culture that when buried in the earth will survive the action of the elements. The white man's goods and the white man's way of living have all but obliterated the Iroquois. The so-called "pagans" have a few ceremonies, make a few ceremonial and useful articles and remember a few legends yet, but outwardly the bronze-skinned Iroquois is dressed as a white man who gains his livelihood as white men do, by working as a section hand, upon the farm or in the shop, or perchance by writing treatises upon archeology. There are few things he can not now do that other races

do. And it should be recorded that several hundred of the younger men volunteered for the late war as soldiers of the American and Canadian expeditionary forces and went overseas in almost every capacity from private to captain, thereby in the most effective manner strengthening the bonds that unite them, the Iroquois, with the common brotherhood of nations. Thus we may see whither they go, but our problem has been to determine whence they came. Our information as we have seen, points to a source to the west, and down the Ohio. We ought to find plain evidences of early Iroquois sites all along the Ohio river and westward along the shores of Lake Erie and even as far as Wisconsin, thence southward to the mouth of the Ohio.

IV

CERTAIN TYPE SITES INTENSIVELY EXPLORED BURNING SPRING PREHISTORIC IROQUOIAN SITE

NEAR VERSAILLES, CATTARAUGUS COUNTY

BY ARTHUR C. PARKER

Burning Spring fort is a precolonial Iroquoian stronghold in the township of Perrysburg, Cattaraugus county, New York. It is situated on the point of a ridge jutting out from the superior terrace on the southeast side of Cattaraugus creek, southeast of the mouth of Big Indian creek.

The earth wall that forms the breastworks of the fort is locally supposed to have been beyond the powers of Indians to erect and is therefore credited, for no apparent reason beyond this, to the French, and the place has therefore been called the "Old French Fort." The name of "Burning Spring fort" has been substituted in this account as more descriptive of its location and as more consistent with fact.

The "burning spring" is found at the foot of the hill upon which the fort is located and takes its name from the gas that bubbles from the rocks beneath the water at the base of Burning Spring falls, a stone's throw from the mouth of Big Indian creek. The gas, up to some twenty years ago, issued in considerable volume, and once lighted continued burning until extinguished by a heavy freshet or by high winds. At present the gas is emitted in small quantities from a crevice in the slate rock and supports but a feeble flame. Still, the picturesque falls, the wide slate-bottomed creek, the sulphur spring, the ancient fort above and the romantic surroundings have for many years made the spot an ideal one for picnics.

The fort proper embraces an area of about one acre. The site is one admirably adapted by its natural surroundings for a fortified refuge, the swift treacherous Cattaraugus on the north preventing easy access from that direction and the high, almost perpendicular, slate cliffs of Big Indian creek on the west forming effective barriers there. The eastern hillside is less steep but is protected by a series of trenches, shielded by walls of earth, dug into the hill at intervals from top to bottom. These outposts are found at all easily accessible parts of the bank. They were possibly intended as vantage

A view of the mouth of Burning Spring or Big Indian creek from across the Cattaraugus. The fort is on the hill above the falls.

places from which an enemy could be fought and driven down the slope. Plate 58 is a cross section of the eastern hill near the gateway of the fort and shows two of the outposts. Plate 59 gives the outline of one looking down and into it.

That these walls and trenches are artificial is proved by the fact that potsherds, fire-broken stones, chipped flints, and stone implements were found below the modern bottoms of the trenches behind them. This indicates that they were occupied. The earth of which the walls are composed, upon examination, proves to have been thrown up by men because the strata of soil are reversed and intermixed.

The fort is separated from the point of which it is a part by a wall 200 feet in length that curves irregularly from bank to bank. That this wall is of artificial origin is evident at a glance and this is confirmed by an examination of the earth of which the wall is built. The lake-washed sand is found on top while the yellow sand and top soil are found beneath. The base of the wall is 14 feet in thickness while the ditch from the crest of the wall to the outer edge of the excavation is 16 feet wide. The average height of the wall from the bottom of the trench is 5 feet. Near the eastern side of the fort where the hill is not steep the wall as it approaches it is higher and steeper and the trench deeper. A depression in the top of the wall at this point seems to indicate the ancient gateway. A log probably bridged the ditch at this place over the deep pit.

That the site was anciently occupied by man is to be judged not only from the wall but from the pottery fragments, flint chips, flint articles, stones showing signs of use and fire-broken stones found scattered over the surface of the ground within the wall-enclosed area. Such objects always constitute good evidence of aboriginal occupation.

In view of the interesting location of the Burning Spring site, its remarkable features and pronounced evidence of aboriginal occupation it was chosen as a site most worthy of archeological research, the object being to discover if possible the tribal identity of the one-time occupants and builders of the fort, and to find as many specimens of their manufactured implements, etc. as possible, the former to be deduced from the latter.

The owner of the fort, an Indian, never permitted anyone to excavate in it and before his death in 1902 he instructed his two daughters to see that no white man should ever touch it if they could prevent it. Many people, however, at various times surreptitiously dug holes in the wall hoping to find relics therein and a few

Large refuse pit at Burning Spring, with pottery fragments, flints and stone mortar in place as found. The stratification of this pit is plainly visible.

more experienced than the rest dug pits near it. Beyond this no systematic effort has ever been made to excavate the site.

A lease was secured August 20, 1905, and excavations begun in a narrow strip that lay on the southern end near the wall, all other portions at the time being under cultivation. Between August 20th and October 15th twenty-five trenches 8 to 10 feet wide were dug through the stratum showing signs of disturbance, crops having been removed about September 20th, permitting free use of the ground. In the trenches were found thirty-five pits while fifteen others were discovered by the "post holing" method. These pits, with few exceptions, were fireplaces. Fifty inches was the maximum depth to which disturbed earth extended and 30 inches was the average. Usually the pits contained several layers, the bottom being composed of a deposit of charcoal and ash intermixed with fragments of broken pots, flint chips, etc. A layer of stained yellow sand covered this and above it another stratum of charcoal and ash, while above all was the top soil that gave no clue to the pit beneath.

Nearly all the objects in the collection of archeological material were discovered in these pits.

Pits of this kind are common on most Indian sites; as is commonly known fires were built within them for heat, light and for cooking purposes. A deposit of charcoal and ash thus accumulated in the bottoms of the excavations. To extinguish the fire loose dirt or sods were thrown in, covering the embers and smothering the flames. Sweepings from the wigwam floor were also thrown in. This refuse consisted of broken earthenware, bones of animals, shells of shell fish, waste food, discarded stone implements and other similar things. Often by accident or intent objects of value, such as perfect flints, bone implements, trinkets etc. were swept or thrown in. A new fire was built and the process repeated until the pit was filled and abandoned. Pits are therefore places in which one may find many things of interest bearing on the life and arts of the ancient people whose history he is endeavoring to discover.

Much of the vegetable matter thrown upon the fire in pits became carbonized, thus preserving its form. In the Burning Spring pits were found charred walnut and butternut shells, corn and wild plum pits. We may be fairly sure therefore that the occupants of the site ate such things though they probably ate many other things besides.

The bones in Burning Spring fort pits were so far decomposed that only a few were discovered, a few bones of bear, deer and fish

being the only ones found. In almost all sites in the vicinity the bones are almost as tough and hard as when the meat was stripped from them several hundred years ago.

The pottery from Burning Spring is in most ways similar to all early Iroquoian pottery in composition and design. A critical study and comparison does not show it to be different in any essential respect. The pipe pottery is somewhat different in form and design from any Erie pipe pottery from sites in which European articles are found. The bowls are thinner and more capacious. The designs on the earthen pots are numerous and a great deal of ingenuity is displayed in ornamentation by means of dots, single lines, parallel lines, oblique lines and dashes. Specimens showing fabric markings, those showing imprints made by a cord wound stick, and also those on which there are imitation cord marks are numerous. Pottery tempered by mixing with the clay, pulverized flint, quartz mica schist and shell and coarse sand are among the specimens. A number of sherds perforated on either side of a fracture were discovered. Sinews or bark cords were probably passed through these holes to bind the break which was cemented by pitch.

The stone implements are most numerous and varied. Many hammerstones were found. These were usually of natural discoidal pebbles pitted or picked on either side to afford a better hold. The collection contains a number of anvils bearing the marks of flints that have been chipped upon them. Two grinding stones and two mullers were found. Specimen 177 is a good example of a smooth shallow matete while 132 is a rough one which, when reversed, served as an anvil. Three cylindrical pestles were discovered in pits. Specimen 22 is a good example of a chipped pestle. Specimen 108 is a pestlelike object made from some soft stone. It is so soft that it could hardly have been used for heavy pounding. The stone axes or celts were among the interesting specimens of the polished stone implements. They are interesting because they are dissimilar. That the ancient inhabitants of the site were fishermen seems evident from the number of net-sinkers found. They are of the usual type found on all sites ancient or modern. Specimen 115 is a good illustration of the average form of a net-sinker.

Flint objects were fairly abundant and include scrapers, a few perforators, knives, spears, triangular arrow points, a few notched points, blank or cachè blades, rejects, broken points and chips — in fact, a complete collection of flint objects and the waste and accidents incident to their manufacture.

Plate 58

Outline of the Burning Spring fort showing cross section

Plate 59

SCALE: ONE INCH = FIFTY FEET

MEADOW:

Notebook sketch of the area within the Burning Spring fortification. The wall and ditch are indicated and the trenches outlined.

The flint articles found at Burning Spring are of a different type from those found in the site at the mouth of the Cattaraugus creek and were made by a different people. The material is also different, no jasper or fine quality of flint being found. The material without exception is the local flint and chert.

Three disintegrated skeletons were found in pits on the eastern side of the fort, but these were so far decomposed that they would have resisted every artifice to restore them.

Each grave pit contained a smaller intrusive pit and a quantity of charred straw or grass. Grave pit 1 contained a large broken pottery vessel, pit 2 a broken pipe bowl and pit 3 a rude axe or celt.

Nothing of the positions of skeletons could be determined. That no complete skeletons could be found is to be regretted.

No metallic articles were discovered, notwithstanding the fact that Bulletin 32, *The Aboriginal Occupation of New York*, contains a paragraph on the site in which it is stated that explorers in 1838 discovered skeletons and iron axes within it. Such articles may have been found near the site near the mouth of Castile or Indian creek 2 miles above Burning Spring and been credited by mistake to Burning Spring fort.

The character of the objects found here leads to the conclusion that the site is one occupied by a branch of some early Iroquoian tribe. It can not have been the Seneca for it antedates the Seneca occupation. It is probably Erie, but if so, seems very early. The vessel pottery is similar to the early Iroquoian; for example, Jefferson or Onondaga counties. The pipe bowls are early Iroquoian but the bowls are thinner and of greater capacity. They are Iroquoian but not of an ordinary type.

A PREHISTORIC IROQUOIAN VILLAGE AND BURIAL SITE IN CHAUTAUQUA COUNTY

By ARTHUR C. PARKER

Early in the month of May 1907, a preliminary examination was made by the writer of some of the earthworks in that part of Chautauqua county lying south of the Chautauqua range of hills in the Allegheny-Ohio watershed. The outlook seemed a promising one, judging from the abundance of earthworks visited and reported. The Cassadaga valley was of special interest and a season's campaign of investigation was planned for this region. Upon the uneven stream-cut hills that rise from the ancient lake bottoms were found everywhere traces of an early people which seemed eminently

Fig. 1 The central pit in the McCullough earth inclosure

Fig. 2 View looking over the burial knoll. Ossuary 5 was found near the stump shown in the left-hand corner of the picture.

worthy of study. How numerous are the fort sites may be suggested when it is stated that from a hill just over the town line in Charlotte are to be seen the sites of seven and possibly eight fort and camp sites.

One of the sites to which considerable attention was devoted is situated in a sugarbush on the Martin McCullough farm, lot 38, Gerry township. Here surrounded by a swamp from which rise sloping hills is a rise of land some 3 feet above the swamp level. Upon this rise of ground is an oval or rather kite-shaped earthwork 1297 feet in circumference. The wall is now from 22 to 24 inches in height and is composed of the earth which was scooped from an outer ditch bordering the wall. This earthen ridge first attracted the attention of Obed Edson who some fifty years ago was engaged in running the lot lines. Some mention of it is contained in the various county histories to which he has contributed or written. Numbers of men distinguished in archeologic science have visited the place and more than a dozen years ago representatives of the Smithsonian Institution made some investigations there. To the west of the earth wall rises a small knoll which appeared to be composed of glacial sand and to the north running through a little valley is a brooklet. Within the wall are numerous pits or depressions 5 or 6 feet in diameter and 3 to 9 inches deep. These, upon examination, proved to be shallow refuse pits with an original depth of from 1 to 2½ feet. A rather remarkable pit is situated almost in the center of the inclosure and measures 157 feet in circumference with a depth of 5 feet. The earth wall is surrounded on its outer side by a ditch which is at present but little more than a foot below the normal level of the surface. The wall at present is on the average 8 or 9 feet through at the base and the crest of the ridge rises 2 feet in places. The ditch and wall are entirely visible in lot 38 and the wall may be traced in lot 30 where the ground has been cultivated for several years. An enormous white pine stump stands on the northwestern side of the wall. A cross-section of this stump was made by Hon. Obed Edson and more than 400 rings were counted. At the northwest corner of the earthwork where the stump stands, the surface of the ground is 20 feet higher than the brook bed, which lies to the north 25 feet distant. At the lot line on the east the earth wall takes an abrupt turn almost at right angles and runs about parallel to the line for 450 feet.

Within the inclosure at about its mid point is the bowl-shaped depression, previously mentioned. The pit is 5 feet deep and 50 feet in diameter. In area the inclosure is about 3 acres.

Plate 6r

LONG SLOPE

Sketch map of the McCulloch Farm site, Gerry, Chautauqua county

It was found after some expenditure of time that very little movable material data bearing on the original inhabitants could be hoped for. Specimens of the arts and manufactures were few and fragmentary. However, bearing in mind that the problem was to discover the identity and characteristics of the builders of the earthworks, it was deemed advisable to continue until they could be thoroughly studied and every important fact obtainable brought to light. Since the area within the inclosure refused to divulge all the desired information, it was sought to discover the burials and wring from the crumbling bones of these swamp dwellers some word or fact to dispel the mystery.

Post holes were dug in the ridge to the west of the earth-walled inclosure to discover, if possible, whether or not there were any burials, it being the spot most suited for graves, in point of accessibility. The surrounding ground was swampy and the loam but a few inches in depth when a stiff clay or hardpan was encountered. The knoll, on the other hand, was dry and sandy.

After forty tests had been made, running from the brook on the north in a southerly direction, an area of disturbed earth was found and a trench staked out for systematic excavation. Following the rule the trench was one rod wide. Trench 1 was run over the crest of the ridge from south to north.

Burial 1, was found at 16 feet in the middle of the trench 20 inches below the surface. A root-eaten skeleton of a young female was discovered. The skull was crushed at the top. Only the skull and upper ribs and upper arm bones were found. The head lay to the northeast, face northwest. Twenty-eight inches southeast and above the head was an ash pit 18 inches deep. It was filled with white ashes. The superincumbent soil was sandy and intermixed with bits of charcoal.

Burial 2. At 16 feet on the west side of the trench, 36 inches below the surface and opposite burial 1, burial 2 was discovered. The skeleton was that of an adult male and lay in a flexed position. Measurements of the skeleton as it lay led to the following data: 33 inches from top of skull to heel; knee to back, 9 inches; pelvis to top of head, 33 inches. The soil was strewn with charcoal bits and potsherds. A black fibrous phosphate was noticeable in the grave soil.

Two empty graves were found between this burial and the next (no. 3). Their character as graves was shown by the soft, loose and disturbed soil which lay surrounded by the hard, undisturbed grit. It was an easy matter to shovel out the grave soil because of

Fig. 1 Grave 6, McCullough farm site, Gerry, N. Y.

Fig. 2 Ossuary 5, McCullough site, Gerry, containing 14 skeletons

its looseness, without disturbing the wall of the grave. Only a few fragments of bones were discovered in these empty graves.

Burial 3. Discovered at 34 feet on the west side of trench 1, 26 inches down. Skeleton was that of an infant 8 or 9 years old. The skull was crushed. The body lay in a grave outlined by a row of flat stones placed upright on edge. Orientation: head, east-southeast; face north-northwest; right side, flexed. Body lay east-southeast by north-northwest. From top of head to end of toes 2 feet 3 inches. Black substance in grave. Ash pit south of skull at 18 inches. Grave soil much disturbed.

Burial 4 was found at 33 feet on the east side of the trench. The depth was 25 inches and the grave outline 60 by 35 inches. A decayed male skeleton lying in the usual flexed position. Orientation: head, south-southeast; face west-southwest, left side. The skeleton as it lay measured 36 inches from top of head to heel and 15 inches from knee to back. The superincumbent grave soil was much disturbed. An ash pit $2\frac{1}{2}$ feet in diameter and 1 foot deep was found just south of the grave.

Between graves 3 and 4 there was a streak of disturbed earth 30 inches deep, as if the entire ground had once been turned over to this depth. There was a thin separating wall as if there had been two other graves here.

Burial 5. At 40 feet on the east side of trench 1 the tops of two boulders were struck and a few inches north of them a heavy bed of white ashes. Beneath the ash bed, 11 inches from the surface of the ground, the tops of several skulls were touched. Careful excavation revealed a small ossuary containing the remains of parts of fourteen skeletons.

The bones were placed in a rectangular heap measuring north-east to southwest, 2 feet 4 inches, by northwest to southeast, 1 foot 8 inches. The large bones, femora, tibiae etc., lay northwest and southeast. Six skulls were arranged around the top of the ossuary and beneath them were four others, all broken. When the bones were removed twenty-seven femora were found which would indicate parts of fourteen individuals. The earth had packed about the outer bones and had not fallen into the interstices of the bone heap below. The area of the disturbed earth was, in diameter 4 feet 6 inches. The two boulders south of the ossuary had probably been placed as hidden markers. Large stones had not been encountered before in the sand of the knoll.

Just beyond the ossuary to the south was a large ash pit 48 inches

in diameter. In depth the ossuary was 16 inches, or from the top of the ground to the bottom, 27 inches.

Burial 6. This grave was discovered at 37 feet outside of trench 1, on the west side. It was 36 inches deep, 36 inches wide and 55 inches long.

This grave, unlike the others, seems to have been an original burial, that is to say, the earth had not been overturned more than once. The other graves seem to have been used several times, the bones being removed for ossuary burial or other disposition, and a new body interred therein.

The skeleton was that of an adult male of mature years (about 60). A heron's lower mandible was found at the forehead as if it had been used as a hairpin. The earth had packed about the limbs and neck and left in the clay-mixed sand a cast of the body. A black phosphate surrounded the bones, the remains of the animal tissue and burial wrappings.

Measurements of position gave the following data: knee to back, 17 inches; atlas to os innominata 2 feet 5 inches; atlas to end of tarsus, 3 feet 2 inches. Orientation: head east; face, south; left side flexed. Bones in good condition except those of the two lower arms.

Burial 7. Another grave was opened at 44 feet on the west side. It was 30 inches deep and contained only a few decayed vertebrae and a deposit of grave dirt. The larger bones had probably been removed for ossuary burial.

Burial 8. At 49 feet on the west side, grave 8 was found. It was 19 inches deep and contained a few decayed bones, part of a femur and the crushed remains of a child's skull. Over this grave was a layer of thin slabs. At the south end of the grave was a boulder 12 inches in diameter. It was 18 inches below the surface. The skull lay with the top east. A large piece of shale lay directly beneath the pelvis. Between this grave and the next was an ash bed 7 inches deep.

Burial 9. At 50 feet in trench 1 touching the line on the east side, 20 inches below the surface, the top of another ossuary was uncovered. Excavation disclosed a bone pile 48 inches from north to south and 33 inches from east to west.

Unlike burial 5, the first ossuary, this was a promiscuous heap of bones cast without order upon a group of twenty skulls arranged in an oval. Four inferior maxillae, six broken femora, five humeri, a number of ulnae, radii, vertebrae, an astragalus, tarsus, ribs and pelvis were found in the heap over the skulls. Of the twenty skulls,

ten were male and nine female. Parts of another skull were found, but the sex could not be determined.

Over the ossuary was a glacial boulder about 18 by 18 inches and a covering of shale and fossiliferous Chemung rock.

Four craniums from the ossuary were in good condition and four others in condition for measurements. All are interesting for the characters they exhibit.

Burial 10. At 50 feet on the west side of trench 1 was an empty grave 24 inches deep. Over it had been cast a quantity of broken stone. From the north wall of the ossuary, running north for a foot, was a top layer of burned stone. The earth here had not been disturbed.

Trench 1 was temporarily abandoned at 54 feet and a parallel and adjacent trench run on the west side.

Burial 11. At 5 feet in the middle of trench 2 burial 11 was discovered. The grave area was 4 by 4 feet and the depth 2 feet. The skeleton was that of a female. The skull was crushed. The arms were flexed to face, the left hand being under the left cheek.

Orientation: head, east; face, south; left side flexed. Head thrown back.

Burial 12. Burial 12 was at 10 feet in the middle west side of trench 2. It was an empty grave with disturbed earth to the depth of 48 inches.

Burial 13. Grave 13 was on the east side of trench 2 at 31 feet. It was 28 inches deep and contained the decayed root-eaten skeleton of an adult female. Area of grave, 3 by 4 feet. Orientation: head, east; face, north; flexed. There was a small ash pit at the head of the grave.

Burial 14. Found at 43 feet in the middle of trench 2. This grave was 28 inches deep and 3 by 3 feet in area and contained a male skeleton in a poor state of preservation. The tibiae were noticeably platycnemic.

Trench 3 ran parallel with 2 on the west.

Burial 15. Grave 15 at 4 feet on the west side of trench 3 was 19 inches deep, 19 inches wide and 30 inches long. There were no bones except the broken skull and the neck vertebrae.

Orientation: head, east-southeast; face, south-southwest.

Burial 16. Burial 16 at 44 feet on the east side of trench 2 was 36 inches deep and contained the pelvic bones and sacrum of a young adult. No other bones were in the grave. This fact seems to point to a removal of the skull and larger bones for reburial.

Burial 17. At 36 feet in trench 3, 18 feet south of ossuary 1, pit 5, the third ossuary was discovered. Six skulls were arranged in the form of an ellipse and the other bones thrown in the opening. These bones, besides arm and leg bones, included ribs, pelvises, phalanges, astragali, tibiae and vertebrae. There were two female skulls.

Burial 18. This burial was in the middle of trench 3 at 19 feet and 18 feet south of the ossuary (17). On the bottom of the grave a few potsherds were discovered but no visible trace of bone.

The problem of the many empty graves in the burial knoll was at first a puzzling one. Some graves contained a few ribs, some a pelvis, one or two arm bones and teeth and others were entirely empty except for traces of bone dust. As an hypothesis the theory was then advanced that the parts of skeletons, the larger limb bones and skulls had been removed from the graves and deposited in the ossuaries; that the graves had been left, open or filled, for use again. The ossuary burial is a Huron, or perhaps more properly a Huron-Iroquois custom, and has usually, perhaps entirely, been held a mere matter of superstition or ceremonial custom. The presence of empty graves and overflowing ossuaries suggested the theory of the economic utility of the ossuaries. The virgin earth being difficult to dig, but once disturbed never packing as hard as before, it would have been a matter of labor, time and space saving to exhumate the remains of the dead and reinter them in an ossuary, and to use the empty graves again as burial places.

Those theories are only tentative and not to be regarded as established until numbers of other places shall have shown the same characteristics.

Excavations within the inclosure. The ground within the earth wall had not been disturbed since its aboriginal occupation except in places where sugar boilers had been erected.

Over one hundred and twenty basinlike depressions were scattered over the surface and varied in diameter from 3 to 10 feet, and in depth, from 6 inches to a foot. These pits were examined to discover their purport. Only six yielded anything in the way of relics. These consisted of flint chips, fire-broken stones, pottery fragments and arrowheads. The earth was not disturbed in any case, except in that of the deep middle pit, for a depth of more than 30 inches, the underlying soil being hard and impenetrable by crude implements.

Middle pit. This pit was carefully excavated. The soil was disturbed for about 9 inches below its modern surface except at the

bottom where there was an ash pit 4 feet in depth and 4 feet in diameter. Mingled through the soil of the large pit was found a quantity of pottery, flint and jasper chips, heat-cracked stones and a number of triangular flint points. In the ash pit at the bottom objects of the same character were found.

The presence of this large central excavation presents the problem of its purpose. To solve this question a number of hypothetical answers are adduced for consideration: first, it may have been a central refuse pit; second, it may have been a place of assembly, its gradual slope affording a seating place; third, it may have been an inner stockade; fourth, it may have been a reservoir into which water was conducted from the spring on the hillside to the east; fifth, it may have been excavated to obtain earth for filling in the northwest corner of the inclosure, which is low and sloping toward a small gully which drains a spring marsh.

A careful examination of the ground showed that the northwest corner had been filled in, presumably with the soil excavated from the central pit. This examination also led to the several considerations. That the pit was not a reservoir is shown by the fact that ashes and refuse matter were found within it, though not in large quantities. That it was not a reservoir is also indicated by the fact that no ditch or outlet could be discovered. One may have existed, however, and the pit been a reservoir previous to its use as a refuse dump, if such it was. The refuse matter in the pit did not occur in such quantities that it would be differentiated from "occupied soil" elsewhere, so that it may have been an inner stockade or place of assemblage.

Articles of stone were not numerous and at the Gerry site only three celts were found and these outside the inclosure on the higher ground.

No hammerstones or anvils were found, but arrow chippings and triangular flint points were fairly numerous.

No bone implement or object of any description was found in the village site and the only bone object found whatever was the heron bill near the forehead of the male skeleton in grave 6.

Extent and character of occupation. There is evidence enough to point out that there was no long occupation of the site, the surface soil being but slightly disturbed to any depth. This evidence also suggests a settled occupation only in winter. The shallow pit seems to have been dug during the frozen season by alternately thawing and digging. If animal bones had been buried some would have remained, as human bones did elsewhere in the site.

This suggests that they were cast on the surface and afterward devoured by animals or lost by decay.

Purpose of the earth wall. The earth wall and trench are palpably parts of a fortification. From the crest of the wall, without doubt, rose a line of palisades which surrounded the inclosure. Indeed, traces of these post holes were discovered all along the ridge.

One of the strange facts which at once appears a curious anomaly is that if this inclosure had been a fortification why such a position should have been selected, when from the hillock to the west, arrows and stones or other missiles could have been easily thrown into the wall-protected inclosure. This very thing would have rendered the fort of little use in times of war or invasion. Two considerations then appear: first, that it was not a true fortification designed to protect the inhabitants from men only, but made for a protection from the wolves and other wild beasts which infested the region even in historic times; or second, that the enemies of the age held the acres of the dead or sacred spots and would not under any provocation desecrate the burial ground on the hill to use as a vantage point from which to assail the living within the inclosure which the burial knoll overlooked.

Camp site outside of inclosure. To the southwest of the burial knoll rises another glacial kame which in length runs east and west. This kame contained ten large ash pits, the one in the summit being 5 feet deep and filled with carbonaceous earth, burnt sandstone and charred corn. Between this kame and the inclosure, the earth had almost everywhere been disturbed and there was a heavy mixture of white ash and charcoal as if the vegetation and trees had been burned over many times. No implements were found here except a celt at the west end of the kame.

The soft mellow loam here also suggests its employment as a garden spot, possibly a cornfield. Charred corn was found in some of the pits.

Age of the remains. Several considerations determine the age of the remains. The absence of European articles at this place is good presumptive evidence that it is prehistoric. The similarities between the characters of the occupation and those of the early historic Erie point out an early Erian people. That they were early Iroquoian is evident from an examination of the artifacts but that they were early Erian is manifest by certain differences in form of culture and occupation. The remains would seem to be at least 500 years old, and even a greater age may be safely ascribed.

A PREHISTORIC IROQUOIAN SITE¹
ON THE GEORGE REED FARM, RICHMOND MILLS,
ONTARIO COUNTY
BY ARTHUR C. PARKER

This site, first examined by me in 1905, affords an unusual example of a type site that we may study as a definitely prehistoric Iroquoian place of occupation. From it we may gain some inkling of the ancestors of the historic Seneca and indeed make some surmises as to their more remote progenitors. This site is of the Burning Spring cultural horizon, but is not of so great an age.

It was not until 1916 that it was possible for the writer to make any intensive study, when through the generosity of Mr Alvin H. Dewey, president of Lewis H. Morgan chapter of the New York State Archeological Association, several trips were made to it, and supplemented by nearly a month's study of Mr Dewey's remarkable collection made from this site and from the surrounding region. This collection is now the property of the State Museum. Mr Dewey's interest in this site and his conviction of its importance as a key site to Seneca and general Iroquoian archeology has inspired the paper here presented.

The Reed Fort Site

The general location of the Reed Fort site is in the northwest portion of the township of Richmond, Ontario county. It is located on lot 50, about one-fourth of a mile due east from the line of Livingston county and 280 rods due south of the Livonia-Richmond Mills road. From the town or settlement of Richmond Mills, measured from the bend of the south-bound road, the site is almost exactly 1 mile up the outlet of Hemlock lake. It is frequently called the "Richmond Mill Site" from its proximity to the village of that name, situated in the narrow valley and between the steep hills to either side.

The site may be reached either from the Alva Reed farm or from the George Reed farm, it being situated upon the latter. The nearest railroad point is Hemlock, a small terminal station on the Lehigh Valley Railroad, Hemlock branch, out of Rochester. A better route is probably the Erie Railroad out of Rochester to Livonia Station. Here auto or horse liveries are available and the site may actually

¹ From the Transactions of the New York Archeological Association, Morgan Chapter, v. 1, no. 1, Feb. 1918.

Plate 63

Fig. 1 View looking toward the neck or upper end of the Richmond Mills site. The trees on either side mark the beginning of the precipitous slopes.

Fig. 2 View looking down the Richmond Mills site. There are deep refuse heaps in the slope to the right.

be entered by following the road due east, making allowances for the bends near the Ontario county line, to the first southeast road down the hill, $5\frac{1}{4}$ miles from Livonia. A road running down the hill one-fourth of a mile farther on will also lead to Richmond Mills. The south road should now be followed for three-fourths of a mile to the farm of George Reed, through whose barnyard runs a lane directly to the site. The unselfish and kindly interest of Mr Reed has unfailingly opened the gate to the explorer who had a genuine scientific interest.

Located from the standpoints of aboriginal geography, the Reed Fort site is situated just off the main trail from Allens hill to Hemlock, which in general followed the valley of the outlet from its juncture with Gates creek. The trail from the outlet of Conesus lake to Honeoye lake crossed the Hemlock outlet about a mile southwest of the site, but a supplementary trail still in use when the township was settled passed directly over the site and southward, again striking the Honeoye trail at the headwaters of the larger stream forming the northeast side of the site. Just beyond are two non-Iroquoian sites on the P. P. Barnard farm. The important aboriginal sites to the southward are those at the foot of Hemlock lake and at the outlet of Honeoye. It is along the Honeoye outlet from the lake to the Genesee that many important sites are found. Nearly all, if not all the sites near the Reed Fort site are prehistoric and pre-Iroquoian. We except only the later historic sites at Hemlock and at Honeoye destroyed by Sullivan in 1779.

The Reed Fort site stands alone and in a setting that is non-Iroquoian. This suggests that it was settled or occupied soon after the driving out of the non-Iroquoian tribes from the region. We can not even be sure that when the site was seized for occupation the original claimants of the region were all driven out, for there have been discovered fragments of charred human bone that look suspiciously like the evidences of the torture stake of a neighborhood victim. Mr Dewey has in his cabinet the fragment of a lower jaw, one end of which is carbonized. It has a projecting chin that seems to betoken the stubborn resistance of the victim to the intrusion of the Iroquois and his defiance of them even in the flames.

During the past seventy-five years this site has been gone over by collectors who have carried off a very large amount of material. During the past twenty years excavators have been particularly active and thus far no object of European origin has been discovered in any pit or refuse heap.

Plate 64

Map of the Red Fort site, Richmond Mills, Ontario

The Reed Fort site is a sandy arm of the terrace projecting nearly westward into the Hemlock valley. It covers a sloping sandy hill lying between two brooks that have cut deep ravines. The place is a natural fortification since the brooks at the southwest end come within 30 feet of each other, measured from the rims of their banks. The effect is a natural inclosure easily protected from human and beast enemies. From this upper neck the area gradually expands to a point directly above a fine spring that flows into a large brook on the north bank. From this point the site gradually tapers down the slope until it reaches a steep knoll the base of which rests in a more level space between the brooks, which again approach within 40 to 50 feet of it. The brook on the northwest side is shallower at the upper end but quickly eats its way into the shale and plunges over a series of falls until at the lower end of the fortification the banks are 30 to 40 feet in height. The brook on the opposite side is deeper and throughout the length of the hill its depth is 40 to 60 feet with high shaly embankments impossible to climb in places. There was once a gas spring in the bed of this creek below the falls. Along these embankments, particularly at the upper end, the refuse heaps are found scattered over the end of the bank and down the talus slope almost to the bed of the brook. In fact the entire outline of the fortification is nearly bounded by refuse heaps.

The site covers an area of about 5 acres, which was ample space for a considerable Indian village. When the site was cleared about 1850, it was covered with a dense growth of large oak trees, with pines at the lower slope.

The Seneca Indians in 1850 had a settlement near Lima and frequently passed over this site at the time it was cleared and frequently hunted, fished and worked in the neighborhood. They told the original settlers they had no idea who had lived on the site, and that the pipes, flints and fragments of pottery were of as much interest to them as to the settlers who opened up the tract. We suspect, however, that the Indians *did* have some knowledge of its occupation by their own ancestors but did not wish to talk about a "dead village." There was once a superstition about bringing back the ghosts of the dead by so doing.

From this time on antiquarian and amateur archeologists commenced their search for relics, and the first spring plowings were always a signal for relic hunters to pick over the surface for finely shaped flints, pipes and shell and bone trinkets. Not much excavating was then done. During the recent years the most successful collectors so far as we know have been Alva Reed, P. P. Barnard

of Honeoye, Alvin H. Dewey, H. C. Follett and G. R. Mills of Rochester, and Frederick Houghton of Buffalo. A large share of the earlier material found by individual collectors is in the New York State Museum collection, but an even larger collection has been acquired through the patient research of Mr Dewey assisted by his enthusiastic helpers, Casper Keer, H. C. Follett and George R. Mills. No graves were found until about 1912, when Frederick Houghton, excavating for the Buffalo Society of Natural Sciences, found a burial site on the projecting nose across the ravine east of the spring and nearly opposite the falls. He found no objects in the graves. Our examinations of this site made in 1905, 1910, 1911 and 1916, together with the records of Mr Follett and Mr Dewey, have resulted in the series of notes here given.

It was found that the soil in nearly every portion of the site was deeply stained and that there were natural depressions irregular in shape that seem to have been used as refuse dumps. Even after much cultivation for farming purposes, the soil still shows blackened areas that outline the village dumps. Some of these pits and deposits are 6 or more feet in depth and filled with broken stone, ashes, animal bones, charred corn, and broken implements with an occasional fine specimen in good condition. As we have previously stated, the larger deposits were along the northeast bank, sloping toward the falls. In many of these sidehill dumps the débris in which ashes are mingled are several feet in thickness and have led some excavators to think that the site was occupied for a prolonged period. Our opinion is, however, that a village of 150 to 200 people occupying this site for 10 years would produce the amount of ashes found in the dumps, especially if refuse had been consumed as well as fuel, but others strongly argue that the occupation was as long as 50 years.

The present appearance of the site is that of a sloping sandy hill edged by ravines and fringed with trees. The flanking brooks flow the year around and the larger one has a considerable fall over which the farm owners have built a bridge upon which the road across the site runs. Above the falls it is possible to walk along the edge of the brook and up the ravine for a considerable distance. The ravine is wide and has a flat bottom which gives ample space for the meandering of the stream. Near the upper end of the fort, from the base, a natural trail runs up the embankment along the projecting nose, but access was possible though not easy from almost any other point. Along this embankment from the falls southward and up the ravine the débris may be seen mixed with the talus. An

excavation reveals quantities of animal bones, broken pottery and fragments of implements.

From the lower end of the fortification the trail runs down to a sloping flat that gradually leads to the valley level. From this point it is about one-fourth of a mile to the Hemlock lake outlet.

The character of the implements found on the site are without question prehistoric Iroquoian and presumably early Seneca. Two sites three-fourths of a mile to the northeast, on the Alva Reed farm, are non-Iroquoian, as are most of the contiguous sites where relics are found in any quantity. One site on the Alva Reed farm, situated west of his house and in the woods, is probably similar in age to the fort site. It is Iroquoian.

Where the Implements Are Found

Relics on almost any site are first found on the surface as the result of excavations, leveling, land clearing or plowing. This was true of the Reed site, which has been "surface hunted" since it was deforested. The implements found on the surface are those that have especially resisted surface weathering and decay. On this site, as on others, these are anvils, matetes, hammerstones, chipped flints, celts, fragments of pottery and occasionally shell, bone and slate articles. Frequently animal bones are also found. The more fragile articles are seldom found on the surface.

Many specimens have been found in surface dumps or deposits as well as in refuse pits. These occur on portions of the site and seem to indicate the former presence of bark long-houses. One deposit on the southwest side near the falls of the smaller brook is nearly 30 feet long and 6 feet deep.

The inhabitants of the site, however, carefully threw most of their refuse over the banks and into the brooks. Much of this refuse collected in slides or dumps along the banks and became covered with the disintegrating shale and the overwash of storms. Where the deposit became obnoxious there seem to have been large fires of waste wood for the purpose of incineration. Indeed many of these dumps, especially near the bottom of the slopes, are covered by thick layers of white ashes and in some cases charcoal. To examine the banks one would think that the inhabitants had purposely kept up heavy fires to hold back either the invasion of human enemies or of the no less savage mosquitoes.

The dumps along the edges have proved the most fertile sources of specimens and one is surprised at the fine objects that were apparently discarded with refuse, such as fish hooks and bone combs.

After nearly 20 years of experience in New York archeology it is the opinion of the writer, based both upon his excavations and upon a knowledge of Iroquoian customs, that articles of value were frequently cast aside with the bones of animals eaten for food as a sacrifice to the spirit of the slain forest-brother who gave of its pelt and its meat that the man-animal might be clothed and fed. Trinkets were also often sacrificed to plants and vegetables. During the annual wild pigeon hunts of the Seneca, wampum beads, colored feathers, brooches of silver and other trinkets were buried beneath a little fire under the trees where the pigeons were killed. The arrow points or spears that pierced and slew certain animals also were never used again but thrust into the pits with their bones. We believe that this is the first explanation of the abundance of useful articles, apparently carelessly discarded, that has appeared to explain their presence in New York refuse pits. Without doubt many articles were also lost, or without intention swept out in the rubbish of the lodges.

Mr Dewey describes the dumps as follows:

"Starting at the bridge across the ravine on the north side of the site, then going south, the ash deposit excavated in September and October 1915 is found all the way around to the neck of the site. The first slide of any importance is about 25 feet from the bridge. It has an average width of 70 feet and extends up and down the bank for 40 feet. From this point south for a distance of about 100 feet there is no evidence of any deposit. The banks here are steep with no growth of shrubs or trees and any refuse thrown over would have gone into the brook at the bottom and have been washed away by high water.

"The next deposit is a small one having a width of only 34 feet and a length of 40 feet. Forty feet from this point begins the third deposit. Conditions here would indicate a double slide. It had a width of 50 feet but was intermixed with shale and overburden. The deposit was very thin and contained few artifacts. Farther on by 50 feet to the south occurred the fourth slide or deposit. This was by far the largest and was 105 feet wide. At this point the ashes were deep in places though quite thin in others. Many artifacts were found in this dump, including two fine bone fish hooks, numerous awls and some very fine potsherds. A perfect effigy pipe of stone was found in this place. The fifth dump was 76 feet farther south where the bank is 50 feet high. The deposit had a width of 75 feet and was rich in bone material.

"We have here, therefore, a deposit of refuse of a known extent of 334 feet with an average width of 20 to 25 feet. The ashes vary in depth from a few inches to several feet. One pit was of solid wood ash dry and clean, 6 feet long and 5 feet 10 inches deep. Not an artifact was found but at the bottom was a quantity of large flat stones that plainly showed a long contact with fire and heat."

Mr Dewey has not here described the deposits on the southwest bank along the smaller stream discovered by George R. Mills. Here the deposits have been rich in material, though of far less proportions.

Mr Harry C. Follett, who for some time has been an interested and patient investigator of aboriginal sites in the Genesee country, has left a vivid account of the site in his record which he has turned over to the State Museum. Mr Follett says:

"The surface of the village site is dotted with black spots which prove to be refuse. The bank of the ravine encircling almost completely the entire site is rich in refuse and has been completely dug over and over in eager search by relic hunters for implements, and it is to be deeply regretted that it could not have been done in a scientific manner and complete data taken to enable us to form some definite conclusions of the strange people.

"In September 1915 Mr Dewey and myself were escorted to the site by George R. Mills of Rochester, who had been excavating in the refuse on the bank of the north ravine and who had disclosed some large deposits of ashes. The work which had previously been done here is similar to the devastations on many other sites. Excavations had been started in the heart of the pits, following up the banks to the top, leaving the bottom, the most important in many cases, buried under the débris. To gain access it was necessary to do considerable work. While working here we were visited by Mr George Reed, who gave me considerable information for which we are indebted to him as we are also for the courteous way in which he treated us.

"By making tests along the banks we were convinced that there were several pits which had not been disturbed. These were natural depressions formed by wash in the shale rock and had become filled with the ashes which had been deposited at the top of the bank and washed down filling the holes from 6 inches to 6 feet deep. This was conclusively proved by thorough work in each pit which terminated at the top or nearly so ranging from the bottom from 25 to 100 feet gradually drawing to a point at or near the top of the bank. These pits in some places were rich in bone material and

Plate 65

CERTAIN TYPES OF BONE ARTICLES FROM THE RICHMOND MILLS SITE. $\times 7/8$.

some were almost void of any kind of implements. They produced specimens of elk teeth, elk and deer horns, bone awls, perforated bears and racoon teeth, also many racoon penis bones, a few perforated potsherds, worked bone of all descriptions and manner, bear molars polished and perforated representing the human foot, polished celts of the regular type, a few shale implements, together with various types of flakers, a few net and line sinkers and bone fish hooks.

"While here we viewed a collection made from this site by P. P. Barnard, of the town of Richmond, and which contains some of the finest types of bone implements and ornaments I have had the opportunity to inspect. There are approximately 300 triangular points (which is the predominating type), 8 or 10 celts of fine workmanship, 10 or 15 elk and bear teeth, cut, polished and perforated bone beads highly polished and showing much wear.

"Personally in my excavating I did not encounter any human bones but am told that human skulls have been found in the refuse.

"The work performed thus far leads me to conclude that the refuse was deposited at the top of the bank and washed down as previously stated.

"Parched corn and even cobs are frequently encountered. I also found what I determined was a squash seed. Beans were found, but were scarce.

"I do not know of nor have I read of another site anywhere in New York State comparable with this for variety, richness in implements, masses of débris."

Mr Follett afterward discovered that there had been a natural gas spring in the creek bed.

Specimens from the Site

The cruder artifacts from the Reed Fort site are stone anvils, matetes or lap stones, hammers of several types, notched sinkers and fire-burned stones.

The anvils and mealing stones are fragments of flat stone from 1½ to 4 or 5 inches in thickness. They are seldom more than a foot in diameter. Some are nearly square and others are more circular, but no attempts were made to more than approximate these geometrical proportions, and this only for the sake of convenience in handling. These stones are similar to those found on many of the earlier sites in this region.

The stone hammers are stones either natural or worked from pebbles and of a size convenient for holding in one hand. The

Plate 66

CERTAIN TYPES OF BONE ARTICLES FROM THE RICHMOND MILLS SITE. $\times \frac{7}{8}$

1, phalanx with upper end broken in and apex perforated; 2, phalanx with apex worked and upper end carefully cut out; 3, phalanx partly bisected; 4, similar to 2, but showing more work; 5, phalangeal cone; 6, serrated rib; 7, similar to 6; 8, 9, anterior tips of lower deer mandibles, notched and perforated; 10, perforated joint surfaces; 11, perforated ball joints.

mullers, used for grinding and cracking corn, are more symmetrical than ordinary pitted hammerstones and the flat faces show evidences of grinding on the mealing stone, despite the shallow pit sometimes present in combination hammers and mullers. Many of the mullers are neatly formed and quite symmetrical, while some are exceptionally so and resemble chunkee gaming stones. Some of the hammerstones from this site are made from hard concretions, but most are formed from water-washed pebbles. Some interesting hammers are formed from celts, the cutting edges of which have been broken off.

The hammers and abrading stones from this site may be classified as follows: (1) natural pebbles discoid in shape and showing use by hammering on the edges or circumferences; (2) natural pebbles of discoidal shape showing a battered circumference and having pits worked in on either side of the flattened surfaces, the two pits being opposed to give a thumb and finger hold; (3) natural pebbles reduced to better form by grinding, abrading and polishing, the edges of which show use as hammers and the sides pitted for thumb and finger hold; (4) the same form showing evidences that the stone was used also as a muller; (5) round stone hammers showing battering on two opposed faces, and not pitted; (6) naturally rounded stones showing battering in several faces; (7) stone balls artificially worked to form and showing primary use as hammers with a probable secondard use as club heads of the type enveloped in raw hide; (8) broken celts used as hammers, butt and broken bit being the battering surfaces; (9) concretions used for battering; (10) flat, thin pebbles showing use as hammers on one end.

The collection contains more than three hundred selected hammerstones of all these types, while in it also is a box of 3 cubic feet in capacity filled with broken and second-rate specimens. Mortars and hammerstones have been found on the surface in the dumps and even in the creek below the site.

Other stone objects are cylindrical pestles (parts of eight being found), stone beads, stone disks, perforated disks, like Jefferson county specimens, and grooved bolas or club heads. The celts are mostly well formed and thick. Some show most excellent polishing. The thin splinters of slate having chisel edges are also interesting, there being about seventy-five in the collection. No grooved axes have been found here.

The arrow points of chipped chert (commonly called flint) are of the recognized Iroquoian form, that is to say, triangular and without notches, stems or barbs. This is so far true that out of

1195 specimens available for actual study only eight have notched stems. Only sixteen knives and spears of all shapes have been enumerated. There are scrapers but no drills.

Perhaps the nearest approach to ornaments in stone which the site affords are small pieces of shale having one perforation for suspension. They do not resemble pendant gorgets.

Stone pipe bowls have been found in several instances. Some are crude bowls of sandstone having large beveled stem holes. Others are more neatly formed and resemble small urns. This is one early Iroquoian type and its distribution is quite general in the Iroquoian area. One of these stone bowls in the collection has a face effigy worked out on the side away from the smoker.

Two striking pipe bowls and several fragments were found by Alva Reed in the ash and refuse beds. These bowls are human and animal effigies represented as clinging to the ovoid bowl. One striking specimen represents a lizard or an otter and is similar in general concept to the effigy pipes described in the Ontario Provincial Museum reports by Col. George E. Laidlaw.

Sherds of broken pottery vessels are scattered throughout the site and especially in the dumps. The pottery is of the usual Iroquoian make so far as its consistency is concerned. Some sherds are thin, as thin as one-eighth of an inch, while one sherd is three-fourths of an inch thick. The general shape of the vessels is Iroquoian, like the pots of Jefferson county or the Mohawk valley, with the exception that the collars are higher and there is not the same degree of overhang. The decoration is distinctive. It is the triangular plat filled with parallel lines, each adjoining plat having the lines running at right angles to the other. This is varied by parallel lines above and below with occasional dots and dashes regularly placed. Iroquoian pottery generally has the decorations drawn on with a bone or wood stylus while Algonquin forms generally have the pattern *impressed* in with cord wrapped paddles or sticks. Most of the pots from this site were very large, larger than the later Seneca made. The Reed Fort pots in some instances must have held 6 to 8 gallons while the smaller pots probably held 6 to 8 quarts.

The Reed Fort vessels were of the period when effigy faces were placed at the projections on the raised collars, in this respect being like the pottery from the Atwell Fort in Onondaga county, from the St Lawrence site, Jefferson county, and like that from Burning Spring,¹ Cattaraugus county, though the last named site is even earlier in its occupation than the Reed Fort. All these sites are

¹ See Annual Report, Director of the State Museum for 1905.

Plate 67

FRAGMENTS OF CLAY AND STONE PIPES FROM RICHMOND MILLS. $\times \frac{3}{4}$.

1, small bowl with coiled rim; 2, face effigy with thick features; 3, face with sharp features; 4, square topped or castellated bowl; 5, face with skin of animal head drawn over its head: (the slots on the chest are typical of Iroquoian carving and modeling on pipes); 6, double faced pipe; 7, 8, 9, stone pipes of modified bowl shape. 9 has a crude face. Specimens from A. H. Dewey collection, in State Museum.

similar in character, except that at St Lawrence, being projections of hills into valleys and having a walled neck. No complete pottery vessels are reported from the Reed Fort.

Of large interest are the specimens of clay pipes from this site. In general type they are like the pipes from prehistoric Onondaga sites in Jefferson county though some types are distinctly Senecan or Seneca-Neutral. The bowls are round with decorative lines and dots; some have square raised rims, like the so-called Huronian forms, and others have human face effigies modeled on in the characteristic Seneca style. One pipe in the collection has the face of a woman with a wildcat robe over the head. Its counterpart in technic is Mr Dewey's pipe from Stone Church, Genesee county, which has two figures seated side by side, one male and the other female. One stone pipe shows a naked and grotesquely formed female and another is a phallus in clay.

The implements of bone constitute the largest range of forms. Almost every bone in the various food animals seems to have had a use, especially leg and jaw bones. Even the teeth were drilled or grooved for pendants and beads.

Bone awls have been found in large numbers and Mr Dewey has compiled a list of 525 specimens positively known to have been found on the site. The various types are represented in plate 65.

Beads or small cylinders of bone were worked from the leg and wing bones of birds and small mammals. Many are highly polished. Some of the bone cylinders are as long as 3 or 4 inches and seem similar to the tubes used by the Seneca shamans and claimed by them to have been swallowed in the process of extracting disease from their patients. The phalangeal bones of deer and bears were worked in many varied forms, some being partly sawed in twain and others worked into cones that may have been fastened on the fringes of the leggins like the more modern tin and brass jinglers of the Indians of the historic period. Some may have been the cups used in the cup and awl game. There are many examples of ball joints perforated as pendants and some specimens of the toothless anterior portions of deer jaws cut, polished and notched.

Of considerable interest are the fish hooks of which we have more than twenty specimens besides those in process of manufacture (see figure 25). The series illustrating this process is of considerable interest and shows that two hooks were made at the same time by making an oval link out of a section of bone and then cutting it in the middle. The books are without barbs and

similar in appearance and process to those described by Prof. F. W. Putnam from Madisonville, Ohio, or by Professor Mills from the Baum and Gartner sites.¹ In general it may be said in passing that the hook is rather long and sharp and that the end of the shank is in most instances slightly knobbed or grooved for the attachment of the gut or cord line.

Fig. 25 Early Iroquoian fishhooks. $\times 1/1$.

Of importance to the comparative archeologist are the metapodial bone draw shaves found in the refuse heaps. These are so far unique in New York sites and their presence in the Reed Fort site is significant. They are commonly found in Ohio sites of the Baum

Fig. 26 Antler combs from the Richmond Mills site, Ontario county. $\times 1/2$.

¹ Cf. fig. 65, Mills, William C., *Explorations of the Baum and Prehistoric Village Site*. Ohio State Historical Society, Quarterly, 15:1.

culture and Professor Mills has several hundred specimens from Ohio localities.¹

Perhaps the most striking of all the objects found at the site, except the pipes, are the antler combs (see figure 26). The first specimens found were plain combs, one with three teeth and one with four. Each had a hole drilled through the top projection.

Fig. 27 Notebook sketch of unique five toothed antler comb from Richmond Mills site. Dewey collection.

Then an ornamented comb was found having a top like an arched doorway and three holes bored on the points of a triangle. Later specimens were found having at the top effigies of birds, either a heron or a woodcock. The teeth of the combs are worked out round and measure about three thirty-seconds of an inch in diameter. The points have at one-eighth of an inch above the tip a groove or several grooves incised around them. In these combs we have the prototypes of the later Seneca combs with complex effigies of birds and animals and many teeth evidently sawed in with a metal saw derived from European traders.

Other antler objects in the collection are a scraper handle, chisels and pins or pitching and flaking tools, arrow points, digging tools and a remarkable antler prong drilled near the base and having a series of serrated notches at the basal end. Doctor Beauchamp, who examined it, thinks it may have been one of the "horns" of a chief's emblem. This is quite plausible.

The teeth of animals, especially the tusks, were favorite forms for perforating and grooving with these prehistoric people. The teeth of the bear, fox, wolf and elk were perforated as pendants. The

¹ Ibid., p. 54, 55, fig. 37, 38.

molars of the bear were especially prized and were cut and perforated at the root. Some have one root-prong cut off and the tooth worked down in the shape of a human foot. Several specimens, indeed, have the toes indicated by incisions. Beaver teeth were also cut at the roots and probably used as small scrapers or chisels. Some of the beaver teeth are split and ground thin, probably for shaving tools or knife blades for wood working. One joint ball hollowed out like a small cup was found (figure 28).

Bones needles are among the more fragile articles, and twenty-nine are known to have been discovered, besides numerous fragments. They are thin segments of bone worked long and smooth and having one or two eyes in the center.

Harpoons of bone and antler are also to be mentioned. They are similar to those found on Algonkian sites and have four or more barbs at the point. We should not neglect to mention antler arrow points, conical in type, and thin cone and antler points.

Shell ornaments, while not prolific, are not uncommon. There are beads drilled from the columellae of large marine shells and disk beads of varying sizes. A few specimens resemble small circular gorgets and are drilled at one or both edges and opposite. There is no shell wampum of the type used in historic times. Some small shells are found drilled at the lip for attachment. These are generally periwinkle shells from fresh-water sources. Valves of the Unio are found worked as potters' smoothers.

No metallic objects have been reported except several pieces from the surface which may have been lost by the later Seneca when they passed over the trail or as they camped upon it. These are a few scraps of European brass, several hand-made nails and a small chunk of iron. All may be regarded as intrusive.

The bones of animals cracked and split for the marrow or for boiling in soup are abundant. Careful observation will show that literally "bushels" are to be found. So far as our observations go the following bird and animal bones have been identified: deer, moose, elk, black bear, raccoon, woodchuck, muskrat, rabbit, skunk, gray squirrel, field mouse, fox, dog, otter, mink, wild cat, panther, wolf, Indian dog, beaver, box turtle, snapping turtle, wild

Fig. 28 Joint ball hollowed out like a small cup

turkey, heron, duck, eagle, snipe, horned owl, snake, sturgeon and other fish.

Of plant foods there have been discovered seeds of maize (cob and kernels), squash, bean, hickory-nut, acorn, butternut. Some charred grass and some bark have been found. The use of tobacco may be deduced from the pipes.

List of Objects Known to Have Been Found in the Reed Fort Site

The abundance of specimens found in the Reed Fort site may be known from the list compiled by Mr Dewey. This list records only the specimens actually in known collections and does not include the hundreds of specimens taken out by collectors who came

Fig. 29 Certain stone and clay artifacts from the Richmond Mills site. 1, sandstone pipe bowl; 2, animal effigy grasping pipe bowl, statite; 3, fragment of knobbed pipe stem; 4, fragment of face from pipe bowl, clay; 5, face from raised corner of a pottery vessel.

for a day's or week's excavating and left no record. As a matter of fact, investigation has shown that articles from the site have been scattered all over the country. This is especially true of the bone implements.

Mr Dewey's list is compiled from the catalogs of his own collection in the State Museum with that made by Alva Reed. The lists of George R. Mills, P. P. Barnard and Harry C. Follett have also been tabulated, together with those of several other local collectors. It is thus seen that the Dewey compilation is only a fragment of the total. It may be taken as an average proportion of articles in the total accumulation. Some exceptions in individual instances may be made; however, since earlier collectors collected mostly celts, arrow and spear points, pipes and the more striking implements of bone, many more arrow points, celts, and the like, may have been picked up in proportion than hammerstones, bone needles, broken pipes, and pottery rim fragments. The earlier collectors probably almost entirely ignored the rougher hammerstones and metates. The statement that the list is an "approximate third" must therefore be kept in mind as an estimate only. It must be regarded, however, as an estimate built upon a careful study covering a period of years of observation; and yet, as we have remarked, estimates are quite certain to be inaccurate in some details. The list of known material follows:

- 1187 Triangular points
- 8 Notched arrows
- 16 Spears, all shapes over 4 inches
- 32 Celts
- 20 Grooved stone war club heads
- 21 Stone (slate) implements with worked edge
- 265 Pitted or hammerstones
- 33 Metates or mortars
- 8 Pestles, broken
- 40 Net sinkers, some very fine
- 16 Stone disks, not perforated
- 14 Stone disks perforated for suspension
- 16 Stone beads
- 1530 Pieces of pottery ornamented
- 8 Pottery beads
- 12 Pottery fragments, showing effigies
- 12 Pottery fragments drilled
- 120 Shell beads
- 384 Bone awls, pointed
- 72 Bone awls, blunt point
- 56 Bone punches
- 6 Bone arrow points
- 26 Bone fish hooks
- 9 Bone harpoons
- 708 Bone beads
- 28 Bone pieces perforated for suspension other than beads

- 7 Bone combs, whole or in part
- 24 Bone needles
- 9 Bone draw shaves
- 1 Bone ceremonial object
- 63 Worked deer antlers
- 3 Hair pins
- 2 Tally bones
- 62 Bear's teeth perforated
- 44 Bear's teeth not perforated
- 29 Elk teeth, perforated
- 7 Elk teeth, not perforated
- 43 Moose, wolf, dog teeth
- 9 Stone pipes, whole
- 5 Clay pipes, whole, plain, or ornamented
- 28 Pipe bowls, stone or clay
- 82 Pipe stems, 2 inches long or over

Significance of the Specimens

Implements and artifacts from any archeological site may be divided into six classifications according to their cultural significance. These are:

- 1 Permanent forms common throughout the continent, or more narrowly to a general geographical area.
- 2 The general current types common to the cultural period to which the site belongs. On a single site, the normal forms.
- 3 Survivals of forms more commonly found on older sites, or found frequently in sites of another culture.
- 4 Forms that show experimentation, or that they are in process of developments; forms that have not arrived to the status of either 1 or 2.
- 5 New forms found sparingly in the site but more frequently in later sites.
- 6 Aberrant or unique forms not found elsewhere.

By classifying the specimens from the Reed Fort site by these standards we may be able to trace something of its history and later influences, culturally speaking. Here we find hammerstones and lap-stones, bone awls, chipped flints and celts falling in class 1. In class 2 are the heavy celts, the triangular arrow points, bone awls, needles, worked phalanges, bone beads, perforated animal teeth, pottery decorated by plats of triangles filled with parallel lines drawn on, pottery pipes with raised edges on the bowls, either square, trumpet flaring or having various effigies modeled on, vase or bowl-shaped stone pipe bowls with large beveled stem holes, effigy stone pipes with otters or lizards worked out on them, crude and rather large shell beads, bone

combs with three and four teeth, harpoons, fish hooks, etc. In class 3 are found the metapodial bone scrapers or draw shaves, roller or cylindrical pestles, not found in any later sites, pottery disks ornamented like the later shell "runtees," conical bone arrow-points, etc. Certain forms of the pottery and pipes fall in classes 4 and 5.

The absence of certain objects is significant also, particularly as these certain objects were used by other and adjacent tribes, not of the same stock, at the same period of time. These are grooved axes, many notched arrow points, steatite vessels, mica ornaments, native copper implements, monitor pipes, clay pipes with sharp elbow bend below the bowl, etc. No banner stones, bird stones or two-holed gorgets are to be found, and no bone or clay object is decorated with curved lines. In this we have proofs that the culture of the Reed Fort site was a crystallized one and of some standing in point of time. We may also see in this the action of certain taboos, prejudices and conventions.

To solve the riddle of our site we must now ask with what other sites the objects listed under classes 2, 3, 4 and 5 compare. In these things we may find some clues.

An examination of the most important fort sites in the Genesee country plainly shows that the Reed Fort site is Iroquoian and Seneca, of precolonial time and possibly pre-Columbian. It may antedate the foundation of the Iroquois Confederation. The specimens found show that the people were in closer touch with their neighbors to the west of them than those to the east, though in point of general culture they were the same. But the large high-collared pottery puts the contact with western New York. It was but a day's journey or at most two to the country of the lower Cattaraugus and the lower Allegheny. The Niagara frontier was but 80 miles distant. In all this country lived the Erie, the Neuter, the Kahkwa and the Wenroe and perhaps smaller divisions of the Iroquoian stock. Across the Niagara and to the north were the Huron. But the immediate neighbors of the Reed Fort site, if not indeed their progenitors, seem to have come from the region to the southwest. Perhaps the people of Burning Spring Fort in Cattaraugus county were their ancestors. Certainly the pottery and pipes seem to point out this while the vase and bowl-shaped stone pipes are typical of the country west of the Genesee. Cylindrical pestles are found both on this site and at Burning Spring but not on later sites. Once the proto-Seneca may have used long pestles. Strangely significant too are the bone draw shaves. They are Ohioan, as we have already

intimated, and typical of such sites as the Baum and Gartner sites (Mills). The decorated pottery disk is also Ohioan. The barbless

Fig. 30 Pottery disk from Richmond Mills

fish hooks may be also for they are quite identical in point of form and method of manufacture. These things therefore, fall in classification 3. Here we find the first specimens of bone combs. Only a few other specimens like them have ever been found, and these in Onondaga, Montgomery and Jefferson counties, in early sites. Unlike them, however, the Reed Fort site combs have effigies on the top. These combs are the prototypes of the numerous bone combs found in the

Seneca sites of the middle historic period, and have numerous teeth made by sawing.

The clay pipes show some experimentation in form and decoration, in this respect being like those from Burning Spring, but other forms are transmitted constantly and without change up to the time the Seneca gave up their home-made pipes. The fixed type pipes are the square-topped "Huronian" pipe, the trumpet pipe, an early form of the ringed bowl, and the human face effigy.

Conclusion

Our belief regarding the site is that it represents one of the villages of the early Seneca before the opening of the colonial period. It was occupied for many (perhaps fifty) years and then abandoned, like all other sites of like character, that a new and cleaner site with more wood and game might be had. Its inhabitants were hunters and fishermen, traders and tillers of the soil. They were in communication with the people along the Genesee, down the Allegheny and westward along the valleys of the Buffalo, Cattaraugus and Tonawanda creeks, though most of their journeys were probably to the south and westward. They were descended from the unspecialized Iroquoian peoples of the upper tributaries of the Allegheny and from the more stable Iroquois farther west and south. They were not without wars and for some time struggled with the dispossessed Algonkian peoples whom they pushed southward. They knew of their kinsmen to the east but the country between Canandaigua lake and Lake Oneida had not yet been conquered. When it was finally won the Mohawk came down from the north and the

Onondaga left their seats in the hilly country east of the foot of Lake Ontario. Thereafter the Iroquois began another period of integration that finally led to the formation of their famous confederacy. Up to this time the early Seneca had mingled more with the Erie and the Neutral nations, than with the Onondaga and Mohawk.

When the site was finally given up and was claimed as the abiding place of the departed spirits, the living people marched down the Honeoye to a new place. Their arts and crafts were perpetuated, though their pottery gradually lost its collar and the notches at the bottom of the collar became the notched rim of the pot. Gradually the goods of the strangers from across the sunrise sea began to creep in and as the village moved on again and again the original town was forgotten to all save the keepers of the traditions.

A MIDCOLONIAL SENECA SITE IN ERIE COUNTY

By M. RAYMOND HARRINGTON

The possibilities of western New York as a field for archeological research have long been known, so many years that it seems remarkable that the region has not been entirely exhausted. But notwithstanding the more or less systematic labors of many investigators there are still a number of interesting sites to be found in the general vicinity of Buffalo that will repay the efforts of the careful archeologist. This is well illustrated by the results obtained from the exploration, in the summer of 1903, of an ancient fort and burial site about $2\frac{1}{2}$ miles up Cattaraugus creek from Lake Erie and about 30 miles southwesterly from Buffalo, on the Cattaraugus Indian reservation. The investigation was carried on by Arthur C. Parker and myself, under the direction of Prof. F. W. Putnam for the Peabody Museum of Archeology and Ethnology of Harvard University. To Mr Parker is due the credit of furnishing the information which led to the selection of this particular locality for exploration, and it was his knowledge of the region that made possible the speedy discovery of a suitable site upon which to work.

We arrived at the Cattaraugus reservation early in May 1903, and immediately made inquiries and investigations. We visited a number of places where arrowheads and potsherds had been reported, but did not discover anything of importance until May 4th, when we came upon the vestiges of an old fortified Indian village or stronghold situated on a terrace overlooking the flood plain of Cattaraugus creek, about $1\frac{1}{2}$ miles eastward from the little village of Irving.

Not much was to be seen of the fortification — merely a nearly obliterated curved bank of earth fencing off a projecting point of the terrace from the rest of the plateau. On a low knoll, forming part of the embankment, though perhaps natural, stands the house of the late Rev. Henry Silverheels, an Indian preacher of some note, now occupied by his daughter and half-breed son-in-law, John Kennedy, who works the land within and about the ancient inclosure. We named this earthwork the "Silverheels site" in honor of its former owner. One can fancy how the embankment must have looked before the plow had made such inroads, by comparison with the other similar ancient forts, farther up Cattaraugus creek, which are mainly in an excellent state of preservation. In these the wall is bordered on the outside by a ditch, the two having a combined height from the bottom of the latter to top of the former of about $5\frac{1}{2}$ to 6 feet. Probably the same condition existed here.

A brief examination of the site and its surroundings was sufficient to show that the spot had been indeed well chosen. Here was a flat-topped point projecting into a swampy portion of the Cattaraugus flood plain — a point whose bold steep banks arising from the swamp to a height of 30 feet or more made it easy of defense on all sides but one, and that side had been effectually blocked against a possible enemy by the embankment and the palisade which doubtless surmounted it in ancient times. Several springs of clear cold water issue from the bluff within 8 feet of the top — another considerable advantage in time of siege. Not more than half a mile across the flood plain flows Cattaraugus creek, a stream whose shifting course may have been much closer to the fort in former years. This doubtless furnished the tribesmen with abundant fish at the time of the great spring runs, when the stream is full of mullet and catfish from Lake Erie. Game must have been plentiful and corn could well have been raised both on the plateau outside the wall or on the higher levels of the flood plain below, beyond the strip of swamp. Here are also plentiful evidences of former occupation and everything seems to point to a contemporaneous habitation of the two sites. Perhaps the principal part of the village was situated on the flats, in which case the fort may have served merely as a retreat in times of war and freshet, and as a burial place. The map shown in plate 70 will give some idea of the general surroundings of the site, while plate 71 gives the details of the fort itself.

Upon the surface of the plowed ground within the inclosure were easily distinguished many signs of previous habitation; arrowheads, flint chippings and rejects, broken celts, bits of pottery and fire-cracked pebbles lay scattered here and there, while the naturally

The southwest side of the Silverheels site viewed from the flood plain of the Cattaraugus. There were many burials at the top of this point.

Plate 70

Sketch map of the Silverheels site, Cattaraugus reservation, near Irving, N. Y.

Plate 71

Sketch showing the trenches and graves found in the Silverheels site

indications to mark the graves; our only guide was the stained earth and similar traces of disturbance above them. Fifty-one of the sixty-five graves yielded articles of utility and ornament that had been placed with the dead — anything from a single bead to pipes and pottery vessels. Most of the yellow soil was deeply stained with black by years of fires and accumulating refuse. We also heard from different Indians that Henry Silverheels, while digging a pit in which to winter his potatoes had unearthed human bones, and had found others later while grading a road from the terrace to the flats. On looking over Beauchamp's "Aboriginal Occupation of New York" we found the site listed and mapped, but not accurately.¹ It seemed probable from the accounts heard and from the surface indications that excavation would reveal much of interest, so we began work by digging a number of small test pits on "post holes" here and there with a view to determining the depth of the Indian layer and discovering the most promising portions of the site. The result showed that the Indian or stained layer averaged only 8 to 12 inches deep and that traces of deeper disturbances were most frequent out toward the point. Most of the Indian layer was badly plow-torn, but in the deeper portions undisturbed ash beds of considerable size were sometimes met with. A system of 8 foot trenches was then planned not to cover the entire inclosure, for time would not permit, but to run as indications proved favorable. We did not begin a trench series on the side of the area to be explored and run them in regular order because we did not know just where the best material lay and did not think it advisable with our limited help and time to waste labor on unproductive ground. So we drove one trial trench 8 feet wide in a westerly direction parallel to the edge of the bluff, as shown in plate 71, and another at right angles to it northward. Then we added parallel and adjacent trenches where it seemed most promising. The trenches were always dug a few inches deeper than the Indian layer. Thus, by examining the underlying yellow sand as the work went on we could at once detect the presence of a grave or other artificial disturbance by the stained appearance of this sand and the absence of stratification. These disturbances are classified as graves, ash pits, ash beds, post holes, and unexplained disturbances; and if sufficiently interesting, described and numbered in order as pits 1, 2, 3, and so on.

Out of the one hundred pits thus listed and described, sixty-five were burial pits or graves, and of these six contained more than one

¹ Beauchamp, W. M., "Aboriginal Occupation of New York," p. 65.

Grave of colonial period Seneca, Silverheels site. Note crushed pottery jar and owl effigy pipe at top of skull.

skeleton. None of the graves was more than 43 inches deep: the average was about 2 feet, 2 inches. Some skeletons were so near the surface that they had been disturbed by the plow, but these were usually of infants. There were no stones, mounds or other surface skeletons headed westward, but the graves were arranged in no definite order. We divided the burials into the following classes which will be taken up in order: (1) folded skeletons, (2) extended skeleton, (3) infant burial, (4) bone burial and (5) ossuary.

The typical folded adult skeleton (thirty-nine out of the seventy-three found were in this position) lay about 2 feet deep on the side, heading west, with knees more or less drawn up and arms flexed (plate 72). Generally the hands had been near the face, but these were seldom found, the bones having usually disintegrated. Even children were generally buried in the folded attitude. The position of the body had been easy and natural in most cases, although some had evidently been forcibly folded. One, in pit 37, even had the sole of the left foot against the right knee, a very strained position. This badly disintegrated skeleton lay at a depth of 27 inches, heading north; charred corn was scattered about, and near the breast lay a broken pottery vessel. Beneath the skeleton, and filling the whole bottom of the pit to a depth of 39 inches from the surface, was at least a bushel of charred corn, in two layers, beneath which a layer of charred wood, bark and grass was found. In all probability an old corn-cache pit had been later used for burial purposes.

A good type of folded skeleton, found in pit 24, is shown in figure 31, an adult male lying on the right side, headed west, at a depth of 28 inches. The left arm was bent, the right straight, the legs drawn up in a natural position, the jaw fallen. Lower bones, ribs and vertebrae were in bad condition. Not far from the face was a large deer-antler spearhead pointing west, against which lay a terracotta pipe in the form of a coiled serpent. Between the end of the outstretched right arm and the knee, where the hand had been, were found thirteen triangular flint arrowheads.

The skeleton in pit 85 (plate 73) will also illustrate the extended burial. An iron trade-axe or tomahawk of early form and a rude arrowhead lay near the forehead; near the face a terra cotta pipe and a rude stone knife showing traces of a handle, and not far away a pottery jar of graceful shape broken by roots. This skeleton also headed west.

Another burial of this sort, found in pit 43, without accompanying objects. It should be remembered that all these skeletons have

been carefully laid bare with trowel and brush so as not to disturb any of the bones before the photographs could be taken.

A problematical case was that of a folded skeleton in pit 66, lying in regular order at a depth of 36 inches. One of the femurs had been separated from the skeleton after burial and lay just

Fig. 31 Folded skeleton from the Silverheels site, Erie county. A serpent effigy pipe lies over a barbed conical spearhead near the face and thirteen arrowheads lie near the knees.

beneath an ash layer only 12 inches from the surface. Another strange feature was the finding of the charred remnant of a log of wood 4 or 5 inches in diameter lying beside the skeleton.

Only five skeletons in all were found extended, and of one, but a few crumbling fragments remained. They lay deeper than the

Extended burial in the Silverheels site, near Cattaraugus creek, Erie county. Extended burials in this site are rare. European influence is indicated by the iron hatchet.

average folded skeleton and were all accompanied by objects of interest. One of these, found in pit 50 at a depth of 38 inches, had an iron trade axe near the skull and a pottery jar at the right hip. At the left side of the skull were the jaw-tips and front teeth of some large carnivora, probably once forming part of a wolf skin head-dress such as some of the early explorers describe. I found similar jaw-tips near an Indian skull at Port Washington (Long Island), in 1900. On the left arm lay a bone, which upon examination proved to be one of the mandibles of a large bird, perhaps a heron. The man had been about 5 feet 6 inches tall.

In pit 64 another extended skeleton (see plate 74), probably that of an adolescent female, was found at a depth of 28 inches, headed west. While the skull was in fair condition the other bones were nearly gone, but enough remained to show the height to have been about 5 feet 2 inches. Near the right hip stood a pottery vessel bearing a prominent raised rim ornamented with deep notches; and near the right knee a pile of twenty-three bone tubes 3 or 4 inches long and half an inch or more in diameter, some of which were decorated with transverse parallel scratches, together with a small iron trade knife. A brass bracelet encircled the left arm; a number of red and blue trade beads surrounded the neck. Here also were large beads rudely fashioned from the columella of *Busycon* (*Fulgur*) *caricus* or some similar marine shell. At each side of the skull, near where the ears had been, lay a group of three long red trade beads, probably once forming ear pendants. Red ocher in considerable quantity lay behind the skull.

Another extended skeleton of considerable interest was found in pit 68. This well-preserved skeleton, 5 feet 7 inches long, lay at a depth of 25 inches and, as usual, headed west. The bones of the right leg showed disease, possibly rheumatism as the distal end of the fibula was extended by rheumatic exostosis. Near the place where the right hand had lain were three triangular arrowheads, on the right elbow a deposit comprising the following articles: one iron knife, three bone implements (possibly flint flakers), seven worked flints (some perhaps rejects), three chipped flint points, one sheet brass arrow point (triangular), two flat oval stones showing much rubbing and scratching, a bit of purplish pigment, some copper beads and some bits of copper-stained bark. On the right wrist was a metallic bracelet, perhaps iron. The man had possibly been an arrow-maker.

The last extended skeleton also presented a number of interesting features. It was found in pit 78 at a depth of 40 inches, headed

west. The arms were doubled so that the hands touched the chin. The skull, beside being forced apart at the sutures by the weight of the superincumbent earth showed a gaping hole apparently made in ancient times, while beneath the sternum lay a triangular flint arrowhead, which by irritation had evidently caused a pathological condition of the bone above it. Besides a terra cotta pipe, two iron knives and two bits of paint lying near the right arm, a few fragments of a bag made of skin with the hair left on, probably preserved by copper salts, were found near the right shoulder. Some blue beads and fish teeth encountered here had evidently been in the bag. The neck was encircled by five long, red pipestone (catlinite) beads, two of which were decorated with notches. Along the lower leg were strips of skin, evidently part of the leggings, preserved by the copper beads sewn along their edges.

A certain type of infant burial, met with in a number of instances, was peculiar. The tiny fragments of bone were surrounded by or covered with a very distinct layer of charred bark and grass. Almost without exception trade beads or wampum, sometimes even tiny jars, were found with the remains. Sometimes the infants' graves were extremely shallow, in one instance (pit 96) being only 10 inches deep, but still containing decayed infant's bones, a few glass beads and a little pottery jar in good condition. In another case, that of pit 60, the parents had been especially lavish with their last gifts. Here the remains of the little skeleton lay at a depth of 21 inches, heading west. Near the skull was a small pottery jar in good condition, at the neck a double row of copper beads, together with Venetian and long red trade beads, perforated elk teeth, large shell beads and a quantity of wampum. Around one arm was a tubular brass bracelet and in the pot a number of conical copper ornaments or jinglers and two pieces of decayed wood. Both the copper beads and the wampum in some instances kept their position in short strings, the former being due to the preservation action of the copper salts on the fiber or sinew string, the latter to the lime from the shell of which the wampum was composed having cemented the beads together. Near the surface of the grave were distinct traces of fire.

A number of graves, both of infants and adults, exhibited near the surface a layer of ashes indicating that the custom of keeping a fire on the grave for some time after burial may have been practised here.

Three cases of "bone burial" were found on this site. As may be seen by the skeleton to the right in plate 75, found in pit 30, and

Extended burial of colonial contact period Seneca. Note the pottery jar and the bundle of bone tubes near the leg. Silverheels site.

by the one found in pit 95 shown in figure 16, the bones were practically all disjointed and placed without definite order, except that in both cases the skull lay at the west end of the heap. In some cases all the bones of an arm, say, would be in their relative positions, but the proximal end of the humerus might lie in contact with the sacrum, which in its turn might be entirely disconnected from the lumbar vertebrae. Judging from this disarticulation the snail shells found in some of the skulls and the absence of many of the smaller bones it seems probable that the bodies had lain exposed until much decayed, possibly in tree burials or scaffolds¹ or had previously been buried elsewhere—at least they must have been in a fragmentary condition when brought to this site for burial. A pipe and a flint scraper lay near the skull of the bone burial and a broken jar accompanied another burial.

Very similar to the bone burials in many respects, even to the snail shells within the skulls, and differing from them only in the number of skeletons contained, were the ossuaries, of which three were found, two small ones within the fort and a large one on the flood plain below. One of the former, found in pit 62, contained two adult and one child's skeleton, disarticulated as in bone burials, without accompanying objects, at a depth of $26\frac{1}{2}$ inches. An interesting feature of this ossuary was the presence of a layer of more or less charred bark forming a stratum across the pit 6 or 8 inches above the skeletons, which had sunken in at the center as the dirt had settled down around the bones. Still another feature of interest was the intrusion of a later ash pit (61) into the side of the ossuary. This feature of an ash pit intruding on a grave was observed in a number of other instances and seems to show that these people did not in all cases even temporarily mark their graves or that a long time had elapsed between the two excavations. Traces of three superimposed excavations were observed in pit 30, which contained a bone burial in good condition as before mentioned, and also a very much decayed folded skeleton in regular order by its side, at the feet of which (in a unique position) stood a small jar. The pit ran down some distance below the skeletons and yielded, in this bottom portion, several chipped points and other objects. It looked as if the folded skeleton had been buried in a preexisting pit, then in after years the "bone burial" was interred. A small ash pit dug into the side of pit 30 may represent a fourth intrusive excavation.

¹ This was the Seneca custom within the memory of many of the Seneca over 90 years old. See Morgan.

Double grave, Silverheels site. 1 is a disintegrated flexed burial with a pottery vessel at the feet; 2 is a typical bundle burial. Note the ring bowled pipe.

The other ossuary within the fort was found in pit 79, and contained the disjointed skeletons of an adult and a child, and a folded child skeleton in order accompanied by much wampum and red trade beads.

On May 25th, John Kennedy, while harrowing a field adjoining the flood plains site, dragged up a few bits of charcoal and human bones, which he recognized as indicating something of interest beneath. The next day we made excavations at the place he pointed out and unearthed a circular ossuary about 6 feet in diameter and 2 feet deep, filled almost to the surface with a mass of intermixed human bones. No regular arrangement could be made out, but most of the long bones were rudely grouped in one part of the pit, the skulls in another and so on. The whole ossuary was not uncovered, merely the top and one side and only a part cleared out, still nine skulls, representing people from infancy to old age, were observed, including those removed and sent to the Museum. The bones near the surface were much decayed and badly broken, showing signs of fire; while a few bits of charcoal and scattered potsherds lay among them. The bones were so soft and so tangled that an attempt to excavate the entire deposit would merely have resulted in their destruction; and this fact, together with the expressed disapproval of the Indians, rendered such an attempt inadvisable. The bone deposit was probably surmounted in former years by a mound, the last of which may have been destroyed that very season by the spring plowing.

Ossuaries of this sort are said to have been commonly made by the Iroquoian people, who collected the bones of their dead at intervals and brought them in bundles to be deposited together in a mound.¹

Before leaving the subject of burials some mention should be made of the physical condition of the skeletons a number of which exhibited abnormal features. The skeleton in pit 67 showed decided deformity of the spine and skull, that in pit 68 a diseased condition of the right fibula, while several vertebrae and other bones from different graves showed ankylosis. Injuries of the skull which had apparently taken place before death were observed on several occasions, especially in the case of the skeleton in pit 78, which moreover showed an arrow wound beneath the sternum. Decay of bones in general was very irregular, even in the same skeleton, a state of

¹ Morgan, *League of the Iroquois*, 1851, p. 173.

affairs easily accounted for by the action of roots. Teeth as a rule were quite sound but in the older individuals they were well worn and often a few (mainly molars) were missing. The teeth of the skeleton found in pit 93 were very abnormal.

Next to the burials in point of number and interest were the ash pits or fire holes. These consisted of more or less cup-shaped depressions in the ground running from 18 inches to 4 feet in depth and 3 to 6 feet across, filled with stained earth, ashes and charcoal often laid in strata of varying thickness, conforming as a rule to the curve of the bottom. Quantities of fish bones, broken pottery and charred corn were taken from these pits, as well as a number of split deer bones, fresh-water shells, bone awls and heads of the same material, and arrow points, whole and broken, together with all sorts of flint chippings, rejects and general refuse. Occasionally objects like perfect pipes or jars were found but such finds were very rare in the pits. Some contained almost nothing of consequence, others much of interest, while a few were given over mainly to corn. Pits 27 and 28 were good examples of this class. The former, about 27 inches in diameter and 20 inches deep, contained a large quantity of charred corn, evidently mature and shelled, surrounded by fragments of bark carbonized by fire. Beneath and around the corn and its bark sheathing lay gray ashes. A broken metate-like stone, a muller, an arrowhead, a few fish bones and some potsherds were also secured. Pit 28, 20 inches deep, contained in its center a quantity of ashes and burnt red earth surmounting a mass of charred green corn on the cob, as shown in figure 21. The pit was lined with charred grass.

Another interesting pit was 42, from which a cross section was drawn. A typical pit in every particular, it was bowl-shaped, a little more than 6 feet in diameter and attained the depth of 42 inches. Below the plow-torn layer the stratified structure at once became evident, while at a depth of 20 inches was found an irregular layer of reddish and yellow ash immediately overlaying a densely black layer of charcoal, containing corn-cobs, corn, nuts, bits of squash stalks and a small piece of braided corn husk, all in a charred condition. Below, stained earth with scattered black streaks extended down to the yellow sand in which the pit had been dug. Near the charred layer were exhumed the few objects obtained in this pit; a few bone beads, three arrowheads, a broken terra cotta pipe stem, part of a metate-like stone, a bit of paint and some *Unio* shells. Another pit, 47, was of somewhat different structure. It

contained the usual refuse such as fish bones, bird stones, chips, potsherds, broken implements, ashes and charcoal.

As mentioned before, a number of pits had been dug into earlier graves. Pit 40 was another case in point. This pit was originally a grave, and contained parts of an extended skeleton, but had been later disturbed by an ash pit, reaching nearly down to the bones and containing hundreds of charred acorns.

What was the purpose of these pits, so numerous on Indian sites throughout the East? The answer seems to be quite simple. Although differing slightly with individual pits, as a rule they seem to have been dug for use as ovens, clam-bake style, and the presence of fire-cracked stones in many of them helps support that theory. Most of them have evidently been used a number of times at least, at varying intervals, as shown by the ash layers separated by accumulation of dirt broken down from the sides and miscellaneous rubbish, for which these pits doubtless served as handy repositories. Some had been filled up after being used but a short time, others had been made to do duty as graves — perhaps in the winter when the surrounding ground was frozen. Several showed indications of having been corn-caches or receptacles for storing corn, well known to have been used by Iroquoian peoples and frequently to be found on their village sites. The green corn pit 28 was explained to me by a Seneca who described the ancient receipt for the preparation of green corn. He described how the Indians used to build a fire in a pit dug for the purpose, withdrawing it when the earth was sufficiently heated. They then lined the hot pit with green grass and husks, put in their corn, covered it with grass and husks over which was placed a protecting layer of cold ashes, rebuilding the fire above it and thus roasting the corn to perfection. In the case of pit 28 the fire had evidently been left burning too long. Probably this "clam-bake" method was used for other foods as well; hence the numerous pits.

Less definite and harder to explain than the pits, yet, one might say, shading into them, were the irregular depressions and deposits classified as ash beds. These were scattered over the southern part of the inclosure and did not seem to have definite outline. Some were as much as 10 feet across, but seldom reached a depth of more than a few inches below the plow-torn layer. The name is self-explanatory; they were merely layers of ashes and stained earth with scattering animal bones and artifacts. In one case, however, we found part of a charred rush mat rolled on a stick, but this unfortunately fell to pieces.

Near graves we sometimes found narrow depressions filled with black dirt, charcoal and refuse penetrating some 18 inches into the yellow sand. We gave them the name "post holes" which seems to offer the best suggestion as to their probable origin and use. Perhaps the posts supported palisades or fences surrounding the graves, such as were seen by the early explorers among the Iroquois.¹

During the course of our excavations we met with a number of unexplained disturbances which we traced downward, as usual, to the undisturbed yellow sand, sometimes more than 4 feet deep. But we found nothing — no chippings, no charcoal, no trace of man except the disturbed sand with its tell-tale black stains. I can conceive of no feasible explanation for these apparently useless expenditures of labor. One somewhat similar disturbance, however, on the northern side of the fort we laid to some excavation of more modern times.

The foods of the former inhabitants of this site, as indicated by the specimens found, must have been quite varied. Among animal foods fish predominated; almost every pit yielded from a few to large quantities of fish bones, among which the presence of the cat-fish could be detected by the numerous characteristic fin-spines, and of the sturgeon by a few scattered bony scales. The raccoon and the woodchuck were the best represented among the small mammals; larger mammals were scarce, but two bear teeth were found. Strange to say, deer bone, so abundant on many other sites, were here decidedly rare: all of the few found, however, were split for the marrow in the usual fashion and some showed partial burning. In one pit several bones of a large mammal were found, with a perfect arrow point close to one of them as if it had been embedded in the flesh. I did not attempt to identify the bird bones found. Crumbling *Unio* shells were not infrequent in the pits, and at least one deposit of more than a dozen *helix* shells was obtained, both indicating their probable use as food. Turtle bones were rare — a contrast to their abundance in the ancient shell-heaps of the New York seaboard.

Corn evidently held first place then, as now, among the foods of Iroquoian peoples, for it was very abundant in many pits, both in the form of charred grains or cobs and sometimes in very large quantities as described before. The cobs are quite short, but the kernels themselves seem as large as in modern corn. In pit 40 at

¹ Cf. Journals Sullivan's campaign.

the bottom of an intrusion penetrating the older grave were several quarts of charred acorns. A few charred beans and squash stalks alone remain to tell of the former use of these famous Indian staples. Fruits were barely represented by a few charred pits, thought to be of the wild cherry. Tobacco, or a substitute for it, was discovered in a charred state within the bowl of one of the terra cotta pipes.

The artifacts obtained within the inclosure show that its ancient occupants manufactured implements, utensils and ornaments of stone, clay, bone, antler and turtle shell. They possessed moreover brass of European origin from which implements and other objects were made and also shell objects obtained in trade. Skins of animals, furs and vegetable fiber were also used, and the use of wood may be inferred.

Chipped stone implements, although quite abundant, were remarkable for their paucity of forms. Nearly all were triangular blades, doubtless in the main arrowheads, without notches or stems and made of black or gray flint. The workmanship of course differed considerably, some points being rather rude, others exquisitely thin, symmetrically shaped and keen. A very few notched blades were obtained, probably knives. Another type of what must have been a cutting tool of some sort was found near a skeleton in pit 85. It was long and rectangular in shape and bore distinct traces of a wooden handle of some sort. A few beveled scrapers and a drill or two complete the list of chipped implements found within the inclosure. Rejects and unfinished implements were also obtained in fair quantity. Similar forms prevailed upon the flood plain site, an argument in favor of the theory that both places were occupied by the same people, probably at the same time. Strange to say, on the plateau just outside the embankment a few pieces of a different character were picked up, perhaps relics of an earlier habitation. These were large and notched forms unlike any found within the fort or upon the flood plain site.

A few celts, mostly rude or broken, were unearthed from the pits and general refuse of the fort, and picked up on the flood plain, but no grooved axes whatever; in fact I have never heard of their being found in the neighborhood. Water-worn cobbles, sometimes pitted and showing use as hammers, were common; there were also a number with shallow pits but no trace of battering. The finding of a broken metate like stone and a muller in pit 27 near a quantity of charred corn indicates their probable employment in corn preparation. Several such metates and mullers were found. Net sinkers made by notching the opposite edges of flat pebbles were plentiful

on the flood plain but only occasional in the fort—a fact easily accounted for by the closer proximity of the former to the fishing grounds along Cattaraugus creek. There were also several worn and polished “slick stones,” possibly potter’s tools, and a few other implements of a rude and undeterminate nature.

The highest example of stone art secured was the realistically carved owl pipe near the back of the head of a folded skeleton in pit 29. In the grave were also a broken pottery vessel, some wampum, a piece of flint, some greenish clayey stone, possibly paint, and an iron trade knife, the sheath of which had evidently been decorated with wampum, for part of a curved design composed of three shell beads could be made out when the iron was raised. The pipe itself had been very carefully carved from limestone and is in every way a splendid example of Indian art. It was evidently intended for use with a wooden stem, which had entered just above the tail of the owl, thus causing it to face away from the smoker. The feet are extended forward to give a good finger hold and the head raised above the rim of the bowl.

A number of red catlinite or slate beads, also excellent pieces of workmanship, were found in different graves. They were an inch or more in length, slender, and more or less cylindrical, although sometimes having a squarish section. This latter type was decorated with notches along their full length. The source of the catlinite once in common use among Iroquoian peoples is a question I have not been able to work out but it must have been brought in from western tribes by trade or conquest.

The only representative of the gorget class of ornaments was a small flat oval stone amulet scalloped along its edge, drilled near one end and bearing on each side a rude incised human figure. Later a perforated pendant effigy was found by Mr Kennedy (see figure 32).

Paint was represented by red pigment found in a number of graves, sometimes in considerable

quantity, and by a few pieces of purplish and greenish soft stone.

Articles made of bone and antler were not very numerous nor were they in great variety. Awls of bone were occasionally met with, some merely sharpened splinters, others more elaborately finished, one being even decorated at the blunt end with a design

Fig. 32 Effigy found with tortoise rattle

composed of short incised lines. But one bone needle was found — a broken one. The purpose of the twenty-three bone tubes 3 or 4 inches long found with an iron knife piled up near the right knee of the skeleton in pit 64, before described, remains a matter for speculation, nor does the occurrence of parallel transverse notches on the sides of some of them seem to give any clue. It was suggested by one of our Seneca visitors that these tubes may have been medicine receptacles. Eight similar ones were found in a pottery vessel near the face of the skeleton in pit 97. Smaller tubes suitable for beads were found in a number of pits, and were probably used as such. The bony part of a turtle shell containing large beads and small pebbles found in front of a folded skeleton in pit 58 indicates that the ancient use of a turtle shell rattle was similar to the Gánōwa gūstahewēsēn of the modern Seneca. (Plate 76 shows a similar rattle.)

The most interesting of the bone objects found was a small human figure very neatly carved, but with no trace of arms and with the feet missing. It was discovered in pit 33 at the depth of about 18 inches from the surface in a layer of charred bark, where it was associated with small copper beads covered with verdigris and still adhering in strings, scattered glass trade beads, and infants' bones — a typical infant grave. When this figure was shown to the Seneca they informed us that the "ga-ya'-da" or image was a very powerful "witch" charm, and that similar ones had been often used by their men of magic. They even told stories of finding such an image amid the belongings of a deceased mystic, done up in a large ball of cloths and skins, the inner of which was soaked with blood. Personally, I think that if the image had been so highly thought of in ancient times it would never have been buried with an infant, and that it probably was merely a toy — a doll for the child to play with in Spirit Land.¹

Some mystic purpose, however, may have prompted the placing of several raccoon penis bones with an infant in pit 49, as such objects are still to be found in "mysterious packages" among Iroquoian peoples today.

A few perforated elk teeth found in another child's grave (pit 60) hitherto described, were of the sort highly prized as decorations by the modern western Indians, and were here doubtless used for the same purpose.

A fine specimen of antler implement was the spear or harpoon head discovered with the skeleton in pit 24, hitherto described and

¹ Similar effigies were found at Factory Hollow, Ontario county.

Plate 76

Objects from graves in the Silverheels site near Irving, Chautauqua county. 1, tortoise rattle such as is used by the Seneca Wenontonwisas society. 2, bone comb. 3, fragment of gourd preserved by contact with the copper object within it. 4, small brass kettle found in the grave of a child.

figured. Made much after the fashion of the more familiar antler arrowhead by cutting off the end of an antler, sharpening the point, and drilling out the butt to receive the shaft, it was much larger (4 or 5 inches long), was transversely perforated probably for the attachment of a harpoon line, and showed a backward and outward projection of the rim of the shaft socket, doubtless intended for a barb. But one other variety of antler implement was obtained, a sort of elongated cylinder, probably a flint flaker, unearthed from pit 67. In this pit¹ at a depth of 22½ inches lay a folded skeleton heading west and facing south. The spine showed distinct indications of disease, and certain other bones seemed abnormal. Between the head and knees lay a deposit of objects among which figured the antler cylinder, stained green and well preserved by copper salts from a sheet of that metal just above it. Here were also an oval flat stone showing wear, an iron trade knife, and a small flint point, while near the neck of the skeleton a few trade beads came to light. A few other similar bone or antler cylinders in poor condition were discovered with the skeleton in pit 68, before described. It will be noticed that the skeletons of both pits 67 and 68 had what might be called arrow-making outfits, the only ones found, and were both cripples. Perhaps among these people arrow-making devolved upon those who could not hunt.

Wampum beads were quite common — by far the most abundant of shell objects found. We found them, with few exceptions, only about the necks of women and children. The beads were regulation wampum size, cylindrical, and mainly white, in many cases showing the spiral laminae of the shell columella from which they had been made. Another variety of somewhat similar shell beads was a little larger and more disc shaped. Quite a number of large coarse beads made from the columellae of *Busycon* (*Fulgur*) *caricus* or similar marine shells occurred, often heavily coated with a brownish patina. Large shell discs were rare, but one or two in an advanced stage of disintegration being found.

It was very difficult to make sure of the native copper among the quantity of mostly brass articles found, but there were some beads at least made from this material.² The copper had been hammered out into rough sheets and then bent around into a cylindrical form,

¹ An intrusive ash pit containing, among other things, a large chipped point, had been dug into this grave.

² Later examination proved that there was no native copper implement found here. A. C. P.

making a large rude bead. Seven such beads forming a bracelet about the right arm of the skeleton in pit 75, and four apparently similar ones together with an equal number of copper or brass "jinglers" or conical ornaments made in the same way, were found with the bones of an infant in pit 89.

The salts of this and other copper had caused the preservation in many instances of organic substance, such as the strings of vegetable fiber and sinew upon which the beads had been strung and bits of skin and fur that had lain adjacent to the metal. In the case of the skeleton from pit 78, described before, parts of a fur bag and strips of buckskin legging had been preserved by contact with what seemed to be copper beads. The strips of legging lay along the lower leg bones, the beads being sewn along the outer edge and terminated near the foot in lobes or flaps around which the line of beads continued.

The best discoveries of the expedition were in the line of pottery, of which a collection was obtained comprising a variety and quantity of perfect or nearly perfect specimens seldom met with in the east. In size the vessels

varied from a tiny jar but 2 inches high (see figure 33) to one holding 4 quarts; in shape, from a mere cup to an ornate and elaborately modeled jar; and in texture from rude, coarse and crumbly ware to the thinnest and hardest of which the eastern Indian was capable. Most of the vessels may be grouped

Fig. 33 Small pottery bowl from the Silverheels site, Erie county.

into the following typical classes; raised-rim jars, knobbed-rim jars and cups. The first type is of the characteristic Iroquoian shape, with rounded bottoms, constricted necks and raised rims of differing widths and often decorated with combinations of notches and incised lines. Not infrequently the rim has been modeled up into from one to four peaks rising with graceful curves and adding much to the beauty of the vessel. Below each peak the incised design is often more elaborate and in a few instances a rudimentary handle or ear had been added, reaching from the rim proper down across the constriction. One jar of the raised-rim class, found in pit 88, is

covered from its almost flat bottom to the edge of the rim with incised patterns; in others the neck or constricted part is very long and so on through many variations. The knobbed-rim jars were in most respects similar to those of the preceding class, but the rims, instead of being incised or raised in peaks, are in the form of a regular cog of lateral knobs or points, sometimes merely deeply indenting the lower edge of the rim, sometimes covering all of it with large and prominent knobs. Cups were rare, the few found being merely small flaring vessels without constriction and almost without ornament.

Fig. 34 Pottery vessel from the Silverheels site. This specimen more closely approached the Mohawk valley Iroquoian type than any other found in the burials. $\times\frac{2}{5}$.

Most of the jars were intended, without doubt, for cooking purposes and were used on the fire as is shown by the smoked condition of many of them and the finding of a cracked pottery jar in pit 35, with charred grease or soot in the crack. The mending of pottery

is shown by holes in several potsherds which had evidently been drilled along both edges of a break for the purpose of lacing it together, thus preserving the integrity of the vessel, a common practice among the ancient Indians of the New York sea coast, but rarer in the Iroquoian region. Some of the jars associated with infant skeletons were so very small that it is improbable that they were used as anything but toys. One of the cups found was partly filled with red paint—a circumstance which may give a hint as to the use of the others. Sometimes two or even three vessels occurred in one grave, as in pit 92 where three jars in a row were found with

Fig. 35 Typical Iroquoian vessel from the Silverheels site. Period 1650-87. $\times\frac{2}{3}$.

the remains of two infants, or in pit 82, where a large jar and a small one lay at either side of a little bone dust, once an infant's skeleton.

Pottery vessels and indeed almost all the objects of utility, when buried with a body, were placed, as a rule, at the right side, if it were laid out straight and in front, near the head, if it were folded.

Besides the numerous vessels that were found in good condition there were many that had been crushed by roots or the weight of the impending earth. Moreover great quantities of potsherds were collected from the various pits and a few picked up on the surface of the fort and on the flood plain site.

Four varieties of pottery (terra cotta) pipes were obtained here. The commonest, found only in the graves, are so nearly alike it would be nearly impossible to tell one from the other. They are

Fig. 36 Typical ring bowled pipe of terra cotta from colonial period, Neutral, Seneca and Onondaga sites

composed of a rounded bowl, decorated with parallel and horizontal stripes, from which arises a much narrower stem, which, rounding a gentle curve tapers slightly and ends within a few inches (see figure 36). A variant of this type had the decoration in the form of short oblique stripes instead of horizontal ones encircling the bowl. Two other pipes of somewhat different form were found—one in an ash pit, one in the general digging. A pipe of much interest was found in pit 24, before described, having the form of a coiled serpent, the head of which was raised above the rim of the bowl (compare figure 37). A still more complicated effigy pipe, by far the best of the terra cotta ones found, was unearthed from pit 98, associated with an iron knife and one or two very badly decayed bits of human bone. The whole decoration of the pipe represents a seated human figure facing the smoker, with hands at the mouth, a large head topped with a peculiar headdress or possibly a knot of hair, and showing eyes, nose and mouth. The knees were raised

and the feet protracted into long notched ridges along the stem, while the spine and upper arm were dotted. The face looked something like the modern Seneca ceremonial wooden masks or "ga-gó-sa," so much that the Indians considered the pipe a representation of a masker blowing ashes between his fingers as do the "False-face Society" men of today. A quantity of charred material, perhaps Indian tobacco, was found in the pipe (see figure 23).

Fig. 37 Serpent effigy pipe from Silverheels site. Buffalo Society of Natural Sciences collection. x about $\frac{7}{8}$.

Taking up the articles of European origin collected on this site, we find beads of very common occurrence. These are of four sorts: small round white and blue glass beads quite similar to those used by the Indians today, larger multicolored spherical beads and long cylindrical ones, generally a dull red and a close imitation of the original catlinite article, but sometimes blue. Sometimes it was possible to trace in the sand small parts of beadwork designs, which, were usually in curved lines.

There were also small beads that had some appearance — verdigris and the like — of being made of copper. Upon closer examination they appeared to be of glass, in the manufacture of which some salt of copper had been used as a pigment. They preserved, however, the sinew or fiber cord on which they had been strung and any organic substance with which they came in contact.

A number of pieces of sheet brass were procured in different graves, some of which at least had served a definite purpose, perhaps as ornaments. In pit 67 were found several pieces, probably parts of a large sheet, one of which was triangular, notched along

the edge and bore traces of red paint. One triangular arrowhead, cut from sheet brass, was secured, of the same general sort that was found with the famous "Skeleton in Armor" near Fall River and in different parts of New York State from the rock-shelters near New York City to the Iroquoian sites in central and western New York.¹ Beads and jinglers of European brass were not infrequent; the Indians had evidently cut small pieces from the sheet metal and bent them into their present cylindrical and conical forms. Another metallic ornament, of which several examples were found, is a bracelet of slender or brass tubing bent in the form of a very long and narrow loop thus giving it breadth. A short-handled metallic ladle was also obtained.

Two iron tomahawks were unearthed from graves, both of the same early type shown by Beauchamp as figure 99 in his paper, the "Metallic Implements of the New York Indians;" and sharp-pointed iron trade knives were not uncommon. A rude bracelet and two or three awls complete the list of iron objects obtained here. No guns, metallic kettles or articles of silver were found. Judging from the specimens obtained and from the circumstances of their finding, we had here a people gaining their livelihood mainly from fishing, agriculture and the chase; building forts of earth doubtless topped with palisades for their protection; and quite well advanced in the simple arts. Trade with Europeans had brought them numerous trinkets and had made their lives easier by the addition of iron axes and knives to their native implements; but had not yet brought the guns and metallic kettles so common later. Ornaments such as beads and ear pendants were worn almost entirely by women and children, the men seldom allowing themselves even a bracelet. Trade with other tribes is shown by objects made of marine shells and red catlinite. The dead were buried by simple inhumation, in which case implements, utensils and ornaments were often placed in the grave, or by the ossuary and "bone burial" system before described.

Everything seems to indicate that these people were of Iroquoian culture. The characteristic pottery and terra cotta pipes, the use of triangular points and celts instead of notched points and grooved axes, the abundant use of corn, the wampum found, the ossuary system and even the practice of fort building all point to similar customs with the Iroquois. While many of these features may

¹ Beauchamp, W. M., "Metallic Implements of the New York Indians," p. 47-50. State Mus. Bul. 55. 1902.

have been found also among other peoples, their combination here seems practically conclusive proof. But what Iroquoian tribe is this? There are two answers possible: they were either the Erie or Cat Nation, an extinct tribe known to have been of Iroquoian stock, or they were Seneca. Beauchamp, in his "Aboriginal Occupation of New York," places the Erie in the region southwest of Buffalo, and has done so on good authority, as will be seen from an account of this subject prepared by Mr Dilworth M. Silver of Buffalo, who has given it much attention. The Erie, however, were destroyed by the Seneca in or about 1655, according to the Jesuit Relations and Charlevoix's "History of New France." Thus the question narrows down to whether or not the site was occupied prior to that date. If it was, the inhabitants were Erie; if not, they were Seneca. The later is probably correct. The European articles found were of a sort similar to those traded to the Indians up to the first quarter of the eighteenth century. Champlain saw iron trade axes among the Iroquois as early as 1609 and it is well known that beads, knives and the like followed soon after. There may have been, however, more or less occupation of the Cattaraugus valley before their arrival. I could find no trace of any tradition concerning the fort or its former occupants among the Seneca and most of them were even ignorant of its existence. The probabilities are, then, that the site was occupied by the Seneca after 1655.

The region is still a rich one for the archeologist. There are still a number of earthworks practically untouched. One of these, situated on the bluffs south of Cattaraugus creek amid dense timber, still retains its wall, ditch and gates in good condition, and moreover shows a lower second wall within the first.¹

DOUBLE WALL FORT

EXPLORATION OF AN ANCIENT EARTHWORK IN CATTARAUGUS
COUNTY, N. Y.

By M. RAYMOND HARRINGTON

The highly interesting results obtained in 1903 for the Peabody Museum from the ancient Iroquoian stronghold and burial place known as "Silverheels Site" led to a further examination in 1904 of the same region, the valley of Cattaraugus creek, which enters Lake Erie, about 30 miles southwest of Buffalo, N. Y. In this work the writer was assisted by Mr A. B. Skinner of New York

¹ This site was afterward excavated and is reported under the title "Double Wall Fort."

City and Mr William Blueskye of the Cattaraugue reservation. The new site chosen, called Double Wall Fort, was, like the former one, situated on the Cattaraugus Indian reservation. Not only was it the most available of the sites in the vicinity, but it is one of the best preserved aboriginal earthworks in the State of New York. Beauchamp mentions it,¹ but there is no trace of previous exploration—nothing but a few small holes dug near the wall of the fort. The Indians, however, report the finding of celts and other implements in the vicinity.

This site occupies the top of a high bluff on the farm of David Patterson, a Seneca Indian, on the south side of Cattaraugus creek, about $1\frac{1}{2}$ miles downstream from the little village of Versailles, Cattaraugus county. Almost opposite but a little farther downstream is the mouth of Clear creek; back of the site and a few hundred yards distant is the "Jackson Schoolhouse" known also as "Indian School No. 10."

The bluff or plateau is a part of the south terrace of Cattaraugus creek which, in the form of bold bluffs of gravel or slaty cliffs, extends from the vicinity of Gowanda nearly to Irving, broken only by occasional ravines where some stream enters the main creek. Far across the broad flood plains, $1\frac{1}{2}$ miles distant, may be seen the opposite or northern line of similar terraces, from the direction of which the silver ribbon of Clear creek comes winding to join the Cattaraugus. Between the two lines of terraces lie the rich alluvial fields of the Seneca Indians.

The ancient stronghold lies on a long flat-topped point almost separated from the rest of the terrace by a deep ravine in the bottom of which flows a small brook, entering the Cattaraugus at a very acute angle in such a way that the point is directed downstream.

The whole terrace at this point is composed of coarse gravel and sand, underlaid at the creek's edge by blue clay. In spite of their being sandy the banks are steep and the ascent of the point is very difficult, either from the creek or the gully. The top of the bluff is about 50 feet or more above the creek level. Between the Cattaraugus and the bluff proper is a broad talus slope, becoming flat at the creek side.

This narrow strip of flat land is, according to the Indians, the remnant of what was a good sized field once lying at the foot of the bluff but since washed away by the creek in its wild spring freshets. The only easy access to the top of the promontory is by means of

¹ Beauchamp, *Aboriginal Occupation of New York*, p. 34.

Sketch map of the Double Wall fort, Cattaraugus county. (After Harrington)

a long, very narrow "hog back," a tongue of land which forms a continuation of the point itself and slopes gradually down from the flat above to the creek bank just above the mouth of the brook. A narrow path may still be seen along the crest of the "hog back," with steep declivities on either side; handy for getting down to the water and at the same time easy of defense.

Before taking up a description of the earthwork let us glance at the conditions which made the site a suitable one for a stronghold or a place of habitation. Its commanding position with views of both Cattaraugus and Clear creeks and the broad expanse of valley, the steepness of the banks and its consequent inaccessibility, the ease with which the narrow neck could be fortified and the point thus shut off from the rest of the plateau, the good spring on the side hill inside the wall and within 10 feet of the top, all recommend the place from a military standpoint. It was, moreover, a place where all the necessities of life were within easy reach: the above-mentioned spring, the creek with its teeming fish, the good corn lands close by, everything was favorable. Perhaps the field, now washed away, at the base of the bluff was used as a corn field, or perhaps the level tract of the plateau, or of the flood plain across the creek. It does not seem strange that the ancient fort-builders chose this location.

The archeological environment should also be looked into before taking up the details. The Silverheels stronghold, the scene of the 1903 exploration, lies about $3\frac{3}{4}$ miles down the creek and on the opposite side on a point of the terrace where the flood plain is considerably narrower. On the same side as the Double Wall Fort but only $1\frac{1}{4}$ miles below, at the mouth of Big Indian creek, is another similar work, the Burning Spring Fort, which is much older than the Silverheels site. Many arrow points, flakes and the like have been found by the Indians on the now destroyed field at the foot of the bluff at Double Wall Fort, which may point to the previous existence of a camp or even a village there instead of a corn field. Up stream from Double Wall, the first site of which I have definite knowledge is the now obliterated semicircular work on Point Peter above Gowanda and fully 8 miles distant. Across the creek, however, there are several sites within a radius of a mile or so. Immediately across is a low alluvial terrace, part of the flood plain, which shows slight evidences of occupation in the shape of occasional chips, points, net sinkers and potsherds with a few fire-cracked stones scattered over several acres. There are other sites of this

kind on the flats, notably back of the Thomas Indian School, but most of the other traces of occupation are Seneca and more modern, or in at least one case, modern Delaware.

The earthwork of the Double Wall Fort consists of a well-preserved curved wall and ditch crossing the neck of land between the point and the main part of the terrace; and a second and lower wall with a shallower ditch parallel to and inside the larger one. The outside wall has two gates, the inner one none, but instead a gap between its southern end and the brink of the ravine. The walls are concave outward, with ditches in both cases outside. From the bottom of the ditch the top of the highest wall is at one place 5 feet, 7 inches, but this is variable. The ditch itself is 2 feet, 10 inches deep; the wall 15 feet thick and about 215 feet long. The height of the inner wall is 2 feet, 7 inches, its width 11 feet. The two walls are 27 feet apart from crest to crest. A glance at the drawings will show their shape and construction. It is certainly startling to come across the great wall and ditch stretching away into the tangled second growth chestnut, briars and underbrush which cover the site. The photographs give some idea of the effect.

The ancient village stood upon the point proper, cut off from the rest of the terrace by the embankments and the palisades which doubtless once surmounted them. The other sides were protected by their steepness and also perhaps by palisades set along the edges of the bluff. If these were ever used, however, there is now no sign of them. In fact I found no traces whatever of the palisades themselves even in cross sections made of the larger wall. This may be accounted for by the gravelly character of the soil which is favorable neither for the preservation of the actual wood of the palisade nor for retaining any trace of the post hole. There is no doubt that such palisades were generally used; for not only do the writings of the early explorers tell of many instances among the Iroquoian tribes; but decayed or charred portions of them have been actually found *in situ* on other sites similar to this.¹ The pickets must have been planted in this case along the top of the wall, perhaps in a single row. It does not seem possible that any other arrangement could have been effective here. It is difficult to see how the gates were made secure unless perhaps the southern one is recent and was made by the modern Seneca for convenience in

¹ Beauchamp, *Aboriginal Occupation of New York*, p. 27.

hauling timber across the wall and ditch. In that case the northern gate — the only one — would have been well protected by the inner wall, forming an alley between the two walls from the outer gate to the village and giving a greater chance to stop enemies who had succeeded in forcing their way through the gate. If this is not true it would be difficult to account for the inner wall at all, unless as a relic of a still earlier occupation which seems hardly likely. It may be possible, however, that the inner wall was started and never finished. A reasonable explanation for the southern gate, supposing it to be ancient, is that it was made for convenience at a time when war did not seem imminent, to save the trouble of going around through the alley when entering or leaving the fort.

Turning now to the evidences of habitation within the work we find them visible even from the surfaces amid the tangled second growth stumps, briars and underbrush. The most noticeable of all were numerous saucer-shaped depressions in the surface of the ground, much scattered but mainly on the side of the site nearest the ravine: these continued out to within 30 feet of the apex, and averaged 4 or 5 feet in diameter. Another evidence was the presence of very black earth, beginning some distance inside the wall and covering the entire surface of the point nearly out to the apex but apparently thickest on the ravine side. In this black earth on the paths and other bare spots could be seen occasional fire-broken stones and scattered potsherds, which are also washed out now and then along the edge. No other surface indications were visible except of course the earthwork itself.

I decided that a few transverse trenches and thorough "post holing" would give a good general idea of the character of the site, and began work on this basis. Three trenches were dug, but the excavation was made unpleasant and difficult by the interlacing mass of tough roots, the thick vegetation, and especially by the almost constant rain. The trenches were run 8 feet wide and always included all earth that showed any trace of disturbance. Occasional "pits" or cup-shaped holes filled with disturbed and stained earth were encountered, some with a corresponding depression above them, some without. They were generally homogeneous in structure although some showed irregular ash or charcoal layers. On the whole the pits found here contained less in the way of artifacts and refuse than any other series I ever examined. As a rule they were merely black stains — nothing more. We dug into

Ditch and outer wall of the Double Wall fort, near Versailles, Cattaraugus county

one saucerlike depression after another with practically the same result, merely a dark stain running down perhaps 2 feet, a few particles of charcoal, a chip or two, a reject perchance, or perhaps a small potsherd — such were the contents of the average pit.

Fig. 38 Cross section of the wall and ditch at Double Wall

Fig. 39 Cross section of typical refuse pit at Double Wall

Red or black ash layers were of the commonest occurrence here, generally about 3 or 4 feet in diameter and 12 to 16 inches deep. They rarely contained anything of interest, but were remarkable on account of their number, especially the red ones, which were sometimes within a foot or two of each other, or even coalesced. The black or Indian surface layer seldom reached a depth of over 8 inches and was thickest on the ravine side. Specimens from the site were not abundant, nor had they much individual character. Typical Iroquoian celts, pottery and triangular arrowheads told the story, however. The pottery was much like that found at the Silverheels site, only ruder, having much the same style of raised rim. Still the "knobbed-rim" pottery, so characteristic of the Silverheels stronghold, did not appear here. The only pipe found was a plain terra cotta affair with no salient characters by which it might be

identified as belonging to any particular culture. It merely belonged to the general Algonkin-Iroquois type of terra cotta pipes. Pitted hammerstones were rather common, as were chips and objects of flint. As before indicated, a number of flint arrow points were found, mainly triangular. There were also celts, whole and broken, and a peculiar stone chisel. A few charred nuts were found in one pit, but bones of any kind were very rare, although a few, evidently deer, came to light. This scarcity seems very peculiar when we consider the large number of hearths and pits, unless most of the refuse was thrown down the bluff — a custom which seems to have prevailed among the Mohawk branch of the Iroquoian stock, if we may judge from the conditions to be seen on the sites of their old strongholds in the Mohawk valley. But if this was done at Double Wall Fort, we did not find the refuse heap. Perhaps it was washed away or covered by a landslide. Nothing to indicate European influence or contact was discovered. A large proportion of the specimens were found in the surface or village layer and comparatively few in the pits, reversing the usual conditions. Certain spots in this layer seemed richer than others, particularly on the side toward the ravine.

The small amount of refuse gives the impression that the village was neither very populous nor long occupied. We just consider, of course, that the inhabitants may have practised the Mohawk system above referred to of disposing of it, but the probabilities are that the site was used mainly as a war-time stronghold and probably never for any considerable period as a regular village. Perhaps the main town was on the now destroyed field at the foot of the bluff, or even across the creek. The fort could not, it seems to me, have been merely a temporary fortified camp or village intended to be used a short time only and then abandoned forever. Too much labor had been expended on it for that, and the Indian rarely likes trouble for nothing. The "war-time stronghold" hypothesis certainly seems the most probable.

That the people who erected this work belonged to the long extinct Erie or Cat Nation, a branch of the great Iroquoian stock, seems to me unquestionable. They were the only people of whom we have any record in the region during early historic times¹ when the Jesuits first came among the Iroquois, and doubtless had lived there for some time. The site is early, for there are no trade articles; it

¹ Jesuit Relations for 1668.

is Iroquoian, for it yielded the combination peculiar to that culture — celt-axes, triangular arrow points and pottery showing the typical constructed neck, rounded bottom and projecting rim. It is not Seneca, for this people did not enter and settle the region until long after the beginning of trade with the whites, relics of which would certainly be found in abundance on any site occupied by them. Here we have but one conclusion open — that the site is of Erie origin. It would be very interesting, however, to make a further study of these Erie sites, and compare them with those of the early Seneca in the Genesee valley. Then, and then only, could any absolute conclusion be reached.

THE RIPLEY ERIE SITE¹

BY ARTHUR C. PARKER²

General Region

Along the southern shore of Lake Erie between Westfield and State Line, and extending east and west from these points, is a high bluff of Chemung shale rising almost sheer from the water. In various places it is from 15 to 65 feet above the lake level. It forms a most effectual barrier to those who might wish to reach the land from the water or the water from the land. The soil above the shale in general is a loose water-washed sand and gravel beneath which is a substratum of Erie clay which outcrops at denuded places. In this lake border region are numerous springs and brooks. Two miles back from the lake rise the steep Chautauqua hills which form the watershed that sends the streams on the south into the Allegheny and its tributaries and finally into the Gulf of Mexico and those on the north into Lake Erie and finally into the Gulf of St Lawrence. This region by reason of its physical features afforded an ideal retreat for the tribes of men who found their way there after the subsidence of the great glacial lakes, which receding left their shore lines far inland as terraces and hills and their beds as fertile undulating plains.

Traces of early occupancy are found here. On the sites of ancient marshes are found the bones of the mastodon and near them fire-cracked stones and charcoal. There are sites which yield

¹ Condensed from N. Y. State Mus. Bul. 117.

² In excavating this site we employed Everett R. Burmaster as field assistant and as other assistants William Blueskye and Jesse Mulkin, all of Irving, N. Y.

the monitor pipe, others that yield the polished slates called banner stones, gorgets, and bird stones and the notched flints far different from the flints shaped by later comers. That the people who made these things were of the Indian race is evident, but of what tribe or stock is a question we must yet determine. At a later period a new stock of people invaded the region but whether they found it inhabited or whether there was a struggle in which the old race was expelled is merely a matter of conjecture now. Evidences of the wide distribution of these older people seem to preclude the theory of their utter extermination and it seems more probable that they became absorbed by their conquerors or became expelled to regions where their environment changed their culture.

The later invaders who displaced the builders of the mounds and makers of polished slate implements seem to have been some early branch of the Huron-Iroquois family. Their territory is characterized by the earth walls and inclosures which they left and by the pottery and triangular arrow points which are never found on earlier sites untouched by other occupations. The early Iroquoian sites are still further differentiated by the ossuaries which are found upon many of them. Later this territory came into the possession of a people whom we recognize as the Erie, a branch of the Huron-Iroquois, but a people whose culture differed from the earlier Iroquoian peoples of whom they are without doubt the descendants. After the expulsion of the Erie in 1654 the region remained uninhabited save by wanderers and hunters and not until after the Revolutionary War did it become the hunting grounds of the Seneca who had trails through it, one of which passed close to the Erie site at Ripley. Over this trail the Seneca for years traveled on their way to the settlements on the Sandusky in Ohio. Another great trail extended down what was once the Portage road to Chautauqua lake. It began at Barcelona harbor.

There have been noted numbers of sites of aboriginal occupation east of a meridian line drawn through Chautauqua lake and touching Lake Erie on the north and the Pennsylvania line on the south. West of this line, from the archeologist's standpoint, lies a practically untouched region, a strange fact since it presents an exceptionally inviting field for investigation, being as it is the borderland between the territory of the tribes of Iroquoian stock and culture region of that mysterious people for the sake of convenience termed "mound builders."

Ripley Site

For a number of years the writer had known of a site in this locality, one on the lake shore 2 miles northwest of Ripley, but until 1906 had not had occasion to visit it. In 1900 it was reported to Mr. M. R. Harrington and the writer by Prof. W. T. Fenton, when we were assistants on the archeological staff of the American Museum of Natural History. Mr Harrington did some work on the site in 1904 for the Peabody Museum of American Archeology and Ethnology, but because of various obstacles, left the major portion untouched. The excavations which he made during his short stay revealed the fact that the site was a most prolific one. In view of the fact that the New York State Museum had few or no specimens of the Erie culture, and indeed as very little was known of this culture, the site was chosen as the field for the season's operations and a leasehold obtained. The Ripley site is situated on the William and Mary Young farm in lot 27, Ripley, Chautauqua county. It covers an elevation locally known as "Dewey knoll" situated on the cliffs of Lake Erie. On the east a stream has cut through the shale and eaten down the bluffs to the lake level so that a landing is easily effected from the water. This landing is one of the few between Barcelona harbor and the mouth of Twentymile creek in Pennsylvania, where there is easy access to the land on the bluffs above. The stream has cut the east side of the knoll so that for several hundred feet south from the lake the bank rises steep and in places almost sheer from the creek bed. The place is one, therefore, naturally adapted for a fortified refuge and must have been an attractive spot indeed for the aborigines who built upon it a village, a circular earthwork, and who found in the soft sand a most suitable place for the burial of their dead.

Surface Features of the Site

The site was found to be mainly on the level top of the knoll, although a number of graves were found on the south and west slopes. The "unoccupied soil" began at the lake bank and ran back inland to the southern slope. The soil bordering the bank line was a light sandy loam heavily intermixed with carbonaceous substances, animal phosphates, vegetable mold and particles of animal bone. Back to the south it was generally a light shifting sand which rested upon a more compact stratum. At places, especially a few feet down the slopes, the clay stratum outcropped. Here the soil was bare or only sparsely covered with grass. (See plate 81.)

View looking northwest over Dewey knoll toward Lake Erie

The entire knoll was covered by a peach and plum orchard (since uprooted) and it was between the rows of trees that work was carried on. The owner naturally objected to carrying the excavations too near the roots of the trees and thus it was sometimes impossible to take out a skeleton or to open a pit when it lay beneath a tree. In such cases slanting shafts were sunk beneath the roots and the pit examined. This was a somewhat dangerous operation as sometimes the overlying sand would cave down and engulf the curious but incautious archeologist who after a time would be rescued by his assistants.

Preliminary post holing over the knoll soon revealed the character of the site, and in consequence it was divided into two sections, the village and the burial. Parallel and adjacent trenches were staked out and the lines run as far as post holing and surface indications revealed a disturbance or modification of the soil by its former occupation.

Surface Evidence of an Occupation

The surface evidence of an occupation in that portion of the site afterward found to be the village section was pronounced. The ground was strewn with heat-cracked stones, fragments of shale anvils, broken flint nodules, with here and there a fragment of weathered pottery hidden among the roots of the tall grass. The luxurious growth of grass in patches when surrounded by a scantier growth points out a spot of soil enriched by some abnormal agency. The rank thick grass and clover here in the village site was conspicuous and pointed out the presence of occupied soil or "Indian dirt," as archeologists sometimes term it. Except on the western slope, the burial section of the site revealed no trace of its character. On this hillside where the elements had washed down the loose sand some of the graves were left so near the surface that the skeletons had been thrown up by the plow. The broken and crumbling bones, however, would hardly be recognized by the ordinary observer as human remains. Other than the bits of human bone on the surface there was no external indication where graves were located, unless it were conjectured that if graves were to be found at all they would be in the soil most easily excavated.

Village Section

The village section occupied the level top of the knoll bordering the lake bank and ran back south on the west side about 200 feet, and on the east side to the declivity that formed the bank of the eastern hillside. This bank ran at nearly right angles to the knoll

Fig. 1 Looking over the northeast side of the knoll. Access to the land from the lake is from the mouth of the creek.

Fig. 2 View over the falls looking toward the mouth of the creek and the lake.

proper, the whole eastern slope forming an arm that sloped down to the level just above the creek. On the southern bank of this arm were refuse dumps. The east arm was post holed at intervals of a rod, 220 holes being dug. Hardly a sign of occupancy was found except near or along the level. There was no "occupied soil" or "Indian dirt," the soil being in general a stiff clay mixed with sand and gravel and much more compact than the top soil on the level.

An examination of the surface of the village site led to the discovery of a circular earth belt, a part of which was cut off by the lake bank. On either side of this earth ring were pits and occupied soil. The signification of this belt is discussed hereinafter under the title "Significance of some of the data."

Diminution of the Village Plot by the Encroachment of the Lake

It is highly probable that most of the village site has been lost by the encroachment of the lake, which eating down the shale cliffs caused the landslides. Certain it is that land is lost in this way each year. The belief that a part of the occupied area has disappeared is strengthened by the fact that this section is small in comparison with the rest of the site, by the fact that the occupied soil exposed at the bank is deep, by the fact that the bank line intersects a part of the circumference of the circular earth belt and by the fact that the exposed bank shows all along the level top of the exposed occupied soil and pits. It is probable that originally there was considerable space between the shore side of the circle and the bank and that part of the village occupied that space. Village sites upon hills generally extended to the edge of the declivities and if we can establish where the bank line was at the period of the occupation we may say how far the village probably extended. To establish accurately this line is a difficult matter, but inquiries led to the information that from 6 to 12 inches of land was lost each year. Using this assumption as a datum we may infer that the site has lost at least 150 feet since the time of its occupation. The date of this occupation is discussed elsewhere.

Method of Excavating in the Village Section

The village section was staked out in parallel and adjacent trenches 16 feet wide. Excavations were commenced at the wire fence 20 feet from the shore line. A sectional trench 3 feet wide was dug and the dirt thrown back. This left a cross section of the trench exposed and the 3 feet of floor served as a working space.

Plate 81

Diagram of trenches showing pits examined in the village section of the Riplev site

The archeologist examined this cross section and if indications pointed to the probable presence of objects he troweled into the bank, allowing the earth to fall to the floor until it had filled, when it was removed by a laborer. If the indications pointed to a barren spot the workmen spaded ahead until signs of disturbance again appeared, when the section was again examined. When a pit was discovered a clean working space was made and the pit vertically exposed at one side. The pit filling was then troweled from top to bottom, great care being taken not to break the specimens that might come to light with any trowel stroke. As the work progressed measurements of the pit were taken and all the important specimens labeled and placed in trays for subsequent numbering. The refuse material, such as animal bones, potsherds, flint chips and rude implements, were placed in labeled bags. A diagram of the pit was drawn and the details of its excavation recorded in the trench book. Trenching was continued until the trench became barren, when another trench was worked.

Every pit, pocket or post hole was charted, the varying character of the soil and the manner of its disturbance was noted and it is possible for anyone familiar with our methods to take a specimen from the collection and after examining its number and referring to the records, point out on the map or on the actual site itself exactly where the object was found.

To insure accuracy in field records, three of a different kind were made, so that any circumstance omitted in one might be found in one of the others. The first record was made in a "trench book" and written as the actual work progressed; the second record was made on data slips and supplemented the trench book in the matter of measurements, locations, positions etc. of trenches, pits and objects and added the details of the particular thing described on the slip; the third was a survey record, in which every pit, grave or trench cutting was charted to a degree of mathematical exactness. All these records are supplemented by drawings, diagrams, maps and photographs.

Method of Excavating Graves

The burial section was staked out in the same manner as the village section. The workmen in excavating removed the disturbed top soil for a distance of 3 feet, leaving a working space 3 by 16 feet. Excavations were continued until signs of deeper disturbances appeared. These "signs" were foreign substances in the regular strata, such as fire-burned stone, flint chips, charcoal and lumps of clay. Earth of the character here found once disturbed is never

Plate 82

Sketch map of the trenches and graves in the burial plot of the Ripley site

again so compact as originally, and even if there were not intruding substances in the sand its very looseness as distinguished from the rather compact sand surrounding it was a sign of its disturbance. The topsoil over the grave was removed and its outline ascertained. The superincumbent earth was removed for a foot and a depth of 6 inches below explored for signs of the grave bottom and if not found the earth for another 6 inches was shoveled out with great care, the shovel scooping up the earth rather than spading into it. The trowel was used again to dig down and the process repeated until the skull or pottery vessel top was reached. The soil was then removed carefully with trowels. The skeleton and grave bottom were cleaned with fine pointing trowels and finally swept with a brush, care being taken not to move any bone or other object in the grave. A diagram of the grave and its contents was made, the exact position of these objects ascertained by means of a compass and tape. The dimensions of the grave, its number and position in the trench and the character of the soil and other items of importance were recorded in the field book. If the burial was of sufficient interest photographs from one or more positions were made. The skeleton when removed was wrapped in excelsior or cotton and placed in a labeled box but not finally packed until dry. The objects found in the grave were placed in a tray with a proper label and afterward marked with the serial field number, this number being distinguished from the museum serial by prefixing the letter "F." Data slips numbered to correspond with the specimens were filled out and give all the necessary details. Any information not found on the slip may be found in the field record. The various records thus countercheck one another.

New York State Museum Bulletin 117 describes the graves in this site.

Significance of Some of the Data

From the data secured in the course of the operations one might construct a fairly correct account of the life and activities of the people who left so many significant traces. One might picture the scenes of primitive agriculture, the excitement and dangers of the chase, the industries of the pot-maker or the flint-worker or the home life of the warrior father and his wife and children, but this picture is left for the reader to produce. Our work is rather to tell how the facts were gathered and for the guidance of those who wish to revivify the scenes of the past, to suggest how this may be done. Hasty conclusions and preconceived ideas are to be studiously avoided and no theory should be considered more than tentative unless the proof is so strong as to eliminate doubt.

Fig. 1 Grave XX, pit 44

Fig. 2 Grave XXV, pit 51

Indications of an Earthwork

Excavations were not carried on long before enough evidence was secured to point out the former presence of a circular earth ring in the village section. This ring seems to have inclosed the main portion of the village and to have separated it from a group of pits and lodge sites to the south. Just beyond pits 26, 27, 78 and 79 the soil became very hard and compact and the occupied soil covered with a layer of sand and gravel. The earth in the center of this belt was hard and compact. It was evidently disturbed and intermixed but exhibited few signs of modification by the substances incident to human occupation, such as ashes and charcoal. A few inches of the disturbed subsoil overlay the occupied soil on either side of the barren belt. From these facts it was inferred that at some time an earth ring or wall had been leveled down and the earth of which it was composed thrown over the occupied soil. The outline of the belt was traced and found to be circular in form, or rather crescentic, the ends of the belt touching the lake bank. The original form had undoubtedly been circular, the encroaching lake having undermined the cliffs which, falling, had carried away a part of the village site and with it the missing portion of the ring.

The soil most modified by the occupation, that is to say, the top soil most deeply stained and intermixed with waste products of aboriginal activities, was that part embraced within the area of the dirt ring. Just outside this ring there was another occupied layer but it did not extend far. Some time after the discovery of the former presence of the earth wall, on September 4th, Mr George Morse, an old settler, visited the scene of the operations and introduced himself as one of the pioneers of Chautauqua county, and as a man who in his boyhood remembered the site and its features. Mr Morse made a verbal statement to the archeologist which was taken down verbatim.

The earth ring is found in many places in western New York and elsewhere and is the base upon which a line of sharpened stakes or palisades was placed to fortify the inclosure. This being true, the village here must have been within the circular walls of sharpened posts that rose from the earth circle. A number of families probably had lodges outside the fortification. These may have been the less cautious or those who were crowded out through lack of space within the narrow confines of the picket wall.

Fig. 1 Grave LXXXI, pit 120. Two males in single grave.
Fig. 2 Grave XCV, pit 135. Male and female in single grave.

Summary of the record of the graves

BURIAL	PIT	DEPTH IN INCHES	ORIENTATION			CPOSITION	SEX	bCONDI- TION	OBJECTS	POSITION
			Face	Skull	Side					
1.....	4	42	E	S	R	F	....	D	1 pot.....	15" before face
2.....	5	56	W	N	R	....	....	E	.....	.....
3.....	6	42	E	S	R	....	F	D	.....	.....
4.....	7	42	E	S	R	....	....	....	.....	.....
5.....	8	38	W	N	R	....	....	....	.....	.....
6.....	9	30	NE	SE	R	....	M	....	1 pottery pipe.....	Above skull
7.....	10	48	W	N	R	Bdl	....	Cal.	1 oval blade.....	Near skull
8.....	11	60	W	N	R	F	M	....	Pot, celt, paint.....	At occiput
9.....	12	37	W	S	L	....	Juv	....	.....	.....
10.....	13	42	E	N	L	....	M	....	.....	.....
11.....	14	42	NE	NE	R	....	....	Cal.	Pot, bone, tube.....	Top of skull
12.....	15	40	E	S	R	....	Juv	....	2 pots.....	1 before face and 1 at pelvis
13.....	22	28	E	S	R	....	....	....	Pot.....	Before face
14.....	23	52	E	S	R	....	....	....	Pot.....	At occiput
15.....	24	48	....	....	....	....	....	....	.....	.....
16.....	25	42	....	....	....	....	....	E	Pot.....	In bone dust
17.....	33	48	SW	NW	R	....	....	....	Pot, arrow, glass bead fragment	Pot at occiput, arrow in spine
18.....	39	36	....	....	....	....	....	....	Pot.....	Before face
19.....	40	49	N	E	R	....	....	....	Pipe.....	At top of skull
20.....	44	49	W	S	L	....	M	....	.....	.....
21.....	45	46	E	S	R	....	M	....	.....	.....
22.....	47	60	S	E	L	....	M	....	Pot.....	At occiput
23.....	48	30	S	E	L	....	F	....	Pot.....	At occiput
24.....	49	42	....	....	....	....	....	E	.....	.....
25.....	51	51	E	S	R	F	....	D	Pot, pipe.....	Top of skull below jaw
26.....	52	48	S	E	L	....	M	E	Pot.....	At top of skull
27.....	54	55	....	....	....	....	....	E	.....	.....

28	60					Pot.	At occiput (?)
29	29	N	E			2 pots.	At occiput
30	24			R		Pot.	Indeterminate
31	10					Pot.	Indeterminate
32	10					Pot.	Indeterminate
33	30					Pot fragments.	Indeterminate
34	33	NE	SE	R	Juv	2 pots, 1 pipe.	Before face
35	40	N	SE		M	Flints etc.	Indeterminate
36	25	NW	NE	R	M	Pot, arrows.	Before face
37	48	NNE	SSE	R	Juv	Pot.	At occiput
38	52	N	E	R		Pot.	Indeterminate
39	32	N	E		M	Pot.	Pot before face, pipe over head (see records)
40	42	N	E	R		Pot.	Indeterminate
41	53				Juv	Bone implements, pot, pipe, flints, celt	Indeterminate
42						Pot.	Indeterminate
43	34				Juv	Pot.	Indeterminate
44	48	W	S	L		Pot.	Indeterminate
45	38	W	S	L			
46	44	N	E	R		2 pots.	Before face
47	40	S	E	L	M	Pot, celt, pipe.	Pot above skull, pipe at abdomen, celt at jaw
48		SE	SW	R	Inf	Decayed wood.	
49 (a)	30	N	E	R		Flints.	Before eyes
49 (b)	51	NE	SE	R		Pot.	Indeterminate
50					F	9 pots, etc.	Near skulls
51 (a)	42	S	E	L	Inf	(See records)	(See records)
51 (b)	42	S	E	L	Inf	Bar celt.	At abdomen
51 (c)	42	S	E	L	M	Pot.	At occiput
51 (d)	42				F	Pot.	Top of skull, face
52	42	W	S	L		Pot, celt.	Top of skull
53	38	W	W	L	M	Pot.	
54	38	W	W	L	F	Pot.	
55	20	N	E	R		Pot.	
56	30					Pot.	

c F=Flexed.

C=fair D=poor F=entirely disintegrated. Cal.=calcined.

..... Ach mit heile

Unless otherwise stated the position is flexed.

124	79	42	S	W	R	M	D	Charred bark	At occiput
125	80	30	SW	SE	L	M	E	Pot.	At top of head
126	81(a)	48	NW	NE	R	M		Pot.	At top of skull
126	(b)	48	W	S	L	M	D	Pot.	At occiput
127	82	48	N	E	L	F	D	Pot.	
128	83	49	up	SE	R	F	D	Copper rings	On fingers
129	89(a)	42	NE	SE	R	F	D	Pot.	At occiput
129	(b)	52	NE	SE	R	F		Celt.	Top of skull
130	90	40	N	E	R	F	D	Pot, flints, shell beads, etc.	Occiput, face, neck etc. (see records)
131	91	40	N	E	R	F	D	Pot, flints	Between skulls
132	92	47	SW	SE	back	F			at female's scapula
133	93	39	W	S	L				
134	94	42	E	S	R	F	D	Pot, flints	
135	95(a)	42	SW	SE	L	M	C		
135	(b)	48	up	S	back	F			
136	96	48	down	SE	L				
137	97	37	S	E	R	F	D-E		
138	98(a)	48	NE	SE	R	M		Flints	Between skeletons
138	(b)	48	NE	SE	R	F		Pot, flints, ocher, cop-	Top of skull, face, ab-
139	99	42	S	E	L			per bead	domen, feet
140	00	42	S	E	L	M		Pot.	At top of skull
141	01	36	S	E	R	M		Pot, pipe	At face, on arm
142	02	32	S	E	L	Inf	D-E	Pot.	Top of skull
143	03	32	N	E	R			Red ocher	At occiput
144	04	40	N	E	R	Inf	D-E		
145	05	48	N	E	R	M		Flints	Top of skull
146	06	42	SW	NW	R	F	E	Pot.	Indeterminate
147	07(a)	45				F	D	Pot.	Before face
147	(b)	45				Inf	D-E	Pot.	At occiput

a Ash pit burials.

b C=fair, D=poor, E=entirely disintegrated, Cal.=calcined.

c F=Flexed.

Unless otherwise stated the position is flexed.

Post Holes and Lodge Sites

A large number of post holes, that is small holes from 18 to 24 inches deep, filled with substances somewhat different from the surrounding soil, were discovered in the village layers (see diagram of pits, plate 81). The positions of these holes were carefully chartered and were found to bear a certain relation to one another. The character of the soil inclosed by lines bounding these holes was carefully noted and seemed to indicate the dirt floors of lodges. The post holes therefore were probably the holes made by the stakes that formed the uprights of dwellings. Although a number of lodge sites, so called, were discovered it is not to be thought that there were not other lodges elsewhere.

Mortuary Customs Indicated

The areas of most of the graves were large in proportion to the space occupied by the skeletons. In general the bones rested in the center or at one corner of the excavation, leaving a wide space about the bones. Nearly all the skeletons were arranged in a flexed position. From these circumstances it might be inferred that the dead were carefully placed in the graves and arranged by persons who descended into them. This assumption appears strengthened when it is considered that the pottery vessels which probably contained food could not have been easily dropped into the grave and have remained upright as they were in almost every instance. The whole make-up of the graves and the positions of the articles found in them indicate the hand of design. The decayed substances found over the grave bottoms seem to indicate that other perishable possessions were placed in the graves, such as articles of wood, bark, skins and fabrics of bark or reeds. It is not to be supposed that objects were not placed in some graves because none were found. The lack of stone or pottery articles suggests that only perishable substances and utensils have been interred. In the bottoms of many of the grave pits just beneath or mingled with the animal phosphate were layers of charred vegetable matter, either bark, grass or reeds. From this fact it would appear that in such pits fires had been kindled, either to dry the damp earth or to warm the bed for the sleeper whose body must rest so long within it. This is in accord with certain traditions. Thin and sometimes almost imperceptible layers of decayed vegetable matter over some of the skeletons strongly suggest the use of bark or wood as a covering for the bodies before the earth was finally thrown back into the excavation. In a few cases flat pieces of

Plate 85

Grave pit 92, Ripley, at 84 feet in trench 10 was 3 feet 4 inches deep. It contained the decayed bones of an adult male of mature years. The spinal column was in one solid piece, the result of ankylosis. With the skeleton at the places indicated by the photograph were a double edged celt, a perfect pottery vessel, typically Erian, and a stone effigy pipe, representing some mythical animal.

charred bark were found above the bones. The use of a bark or animal skin covering is also suggested by the finds in grave 51, pit 96, where above the copper bracelets a fragment of bark and a piece of deerskin were found preserved by the copper salts. When it is considered, moreover, that a primitive people would naturally reverence the dead, it seems highly probable that they would shrink from casting clods of clay or masses of mud upon the form of those whom they had evidently arranged and dressed with every manifestation of solicitude. Moreover, to have covered the corpse with a shroud of skin or a covering of bark would have added an element of mystery to the interment. The body would have been obscured during the process of burial. To cast stray stones and earth upon the form beneath would have shocked the primitive people to whom care for the dead was probably an important religious rite. If the vessels of clay contained food for the skyward journey it would hardly seem that this food would have been tainted by earthly flavors, but rather covered for cleanliness. This supposition seems to be given weight by the fact that two pots were found in the clay stratum over the mouths of which were wads of clay, the vessels being empty. From the fact that weapons and utensils were buried one is led to think that the people believed or affected to believe that these things, or perhaps the spirits of these things, would be of value to the spirit of the dead. All the clay pipes from the burials contained charred tobacco and from this fact it might be conjectured that the pipe of the sacred herb had been lighted in the grave for a consolation to the spirit as it started out in the new and strange world of spirits.

The positions of the various objects, especially of the pottery vessels, are highly interesting. Most of them were near the head, as were some of the pipes. The table appended herewith gives a summary of the positions of the pots in relation to the skeletons.

Position of the pots. Before face, 11; at occiput, 25; top of skull, 16; near abdomen, 1; at pelvis, 1; between skulls, 2; indeterminate, 14.

Graves in ash pits. Two graves were found in true ash pits. These pits were situated just beyond and outside the earth ring and were side by side (see record of pits 48 and 49). Both pits were shallow, $2\frac{1}{2}$ feet, and the skeletons had only light covers of charcoal and ashes to separate them from the ordinary pit refuse. It may be possible that the ash pits were within or near a lodge site and were used as graves when the ground elsewhere was frozen. Broken pots were found in both of these graves.

Plate 86

Grave pit 96 in trench 10 contained the skeleton of an aged female, the lower right arm of which was almost entirely preserved by the copper salts formed from the heavy copper arm bands and finger rings. Two infants' skeletons were found at her side and the skeleton of a headless male, near which was found a bar celt. Ten pottery vessels were buried in this family grave.

Primitive means of excavating. Trowellike implements of antler were found in several ash pits and were probably the tools used for digging pits and graves. The sand might have been easily loosened with picks of antler or wood or with the shoulder blades of elk or deer and have been scooped up with shallow bark baskets.

The grave fillings in at least forty cases were heavily intermixed with carbonized wood and bark. This suggests that the topsoil had been thawed out to facilitate digging in winter.

Depth of graves. In most cases the graves were dug as deep as it would be possible with rude implements. This depth was to the clay stratum or into it for a few inches. Because of the poor drainage of the clay the skeletons buried within it decayed much more rapidly than those in the loose sand. A table of depths follows:

Table of depths of graves

INCHES	NO. OF GRAVES	INCHES	NO. OF GRAVES	INCHES	NO. OF GRAVES
10.....	2	36.....	3	51.....	2
20.....	1	37.....	2	52.....	3
22.....	1	38.....	6	53.....	1
24.....	4	39.....	2	54.....	2
25.....	1	40.....	7	55.....	1
28.....	1	42.....	21	56.....	2
29.....	1	45.....	1	58.....	1
30.....	6	46.....	1	60.....	4
32.....	3	47.....	1	63.....	1
33.....	1	48.....	15	72.....	1
34.....	1	49.....	3		

Arrangement of graves and position of skeletons. An examination of the map of the burials shows that apparently no fixed system of plotting the graves was observed. The graves seem to have been dug where the sand was softest and most easily excavated. It will be noticed, however, that the graves cluster about open spaces. From this it might be inferred that they were arranged about large trees that afterward decayed.

An examination of the table of orientation reveals that the bodies were not apparently arranged to face any particular cardinal point. This, however, does not necessarily indicate the lack of system. It may be that the position in which a person died governed the position in the burial.

*Orientation by direction of head*¹

HEAD NORTH

Face west on the right side

6F, 8, 11M, 116M..... 4

Face east on left side

14M, 102M 2

Total 6

HEAD EAST

Face north on right side

40, 68juv, 86M, 91, 94, 101F, 112F, 114:1, 114:2, 128,
131F, 137M, 143:1, 143:2inf, 144M..... 15

Face south on left side

47M, 48F, 52, 92M, 96:1F, 96:2juv, 96:3juv, 109, 110,
111, 123F, 123:2F, 139, 140M, 141M, 142inf..... 16

Total 31

HEAD SOUTH

Face east on right side

4, 7F, 22juv, 45F, 51M, 134F..... 6

Face west on left side

13, 44M, 89, 90, 98, 100M, 127M..... 7

Face up on back

135:2 1

Total 14

HEAD WEST

Face south on right side

99, 113, 120, 124M..... 4 4

¹ The numbers refer to the burials and the letter following to the sex, thus, M, male; F, female; inf, infant, and juv, juvenile. Where there is no letter the skeleton is probably that of an adult, the sex being indeterminate on account of the condition of the bones.

HEAD NORTHEAST

Face northwest on right side

15M, 65, 126:2M 3

Face southeast on left side

115:F, 115:2inf, 115:3inf 3

Total 6

HEAD NORTHWEST

Face southwest on right side

39 1 1

HEAD SOUTHWEST

Face southeast on right side

93inf, 107M, 118:1 3 3

HEAD SOUTHEAST

Face northeast on right side

9M, 63M, 67, 94:2, 118:2, 129:1 (face up)F, 129:2F,
130F, 138M, 138:2F 10

Face southwest on left side

117M, 135:1M, 136 (face down), 132 4

Total 14

Not determined 34 34

Total 113

Morphological Characters

Field measurements of the bones indicate that the people were of medium height, 5 feet 7 or 8 inches being the average. A few skeletons were found that approached 6 feet. That the race was stocky is shown by the heavy development of muscular ridges, especially in the case of males whose bones were generally large.

The loose sand affording good drainage preserved the bones when they were not buried directly upon the clay stratum but in either case by the shifting of the sand or through some other agency, most of the skulls were broken or crushed while other bones were in a much better state of preservation. Some of the complete skulls are of unusual interest. In form nearly all are either dolichocephalic

or subdolichocephalic, none being of the brachycephalic type common to the mound-builder region 100 miles to the west. A considerable proportion of the skulls in Erie sites 40 miles east is characterized by alveolar prognathism, but among those found at Ripley only two showed this development. The *os incae* was observed in a few instances and there were some skulls having wormian bones. In one skull the *os japonicum*, that is, the lower portion of the malar bone when divided by a suture, was observed.

The average capacity of the skulls is 1587 cubic centimeters for males and 1440 for females. The average cephalic index would be perhaps 74.4 and the nasal index 47. A careful study of all the morphological characteristics will be made in the laboratory and reported in another place and may slightly modify the averages here given.

In a few cases humeri were observed in which the olecranon cavity was perforated. In two cases an examination of the femora revealed the process termed the third trochanter and the hypotrochanteric fossa. Some femora are platymeric.

Pathological Conditions

With the exception of two cases of ankylosis, no pathological conditions were noted. There are a number of bones, however, that show the repair of breaks.

Only in a few cases were possible clues to the cause of death discovered. In several skeletons triangular arrow points were found between the vertebrae or in some other part of the osseous structure. A remarkable form of ankylosis was observed in the case of an aged male whose entire spine had become cemented into one solid bone. Such conditions are probably rare in Indian skeletons. One low type female skull marked by prognathism and wormian bones had the frontal bone crushed and the perforation filled and repaired by osseous matter. If it is permitted to judge character from the form of the skull one would be strongly tempted to say that the deceased must have been no congenial companion, to say the least.

Identity of the Inhabitants

Erie

The general type of the artifacts discovered in the course of the excavations, especially the types of the pottery, closely resemble Iroquoian forms. In particular they resemble the Erian. The fact that pieces of iron and copper were found in graves and ash pits proves that the former inhabitants of the site had contact, direct or

indirect, with Europeans. That few objects of European metal were found and no glass beads, save a fragment of one, indicates that the people acquired them from a single trader or by trade from other Indians. This latter conclusion in the light of evidence seems the more probable. If the inhabitants of the site had contact, direct or indirect, with the whites, then we may look for historical records by which to identify them. In the Jesuit Relations are found many references to a people who inhabited the region of which the Ripley site forms a part. These people are variously called Eries, Eriegoneckkak, Eriehronnons, Erieé, Riquehronnons, Rhiier, Nation du Chat, Cat Nation, Rhierrhonnons, etc. etc. Besides the accounts by the Jesuits there are several maps which place the Erie Indians in this territory, notably the maps of Sanson of 1656, of Creuxius of 1660, of LaHontan of 1690, and of Hennepin of 1698. From these records and maps we may define the territory of the Eries as the region bordering the southern shore of Lake Erie between the region of the Neutrals on the eastern end of Lake Erie east to the western banks of the Genesee, westward to the western watershed of Lake Erie and the Miami river and southward to the Ohio river. In the Relation of 1647-48 we find the following description of the Erie country:

This lake, called Erie, was formerly inhabited on its southern shores by certain tribes whom we call the nation of the Cat; and they have been compelled to retire far inland to escape their enemies, who are farther to the west. These people of the Cat Nation have a number of stationary villages, for they till the soil and speak the same language as our Hurons.

Under title of "Description of the Country of the Hurons" in the relation of 1653 there is the following paragraph:

Beyond that same neutral nation, in a direction nearly south, there is a lake 600 miles in circumference, called Herie, formed by the fresh-water sea, which discharges into it, and thence by means of a very high cataract, into a third lake still greater and more beautiful; it is called Ontario or Beautiful Lake, but we were wont to call it the Lake of Saint Louis. The former of these two lakes was at one time inhabited toward the south by certain peoples whom we call the Cat Nation; but they were forced to proceed further inland in order to escape the enemies whom they have toward the west. This Nation has various territories, cultivates the fields, and speaks a language similar to the Hurons.

In the Relation of 1654 there is still further reference:

They (the Iroquois) tell us that a new war has broken out, which fills them with fear, that the Eries have taken arms against them (we call the Eries the Cat Nation, because there is in their country a prodigious number

of wildcats, two or three times (as large as our tame cats, but having a beautiful and precious fur). They tell us that an Iroquois town has already been set on fire and destroyed at the first attack; that this nation pursued one of their armies which was returning victorious from the shores of Lake Huron, fell upon the rear guard of 80 picked men and entirely cut it to pieces; that one of their most distinguished chiefs, Annenraes, has been taken prisoner; in a word that the Iroquois are inflamed, and are arming to repulse the enemy, and are, therefore, obliged to seek peace with us.

This Cat Nation is very populous. Some Hurons, who have scattered everywhere since the destruction of their country, have joined them, and excited this war, which alarms the Iroquois. It is said that they have 2000 men, good warriors, though without firearms. But they fight like the French, enduring courageously the first discharge of the Iroquois who have firearms, and then pouring down upon them a hail of poisoned arrows, which they can shoot off six or eight times before the others can reload their muskets.

Sagard, who went to the Huron country as a missionary in 1623, in his interesting *Histoire du Canada*, 1636, has also some notes bearing on the Eries.

Relation of the Erie to other Iroquoian tribes. The Erie belonged to the Huron-Iroquois linguistic stock, as is patent from a review of the records. William M. Beauchamp, the distinguished authority on New York archeology, suggests that the Erie were the parent stock of the Huron-Iroquois family and further suggests that the Seneca were derived from them, possibly within historic times. There seems to be some good base in history for this opinion and the argument can not be better stated than in Doctor Beauchamp's own words, quoted from his address on *The Origin and Early Life of the New York Iroquois*, delivered before the Oneida Historical Society in 1886:

The Senecas had a conspicuous place in the Iroquois league, though the last to enter it, forming the west door, as the Mohawks were the east. On the Dutch maps of 1614 and 1616, the Mohawks and the Senecas are alone designated, and for 50 years more the Dutch hardly mentioned any but these. That they were kindred to the Eries is conceded. In 1615 Champlain spoke of the Iroquois and the Entouhonoronons, whom some have thought the Senecas. In the explanation of his map it is said that "The Iroquois and the Antouhonoronons make war together against other nations except the Neutral nation." They had fifteen strong villages, too many for the Senecas, unless the Eries were included. That the Senecas differed from the other Iroquois in religious observances, totems and clans, habits of life and other things is very clear. A marked distinction appears in their language and they were not very brotherly to the rest. Long after the League was formed they were sometimes at swords points with the Mohawks, and the French Mohawks did not hesitate to go against the Senecas, when they refused to fight against the other nations.

There is good reason for thinking them part of the Massawomekes of Captain John Smith's narrative. Early writers made these any part of the Five Nations, but later students, to identify them, as in the case of the Entouhonorons, with both Eries and Senecas, these being firm friends until 1653. Captain John Smith met these fierce enemies of Powhatan in their bark canoes on Chesapeake bay in 1608. The general description is that of an Iroquois war party, though the name of course is Algonquin. That he did not understand their language makes this almost certain. He bought some of their weapons and increased his reputation by showing these, the Virginia tribes supposing he had taken them by force. But a Maryland trader went to the Massawomekes in 1632, and there remains no doubt that this name included the Eries and the Senecas, then or previously allied. They had palisades of great trees about their villages with galleries at the top.

Destruction of the Erie. One of the most picturesque and tragic accounts of these people is given in the Relation of 1655-56. It is the story of their destruction. In the account they are called the Cat Nation (*La Nation du Chat*). The Jesuit account is without doubt essentially correct and differs in many respects from the rather fanciful Seneca tradition. In one particular both accounts agree, and that is that the Erie brought destruction upon themselves by their own folly.

The account as given in the Thwaite's edition of the Relations follows:

CAUSE OF WAR AGAINST THE CAT NATION

The Cat Nation had sent 30 Ambassadors to the Sonnontouahronnons to confirm the peace between them; but it happened that by some unexpected accident, that a Sonnontouahronnon was killed by a man of the Cat Nation. This murder so incensed the Sonnontouahronnons, that they put to death the Ambassadors in their hands, except five who escaped. Hence the war was kindled between those two nations, and each strove to capture and burn more prisoners than its opponent. Two Onnontagehronnons among others were captured by men of the Cat Nation; one of them escaped and the other, a man of rank, was taken home by the enemy to be burnt. He pleaded his cause so well that he was given to the sister of one of the 30 Ambassadors who had been put to death. She was absent from the village at the time; but the prisoner was nevertheless clothed in fine garments, and feasting and good cheer prevailed, the man being all but assured that he would be sent back to his own country. When she to whom he had been given returned, she was told that her dead brother was to be restored to life, that she must prepare to regale him well, and then to give him a most gracious dismissal. She, however, began to weep and declare that she would never dry her eyes until her brother's death was avenged. The elders showed her the gravity of the situation, which was likely to involve them in a new war; but she would not yield. Finally they were compelled to give up the wretched man to her to do with him as she pleased. All this occurred while he was still

joyfully feasting. Without a word he was taken from the feast and conducted to this cruel woman's cabin. Upon entering he was surprised at being stripped of his clothes. Then he saw that his life was lost, and he cried out, before dying, that an entire people would be burned in his person, and that his death would be cruelly avenged. His words proved true; for no sooner had the news reached Onnontague, than 1200 determined men started forth to exact satisfaction for this affront.

We have already observed that the Cat Nation is so called from the large number of Wildcats, of great size and beauty in their country. The climate is temperate, neither ice nor snow being seen in the winter; while in summer it is said that grain and fruit are harvested in abundance, and are of unusual size and excellence.

Our warriors entered that country remote though it was from Onnontague, before they were perceived. Their arrival spread such a panic that villages and dwellings were abandoned to the mercy of the Conqueror,—who after burning everything, started in pursuit of the fugitives. The latter numbered from two to three thousand besides women and children. Finding themselves closely followed, they resolved, after five days' flight to build a fort of wood and there await the enemy who numbered only 1200. Accordingly, they intrenched themselves as well as they could. The enemy drew near, the two head chiefs showing themselves in French costume, in order to frighten their opponents by the novelty of their attire. One of the two who had been Baptized by Father le Moyne and was very well instructed, gently urged the besieged to capitulate, telling them that they would be destroyed if they allowed an assault. "The Master of life fights for us," said he; "you will be ruined if you resist Him." "Who is the Master of our lives?" was the haughty reply of the Besieged. "We acknowledge none but our arms and our hatchets." Thereupon the assault was made and the palisade attacked on all sides; but the defence was as spirited as the attack, and the combat was a long one, great courage being displayed on both sides. The Besieging party made every effort to carry the place by storm, but in vain; they were killed as fast as they advanced. They hit on the plan of using their canoes as shields; and bearing these before them as protection, they reached the foot of the entrenchment. But it remained to scale the large stakes, or tree trunks of which it was built. Again they resorted to their canoes, using them as ladders for surmounting the stanch palisade. Their boldness so astonished the Besieged that, being already at the end of their munitions of war,—with which, especially powder they were but poorly provided,—they resolved to flee. This was their ruin; for, after most of the first fugitives had been killed, the others were surrounded by the Onnontaguehronnons, who entered the fort and there wrought such carnage among the women and children that blood was knee deep in certain places. Those who had escaped, wishing to retrieve their honor, after recovering their courage a little, returned to the number of 300, to take the enemy by surprise while he was retiring and off his guard. The plan was good but it was ill executed; for frightened at the first cry of the Onnontaguehronnons, they were entirely defeated. The Victors did not escape heavy losses,—so great indeed, that they were forced to remain two months in the enemy's country, burying their dead and caring for their wounded.

The Erie are commonly said to have been exterminated but this is not entirely true. They became exterminated only in the sense that they ceased to exist as an independent people. The surviving Erie who did not flee to other tribes became the captives of the Iroquois, who in accord with their usual policy adopted the individuals into their families and gradually absorbed them.

Date of occupation. From the testimony of the records it would thus appear that the inhabitants of the Ripley site must have been Erie. The testimony of the relics leads to the conclusion that this occupation was of the early historic period. Without doubt the site bridges the prehistoric to the historic. That it must have been earlier than 1654 is known from the fact that the Erie were expelled from their territories by the confederated Iroquois in 1654. That it is not so late as 1654 appears from the fact that by this date the Erie had opportunity to trade extensively with European and yet few European articles were discovered. From the time the Dutch entered New York and the colony of Jamestown was settled, the Erie had opportunity to acquire articles by trade with other Indians, especially the Iroquois. Considering all things, one would be strongly led to place the date of the cession of occupation before 1620. It is highly probable, moreover, that the first occupation of the site was early in the seventeenth century if not during the last few years of the sixteenth.

Description of Implements

Stone

Objects of Rough Stone

The rough and massive stone objects requiring but slight modification from natural forms to adapt them to the purposes intended include hoes, anvils, shaft rubbing stones, pitted hammerstones, lapstones, net sinkers, rounded pebbles, mortars and some celtlike implements.

Figure 1 in plate 87 illustrates a flat piece of shale which has been roughly shaped and from its marks of use evidently has been used for a digging implement, perhaps a hoe. Objects of this class were not common, this specimen being the only complete one found on the site. Large numbers of rounded water-washed pebbles were found distributed over the site. All had been brought from the lake shore and they were not found in the undisturbed soil. These pebbles varied in size from 2 inches to 5 inches in diameter and most

Plate 87

Types of rude stone implements improvised from natural pebbles, the shape of which required only slight modification to adapt them for the purposes intended. 1=Hoe or rude celt. 2=Hammer. 3=Pick. 4, 6=Net sinkers. 5=Pitted hammerstone. 7=Hammer. 8=Anvil and grinding base. 9=Smoother. 10=Pitted hammerstone and small anvil.

of them show signs of use. Many seem to have been heated in fires and others to have been used as hammers or anvils. Round pebbles were also found in the graves but nothing there was discovered that might furnish a clue to their employment. Figure 2 in plate 87 shows one of these pebbles.

Most polished stone articles seem to have been reduced from crude forms by a picking process. Few implements resembling picks, perhaps, have been found. One crude implement, figure 3, plate 87, is of tough granite and seems to have been one of these picks. It is much battered and shows signs of long use. Notched implements, commonly called net sinkers, were not common, only about a dozen being found. They were of the ordinary type found everywhere throughout New York. Figures 4 and 6 in plate 87 show two net sinkers typical of all the rest found on the knoll. Hammerstones were everywhere numerous both on the surface and in the pits. Hammers were of three types, the ordinary round pebbles used as hammers, the ball-like hammers that are battered on almost every part of the surface and the common pitted hammerstones. Some of the larger pitted stones seem to have been alternately hammers and anvils and sometimes resemble small mortars. Figure 10 shows one of this type. Objects termed anvils are the flat stones plentiful everywhere in the village site. They exhibit signs of having been used as bases upon which other stones were worked. Anvils were generally pieces of hard shale or small boulders and most of them seem to have been used for long periods (see figure 8). The flat slabs of shale and sandstone anvils sometimes had shallow hollows on one side and seem to have been used for grinding purposes. It is highly probable that in that state of primitive culture when everything convenient must be utilized, one utensil served as many purposes as could be devised for it.

A number of smoothed and worked stones found in refuse pits and also in graves are thought to be potters' tools. One was found in a pit containing a large quantity of partly worked clay. One of these stones is shown in figure 9 in plate 87 and another in figure 10, plate 88. One interesting specimen of a massive stone implement is the large mortar found in pit 50. It weighs about 200 pounds and was found at one end of a stone-floored pit. It must have been occasionally turned over for both sides show signs of use though only one side was used as a mortar. Mullers or rounded pebbles

Plate 88

Types of celts, from Ripley One-half reduction.

must have been used to crack and grind the corn or other substances. Long cylindrical pestles would not have served the purpose.

Fig. 40 Arrow shaft rubber and polisher. Size scale: 1-3

Four small celtlike implements were found in refuse pits. These had been formed from natural water-washed pebbles the ends of which had been sharpened to an edge, this being the only work done to form the implement. It is hardly possible to state definitely for what purpose these miniature celts were used. Certainly they could not have sustained rough usage (see figures 9, 11, plate 88).

A grooved stone, sometimes called an arrow shaft smoother, is figured in text figure 40.

Polished Stone Objects

No polished stone articles of the type usually termed ceremonial were found in the course of the excavations, although a gorget was found on the hill to the east of the site, unless the very interesting polished bar of Portage shale found in grave 96 is to be called a ceremonial (see plate 88, figure 4). There is a bar of this description in the museum collection which came from Jefferson county and the writer secured another 15 inches long from Mayville, Chautauqua county. All these specimens have sharpened ends like celts, and for the want of a definite name the writer proposes the term "bar celt."¹ Thurston in his *Antiquities of Tennessee*, plate 16, figures an implement resembling a bar celt. He describes it as the ". . . long delicate crescent-shaped 'implement' of highly polished syenite, represented in plate XV [author's collection], also probably belongs to the ceremonial class. It is 11½ inches long. Originally it was probably 12 inches as the point has been broken. It was found by Theodore Haslem in North Nashville (Tenn.)." Objects of this kind are probably rare and but few have been described. All three specimens in the state collection are flattened

¹The writer has since examined another bar celt found by William T. Fenton of Conewango Valley.

Plate 89

Types of chipped flint implements not arrow points. Figures 4 and 11 are scrapers and 7 is a rude drill. See also text figure 41. All from Ripley.

on the bottoms and rounded over the back with gradually tapering ends.

The ordinary celts are of the usual type found everywhere in the Erie cultural area and in general throughout the Iroquoian. Most of the specimens are equilateral, there being none of the adz, "flat-bellied" or "turtle-backed" forms. The majority of celts were found in graves although a few are from refuse pits. Three entire celts and two broken celts were found in a "feast pit" previously described (pit 80). One small double-edged or "bitted" celt came from grave 92 which is shown in figure 13, plate 88.

Stone Tobacco Pipes

The stone pipes are perhaps the most interesting forms of polished stone articles. Those discovered exhibit many interesting features.

Two pipe bowls carved from sandstone are of interest (plate 90, figure 2, 3). Figure 2 is bell-shaped with notches cut around the edge and a cross cut in the rounded bottom of the bowl. In Joseph D. McGuire's *American Aboriginal Pipes and Smoking Customs*, contained in the National Museum Report of 1897, page 428, figure 52, is figured a pipe from Accotink, Va., very similar to this specimen. Of these pipes Doctor McGuire says:

Among the bowl pipes of vaselike form they are found to vary from those which are as broad as they are long, specimens having a height four times as great as their diameter. This type is usually made from steatite, or kindred stones, capable of resisting heat, though, as with most American pipes, there are numerous exceptions to the rule. One in the Smithsonian collection, of gray sandstone was found in a cave on Tar river, Yancy co., North Carolina, and another found in a kitchen heap in Kanawha county, West Virginia, which was made from a brown stone. Other specimens are known of this type made from partially decomposed limestone, feldspar, and even fossil coral. The writer is informed by the Rev. W. M. Beauchamp that this type is frequently encountered in Onondaga county, New York.

Pipes of this urn-shaped type are found also along the headwaters of the St Lawrence, on the south shores of Lake Ontario and Lake Erie, and along the upper waters of the Ohio and its affluents, a typical specimen being from Accotink, Virginia, while yet other specimens in the United States National Museum collection are from New York, Pennsylvania, Ohio, West Virginia, Kentucky, Tennessee, Indiana and North Carolina.

If the area of distribution of the urn-shaped pipe is compared with the tribal distribution first known to the whites, as it appears on Powell's linguistic map, it will be seen that this especial form of the bowl pipe is found in Iroquoian territory on the north, through the Algonquin on the south into the southern Iroquoians. It should be remembered that this area corresponds, reasonably, with the territory influenced by French trade before the advent

Plate 90

Stone pipes. 1, 2 and 3 are from the topsoil or general occupied layer; 4, 5, 6 and 7 are from graves.

of the English. The territory is also in the line of travel from the St Lawrence to the Ohio. The writer is unable to determine how far this urn-shaped type of pipe has been governed by European influences. Its contour is similar to pottery bowls from Tennessee, specimens of which are in the United States National Museum collection.

Figure 3, plate 90, is of an egg-shaped pipe bowl of the same material as the one just described. Around the middle of the bowl is a groove which meets at the stem hole. In Moorehead's *Prehistoric Implements*, page 334, is figured one of these pipes from the Ohio valley. Moorehead remarks that its peculiarity lies in the fact that it is grooved around the center. There is nothing in either of these pipes to suggest European influence as far as the writer can discover. The drilling and workmanship seem to have been done with stone implements entirely. Figure 4 is a pipe bowl cut from a hardened clay. The surface has weathered black but the underlying color is red. In form the pipe is claw or beaklike and is similar to other forms found in the Iroquoian area. The bowl hole is small comparatively and the stem hole large and conical as in the case with all the pipe bowls of the collection. This pipe is from grave 105 and was found with pot 471. A small pipe carved from the local shale imitating this form was found in an ash pit, perhaps a grave fire, near this grave. The pipe is pictured in figure 1, plate 90. A small stone pipe with a short neck into which a reed stem was evidently designed to fit is shown in plate 90, figure 7. This pipe is of about the same material as the large claw form pipe and has two parallel lines incised on the underside of the neck. It was found in grave 101, pit 141, and lay on the arm of a male. The pipe represented by figure 6, plate 90, is the only stone pipe of the stemmed type found. It is carved from a species of serpentine and is smoothed and polished. In the process of drilling the stem the drill penetrated too near the base of the bowl and there is a small hole to be observed in the specimen. The shape of the opening suggests that the bowl had been rubbed down after the stem hole had been drilled and that this hole had been encountered then. The form of the stem hole seems to indicate the use of a metal drill.

Perhaps the most interesting of the pipes is the one shown in plate 90, figure 5. It is clearly the effigy of some animal, probably some mythical monster. Placed face down it appears to be a grazing animal. In this position the hump formed by the bowl suggests a buffalo but the large bulbous tail and the shape of the head do not point to such an animal. The material is rather puzzling. In color it is a bluish white and it appears to be some species of talc or steatite but a test for hardness disproves this. Mr D. H. Newland,

Assistant State Geologist, made an analysis and pronounced it to be an Ohio kaolin. The broken granular surface of the pipe near the bowl suggests that it had been molded from a rather stiff clay and the roughened top of the head suggests that a portion has been broken off and that an attempt had been made to smooth it over by rubbing. It has there the appearance of baked pottery, the surface of which has been rubbed down. The glazed surface, however, has not been produced and this suggests that the pipe has been hardened in the fire. Yet while the pipe from these appearances seems to be kaolin it seems remarkable that instead of having the bowl and stem hole molded, as is customary with clay pipes, that these holes should have been gouged and drilled out, as they manifestly were. The hind leg on the side visible in the photograph is incised but on the reverse side the three lines have every appearance of having been molded as if in plastic clay. It may be that the clay was found in a semihardened condition and that it was formed into the pipe by both processes and afterward hardened by firing. The pipe, while the effigy is unusual, does not differ in general form from other effigy pipes found in the region. There is nothing in the workmanship to indicate the use of European tools or influence [see description of grave 92 and plate 85.]

One of the interesting features about these pipes is that the bowl capacities are small in comparison with modern European pipes. Probably less tobacco could be contained in one than is held in a modern factory cigarette. The bowls of the clay pipes were a little larger. No tobacco ashes were found in any of the stone pipes.

Objects of Chipped Flint

Objects of flint were numerous, especially in graves where complete outfits for their manufacture were found in several instances. Complete flint articles were not numerous on the surface although there was an abundance of chips and broken blades. The ash pits contained numbers but the graves the most. The lack of finished points on the surface may be due to the fact that each year as the ground was plowed the arrow points were picked up. The older inhabitants say that bushels of arrows and "skinning stones" have been carried off. It is probable that most of the durable objects left on the surface when the site was deserted by its aboriginal inhabitants have been removed by the white tillers of the soil who followed them at a later period and whose curiosity was aroused by the strange artifacts which were turned up by their plows. At any rate very little was found except below plow depth.

Of the points that might be safely termed arrowheads, there were but two that had notched shoulders. With these exceptions all the arrowheads were triangular. The workmanship was good and most of the points were thin and evenly worked. The material in general was gray flint or chert but some points were found made from yellow jasper. Most of the points found on the eastern slope of the knoll were of this material.

Fig. 41 Spear or knife of translucent chalcedony. The only form of this implement found in the site.

Of the flint blades, not arrow points, only two had notched shoulders. One of these was a beautifully wrought blade, a spear or a knife, of white chalcedony. It is pictured in figure 41. There were several well-shaped oval blades and a few of the so-called "leaf shape." Scrapers were fairly common, drills rather rare and spears rarer still. There are a number of forms that may safely be called knives. Plate 89 illustrates the range of forms of the larger flints not arrowheads.

Triangular arrow points are commonly called "war points" and notched and barbed points, "hunting points." It does not necessarily follow, however, that these terms are correct, although quite popularly held. The Ripley Erie as well as those of other sites were great hunters, as is manifest from the great quantities of animal bones found in the refuse pits, and yet at Ripley only two so-called "hunting points" were discovered. The great majority of projectile points were of the triangular type, and these were found in the ash pits among animal bones as well as in graves with the bones of warriors and women. It would appear therefore that the triangular points were used for hunting as well as war. Sites of pre-Erian occupancy in Chautauqua county, and elsewhere in New York, yield only the barbed or shouldered "hunting point," few triangular arrowheads being found. Yet this fact does not point out a people who knew only of hunting and nothing of war. Specific terms defining the use of such implements are, therefore, to be avoided. They are more accurately described by their forms as, triangular, notched etc.

Earthenware
Pottery Vessels

All the entire or nearly entire pottery vessels, save two, were found in graves. Most of them exhibited signs of prolonged use. A few seemed to have been especially made for funeral urns and some had been evidently molded in great haste and poorly tempered and baked. Such pots were in every instance broken and the potsherds were soft and flaky, not hard and gritty like good pottery.

The material of which the pots were molded seems to have been the local Erie clay found everywhere in the region overlying the shale beds. The tempering material in all the specimens discovered is invariably pulverized stone, quartz or granitic rock. In no instance is shell to be found. Most of the pots are of a salmon red color, varying from a sooty red to a light orange. The majority are stained by smoke and carbonized grease. This charred grease is especially noticeable around the inside of the rim where the incrustations are sometimes 5 millimeters thick. In thickness the pottery varies from 2 millimeters to 2 centimeters in some fragments. In capacity the vessels range from 5 cubic centimeters in the toy forms found in grave 51, pit 96, to 5 quarts,—4700 cubic centimeters.

Fig. 42 Outline drawing showing three views of the Ripley pitcher nosed pot

The general type of the vessels is Iroquoian, but as has been elsewhere stated they differ in many respects from the central New York specimens of the middle seventeenth century as well as from Erie vessels of that period.

A large percentage of the pots have one raised point that varies from a small knob to a well-developed pitcherlike nose. Pots of this type are found in Ontario and Jefferson counties. The form of one of these pots is shown in text figure 42 which gives the shape at different positions. Another characteristic of the pots from this

Plate 91

Fig. 134 Outline drawings showing the range of pot forms found at Ripley.

site is the row of dots that encircles the pot where the belly meets the neck. Cushing's theory that pots with square tops and line decorations about the rim were modeled after bark baskets appears strengthened by some of the forms which had not only decorated square tops but had the stitching imitated by the dots around the neck, as appears on the bark baskets to which Cushing referred.

Pottery clay in masses, tempered and partly worked, was found in a number of the ash pits. Some of these partially worked masses of clay even yet show the imprints of the potter's fingers. One fragment of a coil was found in an ash pit where it had become hardened and preserved. Several crude partly formed pipe bowls and pot bottoms were found, possibly the work of children. Most of the pots have smooth surfaces although many were found marked with a cord-wrapped paddle. Several smoothed paddlelike stones were found in pits containing clay in masses, which are thought to be potters' paddles used for working over the surfaces of pots. All have rounded ends and at least one square side as if to form a blunt scraping edge. The serrated rib illustrated by text figure 43 may have been used to roughen the surfaces of partly formed vessels to facilitate the process of shaping the wall which was afterwards smoothed.

Fig. 43 Serrated rib

No entire pots were found with any trace of color decoration. One sherd was found, however, which has two parallel bands of brown running over a background of yellowish red. Whether this is simply an accident or intentional is difficult to determine, as the sherd is small. The lower band is well defined and seems to be inlaid into the pottery (figure 44). One broken pot found in a grave had an ear like some of the Ohio forms. These two potsherds were the only departures from the usual Iroquoian forms found in the site and suggest contact with other stocks.

Fig. 44 Sherd

Of equal interest with the pottery vessels are the earthenware pipes, all of which were found in graves. More than a dozen frag-

ments, however, were found in ash and refuse pits. The clay pipes are all Iroquoian in form and decoration and are similar to central New York Iroquois pipes of the early part of the seventeenth century. All the pipes are gracefully made and reveal an artistic hand.

Figure 1 in plate 95 shows the pipe found in grave 14. The bold incised lines that form the decoration are of exceptional interest and are a departure from other forms. The nipplelike stem seems to have been designed as a support over which a wooden stem was fitted, rather than as a mouthpiece. The pipe contained charred tobacco which has been carefully preserved intact in the bowl. The writer has never seen a pipe of this kind in any collection nor illustrated in any work on archeology, and the specimen is probably a rare one if not entirely unique.

The long square-topped pipe shown in figure 2 of plate 95 is the so-called "Huronian" form. It is made of the ordinary clay from the vicinity but has become stained a dark brown. In texture this pipe is perhaps the best example of pottery found in the site. It is very hard and fine grained.

Two views of the two-faced pipe found in grave 20, pit 44, are shown in plate 95, figures 3 and 4. The front view was taken just after the pipe was removed from the grave and was yet covered with particles of sand, as the picture shows. The side view gives a much better idea of the object and shows the two faces, both of which are remarkably alike, the face away from the smoker, however, being more perfect in workmanship. As is the case with all the earthen pipes shown in the plate, this pipe contained charred tobacco.

The trumpet-shaped pipe shown in plate 95, figure 5, came from grave 86 and was found with pot F446 (plate 93, figure 6), and two celts. In comparison with the other stemmed pipes the stem is shorter but does not seem to have ever been broken.

The wide flaring platform-topped pipe shown in plate 95, figure 6, is a modification of the trumpet form. The top or platform is flat and quite perfectly circular. This type is common almost everywhere in the Iroquoian region but particularly so in the Erie region. Many of this type are found in prehistoric Onondaga sites in Jefferson county.

Two interesting pipe bowls in the form of animal heads were found in refuse pits. One is plainly a bear's head and is of polished black clay. The other is of ordinary red clay. It is not easy to

Plate 92

Pots with raised rim points. From graves at Ripley.

decide just what is meant to be represented by the effigy. Some who have examined it have thought it intended for a fox.

Bone

Articles of bone and antler were particularly numerous and varied. Except for about ten specimens all came from ash pits.

The great abundance of awls points out their extensive use. The awls were of the usual forms, flat, cylindrical, tubular, handled, and those having a joint end. There were also awls made from small splinters. The principal forms are shown in plate 98.

Bone beads were found in every ash pit and varied from crudely broken sections of bird and small mammal bones to well-shaped and highly polished cylinders. That so many should have been thrown in among the refuse seems rather remarkable and almost seems to indicate something more than accident. These beads ranged from three thirty-seconds of an inch in diameter to five-eighths of an inch although the majority were about one-quarter of an inch in diameter. One form (see plate 97, figure 5) has the appearance of a handle.

Perforated elk, wolf and bear teeth were found in refuse pits. Perforated bear tusks were found previously by local collectors of Indian relics. Figure 1 in plate 96 is that of a bear's molar. It is a beautiful specimen and highly polished. There were several perforated elk teeth but none with unbroken perforations. Each had been broken. A perforated turtle shell fragment is shown in figure 11, plate 96, and came from an ash pit. Other broken perforated carapaces were found in graves. The small spatulate implement shown in plate 96, figure 12, is nicely formed and polished. Perhaps it was a pottery marker. Two polished pieces of bone smoothed on all sides were found in refuse pits. The one shown by figure 13 is grooved on either side. A bone knife blade, the point of which is broken, is shown in figure 14. Raccoon penis bones were found in several pits. All are smoothed and show signs of use, perhaps as hooks for coarse weaving. Figure 21 is that of a long flat bone implement resembling a shuttle. It is a fine specimen, being nicely smoothed and polished. The notch at one end is smoothly worked and shows no signs of being a broken eye. Figure 24 is probably that of a broken bone needle. Needles were rare in the site. Deer phalanges were found in abundance and most of them are worked to some degree (see plate 96, figure 5, 6). Number were flattened on one side and some were worked down to cones with a perforation at

one end, the end nearest the tip. These cones resemble the cups used in the cup and awl game common among the early Hurons and are probably parts of such apparatus (plate 96, figure 4, 8).

Beaver teeth seem to have been used for scraping or cutting. Several specimens are worked smooth at the base (see plate 97, figure 1-3). One has a slot running from the edge well toward the top.

One very interesting specimen is that of a bone fishhook in process. If finished it would have been a small delicate hook. No sign of a barb appears. The specimen resembles some of those figured by Prof. F. W. Putnam in *The Way Bone Fish Hooks Were Made in the Little Miami Valley*.

A pendantlike tube is shown in plate 97, figure 9. Both ends show the marks of cutting as do both of the pendants of deer's jaws shown in the next figures. Plate 97, figure 10, is notched and perforated lengthwise.

It is perhaps not customary to rank deer jaws as implements. Nevertheless the Seneca up to within the last ten years have used them when they could obtain them, for scraping corn from the green cob. The sharp teeth were raked over the kernels to break and cut the hulls and then the hold on the jaw changed and the milk and meat scraped out with the sharp edge that is nearest the chin. The writer secured one of these jaws in 1903 for the American Museum of Natural History. It is entirely probable that the Erie used deer jaws for the same purpose, as they were Iroquois and closely related to the Seneca. The Seneca have a name for the jaw when used as an implement of this kind, a name for the process, and called the corn so prepared "already chewed." Figure 45 is a drawing of one of these "jaw corn scrapers."

Fig. 45 Deer jaw scraper

Antler

Antler objects were fairly numerous, though not of great variety. Those found in refuse pits were well preserved but those from graves were decayed and crumbling.

Plate 93

Types of the smaller pots from Ripley

Plate 94

Fig. 1 Pot from grave I, pit 4
Fig. 2 Restored pot from burial LXXXI

The antler objects from the site, include flaking tools, punchlike implements, sometimes called pitching tools, chisellike implements, picklike prongs of antler, arrowheads, hoes or digging implements and one antler ball. There were several pieces of antler showing marks of cutting and other working. The large trowellike object shown in plate 99, figure 1, is probably an antler hoe or spade. The edge is worn and smoothed, evidently by use in the earth. Two other hoes are shown in the same plate (figure 5, 10). The larger hoe seems to have had one side cut as if by a metal knife. The "hoes" are all of moose horn. A small chisellike implement is shown in plate 95, figure 2. It is worn and polished and the cutting edge is sharp for such material. A larger chisel or pick is shown in plate 99, figure 4, and seems to have the handle whittled into shape by a metal knife. Punchlike objects were fairly common and seem to have been parts of an arrow-maker's outfit. Indeed they are commonly called "pitching tools" and experiment shows that they are useful in making the long body chips which must sometimes be made to form a flint blade properly. These tools are of two types. Plate 99, figure 9, shows one which has a head. Two antler arrowheads were found. Plate 99, figure 8, represents the better one. It is well shaped and polished but the hole for the shaft is not deep. One flattened ball was found and is similar to the game balls used now by the Iroquois and called "deer horn buttons" (see plate 99, figure 6). Chunks or pieces of worked antler were frequent. One shown in figure 7, is that of an antler base from which the upper part has been cut with a metal knife.

Shell Articles

Among the interesting classes of articles are those of shell. The very interesting necklace of shell shown in plate 100 is the best specimen of its art found at the Ripley site. It came from grave 93, pit 133, and was found about the neck of the skeleton. The better preserved gorget was found in the bend formed by the curve of the front portion of the lower jaw. The necklace is made of discoidal shell beads beautifully made. They are quite uniform and the perforations are perfectly centered. In specimens which have not weathered, the edges are even. The two gorgets and the long pendant from this necklace are shown in plate 101, as is a series

Plate 95

Pottery pipes from graves. 1 is a massive clay pipe bowl decorated with deeply incised lines and has a stem that might serve either for a mouth-piece or as a nipple over which a stem of wood might be inserted. 2 is from grave XXV and is the so-called Huronian type. 3 and 4 are two views of the two faced pipe from grave XX. 5 is a trumpet pipe from grave XX. 6 is a flat round topped trumpet pipe from grave LXXV. All these pipes contain charred tobacco as when found. All from Ripley.

Plate 96

Various bone implements from refuse and fire pits at Ripley

Plate 97

Various bone implements from refuse and fire pits at Ripley

of discoidal beads illustrating the stages of disintegration. A perforated *Unio* shell was found in pit 46 and a shell bead of the older form came from pit 3 (see plate 101, figure 5).

Copper Articles and Objects Preserved by Copper

With the exception of one specimen, all copper articles came from graves. An analysis of these articles by the mineralogist, H. P. Whitlock, indicated that they were all of European copper. The two arm bands contained traces of zinc.

Most of the copper articles came from grave 51, pit 96, and a description of them as they were found will be found under that head. The two bracelets which encircled the arm of the skeleton are shown in plate 102, figures 1, 2. These bands yet retain upon their corroded surfaces the impressions of the skin of the arm against which they rested, although the pictures do not show them well. Finger prints are noticeable on several of the rings and one has the tactile impression on the inner side. Figures 5 and 10 of plate 102 are of two rings which have these impressions upon them. These rings are of the common rolled type made from bands of sheet copper. The arm band fragment shown by plate 102, figure 4, is a fine specimen of rolled copper work.

In graves where copper was present the animal or vegetable matter in immediate contact was preserved by the copper salts. The substances so preserved include wood, bark, herbs, deer hair, deer-skin, thongs, human skin, flesh, bone, nails, hair and scalp fragments.

Figure 3 in plate 102 is that of a rolled copper bead which yet contains the skin thong. Pieces of bark and deerskin massed together are pictured in plate 102, figure 7. The shreds of bark are plainly visible but the skin does not show well. In the same plate figure 11 is a piece of wood preserved by the salts of copper from the ring that encircles the opening. The form of the object suggests a false-face eye. Plate 102, figure 9, is that of a mass of vegetable matter, possibly some herb or tobacco.

Iron

But few pieces of iron were found. Of those discovered in graves or ash pits, none bore the semblance of finished or complete utensils. In a few graves and in one ash pit short rectangular bars

Plate 98

Types of bone awls from ash and refuse pits at Ripley

were found and with them chunks of flint, probably parts of fire-making apparatus. In grave 93 a portion of a small ax, adz or chisel edge was found. It had been broken at a perforation.

Carbonized Substances

Vegetable matter preserved by carbonization was found in nearly all the ash pits but so crushed as to be unrecognizable. Charred wood and bark were found in quantities in most of the pits and the pieces varied in size from small particles to chunks five inches in length and an inch or two in diameter. Charred corn in small quantities was found in several refuse pits and seems to have been the ordinary variety found in most Iroquoian sites. A few beans, squash seeds, hickory nuts, butternuts and plum stone in a charred condition complete the list of the foods preserved by carbonization. Charred corn was found in several of the graves and in one grave the decayed handle of a celt was found. Charred bark and wood were frequent in the graves and fragments of what seemed a bark dish were found in one grave. A long wooden stem, probably a pipe stem was found in an ash pit and a few minutes afterward a clumsy visitor stepped upon the box in which it was temporarily placed and crushed most of it. A small section, however, remained.

Pigments

The pigments were ochers, graphite and bitumen or asphaltum. Charcoal may also be included. Quantities of red ocher were found in some of the graves and some skeletons lay in deposits of it. In other graves the ocher was in little deposits as if it had been inclosed in a bag that had afterward decayed.

Articles Found in Vicinity

Objects which are found in the vicinity of Ripley but which were not found on the site are the following: Of the older occupations; gouges, grooved axes, mica plates, inscribed stones, monitor pipes, banner stones, bird shaped stones, gorgets, tubular shell beads, etc.; and of the later occupations; notched and shouldered arrow points and spears, shell beads in numbers, wampum, iron tomahawks, lead objects, copper or brass arrow points, glass beads, etc.

Various antler implements from ash and refuse pits at Ripley

Necklace of shell disks found about the neck of a female skeleton, grave pit 133, trench 18, at 20 on the west side. Restrung, bead for bead, as found at Ripley.

Plate 101

Shell articles principally from graves at Ripley

Plate 102

Brass and copper articles and articles preserved by contact with copper.

NOTES ON AN ANCIENT SEMICIRCULAR EARTHWORK
IN CHAUTAUQUA COUNTY

BY M. RAYMOND HARRINGTON

While the work at Double Wall Fort was in progress during the summer of 1904, occasional exploring trips were taken about the country for the purpose of discovering new sites. On one of these excursions I succeeded in locating the site of a semicircular earthwork near Sheridan, Chautauqua county, and secured enough material to warrant the addition of a few notes to the accounts already published concerning it.¹

The site is situated on land formerly belonging to Mr J. G. Gould, but now the property of a Mr Deland. Although now practically destroyed, the work could be traced with the help of Mr Gould, who remembers it perfectly in its entirety, and its outlines followed. It formed a nearly complete circle, with a low ridge, probably natural, filling up a gap on its south side. The road from Forestville to Fredonia crosses the work not far from this ridge. The fort must have occupied in all 2 or 3 acres and was situated on the crest of a very low sloping bluff or gravel above a wooded swamp. The gate was on the north side, toward the bluff; the ditch was, as usual, outside the wall. The Bureau of Ethnology account is inaccurate in stating that the work lies "on a bluff above Walnut creek," for there is no creek whatever in the swamp, merely a very small brook, and Walnut creek is fully 2 miles away. Other errors appear in Beauchamp's account: his authorities have so disagreed that he has this one site listed under three different numbers (10, 11 and 12), with estimates of size running anywhere from $13\frac{1}{8}$ acres according to Cheney, to 3 acres according to Reynolds. Neither of the books mention the low mound near the center, almost obliterated, which was pointed out to me but which I could not disturb on account of the crops.

It is difficult to understand the reasons which led the ancient people to erect this fortified village so far inland, even from a creek. The position is not commanding, nor has it any advantages as far as I can see, except that there is a small spring and brook in the nearby swamp. Perhaps they wished a hidden village, out of the usual line of travel, and picked out this place for that purpose. The exact spot may have been determined by conditions of forest growth—natural clearings and the like, of which we today know nothing.

¹ Annual Report, U. S. Bureau of Ethnology, v. 12, p. 511; Beauchamp, *Aboriginal Occupation of New York*, p. 43.

Both Beauchamp and the Ethnology Bureau reports speak of pits in and near the fort, and the latter says they contained nothing but fine gravel. I saw none of these, but within the fort postholing brought to light several pits. Pit 1 was 38 inches deep and 4 feet in diameter with a dense charred layer at the bottom. Here were potsherds from a number of jars of different sizes, two worked stones resembling hematite, and some chipped flints. Pit 2, nearby, was 31 inches deep and contained a few potsherds, together with mammal and fish bones and charred corn. Pit 3 was irregular in shape and about 2 feet deep with a very black layer at the bottom containing much charred corn and cobs. There were a few potsherds in this pit.

Among the articles that have been found here in past years by local collectors and that were picked up by members of the expedition during our two days' stay are arrow points, both triangular and stemmed, broad shallow stone mortars, pestles, celts and celt-adzes, pitted stones, hammerstones, a notched hammer, a *rubbed*, not chipped, slate point, potsherds and several terra-cotta pipes decorated with incised chevron patterns.

The pottery found here is unusually interesting on account of its wide variation from the type found at Silverheels site, Double Wall Fort and later at the village and burial site at Ripley. The pottery common to these latter localities is characteristically Iroquoian, the jars having globular bodies with round bottoms and constricted necks, above which there is a projecting rim, the edge often rising in one or more peaks. This rim is usually decorated with incised lines, especially at the peaks. The general surface as a rule is smooth without "fabric" marking and with hardly any trace of the modeling tool. But at the Sheridan site it was very different. Here the pottery had no raised rim, little or no constricted neck, was generally "fabric" marked and seldom showed any attempt at decoration. The pipes also, as nearly as could be gathered from description, were also more Algonkian than Iroquoian in character. These facts, together with the occurrence of both shapes of arrowheads and the slate point, led me to consider whether the site might not be Algonkian. I even took the abundant flat stone mortars so common in the New York Algonkian region as an indication of this; but these were afterward found in numbers on the characteristic Iroquoian site at Ripley. On the other hand, the presence of celt-axes to the exclusion of grooved axes, and the use of the ossuary mentioned in both books cited, seem to connect the band with Iroquoian stock in spite of the pottery. The site is probably prehistoric;

Pits

SHERIDAN TP.

L.35.R.XI.

Chautauque Co. N.Y.

Scale

250 ft to an Inch

Section of Wall nearly obliterated

Road

Cultivated

Beaver Meadow

The Sheridan earth ring or crescent.

nothing indicating otherwise has been found. Hence it may be of very early Erie origin, or perhaps was occupied by some different and forgotten band of obscure connections. Circumstances prevented a thorough examination of the site, although permission to excavate was secured for part of it. Perhaps it might be difficult to obtain a large collection even if the ground were thoroughly gone over, but from the scientific standpoint it would pay to try. The place deserves at least a fuller exploration for the purpose of discovering additional facts concerning the life and relationship of its mysterious and forgotten inhabitants.¹

THE LE ROY IROQUOIAN EARTHWORK, GENESEE COUNTY

ACCOUNT BY E. G. SQUIER²

WITH NOTES BY H. C. FOLLETT

The earthwork on the hill near Le Roy occupies a portion of an elevated plain or tableland, nearly surrounded by deep ravines formed by Allen creek and Fordham brook, which effect a junction at this point. These streams have worn their beds through the various strata of lime and sandstone to the depth of from 70 to 100 feet, leaving abrupt banks difficult of ascent. These natural features are best illustrated by the sketch map which precludes the necessity for a minute description of the geographical features.

The peninsular hill measures about 1300 feet from north to south, by 2000 feet at its broadest part, and 1000 feet across at the neck connecting it with the general table. Positions similar to this were often selected by the aborigines for defensive purposes, but in such cases have usually an embankment and trench extending across the isthmus.

In this instance, however, the only trace of art is an embankment and ditch, about 1500 feet in length, and running east and west

¹ It is difficult to identify some Chautauqua county sites because of the similarity of the pottery to cord-marked Algonkian forms. An examination of this site, however, seems to stamp it as Iroquoian of the transitional Chautauqua period. The pottery is similar to cord-marked, flaring lipped Iroquoian forms found at Burning Spring, Ripley, Westfield, and other places and is quite like the pottery found at Madisonville, Ohio. It may be that these early sites in Chautauqua county are proto-Iroquoian, or that they mark, as we have suggested, the transitional stage in Iroquoian pottery. A. C. P.

² Aboriginal Monuments of New York. Smithsonian Contribution to Knowledge, v. 2, 1851, p. 48.

across the broadest part of the peninsula, and not very far back from the edge of the ravine. The part which is laid down in the plan is said to be very distinct, the embankment being between 3 and 4 feet high and the ditch of corresponding depth. The western extremity of the line curves gently outward and extends some distance down the bank, which is at this point less abrupt than elsewhere. It is said that formerly trenches existed on the course indicated by dotted lines on the plan, but the statement is not now confirmed by any remaining traces.

A number of skeletons have been found here, together with many fragments of pottery. There have been also discovered some heaps of small stones, which have been supposed to be the missiles of the ancient occupants of the hill, thus collected to be used in case of attack. Various relics of art, as pipes, beads, stone hatchets and arrowheads, have been disclosed here by the operations of agriculture. One of the pipes composed of baked clay is now in the possession of the Rev. C. Dewey of Rochester. The material is very fine and the workmanship good, so good indeed as to induce some doubt as to its aboriginal origin. Another pipe carved from granular limestone was found here, as were also a number of beads, long and coarse, made of clay and burned.

According to Mr Dewey, "the trench was estimated by early observers at from 8 to 10 feet deep, and as many wide; the earth in making it had been thrown either way but much of it inward. The road formerly crossed it by a bridge. When first known forest trees were standing in the trench and outside of it. In size and growth they correspond to the forest surrounding there. Prostrate upon the ground were numerous trunks of the heart-wood of the black cherry trees of large size, which it is conjectured were the remains of a more antique forest, preceding the growth of beech and maple. They were in such a state of soundness as to be employed for timber by the early settlers.

"From all that remains of this work, it is impossible to conjecture for what purpose it was constructed. Indeed it bears so few evidences of design that we are led to distrust its artificial origin—a distrust which is strengthened by the circumstances that in a number of instances elevations and depressions bearing some degree of regularity, but result from the fissures in the substratum rock or other natural causes, have been mistaken for works of art. The fact that the trench in this instance has a course so nearly parallel to the ravine, is also a suspicious circumstance. The spot was not

visited by the author (Squier) but he is authorized in saying that Professor Dewey, who gave the first and most complete account of the works, is now inclined to the opinion that it may be the result of natural causes."

In 1900 Mr Mosley, of Bergen, made burial excavations on this site and states he removed about fifteen skeletons located on the south side of the apple orchard of Mr Knight. He states that articles with the skeletons were very rare.

A double-faced pipe, probably one of the best of its material in the State, now in the possession of the State Museum, is said to have been found on this site. This pipe is illustrated in the State Museum Bulletin, 22.

In the spring of 1915 excavations were made by me in refuse located on the slope and top of the bank of north ravine near the west end. The refuse is shallow and extends back from the edge of the bank 10 or 15 feet varying in depth from 2 to 18 inches. Much charcoal is encountered but very few bones such as are usual in refuse of this character charred corn is plentiful and occasionally a few beans. Bone implements, such as made from deer antlers, and an occasional bone awl and potsherds are plentiful. This end of the plot bears evidence of much previous digging which may account for the rarity of specimens.

During the summer of 1915 the so-called trench or ditch which is plainly visible about half way down the slope was excavated for several feet and is without question of natural construction. It was probably 5 feet deep at this point and had been filled with refuse about 2 feet and afterward covered with field stones, probably since cultivation by the whites. This refuse bore evidence of much fire and the consumption of nearly everything which had been deposited there, except potsherds which are numerous and show some fine work of art in construction. Portions of two or three human skeletons were encountered, perhaps evidence of cannibalism.

In the village site and on the south side of the peninsula several pits were discovered about 3 feet deep, containing great quantities of ashes and few fragments of animal bone. One of these pits yielded half of a human skull (which had been broken on one side), a hammerstone and part of a celt. I presume these are the pits which have been described to me by various collectors as pits "where pottery was made."

I would judge from the refuse that this was a very old and long inhabited site. Tests made on the east side of the road and along the bank show shallow traces of refuse which might have been

extensive in early days as the bank has been disturbed more or less for several years, and is so steep that it could be easily washed down and destroyed. Arrow points have been found on the flat land on the north side.

THE SHELBY EARTHWORKS

BY FRANK H. CUSHING, MEDINA, N. Y.

In the town of Shelby, Orleans county, about 3 miles southwest from the village of Medina, are the remains of one of the most interesting ancient earthworks in the State.¹ This work is situated at the summit of a slight and not abrupt elevation. It consists of two mural embankments, which are now about 2 feet in height, parallel, and 12 feet distant from each other. They describe almost an exact circle, having a diameter of 430 feet and an area of $3\frac{1}{3}$ acres. Two fences upon original "section lines," one running north and south, the other east and west, divide this inclosure into four nearly equal parts or quadrants. Those portions of the work included in the northeastern and southwestern quadrants have for many years been under cultivation, and the embankments are nearly obliterated. The northwestern and southeastern portions are still covered with forest trees. In these portions the walls are interrupted only by two sally-ports or openings for passage. These openings occur at nearly opposite points in the circle. The passage through the outer wall is not in either exactly opposite to that through the inner. In one they are 16 and in the other 30 feet apart. To avoid two large boulders of Niagara limestone, the inner wall at one point makes a slight deflection from its regular circular course.

Upon these embankments are standing trees and the stumps of trees that had commenced their growth long before the Jesuit fathers had explored the region now comprising western New York. Traces of a moat which once encircled this work are still discernible at intervals. This moat is broad in proportion to its present depth, and in this respect is not regular. It was probably made by the removal of earth for the construction of walls, and perhaps it was not intended as an additional defense, though it must to some extent have served as such.

Three features presented by this work add much to its interest: first, it is almost exactly circular in form; second, it consists of two parallel embankments; third, the openings for passage are not

¹ This work has previously been described in Squier's *Aboriginal Monuments of New York*, Smithsonian Contributions to Knowledge, v. 2, 1851.

opposite in the two walls. These three peculiarities distinguish this from all other earthworks known east of Ohio.

- Ten rods south of this work lies a peat swamp, 2 miles in length by 1 mile in breadth. This swamp is or has been covered by a heavy growth of black ash timber. A vertical section of 7 feet in this swamp shows, first, the remains of trees to the depth of 2 feet, next below the remains of marsh plants, gradually becoming peat, which, as the depth increases, changes in character and color from dark brown to light blue. At all depths in this peat are to be seen the remains of leaves evidently brought by the winds from the forests of the surrounding higher land. Underlying this peat is a stratum from 3 to 5 inches in thickness, composed entirely of fresh-water shells, mostly univalves, some of which are apparently species of *Paludina*. Beneath this stratum there occurs another, composed of blue clay intermixed with sand, containing occasionally the remains of shells, among which have been found specimens of the fresh-water clam (*Unio*).

These facts lead to the conclusion that this peat swamp was probably a shallow lake at the time when the works were constructed. This conclusion is also strengthened by the fact that there is no evidence of the existence of a permanent supply of water elsewhere within a mile of the work.

It is proper to state that the supply of fish in this ancient lake was abundant; replenished during the time of high water in the spring of each year from Lake Ontario, 13 miles distant, through Oak Orchard creek, into which its outlet flows.

West from the work, at a distance of one-half of a mile on the eastern slope of a sand hill, is a large "bone pit" where the bones of hundreds have been deposited. It is said by "old settlers" that those portions of the work now included the cultivated fields spoken of, originally presented the same features now seen in those which the forest includes.

Of course exaggerated stories are told of the relics which have been plowed up in these fields. Without doubt many which would be of great interest to an ethnologist have been found, kept for a while, and then given to the children as playthings by those who knew nothing of their value as relics.

On making excavations in those portions still uncultivated, many specimens of great interest are found. They usually lie from 6 to 18 inches beneath the surface, often imbedded in charcoal and ashes. They consist of hammers, sinkers, celts, stone ornaments, pipes, pottery; also implements and ornaments of bone, such as bone

splinters, awls and needles, daggers or dirks, cylindrical ear ornaments, implements for the ornamentation of pottery, perforated metatarsals, and perforated teeth. These bone implements are found in all stages of manufacture, from the rude splinter to the ground and polished implement or ornament.

What was the original height of these works can now only be a matter of conjecture. It is probable, however, that the embankments were from 4 to 5 feet in height and surmounted by palisades. Vegetable mold to the depth of 6 inches has accumulated upon those points most elevated and exposed to atmospheric action; beneath this stratum the relics occur to the depth of 18 inches. The inference, therefore, is that since the work was abandoned time enough has elapsed for the accumulation of 6 inches of vegetable matter by the slow process of growth and deposit on dry land. It was inhabited or used long enough for 12 inches to accumulate. It was probably abandoned when the lake was so nearly filled that it ceased to afford either fish or a permanent supply of water. Since the time when the timber commenced to grow at the surface of the lake, 2 feet of vegetable matter have accumulated.

PREHISTORIC IROQUOIS SITES IN NORTHERN NEW YORK¹

REPORT OF PEABODY MUSEUM EXPEDITION, 1906

BY M. R. HARRINGTON

Jefferson county lies in the angle formed between Lake Ontario to the west and the St Lawrence river to the north. Its shore near their junction is deeply cut with bays and the waters are dotted with islands, while farther south the shore is marshy and protected, lake-ward, by a line of barrier beaches. The interior of the country is hilly, the hills being composed of glacial debris resting on a foundation of limestone or, in other places, shale. Between the lake shore and the hill region lies a belt of low ground averaging 8 or 10 miles wide, whose almost level plain is broken only by a few scattered and usually rocky eminences. This plain is apparently part of the bottom of the glacial Lake Iroquois, whose old beaches can readily be followed for miles along the bases of the hills above mentioned. I refer to the traces of this ancient lake especially on account of the fact that even the oldest traces of man thus far found in the region

¹ Published by permission of Prof. Frederic W. Putnam, of the Peabody Museum, Cambridge, Mass.

are distributed without reference to its shore line, and consequently must be of a date long subsequent to the subsidence of its waters.

In Jefferson county we find evidences of several ancient cultures, all, so far as I was able to find out, prehistoric. When first explored and settled the region was not occupied by any tribe of Indians, although it was used as a hunting ground by several. To wandering parties of hunters, then, the few scattered historic Indian specimens found are probably due, such objects never, to my knowledge, having been found in the original deposits of the village sites.

Of these cultures, the Iroquoian shows the most numerous and uniform indications. Sites whose specimens proclaim them to have been occupied by this people are found mainly in the hill region, especially in the Rutland Hills east of Watertown, but are occasionally found on the lowlands and sometimes directly on the shore.

Next in importance the Algonkian culture, with pottery like that of Long Island and New Jersey, has left its traces in many camping grounds along the shore and in a few isolated spots inland.

A certain class of stone implements, women's knives, men's knives and spearheads of *rubbed* slate, identical with those still made by the Eskimo but decidedly different from the points known to have been made by Iroquois and Algonkian artisans, are found along the valleys of certain streams. These are very rarely found on either Iroquois or Algonkian sites, but when this does happen the specimens are picked up on the surface, not dug out of the pits or refuse deposits. It has been claimed that these may have been left by summer fishing parties of Eskimo, perhaps in very ancient times — a theory which I do not think improbable.

Some mounds, apparently the remains of underground houses but of unknown origin, are to be seen near Perch lake,¹ and near Three Mile bay have been found several unusual burials, including an ossuary with specimens which included a "bird-amulet," a "bar-amulet," a semimonitor stone pipe, four stemmed arrow points, a broad flint knife, a long bone knife with incised zigzag patterns, a pottery vessel, a lot of disk-shaped shell beads and many other objects. Some local archeologists refer this interesting burial place to the Huron, but I doubt this very much for the specimens do not seem Iroquoian.

The archeology of Jefferson county has attracted considerable attention in times past, Squier especially having devoted considerable

¹ Beauchamp, Perch Lake Mounds, New York State Mus. Bul. 87.

attention to it.¹ Local collectors such as Doctors Getman and Amidon in Chaumont, and Messrs Loveland, Oatman and Woodworth at Watertown, have excavated much with good success, as their collections will testify.²

It was thought best to visit as many sites as possible in order to get a general archeological view of the country, and to locate if possible a favorable place for excavation. Two weeks were spent in this work with fairly satisfactory results. It was found in almost every case that the sites had been so thoroughly excavated by the local enthusiasts that it would not pay to examine them further. Except in one site, which was in the lowlands, all had been tampered with and the refuse heaps cleared out; and at this site (Durfee farm) we spent the last part of the season. The first part, from June 15th to September 1st, was occupied in exploring the Heath site in the hill country, where we were lucky enough to find a lot of graves and ash pits undisturbed although the refuse heaps had all been dug over.

But before taking these up I will give a brief summary of the other places visited during the first two weeks of our work and at odd times during the whole season.

Beginning in the northern part of the country, and taking the sites in geographical order, not necessarily in the order of examination, we find first the St Lawrence site, to which we were directed by Doctor Getman. The site is situated along some low bluffs at the headwaters of a little brook flowing into the St Lawrence river, just southeast of the village of the same name, on the property of Doctor Buckman. All the refuse heaps of this site had been examined apparently, together with many of the ash pits, by Doctors Getman and Amidon and their friends. Our brief examination showed that the place had been occupied by Iroquoian people. Ash pits were unusually numerous for a Jefferson county site and indications seemed fairly promising. If we had not found other and better sites we might have begun systematic exploration here. We found part of a stone pipe, several terra-cotta pipe stones, a stone anvil, and numerous potsherds here.

One lake shore site only was visited — the village and burial ground near Limerick, on the Julius Maynard farm at the head of Perch River bay. Here a series of terraces rise from the bay. The

¹ Squier, E. G., *Antiquities of the State of New York*, chap. on Jefferson county; Hough, F. B., *History of Jefferson County*, ch. 1.

² The Amidon, Loveland and Oatman Collections are now in the State Museum.

village site scatteringly covers 2 or 3 acres along the first terrace, while the burial ground was on the second terrace. Here a number of skeletons were found in removing gravel for road-making, buried in the usual folded position at the depth of 3 or 4 feet in the rather tough gravelly soil. Each grave, it is said, was marked by the presence of stained earth and fragments of charcoal. As nothing whatever had been found with the skeletons, and as the village site portion was sown to oats and could not be disturbed, this site was not explored. A little scratching in the partly dug-over refuse heaps revealed a few fragments of clearly Iroquoian pottery, so the site can probably be referred to that people.

We began our examination of the Rutland Hills series of sites east of Watertown by investigating that on John Colligan's farm, at the east end of Rutland Hollow about 2 miles south of Felts Mills. It occupies 2 or 3 acres on a hilltop on the north side of the hollow in a grove of pines and maples.

There is here a spring near the top of the hill, which must have been a great convenience to the Indians. No ash pits were found, even after careful search, but several large refuse heaps on the top of the hill and some smaller ones on the hillsides were noticed, nearly all worked out. All these, as could be seen from the few specimens found, were of Iroquois origin, but near the spring a small refuse deposit was examined, which yielded nothing but a few grains of charred corn and several pieces of purely Algonkian pottery. This small refuse heap probably indicates the occupation of the place for a short time by Algonkian people, presumably before but possibly after, the Iroquois settlement. Such inland Algonkian colonies are rare in Jefferson county, although I have heard from Mr Woodworth, the veteran relic collector of the Rutland hills, of another site yielding the same kind of pottery in the valley just west of the hills. The Colligan site, I decided, was too nearly worked out to repay exploration.

We next crossed the hollow and climbed the opposite height to a site farther westward on the farm of Ex-supervisor Allen, listed by Squier, as nearly as I could study it out, as the "sites near Abner Tamblin's farm."¹ There is no trace now of the earthwork mentioned by Squier but the field, sown to oats, showed scattered bits of Iroquoian pottery and other artifacts. The traces of occupation lie on a slight elevation partly surrounded by swampy ground, on the flat hilltop — not as one would expect from Squier's description, on

¹ Squier, *Antiquities of the State of New York*, p. 24, pl. 3, no. 2.

Characteristic position of flexed skeleton from Heath site near Rodman, Jefferson county

the very brow of the limestone escarpment. There was nothing to encourage systematic excavation, unless perhaps in the oatfield which naturally could not be disturbed.

We passed without stopping another site listed by Squier, but examined the one located on a spur of the hill north (not west) of Burrs Mills, above a little creek.¹ This had evidently been a stronghold, the flat point of the hill being divided from the main plateau by a ditch (and probably an embankment) now nearly obliterated. The place was under cultivation when visited and digging was consequently forbidden, but we discovered the fact that hillside refuse heaps or "dumps" were neither deep nor abundant, but that there had been at least one deep deposit upon the hilltop, besides the spots of blackened earth which probably indicate the location of the bark houses. This site, according to Mr Loveland, has been very rich in bone implements. What few specimens we picked up seemed to show Iroquoian culture. It was apparent that the place had been nearly exhausted.

Passing southward, the next place visited was the earthwork on the brow of the high hill on what was once D. Talcott's farm, overlooking the old lake bottom westward, and in plain view of the island-dotted waters of the present Lake Ontario. This site lies about 6 miles southwest of Watertown, its exact location being shown on the map. It has been very well described by Squier.² More than half of the old oval earthwork with its gateways is still distinctly traceable—the only place of the kind left in Jefferson county, so far as I have been able to discover. Most of the refuse heaps have been rifled and many graves opened but we found a shallow village layer which yielded Iroquois pottery, a celt and a few other objects. No typical ash pits were located, but a number of corn cache pits, mentioned by Squier, are still visible from the surface. I doubt if much could be found here now, except perhaps skeletons. We photographed the best preserved parts of the earthwork.

The only other site of importance examined during the first two weeks of our work, aside from the two picked out for exploration, was the ancient village site on the lowlands of the old lake bottom about $1\frac{1}{2}$ miles north of Belleville on the old Wallace farm, now the property of E. A. Nohle, the exact location being shown on the map. The site occupies a rather flat, sandy pasture south of a bit of woods, near a large spring. The earthwork, if any existed, is gone

¹ Squier, *Antiquities of the State of New York*, p. 22, pl. 3, no. 1.

² Squier *Antiquities of the State of New York*, p. 17, pl. no. 1.

and the only surface indications left are scattered patches of black earth and fire-broken stones, indicating refuse deposits, some of which have been explored. The little digging we had time to do revealed a true ash pit, another similar structure, and yielded Iroquoian potsherds, pipe fragments, a small celt, and some animal bones. Possibly, if we could have found time for it, the place might have repaid systematic work.

While working on the Heath and Durfee farm sites we visited several others, two of which deserve notice. One was located on the farm of a Mr Green, now worked by Mr Stevens, about 2 miles southwest of Heath's. This is located on a rounded hilltop near a brook. Among the boulders which are scattered plentifully over its surface are found occasional refuse heaps, in part worked out, containing Iroquois material, and a few shallow ash pits. A child's skeleton was once plowed up here, but we could not find any indications favorable enough to lead to the abandonment of our other plans.

The other site was about $2\frac{1}{2}$ miles west of Adams, on the old Joe Taylor farm now owned by Floyd Overton, and is located on the map. On a slight terrace dividing Big Sandy creek from a little swale were traces of a camp: black earth, pipe stems, pottery fragments, etc. The outlines were difficult to make out but the place was not in all probability very extensive. The pottery, pipe stems, etc. found were Iroquoian in character.

The Heath site, where most of the summer was spent, was located on the farm of Homer J. Heath, near the west line of the town of Rodman, approximately $1\frac{1}{2}$ miles west of the village of that name (see map, figure 46). A creek bounds the site on the southeast, which, joining another half a mile southwestward, forms the north branch of Big Sandy creek. The northwest side of the knoll where the site is situated is bounded by a small swamp, full of springs, the waters of which flow into the main creek through a little brook around the southwestern end of the knoll. The northeastern end of the site curves into a fine maple forest. Here the expedition tents were pitched.

A number of smaller springs emerge from the hill on the creek side, one of which near the camp furnished us good water and was probably of similar service to the Indian. The knoll itself is a gradually narrowing tongue of land some 600 feet long, stretching southwestward from the higher ground beyond. It is fairly level along the ridge proper as may be seen in the photograph, but slopes down to the creek on one side and to the little swamp on the other.

At the widest part it reaches a breadth of about 160 to 200 feet. Near the southwestern end is a hollow crossing the ridge, just beyond which the land rises again to more than its former height and continues 150 feet to the little brook, forming a sort of semidetached knob. The highest part is not more than 30 feet above the creek. Higher hills encircle the site on the land slide, which seems a peculiar feature for as a rule the Indians did not like to build their villages when they could be commanded from a nearby eminence.

The knoll lies at the point where the creek issues from its narrow ravine among the hills to a broad level valley which seems to have been an arm of Lake Iroquois; so the knoll may have originated as a bar of sand and clay formed around a reef of limestone by the swirling stream, loaded with sediment, as it emerged from the glen into the quieter waters of the bay. The drift material of the surrounding hills is of glacial and not fluvatile origin.

The indications of Indian occupation, as is shown by the stipple on the Heath site map, are scattered over an area about 800 feet in length along the top of the knoll and down the slope at both sides to a breadth of approximately 240 feet. They consist as usual of black soil, fire-broken stones and occasional bits of broken pottery or worked stone showing among the grass roots of the pasture, most abundant in occasional patches.

In order to get more exact information concerning the nature of the site than could be observed from the surface, the distribution of graves, ash pits and refuse heaps, and consequently the best places to dig, the usual procedure was followed, a series of holes being dug resembling post holes, in parallel transverse lines across the hill, each hole of course revealing the nature of the soil at that particular point. The results showed several deposits of refuse upon the knoll in its eastern part, especially just above the spring, but these with one trifling exception, marked "A. H." on the map of the site, had all been overhauled by previous collectors. The one above the spring had been from 18 inches to 2 feet deep and covered an area some 25 by 10 feet, although the exact limits were hard to define on account of the spreading effect of the plow. Westward along the ridge were scattered graves to the number of twenty-seven, containing thirty-two skeletons in all, clustering thickly as shown on the map on the brink of the little transverse hollow. This part was explored by a series of trenches run where it was thought they would do the most good. The little knob west of the

Double burial and an adjoining grave, pits 31 and 32, Heath site. Excavated by M. R. Harrington for Peabody Museum, Harvard.

transverse hollow showed merely a few ash beds and dark stains but no traces of real habitation or burial. Among and near the graves on the hilltop were occasional ash pits, generally small, and large numbers of post holes whose relations and purpose could not be traced out with the means at our disposal.

Fig. 46 The Heath site, Rodman, after Harrington

Near the bottom of the slope on both sides were more refuse deposits, as a rule not more than 14 to 18 inches deep and by no means continuous. Among and along the upper edge of these were a number of ash pits, usually on the northern side of the hill, rather broad and shallow. As with the hilltop refuse heaps, most had been worked over, but the ash pits were usually found intact. A most important phenomena was the discovery by postholing of a trench now plowed full and level with the rest of the field skirting the northern edge of the knoll along the low ground near the swamp and swinging up and across the knoll just east of the natural transverse hollow previously mentioned. In the northeast part of the site one fancies that he can almost make out the outline of an embankment. Although it can not now be followed along the side of the hill toward the creek, this trench or ditch is probably the remains of the oval earthwork which, according to tradition, sur-

rounded the site before the knoll was cultivated.¹ Its form as far as could be traced is shown on the map of the site, and the probable form of the missing part is indicated by a dotted line. The trench seemed to average about 2 to 3 feet deep. Judging from the before-mentioned similar work still extant on Talcott's hill, there was probably an embankment around inside the trench, with one or more gateways across both ditch and bank.

Having concluded this general description I will now take up more carefully the graves, ash pits and other phenomena observed during the course of the work, and to this end will describe in some detail examples of each kind which I consider typical. The graves, as before indicated, were first discovered by the posthole method and then when the grave area was once located it was easy to drive trenches across it, removing the plowed surface layer, and then to locate the graves from above by the contrast of their stained disturbed earth mixed with bits of charcoal to the clear color of the undisturbed sandy soil composing the knoll. Another indication is the marked softness which is still noticeable in the disturbed soil filling the grave. Sometimes ash pits were mistaken for graves at first, and in one case the remains of two skeletons were found in an ash pit below the northwest refuse deposit near the swamp.

No order or regularity was observed in the location of the graves unless the bunching at the southwestern end of the site, so noticeable on the map, may be considered as such. It was also observed that all the graves, and all the pits for that matter, lay within the limits of the old earthwork, although there were refuse deposits outside. In depth the skeletons varied from 8 to 36 inches from the surface to the uppermost bones, with an average a little less than 20 inches. This average would doubtless be somewhat higher but for the action of the plow in removing, year after year, some of the covering of earth from above the skeletons. Some had actually been struck and broken by the plow.

The folded or flexed position of burial prevailed here as elsewhere among precolonial New York Indians. The bodies were doubled up, with knees close to the chest and arms flexed, then laid on their sides in the grave. I have selected two photographs from our series to illustrate this point; representing the skeletons in pits 9 and 51.

Pit 9 was found some distance east of the main group of graves and was discovered in digging the first or exploration trench. Its dimensions were 48 by 30 inches and it contained a skeleton at the

¹ Hough, F. B., History of Jefferson County, p. 12.

depth of 12 inches, lying on the left side heading west and facing north, folded up in the characteristic position shown in the picture (plate 104). Near the top of the grave was a distinct layer of ashes. The bones were in fair condition, although badly cracked by the plow, especially the skull which fell entirely to pieces. Nothing had been buried with the dead, unless a few grains of charred corn may be considered, or the lower mandible of some squirrel found lying on the right side of the crumbling bones. The skeleton in pit 51 was similar except that it headed west-southwest and lay at about 26 inches deep, well out of reach of the plow. This seemed to be the remains of a woman, while the skeleton in pit 9 was evidently that of a man.

Eleven of the skeletons found (about one-third of the total number) were those of children. These, so far as could be traced from the badly decayed bones, lay in the typical folded position.

In five cases the remains of two individuals were found in a single grave, in two instances both adults, in three an adult and a child (see plate 105). Little can be said about these skeletons except to note that of the two in pit 21, "A" had a skull of relatively high type while that of "B" was unusually low, with high brow ridges and considerable prognathism.

In pit 59 we have a good example of a child and an adult buried together. It is interesting to note the irregular decay of the bones, probably due to the disintegrating action of roots and similar causes. The head, shoulders and upper body of the adult are well preserved, while in the lower part and in the child's skeleton decay has nearly destroyed even the largest of the bones.

On the whole the bones are much worse as to preservation than those previously found in New York State by the museum expeditions — due partly perhaps to greater age and partly to local conditions. Many of the bones lay directly upon the clayey hardpan below the layer of sandy soil, which made them liable to long-continued soaking in and after every spell of wet weather.

As to orientation of the burials, little order seems to have been practised. Out of twenty-nine observations, eleven skeletons headed west or nearly so, seven east, one north, five south, three northwest and two southwest. It will be noticed here that there seems to be a preference for heading the bodies west, which became more apparent when we consider that the three heading northwest and the two southwest may have been intended to head west. It also seems to have been something of an object to let the faces of the dead turn

toward the north, for twelve were facing that way, against six toward the south, two toward the east, three to the southwest and one to the northwest.

One favorite Iroquoian method of interment, the so-called "bone" burial, in which the skeleton is more or less completely disjointed before being placed in the ground, was here represented by a single case only, that of pit 52, which contained the tangled and disjointed remains of an adult skeleton. The only bones which remained in the natural position were those of a leg and a foot. The highest bone, a lower jaw, was 35 inches from the surface, the lowest 44 inches. The skull, badly decayed, lay in the middle. The photograph shows this burial in the background rather poorly, while the foreground is taken up with the more ordinary skeleton in pit 51.

The ossuary method of interment, in which many disjointed skeletons were buried together, was not observed here.

We were disappointed to find that while Indian skeletons are by no means of infrequent occurrence in Jefferson county, it is exceedingly rare to find anything buried with them. Three cases (and these are not all sure) were found among the thirty-two skeletons at the Heath site. The skeleton in pit 60 had a decayed bone awl lying behind its head and a supposed but doubtless paint stone near the knees. That in pit 75 had an unfinished celt near the chin.

The clearest case of objects buried with a body was found in pit 71, where an adult and an infant were discovered, but in a very poor state of preservation and covered with stones and slabs—an unusual feature. One of the slabs above the adult must have weighed a hundred pounds. Near the back of the infant lay several bundles of bone beads or tubes, badly decayed, arranged in parallel groups, probably forming part of an ornament or other burial offering. The bone awl, celt and paint stone may have found their way into the other graves by accident—perhaps thrown in with the earth.

A number of graves showed layers of ashes near the surface, which are relics perhaps of a ceremonial fire lighted upon the grave after burial. More definite and particular data for the skeletons will be found in the appended tables. Besides the skeletons there were found in several ash pits a few detached human bones, a lower jaw in pit 64, a tooth in pit 66, and teeth and charred bones in pit 70, all on the northwest hillside, which are rather difficult of explanation. Two other fragments were found in natural hollows on the ridge where they had probably been dragged and covered up by the plow which had detached them from their respective skeletons.

The charred bones in pit 70 formed part of a burnt layer 3 inches thick, which also contained bones which did not appear human.

We found twenty-one ash pits which we considered worthy of record, ranging in depth from 18 to 50 inches and in diameter from 30 to 132 inches. They have simply been holes in the ground generally more or less bowl-shaped, which were dug by the Indians as "ovens" or roasting pits in which to cook food, or as cache pits for storing corn. After more or less use they seem to have become filled with refuse, and the plow coming later leveled them all off even with the surrounding ground so that at the present time in sites which have been cultivated they have to be searched for by the "posthole" or trenching methods, such as are used in locating graves.

There are several general features which characterize these pits as a whole and differentiate them somewhat from those in other Iroquoian regions examined by the expedition. In the first place many of the pits had a tendency to be very broad and shallow around the edge, deepening only near the middle, then the lower part is likely to contain a clear mixture of ashes and dirt without charcoal and with little or nothing in the way of artifacts, the latter as a rule occurring in the upper layers, in ashes and stained earth containing considerable charcoal. Another peculiar fact is that many of the pits are oval in ground plan instead of circular, and others are very irregular. Instances occurred of two pits connected by an ash layer.

Several examples are offered here of Heath site ash pits which are in a way typical, as they show most of the characteristics mentioned above.

Pit 53, found not far from the swamp on the northwest side of the site, was a shallow and rather irregular form of pit, 21 inches deep and an irregular oval about 4 by 5 feet in ground plan. It was filled with an almost homogeneous mass of ashes mixed with a little soil, broken only by occasional rough blocks of stone, and contained, besides the usual charcoal, broken animal bones, a piece of pottery decorated with conventional human faces, another with raised decorations, a pottery disk and several broken bone beads.

Pit 61 exemplifies the type with widespread top and shallow edges and illustrates one form of the barren bottom filling occurring so frequently in this site. In this case little was found below the layer marked "clay" but in the mixed ash layer above, potsherds, pipe fragments and animal bones were obtained. Among the sherds were many fragments of a small neat pot.

Pit 62A, with its adjunct 62B, found on the southeast hillside, showed very well the before-mentioned coupling together of pits. Its section also illustrates the widespread top; and the middle layer of red burnt dirt and ashes suggest that it was used at two different periods without cleaning out, the lower black layer having accumulated meanwhile. The main part (A) was 8 feet in diameter and 50 inches deep, the small "addition" (B) (which may have been a preexisting pit) being $4\frac{1}{2}$ feet long by 4 feet wide and 30 inches deep. Its homogeneous black filling differs considerably from the comparatively complex structure of 62A. The contents of the two pits could not be separated conveniently. Pottery fragments, animal and fish bones, charred corn cobs and corn, charcoal, fire-cracked stones, a fine triangular flint arrowhead (flint arrowheads are rare on Iroquois sites in this region), flakes of flint and quartz, rejects of blade making, a hammerstone, net sinkers, a gaming bone — all figured among the specimens found.

In digging our first trench, which was run southward along the ridge, we kept careful track of all the "picket holes" found, in the hope that other trenches run parallel and adjacent would reveal their purpose, whether for holding pickets of smaller inclosures within the fort, or for the posts of houses. But this trench did not penetrate any spot promising enough to trench further, so no adjacent trenches were dug and the lines of picket holes were not followed out. This might have been easily done, and the old ditch of the fort reexcavated if help had been available, but Mr Irwin Hayden, my assistant, became ill July 1st and had to return to Boston and it was nearly two months before I succeeded in obtaining other help. Some general facts concerning the "picket holes" were recorded, however. It was found that there had been holes in the ground, apparently to accommodate pickets, and that they averaged about 8 inches wide by 19 deep. All were filled with more or less stained earth, and some contained an admixture of charcoal and ashes, with fire-cracked stones and occasionally implements, potsherds and bones. A drawing was made showing a double line of these pits that crossed trench 3 at right angles. These were about 6 inches in diameter and 20 inches deep, separated by a space of 8 inches. Perhaps they formed part of some inner stockade. In this connection it should be noted that the principal burial place lay between this row of holes and the ditch of the old fort, so it is possible that they supported a sort of graveyard fence.

As for the specimens found here I will not describe them until the end of this paper, when they will be taken up in connection with those found at the second site (Durfee farm), which were similar, I may say identical, in character. It is sufficient to note here that they were of characteristic Iroquoian type, and, in the absence of European trade articles, may be considered prehistoric.

The indications seemed to give out at Heath site about the end of August, and while I thought we might find a few more skeletons at Heath's it was considered best to go to a fresh site.

Durfee Farm Site

The place picked out for this purpose is situated on the lowlands of the old lake bottom about 3 miles north-northwest of Pierrepont Manor, on Taylor brook, in the vicinity of the scattering group of farmhouses locally known as Taylor Settlement. The Indian village site lies on a low flat-topped hill, known as the "Old Fort lot" once belonging to the old Durfee farm,¹ but now divided among John Eastman, Egbert Cole and a Mrs Mayo, to all of whom the thanks of the expedition is due for permission to excavate.

The part of the hill occupied by the Indians is almost flat and rather sandy, the sand lying upon a clayey substratum resembling till. Its longest extension is from north to south. Along its western border flows Taylor brook which has formed in one place a rather high-cut bank. Directly west of the hill near a limestone outcrop, are two springs, one of unusually large size, whose waters combine to form another brook, which flowing around the southern end of the hill joins Taylor brook some distance below. The largest spring which was probably one of the principal attractions determining the settlement of the site by the Indians was photographed. The site is almost commanded by a higher stony knoll rising from the west side of the hill, but which is apparently just outside the limits of the site, and does not show much trace of occupation.

The flat hilltop, which covers about 5 acres, and the hillside leading down from it show, especially toward the southern part, a considerable area of "village dirt" on the flat averaging from 8 to 18 inches deep — a very black soil, with occasional bits of pottery and other refuse. The general distribution of these indications of habitations is shown by stippled shading on my map of the site. Pits were scarce, and very poor in relics when found, the two described later being the sole exceptions. They were mainly observed near the

¹ Hough, F. B., History of Jefferson County, p. 12.

Plate 106

Durfee farm site, Ellisburg, Jefferson county.

southern end. Only one skeleton was found as a regular burial — which will also be described later.

Nevertheless we succeeded in finding a surprising quantity of material here, but it was the refuse heaps that yielded it. There were a number of these, mainly in the western part, some on the hillside and some on the top but all at the edge of the site.

Refuse heap "A," at first called the "west refuse heap" was the largest example of the hillside variety, and was located in a little cave of the west slope of the hill. It was somewhat fan-shaped, the narrow end being at the brink of the bank, the outer edge at the bottom 22 feet distant. Its widest part was 36 feet and it attained a depth of from 30 to 34 inches. At the foot of the hill, as might be expected, the deposit was full of stones, fire-cracked cobbles and the like, which on account of their weight had rolled to the bottom. The upper few inches of the deposit nearest the surface was composed usually of small ordinary soil; from this point down a mixture of ashes and soil prevail. Near the bottom were pockets, streaks and layers of solid charcoal or ashes, usually of small extent and rather irregular. The underlying soil was usually quite clayey. Sometimes potsherds and other specimens were found embedded in this substratum, as if trampled in while the ground was still soft. Pottery fragments were very abundant in this heap, but mammal and bird stones were rather rare. Fish bones on the contrary were quite common, as were *Unio* shells and charred corn in small quantities. The many implements, utensils and ornaments found here will be described later. This was undoubtedly an ash dump for the old Indian village where everyone came to throw their garbage down the hill.

Fifty feet southeast of this was refuse heap B, on the slightly sloping ground where the hilltop dips a little before rising in the stony knoll to the westward. It was oval, the longest axis being from east to west, 29 feet, with a breadth of 17 feet. Excavation, which was accomplished by means of these trenches, showed that the deposit filled a roughly bowl-shaped cavity, with edges steep in some places and gradual in others, and which was probably natural but possibly dug artificially for a garbage repository. The deposit reached the unusual depth of 40 inches in the deepest part, and consisted of a mixture of ashes and soil in varying proportions. There were frequent but irregular streaks of ashes and charcoal, sometimes slightly saucer-shaped suggesting a fireplace. In one of these a few

charred human bones were found. Fire-broken stones were frequent, and mussel (*Unio*) shells, mammal, bird and fish bones occurred in considerable quantities. Pottery, implements and ornaments were quite abundant and will be considered later.

Refuse heap C was just northeast of B, a little higher up toward the turn top of the village knoll. It proved to be roughly oval, and 14 by 20 feet in size, gaining however a maximum depth of only 18 inches. The specimens were of the same general character as in the other deposits, but were not so thick.

On the eastern slope of the hill, toward the springs, was refuse heap D, at first called east refuse heap, a scattered collection of irregular hillside deposits of refuse of ordinary type, in the whole, but rather poor in relics. One feature, however, merits special description and discussion — the presence of articles of European make intermingled with Indian artifacts — a phenomenon not duplicated anywhere else on the site. On digging into a low hummock on the surface of this heap very black earth was found, mingled with fire-broken stones. A few fragments of Indian pottery then appeared and we thought we had found a regular Indian refuse heap. But we were soon surprised to find bits of European crockery among the Indian things. At the depth of about a foot a 2-inch ash layer was discovered covering an area 6 or 8 feet square and beneath this again 6 inches more of black earth in which were mingled Indian pottery, European crockery, an Indian bone implement, some iron nails, an old button and pieces of window glass, some *Unio* shells and a few bones which resembled those of the cow and the pig. Now the question arises how did this remarkable admixture occur? I do not believe that it was due to contact between the Indians and whites for two reasons: first, because none of the articles of white man's manufacture found was of the sort traded to the Indians — no glass beads, sheet brass or iron hatchets occurred, and none has been reported in the neighborhood; second, that not one article of European make was found elsewhere on the site. For this reason I think that the admixture was due to the presence of a settler's cabin on the very much older Indian refuse deposit, after the makers of the latter had been gone for many a year. The burning of the cabin might account for the ash layer in what was probably the foundation hole.

Refuse heap E lay on the very steep-cut bank where Taylor brook eroded the northwestern part of the hill, and occupied a sort of a pocket, 12 feet from top to bottom, 6 feet wide and attaining a

depth of 38 inches. The "pocket" may have been a gully in the face of the bluff which became filled with refuse thrown over from above. The lower part was largely clay with only slight traces of disturbance and occasional stains of black. Pottery, animal bones and *Unio* shells were found, and also bone implements, pipe fragments and the like. Near the downhill end of the deposit, on the south side, at a depth of from 17 to 25 inches, was a mass of human bones embedded in almost solid clay, representing all parts of the body except the skull. The joints were usually broken, and one bone looked as if it had been subjected to the action of fire.

Refuse heaps F, G and H were small examples of the hilltop variety, as is shown on the chart of the site. They attained a depth of about 2 feet and contained, as a rule, the usual material.

Refuse heap I was also small, and was found on the hillside, as indicated in the chart and the photograph. Only about 6 feet in diameter, its principal claim to notice lay in the fact that it contained two black layers, separated by a 6-inch layer of clay. Rather good material of the usual sort was obtained from both layers.

Still farther southward was refuse heap J, apparently filling a hollow in the little flat shell of land between the rock knoll and the flood plain of the creek. Its dimensions were about 10 by 12 feet, and it reached a depth of 20 inches near its north edge. The filling of stained earth was rather soft and dry, with a layer of charcoal, charred corn and the like at the bottom. A surprising amount of material was taken out here, including some portions of clay pipes in animal forms.

A few ash pits were observed, as before mentioned, on the flat hilltop but only three of them deserve description, all of which are located on the chart. Pit 1 reached the depth of 20 inches, was homogeneous in construction and had a diameter of about 4 feet, but the outline was very irregular. A little ordinary material and several large decorated pieces of the same jar were found within it, and a photograph was taken showing them in position. Adjoining this on the west and shading into it so that the line of demarcation could not be distinguished, was pit 1A, containing the skeleton of a child which lay about 30 inches deep on the right side heading north-northeast. It was drawn up in the usual folded posture, and there were no accompanying objects.

Pit 2 was found about 2 feet east of pit 1 and turned out to be 3 feet deep by 4 feet 6 inches wide — a typical ash pit, with irregular layers of black charcoal and white ashes containing a little of the usual refuse.

Another structure that might almost be called a pit was found beneath refuse heap A about 6 feet above the bottom of the slope. It was a saucer-shaped layer of calcined material, 14 inches from the surface, underlaid by charcoal and some 2 feet in diameter. In its hollow were found some fragments of human skull, some broken stones and a few potsherds.

Specimens. The description of the work ended, we will now take up the specimens found at both the Heath and Durfee Farm sites. There was no difference perceptible in the patterns and forms of the pottery, bone implements, etc., so that it was clear to me that the specimens from both places should be considered as representing the arts and life of one and the same people. Of course, some things were found at Durfee farm and not at Heath's, and vice versa; but these articles were of the rare varieties, of which one could not expect to find a full set in either site. The specimens will be classified according to use, under the heads of weapons, implements, domestic vessels, pipes, ornaments, games, foods and specimens showing the methods of manufacture.

The most common objects which can be classed as weapons were the arrowheads of bone and deer antler. The antler point was merely, as a rule, an antler prong drilled out at the base to receive the shaft and whittled or rubbed down to a fine point at the tip. When well made a cross section of this type would be lenticular. The commonest bone arrowhead is a small hollow bone, such as the femur of some small animal, cut off square at one end so that the marrow cavity would serve as a socket for the arrow shaft, and sharpened at the other end. Arrowheads of solid bone are also found, made like the stone arrowheads in triangular and sometimes slightly stemmed forms.

Objects of chipped stone were rare, but a few triangular arrowheads, in the main nicely chipped after the old Iroquois pattern, were secured.

One specimen only of the barbed harpoon of bone, which is usually fairly common in this region, was found; but this was struck in digging by one of the assistants and so badly broken that it was almost unrecognizable. Another somewhat similar but smaller barbed object was exhumed, perhaps an arrowhead for fish, or one of the prongs of a fish spear. There was also a small, slightly curved bone barb sharpened at one end but with the other roughened for attachment to one of the jaws of a fish spear, or to a wooden fish hook.

Perhaps the stone celts found in considerable numbers on both sites were sometimes used as weapons, but their shape and small size leads me to doubt their efficiency as battle axes.

Under cutting implements we may enumerate first, as most abundant, the knives or chisels made of split incisor teeth of the beaver, ground down to a narrow cutting edge; then came leaf-shaped knives of flint, the regular Iroquois type. It should be mentioned here that flint or even chipped implements of any sort are very rare on the Iroquois sites of Jefferson county.

Bear teeth ground off longitudinally or diagonally on one side may have also served as knives, a type of implement peculiar to the region. There was also a knifelike blade of bone with a long stem bearing many notches, apparently for the attachment of a handle, but whether this dull-edged implement could have been really used as a knife is difficult to say.

Piercing implements, especially awls of bone, were abundant. These were of all grades of make and finish, from a mere unworked bone splinter showing signs of use to a beautifully rounded and polished slender awl nearly 12 inches long. Some showed signs of decoration composed of straight lines and notches, as shown by certain Loveland specimens. One awl was discovered encircled by a bone bead; another was double pointed, while a number had been used and resharpened so often that they were reduced to mere stubs.

Bone needles were of the flat, slightly curved type, made of parts of deer ribs or sometimes of bird bones.

A stone nodule pointed at one end seems also to have been used as a perforator.

The stone celts found were usually small, but were probably hafted as axes or adzes, for chopping (with the aid of fire) and a piece of a true adz was found, also of stone. Some slightly chipped cobbles may have been used as hand axes or choppers.

Pounding, pecking and crushing were represented by disk hammerstones, some with finger pits, by shallow mortars or metatellike hollows in stone slabs, and by mullers of much the same form as hammerstones to go with them.

Among the miscellaneous implements were grit stones with grooves showing the sharpening of bone implements, a few scrapers, including a flint knife with one end specialized for scraping, stones apparently used in smoothing pottery, net sinkers and stones cracked by heat as if they had been used for stone boiling, if one can include these last under implements.

The pottery vessels of which so many fragments were found, had apparently all been of typical Iroquoian shape, possessing the globular body, constricted neck and rather broad projecting rim or cornice to a marked degree, often with one or more high projecting points. Sometimes a point was protracted into a long flat ear, sometimes it projected in a form resembling the ram prow of a warship, a mild type of which is shown in figure 2, plate 92. Sometimes there was even a handle connecting the projecting point with the body of the pot below — a local development. Decoration was well advanced and the patterns frequently showed unusual taste and skill in design and execution. They are composed of combinations of straight incised lines, small circles, dots and notches usually in geometric patterns, but occasionally representing the human face in conventional form. A few specimens bearing raised decoration were found in both places, and one vessel had been painted yellow. The patterns were usually confined to the projecting cornice but sometimes also formed a band encircling the pot where it begins to expand, just below the neck, and sometimes covered the neck as well. The vessels varied much in finish and degree of ornamentation, and in size from a perfect tiny pot, only about $1\frac{1}{4}$ inches high, to fragments of vessels holding several gallons.

Pipes were generally of terra cotta, but one fragment of a stone pipe was found. All the former were of typically Iroquois patterns, including the trumpet or morning glory shape, the still more common type with straight sides and encircling rings, others decorated with dots, and some with straight-line patterns copied from pottery designs. Some were in eccentric shapes and others took the form of, or bore representations of, life forms such as the human face. While pipes of all kinds were found in considerable quantity, they were usually broken. Sometimes they were beautifully made, and in the case of the trumpet form, often highly polished.

Beads of different kinds were the most numerous class of ornaments found; and among these, beads of bone predominated — the regular tubular form, more or less polished. Stone beads were fairly numerous, some of serpentine being nicely made and polished, while others of red slate were ruder. Several specimens were found of terra-cotta beads made of broken pipe stems. Another form of bead was a long cylindrical kind of considerable thickness made of the columella of some large marine univalve evidently obtained by trade or capture. Still another was the shell of a small fresh-water snail, perforated for suspension. I saw several disklike beads of

Unio shell in Mr Loveland's collection obtained some years ago from the very site where we worked on Homer Heath's farm.

The most interesting ornament found was the greater part of a disk or gorget made of human skull with six perforations, another article of which nearly every local collection has one specimen. Stone gorgets were not found by the expedition and the few found to my knowledge on these Iroquois sites by local collectors could better be called pendants, being rather thick and perforated only near the end or edge — quite unlike the typical gorget which I never saw on or from an Iroquoian site. A bear's tooth perforated for suspension was also evidently an ornament. Perhaps under this head may be included also some sheets of mica, a quartz crystal, and a paint stone showing rubbing.

Under the head of games are classified the usual perforated deer phalanges for playing the game of "cup and peg," other phalanges rubbed to a sort of pyramidal shape characteristic of this region; a large number of small disks of slate and pottery, some of which were wholly or partially perforated, and some scratched on one side.

The vegetable foods of the old people were represented by charred corn, kernels, stalks and cobs, wild plum stones, hickory nuts, butternuts, and calamus roots; animal foods by the bones of the deer, bear, raccoon and other mammals, by the bones of various but as yet unidentified birds, of sturgeon and other fishes, and by the shells of the Unio or fresh-water clam. Specimens showing the method of manufacture of stone implements were confined to a few flint and quartz chips and rejects, and unfinished beads and disks of serpentine and slate. An unusual process, observed for the first time here, was the *chipping* into form of large pieces of bone for bone awls and harpoons. Bone beads and awls were also obtained in the process of manufacture by the more usual grooving, shaving and rubbing methods.

Wads of clay and parts of coils preserved by accidental burning tell of the manufacture of pottery vessels and sherds chipped roughly into circular form, of the making of pottery disks.

Finally a charred bit of birch bark found in an ash pit may have been intended for making some vessel of domestic use.

Taking the collection from both sites as a whole, it can be said to be thoroughly Iroquoian. The form and the decoration of the pottery and the pipes, the triangular form of the flint arrowheads, and the exclusive use of celt axes in place of grooved axes, taken together, are unmistakable. In a few minor details, however, the material culture differs from that of other Iroquois regions examined by the expedition; there are certain features peculiar to the locality.

Among these are the abundance of stone beads and disks of pottery and slate, the presence of the bear-tooth knife, the perforated gorget of human skull and the pyramidal "gaming bone." Pottery reaches an unusual development here, especially in the occasional use of handles and the exaggerated "high points," and the conventional human face is used more here than elsewhere.

The question then arises, To what branch of the Iroquois did the makers of these articles belong? The information at hand seems to point to the Onondaga. I am not familiar enough with historic Onondaga collections to be sure on this point, but the Onondaga Indians of today, according to Beauchamp,¹ claim this more northern region as the home of their ancestors in precolonial times and he himself favors this view.

As to the age of the sites examined, our only criterion is the fact that no European trade articles were found on either site, the few bits of crockery and the like found in one small spot at the Durfee farm site being demonstrably not contemporaneous with the Indian remains, but much later. For that matter I have yet to see an article of European make found really associated with the Indian remains on a Jefferson county Iroquoian site, as they can be seen any time in the Mohawk valley or in western New York. We can thus assume that these Iroquoian sites, or at least the two explored by the expedition, are precolonial, and were probably occupied by the Onondaga before they moved south to their present location near Syracuse. To my mind the specimens illustrate the prehistoric Iroquois culture at its best.

Before leaving the region I photographed certain specimens from Mr Loveland's collection in Watertown, all from the local Iroquoian sites, which illustrate types most of which were either not found by the expedition or were found in a fragmentary condition. A brief description of the specimens is appended with the pictures. In closing I wish to give credit and thanks to Mr Homer J. Heath, the owner of the Heath site, and to Mr P. W. Kilmer and his sons, who work the Eastman farm at the Durkee farm site, for gifts of specimens and their many kindnesses to the members of the expedition. To Mr Robert D. Loveland of Watertown our gratitude is also due for his hospitality and for the permission to photograph his specimens. Doctor Getman of Chaumont gave us specimens, and both he and Doctor Amidon of the same place showed us their collections and gave us helpful hints.²

¹ Beauchamp, *Aboriginal Occupation of New York*, p. 12.

² The Loveland Amidon and Oatman collections are now in the State Museum. A. C. P.

THE OWASCO ALGONKIAN SITE

BY A. C. PARKER

An early Indian village or camp site on the shores of Owasco lake near its present outlet, has been reported by several students of archeology during the period of twenty years and considerable quantity of material has been discovered in the vicinity. In the spring of 1915, Mr E. H. Gohl of Auburn, by fortunate circumstance, discovered one of the large dump heaps of the village and succeeded in unearthing several hundred fragments of pottery and numerous stone implements. At the joint invitation of the Auburn and Syracuse Electric Railway Company and Mr Gohl, this department was enabled to make an examination of the site by excavation.

An inspection of the site led to the conclusion that it was a small village site. The ground which it covered was on one of the shore or beach lines of Owasco lake, that had been laid down when the lake was 20 or 30 feet higher than at present. The Indian site covered the slope at a point most convenient to access to the outlet, which was undoubtedly a fishing place.

Mr Gohl had opened up one refuse heap and had discovered the fragments of two large pots which he succeeded in partially restoring, when the operations of the Museum commenced. Excavations covering a period of about three weeks resulted in obtaining some two hundred fragments of pottery including rims, fragments of about ten pipes and one complete pipe. The implements of chipped flint were rare and nearly all of a triangular pattern, and the arrow-heads are not notched. One ovate knife is of chalcedony. The bone material consists of phalangeal cones of a type frequently found on similar sites, bone awls, cylindrical beads and bone needles and shuttles. One harpoon tip and two antler pitching tools or pins were discovered. The stone material consists of metates, anvils, hammerstones, notched sinkers and small scrapers. A large block of chert was found in one section of the site and among the numerous fragments scattered about it were several partially completed implements. The block was probably the source of an arrow-maker's material. Two perforated stones were found, one a large discoid bead and the other a fragment of an unfinished gorget. Unio shells were numerous and there were fragments of the bones of deer, bear, wild turkey, raccoon and several varieties of fish.

THE OWASCO LAKE POT

An Algonkian pot discovered in fragments in an Algonkian site at Lakeside park,
near Auburn

Ash pits were numerous and within an area of 100 square feet, fourteen were noted. In nearly all of them the underlying sand was burned hard and red and the accumulation of white ash in several instances was from 3 to 6 or 7 inches in depth. In a large deposit which appeared to be a central location there was a saucer-shaped depression filled with ashes and carbonaceous substances. This depression was 14 feet in diameter and in the center there was a depression paved with flat stones. This was filled with ashes. The remains of a dog's jaw, fragments of split deer bone, fish bones and several kernels of charred corn and hickory nuts were found in the ashes. The stone basin was taken up and has been restored for exhibition purposes in the Museum.

An examination of the pottery articles leads to the conclusion that they are of Algonkian origin. They are similar in every respect to articles found on Algonkian sites along the Seneca river, Oneida lake and along the east shore of Lake Ontario stretching northward to the St Lawrence. Similar material is also found southward in the valley of the Chenango and along the tributaries of the Susquehanna. From the character of the articles we judge that the site was precolonial and perhaps prehistoric. The occupants were probably some division of the Delaware family who came into the region before the Iroquois obtained control of central New York. The collection has been cataloged and has already been installed in Archeology Hall.

Fig. 47 Elbow pipe from the Owasco Lake outlet. Algonkian. X.

One of the important specimens in the collection is the pottery vessel restored from more than two hundred fragments. This vessel is typical Algonkian in shape and decoration and is the largest Algonkian pottery vessel in the possession of the Museum. (See plate 107.)

Plate 108

Articles of bone found at Lakeside, Owasco lake outlet, by E. H. Gohl,
1915

TWO CHARACTERISTIC COASTAL ALGONKIAN SITES

BY ARTHUR C. PARKER

The coasts of Long Island, both north and south, stretching to its eastmost limits, are marked with evidences of former Indian occupation. Some of these sites are inland upon some portion of the land naturally attractive in aboriginal times but most of them are adjacent to the shores of sheltered bays and coves or upon tide creeks.

Matinick Point Site

In 1901 it was my privilege to join an expedition sent out by the American Museum of Natural History under the leadership of M. Raymond Harrington, then working under the direction of Prof. Frederick W. Putnam. Mr Harrington, who had made a good survey of the Long Island coast, found that there were a number of camp and village sites along Oyster Bay, especially near the villages of Oyster Bay, Bayville and at Matinick point. It was the latter place that was chosen for excavation. Here upon a rise of ground between Peter creek and a small fresh-water brook was what seemed to be an extensive shell heap and evidences of a village site. Mr Harrington secured permission of Miss Matilda Cock, the owner of the land, to conduct his investigations.

Investigation revealed scattered deposits of shells and heavily disturbed earth running several hundred feet back and up the slope from the swampy land near the brook. It was only by diligent postholing that the occupied area was outlined, for while there were surface indications in the way of shells and occasional potsherds, the land had been plow-torn and cultivated for nearly 200 years. It was interesting to note, however, that the portion of the land modified by the presence of "Indian dirt" grew the rankest grass and the tallest weeds. This was one way that the village site was located. The postholing assisted to determine the depth of the deposits.

The area was staked out and trenches were outlined running up hill and away from the brook. The digging was done down hill to the brook. By our excavations it was found that the soil stained by occupation varied from 1 foot to 2 feet in depth. There were frequent ash pits, in the form of bowl-shaped depressions filled with ashes, charcoal, animal bones, and the shells of clams and oysters. There were occasional sea snail and scallop shells.

Deer bones were fairly plentiful and one complete antler was found. Other bones were of turtles, snakes, raccoon, dog, mink,

woodchuck and certain bird bones, presumably duck and wild turkeys. Shells, however, predominated.

Some of the pits were filled with shells all of one kind, as scallops and soft shell clams. Mr Harrington thought pits of this kind evidence of native clambakes and says in his notes:

This theory seems to be borne out by the fire-broken stones and ashes in the pits, and the fact that most of the shells show no signs of having been forcibly opened. A fire was probably made in these pits on a bed of stones, when such could be procured, and kept burning until the stones and the surrounding ground were very hot, when the shell fish and other food were put between layers of sea weed. Then the whole must have been covered and left to steam until the food had been thoroughly cooked.

Aside from the abundant evidences of food found in the shell and refuse deposits, there were found fragments and in some cases entire specimens of artifacts. The records show that there were numerous chips of flint and quartz, flint and quartz jasper and argillite arrow points, of the notched variety, scrapers, drills and knives. In one small pit there were two cache blades of oval pattern. Larger objects were shallow mortars or metates, hammerstones, pitted stones, chipped pebbles, probably choppers, and a fine maul with a pit and grooved sides. One of the best specimens was a grooved axe, rather well made, and found about 18 inches below the surface in soil that showed only slight traces of occupation. Another interesting specimen was a broken gorget that had been redrilled. Pigments were represented by one piece of graphite, evidently much rubbed, some yellow ochereous clay and cuplike modules of limonite with a red pigment clinging to the inside.

Many fragments of pottery were found. The decoration was characteristically Algonkian, and consisted of impressed patterns of cords, coarse fabric, twisted grass, and twiglike markings. The decoration was carried over the rims of the pots well down into the neck. One specimen was impressed with the edge of a scallop shell. The tempering material was coarse sand in some instances, but in the majority of cases of pulverized shells. No sherds showing pottery with a constricted neck were found, and the few fragments that had incised designs were crudely marked.

Bone implements were fairly numerous, considering the character of the occupation. There were awls made of splinters of deer bone, some of them being exceptionally well made. Some were decorated with incised lines. Several specimens were perforated for tying to the belt or other place. Several broken needles came from the

refuse; these were thin, flat splinters, neatly worked and perforated in two or more places in the middle. Several pieces of tubular bone were found, one of them being marked with six incisions drawn across the object. Of considerable interest were the fragments of mentapodial bone scrapers, or drawn shaves. The two fragments discovered lacked the joints that served as handles at either end.

Some pieces of worked antler were obtained, among them two specimens that seemed to be parts of chisels or small wedges. One piece of antler worked in the form of a small cylinder and broken, seemed to have been part of a flaking tool used in making flint articles.

In one pit in the center of the slope was a dog's skeleton, and near it a fragment of a human skull. The bones of the dog were properly related, except the hind legs which had been dug away after burial and partly calcined by the fire from a pit that had intruded into the burial. The human skull fragment was the only human bone found. Efforts were made to locate the burial ground but it was not discovered. Local traditions related by the people about Matinicock mentioned the finding of skeletons in other places, and thus it may be that no burial ground was associated with the site at least not nearby.

The only cultivated vegetable foods found were a few kernels of charred corn, one bean and what seemed to be a plum pit.

From our excavations it was concluded that the site marked a small village of the Matinicock Indians, and that the time of occupation was precolonial. The spot was well sheltered, the soil, especially on the top of the rise, was dry and well drained, access to the tide creek was easy and the fresh-water brook furnished an abundant water supply. Food must have been plentiful and well within reach. The waters of the creek were filled with fish and the mud afforded a plentiful supply of oysters. From the site it was an easy row to any part of Oyster Bay proper, while the overland trails led to inland hunting grounds.

Dosoris Pond Site

While conducting our excavations at Matinicock, Mr Harrington and myself found it possible on frequent occasions to visit other sites. Many of these were too scattered and too small to repay investigation. With one, however, we were particularly impressed. This was situated on Dosoris pond, near Glen Cove, and lay entirely upon the estate of Mr James Price. Of the many visitors who came to our camp at Matinicock, Mr Price had been one of whose sympathy we were sure. He at least realized that the

young men in overalls who were perspiring over the strange task of turning over all the Indian dirt on Matinicock point and looking at it, were conducting a sane operation. We were thus invited to examine the Dosoris site, the greater portion of which lay upon the front lawn of the Price estate. Mr Price's cooperation extended even further, and he not only housed the expedition but assisted in a manual way the burdensome work of excavating the shell heap.

Dosoris pond is a small tidal cove, of such a character as to be especially hospitable to innumerable shell fish. A fresh-water brooklet runs into the pond and along this stream one of the shell heaps is located. The other is at the top of the rise of ground about 100 yards to the west.

Shell heap 1, in the hollow near the brook, was 25 yards long and about 14 yards wide. In places the depth reached 42 inches beneath the surface. It was a thick, compact deposit of marine shells, so thick, indeed, that digging with a spade was a difficult task. There were fourteen pits in and at the edge of this deposit, several being as deep as 50 inches. These pits were filled with fire-cracked stones, charcoal, deer bones, split for the marrow, fish bones, and occasionally artifacts, such as bone awls and fragments of pottery.

In one pit were found fragments of chert, two quartz points, a bone awl and beneath a flat stone the crushed skeleton of a dog. Another pit contained, besides the shell refuse, a bilateral mortar, three bone awls and a quantity of potsherds.

The upper deposit, shell heap 2, was 35 feet long and of nearly the same width. Here the shell deposit was nearly 3 feet deep. At one place at the edge of this heap a stoned-up cache or cellar was found. It was made of small boulders and inclosed a well of more than a foot in diameter. This cache had been built upon an older deposit that went down 3 feet farther. Some argillite points were found in this heap.

There was a small burial place midway between the two shell heaps, but it had been disturbed by excavations made when laying water pipes. No complete burials were found, the bones being intermingled and badly broken. What Mr Harrington's excavations were, after my return to New York, I have not learned, but from his notes it seems that no burial ground was found.

The implements found at Dosoris. The chipped implements and others of stone found at the Dosoris site are similar to others found on the surface, and other shell heaps, as at Matinicock. There were chipped points of quartz, gray flint, yellow jasper and argillite.

Some were broad triangles. Net sinkers were found, objects strangely absent from Matinicock. The mortar we have already mentioned.

Articles of bone include awls, some finely finished, broken needles, antler tips, two antler punches, perhaps pitching tools, an antler arrow point, a worked beaver tooth scraper, an antler pottery marker, parts of a turtle shell cup and a flat tablet of bone.

It seems surprising, when making an examination of shell heaps, that shell was not employed to a greater extent for implements. A few were found here, however. Among them a scraper made of oyster shell and some perforated shells, probably ornaments. Of perhaps greater importance were the numerous parts of *Busycon* shells, especially the columellae, worked into small cylindrical lengths for cutting into wampum beads. A fairly good series showing all stages of the process was obtained. Mr Harrington found one deposit of these in which was a small awl and sharp quartz flakes. He thought that they had been inclosed in a wampum-maker's bag when lost.

The pottery fragments were particularly interesting. Most of them were typical coastal Algonkian sherds, showing about the same type of decoration as at Matinicock, except that the designs were better. Among the sherds were several that were Iroquoian. One had incised lines in triangles and revealed a raised rim and constricted neck. One had a conventional face similar to prehistoric Iroquois designs. All the pottery seemed better made and tempered more carefully than at Matinicock.

The shell heap appeared to be precolonial and to have been entirely the work of members of some Algonkian tribe, possibly the early Matinicock. In later days it may have been a spot where clams were caught and dried for winter supplies or for barter. The existence of wampum shells may indicate that at this place these valuable beads were blocked out, later to be carried away and finished. The presence of Iroquois pottery may point out contact with these people or indicate that they came down from their Mohawk valley homes to take tribute of food and wampum even in prehistoric times.

Evidences of occupation were not confined to these shell heaps near the pond. In almost every field about the place arrowheads, fragments of pottery and other implements have been found. Indeed most of the territory between Dosoris and Matinicock seems to have been occupied in spots, here and there, for relics are found upon almost every farm and in almost every garden. The region was one where there could be no hunger while the shell fish lasted.

V

NOTES ON CERTAIN ARCHEOLOGICAL SUBJECTS

In presenting this section of this volume, we are keeping in mind that our aim is to be of service to the new student, as well as to give information to the professional archeologist. In our descriptions of the various cultures and the various sites examined certain subjects and certain specimens needing further description are mentioned. In these notes, therefore, we have striven to supply information along these lines. There is no pretense of exhaustiveness and no attempt to cover all subjects. Part V is simply a series of notes for the sake of convenience arranged in alphabetic order. Many descriptions not here found may be treated in the general body of the work. Consult the index for such topics.

Adzes. Adzes are similar in outline to celts but are made with one surface called the belly, flatter than the other or upper surface called the back. They were designed in most cases to be mounted flat like a steel adz of the present day. Certain forms had the butt end inserted in an antler or wooden block, which in turn was hafted. The Eskimo used this form recently. Some adzes have grooved backs, similar to the grooved axe, but the underside that rested upon the bed of the handle had no groove.

Adzes are particularly numerous in central, southern and western New York. In all these localities the beveled type is frequent. It is interesting to note the high degree of finish of most adzes, as opposed to the rougher forms in which celts are found. Many have a high polish and in numerous instances the material is of some ornamental hard stone. The sizes vary, as in celts or gouges, from very small forms measuring but little more than an inch to larger ones measuring 10 or more inches.

Adzes were wood-working tools probably used to dig into very soft wood, or to remove the charred matter from utensils made by the use of directed fire. Some may have been skin scrapers or hide dressers. Adzes are less common on Iroquoian sites than celts, being mostly found in places once occupied by tribes who used grooved axes, notched flint points and spears, cord-marked clay pottery, steatite vessels, banner stones and other "problematical slates." The method of manufacture was identical to that of celts,

Polished adzes from New York localities. XI-2

1, highly polished adz from Glens Falls; 2, small granite celt-adz from Seneca River; 3, beveled adz, Honeoye Falls; 4, small black adz, Van Buren; 5, bottom side of adz, Van Buren; 6, bottom of double bitted granitic adz from Avon.

and all well made forms, will spin upon the point of balance. Consult, H. B. 30, Bur. Am. Eth., Moorehead, The Stone Age, Prehistoric Impl.; N. Y. State Mus. Bul. 18; Bur. Am. Eth., Rep'ts, 1892, 1899.

Antler, uses of. The antlers of deer, moose and elk afforded a highly valued material for the aboriginal craftsman. From this material were made many tools and even ornaments. Among such objects may be named knife handles, digging blades, awls, punches, pitching tools, pins or plugs, war club points, arrowheads, spear points, combs, gambling buttons, wedges and spoons.

The aborigines understood a method of softening antler in order to reduce it more easily to a desired form, subsequently allowing it by some process to harden again. Partly worked antler objects, especially on Iroquoian sites, some of them relatively old, show that long shavings were cut from them. The marks of the sharp flint knife or scraper are plainly seen on others. One might suppose that these marks were caused by steel blades, did not experimentation by native methods show that identical marks can be produced by use of sharp flints. M. R. Harrington, who worked out this method as early as 1907, was moved to do so by finding long antler shavings in a refuse heap that yielded no sign of European contact.

Entire antlers were sometimes used by the Iroquois for the head ornaments of sachems, who, according to the ancient ritual, were "crowned with deer antlers."

Anvils. Anvils are usually slabs of hard rock or small flattened boulders, used as bases upon which other stones were broken or otherwise reduced. Many are found on all village sites and frequently in workshop and camp sites. Many large hammerstones show that they were also used as anvils. The backs of mortars and grinding or polishing stones also show abrasions.

In size, stones purposely shaped for flat anvils resemble metates but as any rock might have been employed as a base upon which to hammer other stones, an anvil might be of any size from that of a hammerstone to that of the largest boulder.

Anvils are seldom to be found in the amateur's collection, for the reason that they are not showy specimens. The scientific collector preserves them because of their cultural significance. They are a part of the tool kit of the aboriginal craftsman and specimens from every site should be preserved with as religious care as any of the finer specimens. It is impossible to reconstruct a vanished stone age culture unless we have a full complement of its artifacts. Perishable objects of skin and wood have rotted away. Every stone utensil is therefore of importance.

Argillite. A variety of slate. This term usually refers to Trenton argillite, a compact slate that is suitable for making chipped implements. In New York the area in which argillite implements have been found is limited to the coastal region, the Delaware and Susquehanna valleys and the lower basin of the Hudson. The material when found in the form of chipped implements is generally much weathered, having a chalky surface varying from deep red to purple or even a brownish black. On certain sites in the Delaware and Susquehanna valleys in New York and in other localities in New Jersey, chipped argillite implements are found to the exclusion of all other forms. All are old and greatly weathered, which with their exclusiveness gives rise to a theoretical "argillite culture." There is an argillite quarry, showing aboriginal working, at Point Pleasant, Pa.

Arrowheads, chipped stone. Arrow points of stone were generally small, few except long, slender types, being of a length greater than $1\frac{1}{2}$ inches. Heavier forms were used for other purposes than for bow-driven projectile points. The commonest error of the inexperienced collector is to call all chipped flints, regardless of size, arrowheads, but this is simply following erroneous precedents, a course by no means entirely avoided by many who are presumed to be experts. Arrowheads are made of all the varieties of stone that could be used, the material ranging from compact slate to obsidian. In New York the usual materials are hornstone, chert, yellow jasper, quartz, diabase, argillite, chalcedony and slate. To a considerable extent the material used governed the form of the finished implement. The more compact substances, like the better grades of chert, were the most useful, because of the better chipping qualities of the stone. Quartz, while it was a favorite material with the coastal people, was not so good a material as jasper or chert. The quartz point in general is thicker than one of chert. This is due to two reasons, the brittleness of the stone and the more obtuse chip. Some quartz points, however, due to the quality of the stone and the expertness of the workman, are thin and neatly formed.

While it is true that the material to a limited extent governed the finished forms of arrowheads, to a far greater extent the shape was governed by the desires of the makers of the points. Their first object was to produce a small, narrow point designed for puncturing and penetrating animal flesh. The point therefore must be sharp and its edges thin. Moreover the size of the point must be such that it would not be so heavy as to take away from the force of

the bow, or so large that when it reached its objective it would rebound or at most make only a bruise. Such bruising or stunning points as are found are blunt and evidently designed for killing or stunning birds or small mammals. The second object of the arrow point makers was to produce points of a certain style, the reasons for which they had in mind. Whatever may have been these reasons, we may only conjecture, but we do know that there are numerous forms and combinations of forms.

Fig. 48 Quartz blades in various stages of chipping and revealing the process of making an arrow point. From Long Island. $\times\frac{7}{8}$

In many sites the various types found are so distinctive that related sites elsewhere may be identified. By this and other means we are frequently able to trace the migrations of tribes; thus, if small triangular points prevail we may assume (in New York) that the Iroquois have occupied the site where the specimens were found. Fragments of decorated pottery would of course be strengthening evidence.

The numerous forms in which arrowheads were made make any attempt to describe all varieties a lengthy and difficult task. Not only

is there confusion as to how to classify forms but there is often no agreement as to parts described. One authority may arrange his forms by the blade point, another by the style of notching, and still another by some marked characteristic, as serration or beveling. Manifestly, for the purposes of description some standard should be applied. One of the best systems is that used by Thomas Wilson in his, "Arrow Points, Spearheads and Knives of Prehistoric Times." National Museum Report for 1897. (Consult also Moorehead, Stone Age; Beauchamp, Aboriginal Chipped Implements of New York, N. Y. State Mus. Bul. 16.)

Arrow shaft rubber. Among the rarer abrading tools are grooved sandstone cobbles or fragments of rock, having long grooves approximately the size of an arrow shaft. These implements are thought to be shaft rubbers and designed to smooth and polish arrow shafts or other spindles. These rubbers are always made of some gritty stone, useful as an abrasive. Some are of a size easily held in the hand, others heavy blocks though portable, and still others are large boulders.

Awls, bone. Long splinters of bone, and occasionally tubular bones, sharpened at one end (in some cases both ends) are termed *awls*. There are several types of awls, and types can be multiplied as various differences are thought to separate varieties. The general forms are:

- 1 Sharpened splinters, whether rough or polished, of various lengths from 1 to 10 inches or more. Some have rounded ends and many are highly polished by long usage. The splinter awls vary from blunt specimens in which the point starts from an abrupt angle, to points that taper gradually and are beautifully founded.

- 2 Shaped splinters that are entirely rounded, no angular lines remaining, these being quite rare.

- 3 Tubular awls with niblike points (like a pen point) and made from bird bones or the leg bones of certain small mammals.

- 4 Joint end awls, which as the name implies have the natural joint at the upper or handle end.

- 5 Jaw bone awls made from entire jaws or segments, sharpened on one end.

- 6 Engraved awls.

- 7 Perforated awls, etc.

Awls may be flat with flat, irregular or rounded edges, or they may be solid cylinders. They may be double ended, or have one end in

Plate 110

Bone and walrus ivory implements from Jefferson county. 3-4

1 to 4, from early Onondaga sites; 5, 7, 8, 9, 10, 11, 12 from very early refuse heaps near shores of Lake Ontario. 8 and 9 seem to be ivory. Specimens mostly from the R. D. Loveland Collection in the State Museum.

the form of a punch, scoop scraper or may be notched or perforated.

It would be idle to assert that awls were used solely for perforating skin or bark. Some may have been arrow points, some food sticks, some shuttles, some pegs for holding pieces of wood together or for driving into posts, some may have been piercing tools for punching holes in the nose or ears, some may have been spikes used on war clubs, and some used for corn huskers. The awl was probably used for every one of these purposes and others where a piercing instrument was required.

Awls are found made from bone, antler and walrus ivory. Those of ivory have been found in Jefferson county, particularly on early Algonkian and Eskimoan sites. Some are engraved.

Bone awls found in American Indian sites are similar to those found in the kitchen middens of England, Denmark, Belgium, France and Switzerland. The aborigines of each continent saw in bone a convenient material for tools, especially piercing instruments.

In New York bone awls have been found in refuse heaps, in shell heaps and in graves. When found in ash deposits the action of the ashes has been preservative and has kept the original high polish of the surface.

Collectors should use care not to feel the end of awls for fear of breaking them, and when placed in the cabinet they should be laid on some soft material, such as felt or sheet cotton. Never glue the specimen to a mount.

Axes. See grooved axes. Axes are cutting blades of stone (or very rarely of native copper) designed to be mounted on a handle. There are two general forms, the grooved axe and the ungrooved axe or hatchet.

Balls. Stone balls seem to have been originally massive hammers that had been battered into spherical shape. Many such are found in the upper Genesee valley. A peculiar form of stone ball found, so far as we have evidence, in the valley of the upper Hudson, is that having small opposed pits, as if to facilitate grasping between the thumb and forefinger. It is quite possible that some of these stone balls were used in playing games either on smooth ground or upon the ice.

Banner stones. The term *banner stone* is applied to a certain class of perforated (or notched and grooved) objects having a wing of hornlike extension from a grooved or perforated midrib. Finished forms are highly polished and show few if any signs of

Plate III

Banner stones from central New York. Otis M. Bigelow collection, State Museum.

usage. They are prehistoric objects and no definite use has been ascribed to them. The central perforation suggests that they were mounted on staffs or spindles giving rise to the name banner stones, alluding to a fancied similarity between them and the ornament on the end of a flag pole. Many writers refer to banner stones as "ceremonials" or "problematical forms."

The range of form of these objects is varied but in general nearly all conform to a general type, the extremes of which merge into forms similar either to flattened tubes or to boat stones. The usual types of the banner stones are: (1) bilunate, (2) bipennate, (3) palmate, (4) lunate, (5) picklike, (6) hornlike, (7) geniculate, (8) grooved ball. Each of these forms may be still further subdivided. The bipennate form, for example, has wings of many varieties. Some are rounded, some like the ends of knife blades, some like the flaring butt of an axe, some like a butterfly's wings, and some reel-shaped. There are other common types also.

The maker of a banner stone had some definite prototype in mind as well as a specific purpose for which to make it. For example, the horned type resembles buffalo horns laced together at the bases.

The materials from which banner stones were made are usually soft, easily worked stones as marble, steatite or slate. Banded slate seems to have been the favorite material. More rarely some harder stone is employed, as granite, syenite, compact sandstone or even quartz. When made of such materials the labor of shaping the wings and perforating the midrib was one of long duration. Many of these specimens yet in process are found throughout the banner stone area.

Possible uses. The varied forms in which the so-called banner stone is found suggest in a measure varied uses of this puzzling artifact. To the writer it seems probable that the pick or horned type, the thin-winged butterfly type and the elliptically pierced type may have been intended for distinct and separate purposes.

In many instances by examination it is found that the hole perforating the body of the banner stone tapers, as if for the insertion of a tapered rod. An examination of many broken specimens clearly indicates fracturing by internal pressure. Banner stones made for experimental purposes and broken by internal pressure within the socket show fracture lines identical with those of ancient specimens. Thus it seems reasonable to believe from the form of the stone and its perforation that banner stones were designed to be placed upon rods, spindles or shafts. By placing a banner stone upon a shaft

Plate 112

Bipennate banner stone from Sidney (W. E. Yager collection). Certain defects brought about the attempted reduction in size, indicated by the incision near the top. (Size $\times \frac{1}{4}$.)

and studying its poise and the use it suggests, we may arrive at some approximation of the actual purposes of the implement. In conducting our investigations, therefore, we placed a thin-winged banner stone on the rear end of a javelin shaft to see what effect this would produce. We found by experiment that an ordinary spear shaft headed with a sharpened flint does not fly with precision but rotates to a perceptible degree at the point of balance, causing both point and tail to describe circles, the circumference of which depends on the degree of rotation and the length of the shaft. Thus, a spear does not fly with absolute precision. To be of correct form for throwing we discovered that the shaft must have a certain taper. The taper offsets to a considerable degree the rotation of the extremes and has a well-defined mechanical effect on the shaft. A well-tapered rod can not be thrown small end foremost; if this is done it will turn in midair and proceed large end foremost.

Using a well-tapered shaft $5\frac{1}{2}$ feet long and $1\frac{1}{8}$ inches in diameter at the head and about one-half of an inch at the tail and placing a banner stone upon the tail, we conducted experiments in javelin throwing. It was found that the thin wings of the banner stone acted in a similar manner as the feathers do to an arrow. The javelin thus arranged could be thrown with greater precision, with greater poise and at least one-fourth farther, than a shaft without the banner stone. Although the banner stone consumed a certain amount of additional propulsive force, yet the advantage was so great through the addition of poise that the projecting force was not expended in keeping up the wabbling flight. Besides giving poise and adding distance the banner stone gives the additional advantage of greater weight, greater impact and greater speed.

It would seem that objects of so brittle a substance would not stand the use of throwing. The author, however, having made one of soft steatite threw it more than fifty times in an ordinary field with no breakage, except a slight one caused by the incomplete insertion of the shaft. When this breakage was sustained the stone was placed with the wide end forward, although the reverse seemed to be the proper method.

The banner stone thus employed on the spear shaft does not break because the shaft strikes the ground at an acute angle and if it does not strike into the ground it has but a slight distance to fall.

By placing a shorter shaft in the hole of a banner stone another experiment was conducted. The pick-shaped banner stone resembles in miniature the war club of the modern Sioux and it will be noted that many of these decorative clubs had comparatively slender handles. By pushing the spindle through the banner stone for some

distance so that 3 to 5 inches protruded we find by handling the arrangement that there is a tendency to whirl the shaft, the weight of the banner stone making the combination spin like a stem-heavy top. This gives rise to the idea of its use as a spindle whorl for fire making and drilling. In our experiments we used nearly every type of banner stone with equal success and all forms of drilling, were used including the pull string, strap bow and pump. The thin-winged forms were especially efficient, the air resistance giving weight and steadiness to the rotating shaft. This is so apparent that a pump drill worked on a smooth surface, in conjunction with a banner stone used as a fly-wheel, keeps the shaft rotating upon one point.

The use of the banner stone upon a spindle must have been apparent to the banner stone maker. A simple twist of the spindle would reveal its possibility as a whorl and with this discovery its use would be suggested. We can not see how the aborigine of the polished stone age could have neglected to employ the banner stone as our experiments suggest.

This subject leads us to inquire into the prototype of the banner stone and to discover the reason for its various forms. The wings of the artifact suggest in some ways the wings of a flying bird, other forms suggest the ears of an animal sewed together or maple seed pods, while still others plainly represent horns. Our knowledge of the Indians' veneration for the thunder bird and indeed their regard for the assumed magical qualities of birds, suggests the possibility that the banner stone wings were the heavy portion of an effigy designed to represent a bird, which was fastened to the spindle or shaft. The horned type of banner stone might represent the horns of a buffalo or some mythical monster that was believed to emit fire or to symbolize power. The horned type of banner stone in a considerable number of specimens has upon the surface at the center certain cross hatches or incised projections which suggest, to the writer at least, an attempt to represent horns laced, sewed or tied together. Any student of Indian mythology will quickly recall the many legends of horned monsters, especially serpents.

Among the uses of the banner stone heretofore suggested is the theory advanced by Frank H. Cushing, which describes the banner stone as used on the stem of a calumet to prevent it from tipping over when placed upon the ground. Within our experience we have not seen banner stones associated closely with pipes, although platform pipes are found many times on the same sites yielding banner stones. We have not learned, however, of a banner stone and pipe from a grave that would bear out this theory.

An interesting specimen in connection with this theory occurs in a highly decorated form of pipe in the State Museum collection. The pipe is of brass of European origin. About the bowl of the pipe extending from the neck-base upward is a large crescent-shaped object perhaps intended to be a moon effigy or more remotely a canoe, though the crescent is too thin to resemble one closely. On one side of the crescent is a figure of a man with an arm extended and holding a shaft having a weighted bottom. The pattern has been cut out and riveted on the crescent. In form this adjunct to the pipe somewhat resembles a banner stone, but we do not believe that the maker of this pipe was ever familiar with banner stones or knew of their actual use. This pipe of brass, which has a wooden core and stem, has an earlier prototype in certain forms of prehistoric Onondaga clay pipes the bowl of which is extended forward and backward to resemble a canoe.

Another use of the banner stone is that of a helmet ornament suggested by certain human figures embossed on sheet copper from mounds. There is some merit in this conjecture when a study is made of the elaborate head dresses of the mound-building period. The Sioux and other Indians within modern times have decorated their heads with horns and the Iroquois cap had a spool-shaped socket at the crown in which an upright feather was placed in such a manner that it would revolve.

Possible prototypes. In connection with our studies of the banner stone as a whorl we have examined the drill spindles of various races in several of the larger museums. We find that the headpiece of a drill spindle employed by the Eskimo, for example, resembles in certain ways the knobbed or blunt-ended banner stone of the horned type. The headpieces are rather more neatly made than the remaining portion of the drill among the Eskimo. The Eskimo top pieces are frequently carved of bone and have at their upper portion (that curve to fit the mouth) wooden projections which are used as handles and held in the teeth. On the lower side is the socket in which the top of the spindle is inserted. One of these headpieces worn through by long use and pushed down over the shaft would quickly suggest a new use. The possibility of wearing through is not remote because the holes were drilled in the bone to a considerable distance in order to prevent the slipping out of the spindle. Indeed to prevent the rapid wearing into the bone or ivory the Eskimo even recently mortised into the headpiece small pieces of rectangular stone into which the hole was drilled. Not all headpieces take a similar form and there is a large individual variation.

In general, however, the headpiece was curved upward so as to fit against the mouth, which gives a crescent or boat shape to many specimens.

The utility of such an object as a whorl, once discovered, would bring about many further variations and new outline motives would be employed. Dr George Byron Gordon in his study of banner stones suggests that certain forms were derived by the lines suggested by a whale's tail and we see no reason why this idea should not seem plausible though tails of other aquatic creatures may have been likewise copied.

Our conclusion is that the banner stone is a portion of a more complex utensil or ornament and was designed to be placed upon a shaft or spindle. The manner in which this was done and the purpose is suggested by the experiments described. We can by no means be certain that any of these suggested uses were employed, but likewise we can not positively say that none of them is valid, especially in the face of the presumptive evidence we have advanced.

Process of manufacture. In the State Museum collections are about twenty banner stones in the process of manufacture. We are able through an examination of these articles (specimens of which are found in almost every stage of the process of manufacture from the crude block of indeterminate form to the finely polished specimen) to describe in a measure the various stages in the making of banner stones. The unfinished forms are usually not of slate which was easily worked and quickly finished, but of compact shale, schist, sandstone or granite. The material out of which this series is made is tough rock not easily worked or perforated.

The first process, after a suitable material had been found, was to chip the implement into shape, outlining the wings and centrum. With the exception of the central bulb from which the wings expand and the indentation on the upward curve, all these heavier specimens in form are kidney or bean-shaped. The second process as indicated by our series was that of picking or pitting, the third process that of scouring or grinding and the fourth finishing the polish. A set of these specimens also indicates that the hole or perforation was started in the centrum on the upcurving side. Preparations for the perforation was also indicated on specimens which have merely been blocked out, by a picked-in indentation. It would seem therefore that the shaft which we postulate was placed in the centrum, was inserted first at this point. It may be possible that the shaft was sometimes placed in the unfinished specimen.

Incomplete banner stones have been found throughout the State from Lake Champlain region on the north to Staten island on the south and westward through the Mohawk valley to Chautauqua county. Other specimens are reported from the St Lawrence valley but a greater majority have been reported from the Finger Lakes region of central New York and from the valley of the Genesee and its tributaries.

Fig. 49 Bar amulet from Bigelow collection. Seneca river near Baldwinsville. $\times \frac{2}{3}$

Bar amulet. This name is applied to a polished bar of ornamental stone with a diagonal drilling from either end to the base. The body of a bar amulet is much like that of a bird stone, the bar having two tails instead of a head and a tail. The term *amulet* as applied to this article is only conjectural. No one knows that it is an amulet. For illustrations, see plates 24 and 113.

Fig. 50 Stone chisels or bar celts. 1. Unadilla; 2 Port Dickinson. $\times \frac{3}{4}$

Bar celt. A long shaft of slate or other compact stone edged on one or both ends as a cutting blade. The term *bar* describes the general appearance of the implement which, however, tapers from the middle to each end. Bar celts are generally rounded over the back and rather flat on the bottom; one end may be edged and one shaped like a blunt pick. In length they vary from about 10 to 20 inches. The material in most cases is compact black slate, though specimens of syenite, limestone and sandstone are found. Bar celts

occur in Tennessee, Ohio, Pennsylvania and New York. In New York at least two specimens have been found in Iroquois graves and others in Iroquois sites.

No use has been yet ascribed to the bar celt and its purpose is problematical. The long, flat underside may indicate that it was fastened to a piece of wood the same width and used as the spike of a warclub. (See plate 88, Fig. 4.)

Fig. 51 Banner stones of compact, hard rock, partially drilled, drilling is nearly always started on the wider portion

Beads, bone. Cylindrical sections of tubular bone, of various sizes and lengths, are termed bone beads. They are found in all stages of completion, from the initial incisions on the tubular bone, through specimens of partly cut beads, rough ended cylinders, and finally to fully polished forms. The smaller tubes having lengths of from one-half of an inch to 4 inches were probably strung as beads on necklaces. Larger tubes cut from heavier and flatter bones probably had other purposes. Deposits of ten to thirty of these have been found in graves. Some have been filled with pigments and others with black substances not possible to determine. Some of the smaller tubes also seem to have been used in other ways than as beads. Inquiry among the Seneca brought forth the information that polished bone tubes were used to hold certain medicines and greases and that medicine men would ceremonially select one, "put it in his mouth and swallow it to kill the disease of his patient."¹ The Ojibwa have a similar practice, related by Miss Densmore, in her work on Ojibwa music.

¹ Related by M. Shongo, a Seneca medicine man.

Bone beads are particularly numerous on Iroquois sites and literally hundreds have been found. The Museum has more than three hundred from the Richmond Mills site, Ontario county.

Bird stones. A certain class of polished slate and other stone objects, having in general a barlike body with an expanded and upward flaring tail and a neck projecting upward supporting a forward-pointing head, and having a perforated base. Occasionally there is only a neck and head rising from an ellipsoidal base. The body of the bar bodied bird stone is perforated diagonally from each end downward into the base. Certain forms have knoblike projections from the head to resemble eyes. Some bases are slightly curved inward and some have ridgelike transverse bars, as if they had fitted into slots.

Bird stones are usually made from banded slate or other attractive stone, but many other stones were used. Some specimens are made of hard rock. But of whatever material they are formed, all show careful workmanship and evidence that they were much esteemed. All finished specimens show a high polish.

Bird stones show much variation from the average bird form. They range from this, backward to simple bars with arched backs, and forward to specimens having either high, long necks and extended beaks or wide-flaring tails, or both these features. Some bird stones resemble floating ducks, other swimming beavers, but of whatever form they may be, all except the simple bars seem to resemble aquatic creatures.

Bird stones are found throughout New York State wherever there is evidence of the Algonkian or the mound occupation. None is found on Iroquoian sites.¹ The greater number have been found in the counties of Chautauqua, Cattaraugus, Erie, Ontario, Livingston, Yates, Cayuga, Seneca, Onondaga, Jefferson, Clinton, Warren, Saratoga, Montgomery. Some have been found along the upper waters of the Susquehanna and the Delaware. The area in which they are found is not large, few being found west of the Mississippi, except perhaps in eastern Missouri, just west of the mouth of the Ohio, few south of northern Alabama, and few east of the Appalachian range. For forms of bird stones, see plate 113.

Consult Moorehead, *Stone Ornaments*; Wilson, *Prehistoric Art* (National Mus. 1896); Beauchamp, *Polished Stone* (N. Y. State Mus. Bul. 18).

Possible uses. There is no known use of bird stones. The article suggests that it was fastened to some other object by means of

¹ Except intrusively.

Plate 113

Bird stones and bar amulets from central New York. Otis M. Bigelow collection, State Museum

thongs run through the holes that slant from the ends into the base. This object may have been a helmet or headdress; it may have been the wooden base of a roach spreader worn in the middle of the crest of hair. The bird stone may have been the body that supported a duck or other bird effigy on the stem of a calumet, it may have been a fetish used on bundles of arrows (a Navajo custom), or it may have been a canoe ornament (the Eskimo having a similar object made of bone). Again the bird stone may have been used in certain games as, for example, on a snow snake for an ornamental weight, or it may have been used on a float used as a fishing bob, to insure success in fishing. Another theory is that they were placed on canoe paddles.

Fig. 52 Bird stone of schist found by W. L. Stone, Saratoga. 2-3

One observation concerning bird stones is worthy of attention. The basal perforations and the transverse bars sometimes found indicate that the bird stone was fastened or tied to some thin object and that the thongs that fastened the object ran through the resting base, and under it. If a bird stone were tied to the cover of a birch bark box or to a thin section of wood or leather the method of fastening would at once be clear.

Schoolcraft thought bird stones were parts of the handles of knives and indeed they do bear a resemblance to certain Labrador forms made of wood.

Blades, bone. These are flat, smooth pieces of bone with rounded or spatulate ends. Many are highly polished as if they had been used in smoothing other articles. We saw a bone blade in the hands of a Seneca woman as late as 1912, and used as a porcupine quill flattener, the quills being used for embroidery. Some no doubt were potters' tools. Bone blades are more commonly Iroquois than Algonkian, though some have been found in Jefferson county on Algonkian sites. Some are engraved.

Boat stones. A name applied to perforated boat-shaped stones of polished slate or other soft stone. The perforations are placed in the middle of the object at a short distance apart (about an inch) and equidistant from the ends. The under side is more or less deeply

Plate 114

Bird stones. 1, from Ontario county; 2, from Allegany county. G. L. Tucker collection.

hollowed out varying from a slight depression to as complete an excavation as the stone would allow.

New York forms may be divided into three types: (1) the arch-backed bar more or less deeply excavated; (2) the hump-backed bar sometimes having a grooved ridge projecting above and between the perforations; (3) blunt or flat-ended canoe-shaped forms deeply hollowed and having the back bounded by a curved plane.

Boat stones are usually made of striped slate or some similar soft material. In the south some have been found made from steatite. Boat stones are associated with the gorget and banner stone culture, and are undoubtedly prehistoric. Specimens are fairly rare compared with banner stones, for example.

Uses. During the past few years several important boat stones have been discovered, which shed a certain amount of light upon the purpose for which these artifacts were intended. The excavations of Mr Clarence B. Moore along the Harpeth river resulted in the discovery of wooden ornaments like boat stones, which when placed together resembled milkweed pods. The pod was filled with a mass of fiber in which small pebbles were embedded. It has been thought that these pendants resembled milkweed pods and the fiber and pebbles the seed and seed-down. These wooden objects have been preserved by their copper coating.¹ A recent discovery was made by William C. Mills in the mound in Ross county, Ohio, of copper boat stones filled with pebbles. In conjunction with the podlike ornament found by Mr Moore, this might lead one to think that a boat stone was the remaining portion of a similar hollow or podlike pendant or rattle, the other portion of which had been wood or some other perishable substance.

Our conclusions regarding boat stones would be that they are the survivals of more complex arrangements of which the boat stone represents the only durable portion.

Bone, uses of.² Bone was an important and useful material to aboriginal man in New York, as well as elsewhere. It was comparatively easily worked and was suitable as a material for numerous implements. The bones of various animals and birds were used, particularly those of deer, elk, moose, bear, buffalo, duck, turkey, goose, heron and other large water birds. From the bones of the larger mammals there were made awls, spatulate blades, gouges, arrow points, pottery markers and stamps, harpoons, spearheads, fish hooks, needles, shuttles, spikes, phalangeal cones and other devices,

¹ See Moore, *Aboriginal Sites on the Tennessee River*, p. 263-65.

² Consult also Beauchamp, *New York State Mus. Bul.* 50.

and many other objects and ornaments as effigies, carvings of faces, dice etc. From the smaller birds and animals the long bones were taken and cut into tubes, tubular beads and other objects. Jaw bones, especially of the deer, were used for many purposes. A complete lower jaw with the teeth, but perhaps the hinge projection cut or broken off, was used as a corn cob scraper. (This fact was first published in Bulletin 144 of the State Museum, and subsequently copied without credit in many other archeological publications.) The toothless anterior portion of deer jaws was cut into beads, pendants, notched ornaments and even awls. Troughlike awls were cut from the bottoms of deer jaws. From the feet of wolves, dogs, foxes, bears, deer and other animals the two larger phalanges were used for parts of games, for cones, ornaments etc. The teeth of various animals were commonly used (see *Teeth*). Plate 96 shows some of the uses of bone.

Caches. The term cache is applied to places where implements of aboriginal manufacture have been stored or hidden. Caches are generally found in the ground beneath the surface, under Indian rock piles or in springs. Generally the only articles surviving storage are blades of unfinished flint implements, known as blank blades. In many cases they seem to have been covered with a pigment of red iron oxide, which still remains on the specimens when they are uncovered. From three to three hundred blades have been found in New York caches, and so constant are the few simple types that collectors recognize what they term "cache blades." They are usually leaf-shaped, or have the base straight.

Implements stored or secreted in the bottoms of springs or thrust into the earth above them may have been cached or given to the spirit of the spring as an offering. The finding of numerous articles of flint in springs has some unusual significance. By some authorities it is thought that flint and jasper blades were stored in the earth in order that their chipping qualities might not be impaired through loss of "quarry water," that is, the residual moisture. This might account for the storage in springs. In most cases cached blades are neatly piled in regular order, layer on layer. This indicates that time and care were expended in making the deposit.

The largest caches of flint blades have been discovered in Missouri, Arkansas and Ohio. One Missouri cache recently found contained innumerable blades of all sizes. The collection was literally hauled away in wagon loads. The first great cache recorded by archeologists is that found by Warren K. Moorehead near the Hope-well mounds in Ross county, Ohio. Buried in one heap there were 7382 large blank forms.

In New York interesting caches have been found in various localities. One was discovered by George Harris of Rochester near the bluffs on the west side of Irondequoit bay. There were several hundreds of leaf-shaped forms, with straight bases, all covered with a red pigment. Caches of jasper implements have been found along the Seneca river, on the Susquehanna near Oneonta, and on the west bank of the Hudson near Catskill. Caches of flints are reported from the Allegheny county forts, from Warsaw, Wyoming county, from Binghamton, from Dutchess county and from Saratoga county.

Collectors should take care to keep all cache blades together, preserve the pigment covering, if any, and before removing the blades from the hole where found, make accurate observations as to the depth of the deposit, the manner in which the implements are piled and the way any different kinds were grouped together. Groups of specimens found in caches are units and should be kept as such, none being given away, traded or sold.

Celts or hatchet heads. The term celt is derived either from the Latin *celtis* meaning a chisel, or from the Welsh *cellt* meaning a flint stone. Celts are ungrooved hatchet heads and in several instances have been found in the original handles, but it seems probable that some were used without hafting. Adzes, that is, celtlike blades with a flat under surface, are considered in another place.

Celts constitute an almost universal type of implements and are found in every region occupied by stone-age man. So similar in form are specimens from widely separated localities that it is difficult to distinguish certain universal types when the labels are concealed.

In New York State celts are particularly numerous and there are very few sites that yield artifacts that do not contain celts or parts of them. It thus appears they were a common and necessary part of the red man's tool and weapon outfit. With these utensils it was possible to cut soft wood, particularly if the wood had been charred by fire. Indeed it is thought that the chopping process was seldom accomplished without the aid of fire, the celt or hatchet being used to remove the burned wood and give a fresh surface for the flame. As a weapon the celt would serve admirably, but a little experimenting will show that a heavy club, particularly if spiked with a prong of antler or long point of flint, would be much more effective. Certain celt heads may have been used only in the hand and without handles, others may have been bark peelers, chisels and wedges. The term "skinning stones" is perhaps the poorest term that can be applied, but it is a widely known one and is probably used by the uninformed because hunters, farmers and some modern Indians

Types of celts, which occur in many forms. Onondaga county. Scale, $\frac{1}{2}$.

have found a polished celt or hatchet head convenient in removing the skin from an animal.

New York celts are found in numerous forms, lengths and weights. In general, however, they may be grouped in certain forms, each of which may be still further divided by longitudinal cross section. For example, a petaloid celt may be thin, normal, thick or bulbous. Again its outline may be bounded by flat, curved surfaces, beveled surfaces or rounded surfaces. The cutting edge may be acute or obtuse, curved or straight. The general forms of celts are shown in plate 115.

There are so many interesting features about these cutting blades that the celt is a subject for a considerable treatise. The celt reveals as well as any stone implement the craftsmanship of the aborigine, and it speaks as eloquently of his idea of form, symmetry and beauty of finish as it does of his idea of and need of a cutting or chopping implement. The celt suggests through the marks found upon it the manner of its manufacture and thus unlocks the door of the stone age workshops.

The block from which a hatchet, gouge or adz was made, was either a natural pebble of hard stone and suitable shape, or a large flake broken from a boulder or from a quarry ledge. This rough block was the first stage in the formation of a celt. The second process was to batter the rough block to the approximate form by chipping. When chipping could no longer continue the third process, that of picking or pitting, was commenced. This was done by two general methods; first, actual picking by sharp flints; second, by a continuous process of percussion, that is, battering with hammerstones. In this manner the surface of the stone became powdered and worn down. Actual experiment shows that a sharp blow breaks up the stone where struck leaving a pit filled with stone dust. The process is laborious but if worked at continuously need scarcely take a week. Few if any stone axes or hatchets were "the work of patient years." In the fourth stage the picking process is completed and the cutting edge of the celt is ground down with some abrasive. In the fifth stage the edge is polished. Many good and serviceable celts were regarded as complete in the fifth stage. The pitted surface no doubt was convenient for gripping by hand or by handle, and was thought decorative. The sixth stage finds the celt polished over its entire surface except perhaps its butt. Many of the finest specimens have unfinished butt ends.

Many celts are so well balanced that they rest upon a single point and curve in all directions.

Chalcedony. This mineralogical term embraces most of the varieties of tough, siliceous rock used for making chipped implements and includes flint chert, hornstone, jasper, agate, novaculite in part, onyx and carnelian. As a rule the terms employed by archeologists differ from those used by mineralogists, due to the necessity of describing certain forms of minerals found in implements. With archeologists, chalcedony is a light yellowish or cream-colored translucent variety of siliceous rock having a hornlike luster. It is similar to the archeologist's jasper but not of the same color. The mineralogist, however, will insist on another description. Chalcedony is formed by the infiltration of siliceous substances from fossil-bearing rocks, into dikes or cracks in the older rocks, or it may occur in nodules or layers in sedimentary rocks. The material found at Flint Ridge, Ohio, and used in the making of innumerable implements by the aborigines of that region, is called by archeologists chalcedony.

Chert. A variety of flint or chalcedony (*q.v.*), much used for making chipped implements. (See *Flint*.)

Chipped Stone Implements, Method of Manufacture. The most numerous articles in any considerable archeological collection, in our region at least, are those of chipped stone, popularly termed flint implements. Many of these implements are worthy of study and description.

To the uninformed a gracefully shaped and delicately chipped Indian arrowhead represents the product of a wonderful lost art. It seems almost impossible that the beautiful specimen could have been made by an Indian possessing only rude means of making anything. It is an erroneous idea, however, to suppose that the American who centuries ago made such an arrowhead was untutored or ignorant of the best possible tools needed for flint chipping. In many instances with the tools which we call rude he produced a better, finer specimen of stone chipping than could a modern lapidary with all his modern appliances.

Some hard-cutting material is a necessary adjunct to the progress of any people, primitive or enlightened. Since primitive man was not acquainted with the use of metal, it is natural that he should utilize stone, which was abundant everywhere. The use of sharp pieces of naturally broken stone probably led him to break stones, and using such pieces for cutting suggested other uses by modifying the form.

Early man in all probability used natural pebbles as throwing weapons, and natural clubs of wood for striking. His use of pieces

Plate 116

Chipped quartz from Long Island, showing the various stages in the manufacture of an arrow point

of wood for thrusting suggested the spear-shaft, and his experience with cutting stones suggested the spearhead, with which he could more easily kill game or provide himself with a weapon of defense or attack. The game killed required a knife for dressing it and sharp tools were necessary for scraping and cutting skins for garments. Cutting tools were also essential in shaping soft stone into pots, for making wooden vessels, for cutting trees, making bone implements and drilling holes. The pressing need of early man for so many things gave rise to the art of stone chipping.

Although many relics of the ancient American remain in the soil all about us, the ordinary observer passes by unnoticed the pottery fragment, or the bone implement, and picks from the ploughed field or water-washed bank the arrowhead which excites his greater admiration.

The first requisite for making a good chipped implement is appropriate material. The stone must be hard and have conchoidal fracture. It must chip at an acute angle to the medial plane of the mass. The less the angle, the more workable the stone. Flint or chert, quartz, jasper, chalcedony, obsidian, felsite and argillite are all types of stone having a conchoidal fracture.

To chip properly, the stone should be obtained from a moist place, such as the sea or lake shore, the damp earth, or from veins of rock below the surface exposure.

Large pebbles were used and larger masses quarried and broken into fragments. These fragments, chipped roughly into blank forms or "blades," were carried into camp for completion. Concerning the quarries of the ancient American, Dr W. H. Holmes, in "Arrows and Arrowmakers," the *American Anthropologist* for January 1891, says: "In Arkansas there are pits dug in solid rock — a heavy bedded novaculite — to a width of 25 feet or more. In Ohio and other states similar phenomena have been observed. In the District of Columbia extensive quarries were opened in gravel-bearing bluffs, and millions of quartzite and quartz boulders secured and worked. The extent of native quarrying has not until recently been realized. Such work has been considered beyond the capacity of savages, and when ancient pits were observed, they were usually attributed to gold hunters of early days, and in the south are still known as 'Spanish diggings.' From Maine to Oregon, from Alaska to Peru, hills and mountains are scarred with pits and trenches. The ancient methods of quarrying are not known, and up to the present time no tools have been discovered, save rude stone hammers, impro-

vised for the purpose. Picks of bones and pikes of wood were probably used."

Flint Ridge in Ohio and the Fort Erie, Ontario, quarries are fairly well known. I do not find, however, that any mention has been made of the numerous aboriginal "flint" quarries in Pennsylvania except by A. F. Berlin in Moorhead's "Prehistoric Implements," page 187. There are about two thousand such quarries alone in Lehigh and Berks counties, Pennsylvania. Specimens of the material from these quarries are to be found in the Wren collection of Wilkesbarre.

To determine how arrowheads and other chipped implements were made, it is only necessary to watch the process among modern Indians who still remember the art. There are also several good descriptions contained in books by travelers, among them Catlin. The Iroquois generally have forgotten the art and inquiries will bring but meager information. A few, however, remember the fundamental principles but the majority look upon an arrowhead or spearhead of flint with as much wonder as does the ordinary Yankee farmer.

In the description which follows I have combined previously known facts regarding the chipping of flintlike stones with other facts gleaned from a series of experiments conducted by myself under the direction of Prof. F. W. Putnam, in the American Museum of Natural History. These results were embodied in a paper which has never been published. Much of the description which follows later is taken from this paper. In the description of the various processes the reader must understand that where positive statements of methods are made that these methods were those used in experiments and are in accord with methods known to have been used.

The tools used in shaping arrowheads were few and simple, consisting merely of a stone hammer and a flaker. For larger implements a stone anvil, a pad of skins, and a pitching tool were used in addition. The flaker was one of the most important tools in the process and with it the most delicate work was done.

In making an arrowhead the arrow-maker chose, for instance, an oval pebble measuring approximately 4 inches in length, $2\frac{1}{2}$ inches in width and three-fourths of an inch thick. He held the pebble in his left hand, palm downward, the pebble projecting about an inch over his thumb. The hammer was held in his right hand, palm toward the left (see plate 117). He struck a quick, smart blow on the projecting edge of the pebble at the point indicated in the figure.

Method of flaking quartz or flint arrow points. With a hammerstone the pebble or large flake is roughly shaped, then with a bone flaker properly pushed or pressed against the edge, chips are flaked off and the point rapidly finished. A good point can be made in from 5 to 15 minutes.

A large chip flew off, starting at the point of percussion, and running on the under side, gradually thinning and widening as it progressed. This operation was repeated all around the stone. Then the chipped pebble was reversed. The chipping having been successful, the portion chipped away on one side of a surface met that on the other side of the same surface, and the edges became sharp. The flaker (plate 117) now came into requisition. It was a piece of deer antler, or perhaps of bone, as either would answer, and had a roughened surface. A point near the end of the flaker was pressed against the sharp edge of the stone so that the flaker was indented (see plate 117). The pressure of the flaker was against the stone and upward, while the stone was pressed against it and downward. A quick turn of the wrists inward and downward brought off a chip. In this way the arrow point was given definite outline. That bone or antler should be the chief instrument in flaking stone seems at first strange, and yet it was the most important factor in the process. An antler pitching tool was useful in taking off long flakes.

In the manufacture of a large spearhead, the pebble, which is too large to be easily held in the hand, was placed upon the pad of skins which rested upon the stone anvil, the object of this pad being to provide a yielding base; this also was one reason for holding the smaller stone in the hand. The notches in the arrow point were made by making a small chip at the proper place, reversing the blade, and chipping again until the notch was "eaten in." Large stone chips required only the use of the antler or bone flaker to transform them into shapely points. Often many hundred unfinished chipped blades were made and stored in the earth, afterward being dug up and flaked into any shape that necessity required. It was formerly believed that cache blades were buried for safety only, but it is now understood that they were also placed in the damp earth to absorb and retain the moisture that keeps the stone elastic and easy to flake.

It must not be supposed that the arrow-maker was successful in finishing every blade. Often a blow would cause an abrupt fracture or take off too large a chip. This all depended upon the character of the stone and the skill of the operator. Unsuccessful attempts were cast aside and are technically called "rejects." Many hundreds of these may be found on old Indian quarry and camp sites.

The usual chipped implements are the knife, spear point, arrow point, drill and scraper, each kind of implement varying in size and form. The drill is long and narrow, having rough but sharp edges, generally broad at its base, and was used to perforate soft stone, bone and wood. It was sharpened automatically, for as soon as an

edge became dulled the increased resistance caused the material that it was drilling to act as a flaker and compelled a flake to fly off, thereby giving a new edge. The scraper was made from a large chip, flaked so as to be bevelled on one side like a chisel. Many scrapers were made from broken arrow and spear points. It was sometimes fastened to a handle and used to scrape wood, bone and skin. The different forms of spearheads and knives and arrow points grade into one another, often making it impossible to name the exact use of a particular specimen. Perhaps they were used to a considerable extent interchangeably. Knives were of many forms, the chief characteristics being the finely bevelled, sharp-cutting edge. Some were made so as to fit into a handle and others to be held in the hand. The spear was much longer than the arrow point and designed to be fastened to a shaft. Spearheads or spear points were among the most beautiful specimens of the chipper's art. They have been found in abundance on sites of great antiquity, confirming the theory that the arrow point is more modern than the spear. The arrow point could be used only in conjunction with a throwing stick or with a bow, and there is every reason to believe that the arrow was evolved from the spear.

The arrowhead appears in as many varied forms as design and accident could create. It was made from stone, colored by all the hues nature produces — red, pink, yellow, blue, green, black and white — and often from quartz crystal. Different peoples to a certain extent had different styles and individuals often their own particular "brand." The arrowhead was made for all the varied uses to which a missile of its kind could be put. Special arrows were likely used for large and for small game, for birds, for fish and for war, but to venture to define these would be simply guess work. An ingenious device was the bevel head. The cross section of a bevel head is rhomboidal. For a long time it was thought that this form was but an accident in the method of flaking, but I am told that experiments made at the Smithsonian Institution are said to have shown that the bevel head flies with a rotary motion, so that it not only goes more directly, but on striking an object literally bores a hole into it. This seems to require further investigation, however. The "fishing point" is long, narrow and slender. It was designed to be shot into the water at the fish. The small points were made from small chippings with a small flaker. War points are thought to have been fastened loosely to the shaft so that they could not be pulled out of the flesh, even though the shaft were withdrawn. Blunt

arrowheads, or "bunts," were used to hit objects without penetrating them. Such bunts were often made of broken points reflaked.

The arrow has ceased to play an important part in hunting or warfare, the bullet having superseded it. The bullet, however, is the evolution of the arrowhead, its mission is the same, and the principle which governs it is the same. Ancient as well as modern man was aware that a small, heavy object, swiftly propelled, could go where a larger one thrown by hand could not go, and that it would do more damage.

From the hand spear to the arrow, after the bow was known, was but a step; then came the cross-bow and bolt; then the rude musket and bullet. The bullet, being heavier and propelled more swiftly, needed no shaft, nevertheless it is but an arrowhead in another form.

Choppers. In several New York localities, especially along the coast, elongated or oval flat pebbles with one edge chipped are found. The chipping is generally rough and may be on one or both sides of the stone. These objects are thought to be rude hatchets or hand choppers. On coastal sites they are usually made of quartz. Farther inland they are found made from a variety of materials, such as chert, limestone, compact slate, etc.

Collections. See Specimens.

Combs, antler. It has been stated that bone combs have no great antiquity, yet three-toothed and four-toothed bone combs have been found in several prehistoric Iroquois sites in New York. These articles are comblike, in the sense of having long heavy teeth, but they may have been hair or scalp lock ornaments rather than instruments for straightening out strands of hair. The earlier types are narrow and resemble coarse forks with long prongs and long bases. The base may be plain, incised or decorated by fretwork in the form of animals, birds or combinations. These early forms have been found in sites at Pompey, Cazenovia and Watertown in the Onondaga-Oneida area, at Richmond Mills in the Seneca area, and at Ripley in the Erie area. They seem to have been in use just before and immediately after the coming of Europeans. With the opening of the colonial era combs became more elaborate. Steel saws and knives made it possible to make more teeth and to carve more figures on the base. The differences in technic and finish between the combs of Richmond Mills and the Dann site at Honeoye Falls, or that of Boughton Hill, point out the changes that came to the Seneca through the introduction of steel tools. After the middle colonial period bone combs occur only rarely until with Sullivan's raid they became obsolete. (For illustrations, see plates 34,

Plate 118

Typical bone and antler articles found in Iroquoian sites in New York.

1 Early Iroquoian comb; 2 Seneca comb of early colonial period; 3 antler knife handle; 4 precontact Iroquoian comb of bone; 5 precontact Oneida knife handle; 6 antler doll or figurine; 7 Bone-scraping tool from precontact site. 1 to 6, x about $\frac{7}{8}$. 7, x about $\frac{1}{3}$.

35, 37, 118.) The relative frequency of bone combs in certain known sites is as follows:

PERIOD	SITE	NUMBER PER 1000	PER CENT	REMARKS
Prehistoric....	Burning Spring..	.....	....	No graves found
Prehistoric....	Richmond Mills.	3	.03	Not more than 3 or 4 teeth. Some simple animal and bird effigies. Perforation
Prehistoric....	Atwell's.....	2	.02	Not more than 3 or 4 teeth, long rounded tops with hole
Early colonial 1615.....	Ripley.....	1	.01	Plain, with 3 or 4 teeth
Midcolonial 1656?.....	Gus Warren, W. Bloomfield....	4	.04	From 5 to 10 teeth, complex animal effigies
Midcolonial 1656?.....	Silverheel's.....	4	.04	From 5 to 10 teeth, complex animal effigies
Late colonial..	Boughton Hill..	4	.04	Small sawed teeth, 8 to 35. Complex ornamentation, animal effigies in combina- tion
Late colonial..	Dann farm, Honeoye Falls.	12	.12	Of several forms. 10 to 35 finely sawn teeth. Effi- gies as above and conven- tional designs

Common errors. There is no branch of natural science concerning which there is so much guess work and so many false beliefs as American archeology. Many uninstructed persons have taken upon themselves the office of expounders of theories and even the makers of names. We are commonly told that arrowheads were chipped by the aid of fire, and we are likewise assured that hatchet heads are "skinning stones." The fault is not alone that of the farmer boy, for many persons in official positions have done crimes of guess work equally bad. Concerning Indians in general there are numerous erroneous ideas that for the sake of truth should be dispelled. We are able here to treat only of certain popular fallacies regarding archeological matters.

Arrowheads not chipped by fire. There is a widespread belief that the ingenious Indian in making his arrowheads or spears heated the flint and then dropped water on selected spots, thereby causing

flakes to fly off. It is possible that certain kinds of hard stone may be chipped in this manner but the whole process would be so difficult that not one out of a hundred attempts would be successful. Heat sufficient to cause chipping by the application of cold water will granulate the stone and destroy its conchoidal fracture. Flint baked in the fire will easily pulverize. The man who states that the fire and water process was possible ought to demonstrate it by producing one arrow point. While he is making one another person who knows that arrow points were chipped with small stone hammers and flaked with bone tools might produce from a dozen to one hundred points by way of demonstrating the method employed by Indians and other borigines, quite generally. (For methods, see Chipped implements).

Skinning stones. Ungrooved axes, celts or hatchet heads were designed to be mounted in handles and used for chopping. Specimens have been found mounted in handles, both in ancient deposits and in the possession of modern Indians. A few may have been intended for hand hatchets. The term "skinning stone" probably was applied by white hunters who found an Indian stone hatchet head, particularly a well-polished specimen, useful as a blade for pressing back the pelt of an animal in skinning it.

Tempered copper. The copper obtained by the Indians in ancient times was from nodules found in the drift or from layers of the metal found in seams of ore rock. It was pounded into shape on anvils of stone and beaten into form, in some instances at least, in wooden molds. To give greater malleability some aboriginal copper workers seem to have heated the metal. The finished article was rubbed on stones and in sand until the desired polish and the edge were achieved. Native copper implements are never "tempered"; that is to say, none possess a hardness equal to that of iron. There is no wonderful "lost art of tempering copper." No specimen of tempered copper made by Indians in precolonial times exists in any museum, and no person acquainted with metallurgy has ever seen such a specimen. The belief in "tempered copper" is a pure myth.

Mound builders. The builders of mounds were Indians whose descendants were still living at the period of colonization. Explorers in the Mississippi valley witnessed the erection of mounds. Nothing found in the mounds so far examined has revealed anything that the historic Indians did not have or could not make. The mound-building period ended at about the time of the coming of the

white man, though it is probable that the peoples who built the Ohio mounds and others of similar character had ceased this activity long before the era of white exploration because of the intrusions of warlike tribes. The erection of great mounds was necessarily a slow process and could be done only during times of prolonged peace. The mound-building tribes were probably branches of various stocks, among them the Muskhogean, the Iroquoian including the Cherokee, the Siouan and the Algonkian. Not every tribe in these stocks built mounds by any means. There were many cruder outer tribes.

Warfare. Every evidence of archeology shows that the pre-colonial Indians were more peaceful than warlike. The great preponderance of the implements found are those of industry and of hunting, and not of war. Such warfare as did exist was mostly in the nature of small raids only of local importance. There were, however, some great wars that affected large areas, but these were the exception. Indian methods of fighting their enemies were those of hunters stalking their prey.

Nomadism. One of the common fallacies of our school histories is that Indians were nomads, "always wandering from place to place." So far as environment permitted, to state the truth, Indians were not nomads, but sedentary. Each tribe had its known territory and its own fixed towns and villages. This is especially true of the Indians east of the Mississippi. It was only where the land was not suitable to agriculture that there was wandering. The city dweller today is a nomad for the same reason that the Indians of the plains and of the cold north were. The modern city dweller for the purpose of obtaining meat and vegetable food goes to the market sources of these foods, "wandering from place to place" to hunt what he desires. The Indian of the north and of the plains went out after buffalo meat and searched out the regions that produce edible seeds and roots, and was only a wanderer because the source of food supply was distant from his domicile. The plains Indians after the introduction of the horse wandered over the plains in search of the buffalo herds, but generally had fixed winter rendezvous. Some wandering and much warfare were caused after the European invasion by the shrinking of the hunting grounds and the loss of tribal territory. The coming of civilization and of Europeans paralyzed the development and progress of native culture and actually accelerated savagery for a long period of years. Sedentary tribes became wanderers because they were encroached upon. They became hunt-

ers instead of agriculturalists, as they originally were, because a market was provided for furs.

Tepees and wigwams. The eastern Indians did not live in the conical skin tepees used by the Indians of the plains region. All descriptions, pictures and sculptures showing our eastern Algonkian and Iroquoian people as tepee dwellers are incorrect. The dwellings of the eastern Indians were houses made of bark. Some of these houses were more than 150 feet in length and some housed from five to ten families. The term *wigwam* may be applied to the Indian bark house, and *tepee* to the skin tent. *Wigwam* is an Abenaki word; *teepee* or *tipi* is a Siouan word.

Work done by women. The idea that the eastern Indian woman did all the work of the tribe and of the family is erroneous. Indian women had certain prescribed duties; men had theirs. There was a distribution of labor by no means more unjust than exists at the present time in civilization. An untutored Indian coming from some secluded region might at the present time return to his tribe and state that white women do all the work and that all a man did was to leave his house after breakfast and sit all day smoking and looking at a book, now and then making black scratches on it. He would possibly state that the white man loved war and wandered afar to "make fight upon the lands across the big sea water," leaving his women to be machinists, car conductors, farmers, day laborers and voters. This untutored hypothetical Adario would misunderstand our economics as much as the white commentator misunderstands the economics of aboriginal life. As a matter of fact the Indian hunter and fisherman had no easy life. Early missionaries and explorers have frequently written of the Indian hunter's hardships. The men cleared the land, built the stockades, cut the trees, built the houses (which thereafter became the property of the women), procured the meat and skins, defended the village from wild beasts and did other heavy manual labor. The women planted the land, owned the houses, kept them clean, cooked the meat, dressed the hides, or most of them, and did other domestic duties. The division of labor was as equitable as the state of society and environment would permit. Indian women, like their civilized sisters today were, however, required to do as much work as they would.

Copper implements. Native copper implements are rather rare in New York, but there are localities where a considerable number have been found. New York native copper implements include awls, beads, pins, arrow points, spear points, celts, chisels, knives (?), ear

ornaments, adzes and digging tools. The largest number of coppers have been found in Chautauqua county, about Oneida lake, about Lake Champlain and in the Hudson valley near Catskill. Scattered specimens are quite likely to be found anywhere in the provinces of either the Algonkian or the mound-building people. In early days when the land at the west and northwest end of Oneida lake was cleared, farmers frequently sold native copper implements to local tin and coppersmiths. Perhaps fifty good specimens from this locality have found their way into collections. Otis Bigelow collected about twenty, all in the State Museum, some of which are shown in plate 119. Native copper implements seem to have come into this area by trade rather than by manufacture here. All bear evidence of having been hammered out and none are cast. Needless to say not a single native copper implement is "tempered," and, indeed, no aboriginal tempered copper exists in America; all statements to the contrary are pure myths. Examination proved that one specimen that was reputed to have scratched glass had a flake of dark quartz or flint inclosed by the metal at the point where it scratched the glass. It is interesting to note how the American natives had discovered the value of a ridged back to give strength. Nearly all their copper implements have this ridge as the middle line between the beveled planes. Provision for handling was made by three methods: by insertion in a slit, like an arrowhead; by a spiked projection, like a file neck; and by a flanged socket that allowed the handle to be driven in. Copper implements are far more numerous in Ohio, Michigan, Wisconsin, and in the states adjoining the Mississippi than in New York. It is doubtful if more than 250 copper implements and objects, not including separate beads, are to be found in all the New York collections.

Culture. By this term we mean the motives, habits of thought and the activities of a people, represented by what they produce along material and intellectual lines. The materials manufactured by a people represent their *material culture*.

In New York there are evidences of many forms of aboriginal culture, some of which we are unable to identify tribally. Others are recognized as Eskimolike, Algonkian, Mound Builder and Iroquois.

Cups. Stone cups or small mortars are rare in New York. A few have been found along the Hudson and down the Susquehanna.

Native copper objects from central New York localities as follows: 1, Clay; 2, Lysander; 3, Clay; 4, Granby;; 5, Lysander; 6, Seneca river; 7, Glens Falls; 8, Lysander; 9, Van Buren; 10, Glens Falls; 11, Lysander.

The State Museum has four specimens from the Hudson valley in the vicinity of Catskill. The two specimens shown in plate 120 are from the Thompson collection and came from sites near Hudson. The upper figure shows a perforation. The outside of the bowl near the rim has a series of incised patterns resembling bird tracks encircling it. It is not likely that these objects were used for drinking cups for they have little capacity. They rather suggest having been used for paint or medicine mortars.

Cups or dippers were sometimes made from large sea shells from which the columellae had been cut. Some of these have been found on Neuter sites in Western New York.

Cupstones. The term cupstone is applied to certain types of stones having one or more pits pecked or drilled on one surface. Usually these pits or depressions are concave, well made and nearly uniform in size. Certain specimens show a secondary drilling at the bottom of the depression. In a majority of instances cupstones are made from sandstone or other gritty rock.

No known use may be safely ascribed to them though they have some times been called nut stones or paint mortars, both probably erroneous as descriptive terms. A better theory would be that the depressions were used for rounding the ends of wooden knobs, for certainly nearly all cupstones are made of some abrasive rock.

Discoïd implements of stone and clay. Implements and ornaments of this kind have mostly been found in the Iroquois area. Thin segments of slate were worked by the Iroquois as discoïdal beads. Other specimens show no perforation and may have been used in games. Some are perforated as pendants. In the Iroquois areas in Jefferson county numerous disks of pottery are found evidently worked as game disks. The Iroquois still have games where similar dice are used. Plate 121 illustrates various discoïdal articles, all except number 3 being from Jefferson county. The unperforated disk comes from Plattsburg.

Disks, perforated. These vary from roughly chipped disks of sandstone or slate to carefully finished biconcaves. The rougher forms are larger and the holes seem to be picked into the central part of the object from either side until the septum broke through. Rougher forms have been found about Hemlock lake and one broken specimen, originally polished, came from the Owasco Lake site. Discoïdal beads of soft stone have been found in certain

1

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Small stone mortars or cups from the middle Hudson valley: 1, from Hudson; 2, from Catskill.

CERTAIN TYPES OF DISCOIDAL OBJECTS. $\times \frac{3}{4}$

1, red slate disks, Ontario co.; 2, steatite beads, Jefferson co.; 3, black stone disk, thick, Plattsburg; 4, 5, perforated disks, Watertown; 6, 8, 9, pottery disks, Watertown; 7, serpentine crescent, Watertown; 10, 11, 12, plain pottery disks, Watertown. 12 is tempered with pulverized shell.

localities, as about Oneida lake. Some discoidal beads are Iroquoian, and many have been found in Jefferson county. (See Stone beads, biconcave disks.)

Fig. 53 Notebook sketch of limestone disk found at outlet of Honeoye lake by H. C. Follett

Engraved articles. Some articles of stone, bone, antler and shell are engraved with various designs, some of them no doubt being hieroglyphic or symbolic. Articles incised in decorative designs are by far the more common, those containing symbolic figures being relatively rare. Pottery is occasionally engraved, especially fragments. One specimen from the Shinnecock Hills site had an engraved representation of a thunder bird. Slate articles, particularly gorgets, occasionally have engraved designs, but all such objects must be carefully inspected to see whether or not the engraving is aboriginal. The lines should show a weathering similar to that of the surface of the stone. Sharp flints were capable of making fine incisions but care should be taken to see that such lines were not made with the tip of a steel knife blade. The engraved gorget shown in plate 122 is from the vicinity of Afton lake and shows

Certain incised and decorated polished stone objects. $\times\frac{3}{4}$. Birdstone from Cold Spring, Oneonta. Implement shaped like a stamp with triangle engraved on lower side, Onondaga co. Broken pipe with inscriptions, Jefferson co. Stone disk, concave, from Oneonta. Engraved gorget from West Davenport. W. E. Yager collection.

typical decorative scratching. The pipe shows a rarer form of engraving and the figures may be symbolic as well as decorative. With the advent of European tools many aboriginal articles were carved and engraved. This is particularly true of shell ornaments, many of which were cut and carved with metal implements. So far as engraving and "picture-writing" is concerned, the native peoples of this region seemed to prefer wood and other more easily worked material.

Fig. 54 Engraved pipe bowl found by W. T. Fenton at Connewango. $\times 7/8$

European contact. The coming of white men from Europe to the New York area shortly after the opening of the seventeenth century wrought a considerable change in the culture of the Indians. Hitherto they had utilized the simple materials found about them to satisfy their simpler needs. They labored long with flint tools to carve their utensils and weapons; their game was killed with club, spear or arrow. They had no easy means to accomplish anything that required change of form; life was a hardship best endured by him who complained least and was best aware of his resources. At the same time the more vital needs were jealously guarded both by rational means and by use of charms and ceremonies.

The coming of the European caused a cultural upheaval among the American natives, and they saw themselves poorly equipped in many material things, to compete with the pale visitor. The white man valued speed and had sought the means to attain it. He rode horseback and outdistanced his swiftest human pursuer who had none; he had guns and powder — a terrifying means of killing his foe, and even animals.

But what was of more immediate value was his steel axe and knife. With these trees could be felled and he could hew, cut and carve. The finest flint tool was a clumsy, inefficient com-

petitor of a steel implement. The white man also brought brass kettles, steel scissors, awls of iron, sheet metal and wire. He brought a new fabric that he called cloth, and he had blankets, coats and trousers made of it. All these things and many shining trinkets, as chains, beads, thimbles and mirrors, the white man was eager to trade for such simple natural things as beaver pelts. The red man was eager to get these wonderful, convenient articles. To obtain them the red man became more and more a hunter and trapper. Gradually he gave up his stone tools, his skin mantle, his clay kettles and his bone awls. The white man's things were better. Thus the red man became a trader always giving great quantities of raw material for a small amount of manufactured goods. Soon the red man was a dire dependent using material he did not produce and in whose making he had no part. He draped the white man's shirt over his shoulders and hung its lower flaps over his leggins, but he was not a white man; he shot a white man's gun and cut his food with a white man's knife and cooked it in a white man's kettle; yet he was only a barbarian who did not make what he used so constantly. In this manner the Indian's material culture faded away and the white man's supplanted it. The entire process can be traced on the village sites of the New York Indians.

If we were to moralize from this we should write an essay on methods of civilization and point out that to truly civilize a people immediate commercial motives must not dominate the purposes of contact with undeveloped races. If we wish to impart our civilization to them, the effective methods would be to show the native the greater efficiency of our tools and goods and then teach him how to make them.

Excavations. For methods, read "The Ripley Erie Site."¹ The amateur archeologist should not open graves without completely exposing the skeleton and leaving all relics in place until a detailed record and photographs can be made. The position of objects with relation to the skeleton is important. Refuse pits and ash heaps should be charted and a record made of all objects from each pit. Maps should be made showing the location of each pit or grave, and all other features of importance.

Faces, human. Effigies of the human face in stone have been found in various localities, particularly along the Delaware and the Susquehanna and their tributaries. These vary from specimens that merely suggest a face by three depressions, to carvings that are

¹ N. Y. State Mus. Bul. 117.

fairly good representations. In size these face stones vary from discoid pebbles with a diameter of 3 inches to carved blocks of stone 8 or 10 inches in length. The frequency of stone faces in the southern tier of counties may be accounted for by remembering that the Delaware Indians who occupied this region used stone faces, called *mising*, in some of their ceremonies. Effigies of human faces were carved on the posts of their council houses.

Fig. 55 Stone face from Chemung county

The Iroquois made some small maskettes in stone, particularly catlinite, but their largest and best carved effigies were their wooden masks, which were used in various ceremonies, both public and secret. Catlinite maskettes have been found in certain Onondaga and Seneca sites. Metallic eye rings of wooden faces are sometimes found. They are flat disks of brass or copper with the centers cut out.

Bone faces were carved by the Iroquois, particularly by the Seneca. These faces were sometimes made from some animal's patella or from other bone or carved like maskettes from antler. There have been several bone and antler faces found in graves in Ontario and Livingston counties. All are small, none being more than 2 inches in length. Bone faces among the Iroquois belong to the early colonial and midcolonial periods.

Human faces modeled in clay and baked are found on both the pipes and pots of the Iroquois tribes in New York. The modeling of faces on pipes is particularly interesting and in many cases is exceedingly well done, revealing the work of skilful hands and eyes. Faces are particularly fine on certain prehistoric clay pipes. Faces on Iroquois pipes are found in some of the earliest as well as in some of the most recent sites of Iroquoian occupation in New York. (See Pipes and also Stone faces in the description of the Algonkian occupation.) (See also plate 11.)

Firestones. A name applied to pebbles or cobbles that have been heated in fires and used for immersion in bark or skin receptacles containing water and food. By the continuous process of putting in hot stones and taking out the stones when cooled, food was cooked without placing the containing vessel directly over the source of the heat. Some firestones were used in sweat lodges. They were heated and drawn inside the small dome-shaped structure, when water was poured upon them, the steam arose and soon the sweat lodge was filled with hot steam. Cooking stones are commonly found on village sites; some are cracked and granulated. Firestones used in making the steam are commonly found along streams and lakes. Many times a flood that denudes the shore for a few inches will reveal them clustered together in their original position.

Fishhooks, bone. Bone and antler fishhooks are among the rarer of aboriginal artifacts. They are of various forms and sizes, but all have the hook shape. Some being barbed and others plain. Fishhooks occur both in prehistoric Algonkian and Iroquoian sites, but these older specimens are seldom barbed. Some hooks have a smooth stem, others are knobbed to afford a better grasp for the line. Fishhooks have been found on Algonkian sites on Long Island, as at Sag Harbor, and on Oneida lake, especially near Brewerton. On Iroquoian sites they have been found in considerable numbers, especially in the Pompey forts, the Atwell fort (see page 590), the Shelby

fort, the Buffam site, Buffalo, the Richmond Mills site and in various Jefferson county sites, especially near Watertown.

Barbed hooks in some places appear just before the era of the white man, as at the Atwell site, Onondaga county, near the Madison county line.

Hooks are found in the above-mentioned sites in all stages of manufacture. It appears that the Indians in making them first cut off a section of flat bone or a long segment of a cylindrical bone, and drilled a hole the width of the inner part of the hook at each end. Then by careful incision they worked away the bone between the holes, making a long link rounded at either end and straight on each side. Then up from the curve of each end the bone was severed, making two hooks which were afterward sharpened.

A complete series was found by Alvin H. Dewey at the Richmond Mills. Some fishhooks have heavy bottoms perhaps for the double purpose of strengthening the hook and for attracting fish. Many of this type claimed from the Pompey sites are spurious.

Consult Beauchamp, N. Y. State Mus. Bul. 50, Horn and Bone Implements; Rau, Smithsonian Contrib. 25, Prehistoric Fishing.

Flaking tool. A flaking tool is a fragment of bone or antler from 1 to 6 inches in length used for pressing against the edge of a piece of broken flint for the purpose of still further reducing it to a desired shape. Flakers show the marks on one or both ends, of their contact with flint blades. Long flakers might be used without handles but if specimens used by Indian tribes in historic times are any guide, all were securely fastened to bone or wooden handles to afford a stronger grip and greater pressure.

Flint. A variety of translucent chalcedony that occurs in the form of nodules in chalk or limestone. In color it is dark gray, brown and black, varying according to locality and the coloring matter that it contains. In substance it is composed of silica and the siliceous residue of fossil sponges and radiolarians. True flint is very rare in North America and occurs mainly in Arkansas and Texas. Flint is found in abundance in the chalk and limestone regions of England, France, Belgium and in other places along the northwest European coast. Flint, so called, was used by the aborigines of both hemispheres for making chipped implements.

Fossils. Fossils are frequently found on Indian sites and in such places as to indicate that they were collected by the aborigines. Some are worked as ornaments, as stamps or as pipes. The Iroquois in

particular were fond of fossils as ornaments and sometimes placed them in graves. Some modern Seneca collect them by the basketful to put in graves, as among the Seneca of Newtown, Cattaraugus reservation. Mr G. L. Tucker has in the Buffalo Consistory Museum a fine specimen of a large *Spirifer* drilled out as a pipe. He found it on the Iroquois fort at Belmont, Allegany county. A seal pendant

Fig. 56 Objects made from fossils. 1 is apparently a stamp and comes from Broome county; 2 is a pipe made from a fossil *Spirifer* and was found by G. L. Tucker at Belmont. x1

containing a fossil crinoid stem in the Willard Yager collection at Oneonta came from Port Dickinson. Segments of crinoid stems are sometimes found used as beads.

Frauds. Every student of archeology will sooner or later come across fraudulent specimens. They may either be in private collections or offered for sale by a pretended finder. Stone articles as gorgets and pipes seem to be favorites with counterfeiters. A few dealers have made articles of bone. An experienced eye will soon detect faked specimens. The faker generally forgets one or more essential points, or makes his fabrication with some inconsistent feature. Nearly all the various means used to age bone or stone artificially may be detected and the marks of steel tools may be seen with a magnifying glass. Dyes and stains will wash off when the specimen is put in boiling water. Every suspected specimen should be washed in pure hot water as a preliminary test.

It is needless to say that the maker of a fraud of this kind commits a greater moral crime than the counterfeiter of money; for the latter simply imitates a substance that affects knowledge only slightly, while the maker of a fraudulent archeological specimen sets

the seeker of truth far astray and may, if he is successful, delay or prevent the correct alignment of facts that lead to the solution of some important problem. There should be severe penalties for forgery of this kind; indeed, some states make it a criminal offense.

Honest collectors should seek out the sources of frauds and report them to a responsible museum or archeological association. Everything should be done to learn where the frauds were sold, who has them, and pains taken to inform the owners.

Gorgetts. Gorgets are generally thin tablets of stone well formed and polished, and pierced by one or more perforations. This gives to them the descriptive term, "pierced tablets."

The area in which gorgets are found in the United States and Canada nearly coincides with that of the banner stone. In New York gorgets have been found in nearly every part of the State showing any considerable signs of Algonkian or mound-builder occupation. None is found on Iroquoian sites. Some have been found in graves of the polished slate culture, but most have been picked up upon the surface. Some have been found in fragments and others complete, in refuse heaps.

Gorgetts are generally made of some variety of compact ornamental slate, but there are many specimens made of monochrome slate, of shale, sandstone, and even shell. The form of gorgets varies considerably and indeed there are several distinct types, ranging from specimens that seem to be pendants having one hole, to tablet forms having three or more. The outline varies from natural ovoid pebbles through rectangular shuttle-shaped, spatulate, incurved sides to segments of arcs and outcurved sides. The State Museum has many interesting specimens from nearly all parts of the State. (See plate 123.)

Several uses have been suggested for the pierced tablets or gorgets and indeed it is quite likely that these tablets, varying in outline and position of perforation, did have varied uses according to type. Supplementing the theories already on record we wish to record one which had its origin in our investigations among the Canadian Delaware in 1910. Inquiry led to the statement that the Delaware at an early historic period had used gorgets as hair ornaments employing them as roach spreaders, the married women using them as fasteners for a single braid of hair which was looped up. Lewis H. Morgan in 1850 collected a gorgetlike implement made of wood covered with buckskin. This article he found among the Canadian Indians of the Six Nations' reservation. The label states that

Tablet gorgets of various types $\times \frac{2}{3}$

it is a hair ornament. A photograph of an Indian girl with this object placed on her looped braid indicates the manner of its use. We have no certain knowledge that an article of this kind was used upon the natural or artificial crests of hair effected by some Indians, but its use for this purpose in view of our information is entitled to some credence. Our belief, however, is that not all gorgets were used for this purpose.

Amateur archeologists are fond of speculating upon the so-called "problematical" objects and by their very speculations imagine uses for things that are far from the true purposes. Gorgets are one of the favorite subjects for speculation. A sensible view is to consider them simply ornamental fastenings, as a large button might be. Some might thus have been used as roach spreaders, similar to those used by the Shoshoni, who had them of bone, or they may have been used on dance bustles, pouches, on a shirt or shield. In their varied forms undoubtedly they had several uses.

Gouges. Gouges are adzlike blades having a curved cutting edge at the terminus of a scoop or trough. This permits a method of use not possible with a celt or adz. Gouges in general are shaped like adzes and have one side (that on which the scoop or trough is placed) flat, the other side being rounded or beveled up into a back. Like all such cutting blades, sizes and forms differ according to the material and purpose intended. The trough has several variations and subvariations. Its form may be approximated in the following:

- 1 Short scoop, (*a*) shallow, (*b*) medium, (*c*) deep
- 2 Long scoop, (*a*) shallow, (*b*) medium, (*c*) deep
- 3 Trough scoop *A* (*a*) shallow, (*b*) medium, (*c*) deep
B (*d*) broad and tapering toward butt, with
depths (*a*), (*b*), (*c*), as above
C (*e*) narrow and tapering towards butt
- 4 Flat scoops, either as in 1, 2, or 3

The backs of gouges may be (1) flat, (2) beveled, (3) rounded, (4) humped, (5) knobbed, (6) grooved.

Gouges vary from specimens 2 inches in length to those of a foot or more. The degree of finish and the polish differ as do celts and adzes. Some specimens are highly polished and show little or no evidence of wear; others show the picking process and are polished only in the scoop or trough.

Gouges are not widely distributed and good specimens may be considered rare. Few occur in the south, though there are southern

Certain types of New York gouges. $\times\frac{1}{2}$. 1, Lysander; 2, polished slate gouge, Clay; 3, knobbed back gouge of tough stone, Glens Falls; 4, small gouge with two grooves on back; 5, scoop mouth gouge, Ticonderoga; 6, combination adz and gouge, from Schoharie.

forms made of hard shell. Specimens are uncommon west of the Alleghenies, but relatively frequent in New England, Quebec, Ontario, New York and Pennsylvania.

Gouges may have been hafted as adzes and used as working tools for hollowing out wooden utensils (by aid of the charring process), as mortars, bowls, masks and like objects. Some may have been used in the hand only, and without handles. Some early writers suggest their use as sap-spikes or spouts, but unless they had some ceremonial value, we can not see why a wooden tube would not have better served the purpose.

Gouges are found in nearly all parts of the State, particularly where Algonkian evidences are to be found. In Oswego county one was found in a grave with a pendant gorget. On other sites they have been found associated with grooved axes, adzes, beveled celts, plummets, slate knives and steatite pottery. None is found on Iroquoian sites. (See Celts, Adzes).

Consult Handbook 30, B. A. Eth.; Fowke in 13th Annual Rep't B. A. Eth.; Moorehead, Prehistoric Impl.; Fowke, Arch. Hist. Ohio; Willoughby in Prehistoric Burial Places in Maine; Peabody Museum Papers, Cambridge, v. 1, no. 6; Beauchamp in N. Y. State Mus. Bul. 18.

Grinding stones. Stones used for grinding other stones are frequently present on sites of aboriginal occupation, but very few collectors have taken the trouble to collect and to study them. There are several types of grinding stones, each suitable for some specific purpose. Some flat slabs of sandstone have depressed surfaces, or long shallow grooves that appear to have been used with sand and water for polishing celts or other similar implements. A number of grinding stones of this kind have been found on certain Iroquois sites. It is quite probable that numerous gritty stones were used in polishing the large number of implements made and used, but most of these abrasive stones probably show few signs of work that would distinguish them from those only weathered or waterworn. Another type of grinding stone has a flat surface incised by flint cuts. These seem to have been used for grinding bone implements, as bone awls. A third type is found in certain long, flat pebbles having curved outlines. Many such stones are sometimes found together on sites or in graves. They are gritty and some show signs of having been worn down on one end.

The importance of good grinding stones and other abrasives was fully known to and appreciated by the aborigines. To them abrad-

ing stones and abrasive sands were most important to their industries. Without them many articles of bone and wood, not to mention implements and ornaments of stone, would have been the more difficult to make and polish.

Grooved axes. The grooved axe is a widely distributed North American implement having a great variety of forms. It is fairly rare in New York State. The average form is a thick wedge having a groove encircling it at a point about two-thirds the length from the sharpened edge. The butt end is usually thick, wide and heavy, and the bitt in the greater number of forms, the narrowest part of the implement. Certain other forms have a wide blade. The groove in most New York forms is at right angles to the long axis, but a few forms occur where the groove slants at a more acute angle. The material out of which grooved axes are made is almost without exception some hard tough rock, as granite, syenite, quartzite, green stone, tough limestone or trap. Some specimens are of hard shale or sandstone. There is a considerable range in size and weight, some specimens in New York weighing nearly 10 pounds while others are as light as 4 ounces. The average weight of specimens ranges from 1 to 7 pounds. The groove in most specimens completely encircles the axe but in others one narrow side is without it and has a flattened place instead. This was the point upon which the handle rested. Certain forms have a simple groove which is merely a depressed channel surrounding or partly surrounding the axe; other specimens have heavy ridges bounding the groove.

The outline of axe forms varies considerably, as shown in plate 125. Finely finished specimens are found in all these forms.

Most grooved axes have only a rough finish and still show the marks of the battering hammer that pounded them to shape. A few specimens have a polish but even the most highly polished have the groove left in a roughened state to afford a better hold of the handle binding.

See also Notched axes, Celts, Gouges, Adzes, and Grooved axes under the Algonkian occupation, pages 60-62.

Grooved club heads. These implements are among the rarer forms of tools and weapons. They vary from natural pebbles that have been grooved to beautifully formed and polished ovate stones with carefully ground grooves. Some specimens appear to have been reworked from grooved axes. Some show no abrasions, as if they had been ceremonial clubs, while others by their battered ends

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Types of New York grooved axes. $x\frac{1}{2}$. 1, Irving, Chautauqua co.; 2, Versailles, Cattaraugus co.; 3, Mount Morris; 4, Ticonderoga.

have plainly been hammerheads or mauls. Plate 126 shows a few selected types from the State Museum collection.

Hammerstones. Worked stones, designated hammerstones, are found throughout New York State on sites of former Indian occupation. They are similar in size and generally in shape to such stones from the surrounding area, as in Canada, New England and Pennsylvania. The battered edges of many of these worked stones suggest their use-name, hammerstones. Many, however, though having opposed cavities or pits, for "grasping between the thumb and forefinger" have edges showing only the unaltered natural rind.

Hammerstones are usually made from natural pebbles of a size convenient to be held in the hand. They vary in weight from 2 ounces in certain small specimens to 3 or 4 pounds in the largest. The stones chosen are in most cases natural discoid pebbles of granite, quartz, compact limestone or other hard and tough rock.

Hammerstones may be divided into several types:

- 1 Naturally discoidal pebbles, having
 - a* battered edges
 - b* centrally placed pits on either side, but not battered edges
 - c* opposed pits and battered edges
- 2 Natural cobbles or pebbles of thick and irregular shape having battered edges and opposite pits. These have two sides more or less flattened.
- 3 Discoidal hammers carefully worked to shape having evenly battered rims, smooth surfaces and neatly made pits.
 - a* In one form one surface seems to have been a muller. This form grades into the muller, biconcave disk and smooth discoid.
- 4 Polygonal hammers of irregular shape having many faces. These are usually of the hardest varieties of rock as quartz, chert, granite, limestone, diabase etc. In most instances they are smaller in diameter than the discoidal pitted forms and of a shape that roughly fits the hollow of the palms. These chunky hammers are frequently so battered that they become either (*a*) worn down into small irregular masses, or (*b*) by careful handling, purposely worked into spheroids, which become the fifth form.
- 5 Ball-shaped hammers apparently purposely shaped so for other purposes than battering stones. It is possible that some of the finer forms were used as club heads held in tight rawhide envelops or that others may have been balls used in games, or that they were used as special hammers for cracking marrow bones.

Grooved maul or club heads from N. Y. localities. $\times\frac{1}{2}$. 1, wide groove, from Livonia, Livingston co.; 2, battered face, Seneca river; 3, rough grooved pebble of granite, Horse Heads; 4, grooved axe battered down as a hammer, Delaware co.; 5, highly polished grooved ovate club head, Bergen, Genesee co.; 6, grooved pebble, Chemung co.

6 Grooved hammers, in the form of elongated stones nicely worked with grooves for hafting. This form is rare in New York State and specimens are usually small. They resemble thick grooved axes but of course have no edge. Both butt and face show use, but principally the face.

7 Celt or adz forms made either from celts or adzs that had the cutting edges accidentally broken, or purposely battered by use as hammer faces. Most celt forms found in this State seem to have been made after the edge had been dulled or broken, but oddly enough beveled adzes used as hammers are particularly numerous. Some were used to such an extent that only enough remained to hold to the handle binding.

8 Pestle hammers in the form of long heads purposely shaped from hard stone or made from long pebbles of more or less cylindrical or elliptical cross section, are sometimes found. The roughened and scarred ends of these hammers indicate their usage for pounding or breaking stone, and not grain or other soft substances. In length the pestle hammer is not more than 6 inches and may be as short as 3. Some of them appear to have been hafted.

Hammerstones are found in quantities on all Iroquoian sites and only in a slightly lesser degree upon those of Algonkian origin. Hundreds, for example, were picked up on the Richmond Mills prehistoric Iroquoian site. Mr Dewey enumerated 265 actually known to have been found there. Mr Luther picked up 300 on the prehistoric Algonkian site near Naples, Ontario county. Wherever hammerstones are found mullers will be found and also shallow metates and anvil stones. Pitted hammerstones are the most abundant. These may have from two to four pits on each opposite side. Pits are sometimes picked in with sharp flints, bruised in by concussion, or more rarely drilled in neatly. Drilled forms occur in the Chenango valley and the ball form most commonly in the Genesee valley and the upper Hudson.

Hammerstones seem to have been used for pounding stone, for cracking nuts and marrowbones, and indeed for any purpose that they would serve. Those that show no bruises may have been housewives' utensils used for cracking bones, rubbing hides, or perhaps for firestones used in heating water or soup. Hammerstones that plainly show their use against stone were undoubtedly employed for reducing other implements, as celts, to form. By continuous impact upon another stone the surface flakes off where struck and the implement in process gradually takes form.

Types of New York hammerstones. $\times\frac{1}{2}$. 1, compact limestone, Richmond Mill; 2, quartzite, Richmond Mills; 3, Ashland, Chemung co.; 4, drilled pits, Mount Upton; 5, chert, Lansingburg; 6, limestone, Painted Post.

Fig. 57 Antler harpoon from Brewerton. $\times \frac{2}{3}$

Harpoons, bone and antler. In this area bone harpoons are relatively numerous in early Iroquois and Algonkian sites. They are made from splinters of bone ranging from 4 to 12 inches in length, and are found in five general types; those with (1) one barb near the point, (2) double barb near the point, (3) unilateral — several barbs on one side, (4) bilateral — several barbs on each side, (5) barbs on both ends — double-ended harpoons.

Many harpoons have been found in sites along the east shore of Ontario, along the St Lawrence, along Lake Champlain, about Oneida lake and in various Iroquois sites, as at Richmond Mills, Atwells, Garoga, Clifton Springs.

Hematite. A variety of iron ore, generally dark red or black in appearance, which while heavy is relatively soft. This material was used by the aborigines for a number of purposes, but principally for its value as a pigment and for material out of which to make implements. Hematite occurs in masses in the region of iron mines, and elsewhere it is found in nodules and small boulders. Rubbed on rough stone a red powder is formed. This was much used by the Indians who rubbed lumps of hematite into various forms, as pyramids and hemispheres. Certain implements were made of hematite, such as plummets, small celts, grooved axes. These articles are polished a lustrous black.

Hoes, stone. Chopping or digging implements made from pieces of shaly rock, slate, limestone and other tough stones are frequently found along the river flats of the Susquehanna and Delaware and their tributaries. The shape of these objects and the smoothness of their chipped ends suggest their use as hoes. A few specimens have come from the Genesee valley and from the upper valley of the Hudson. The illustration (plate 8)— gives a good idea of the general outline of a stone hoe.

In the Mississippi valley and in the Ohio region hoes chipped from flinty rocks are found. These have an oval outline and some specimens show polishing due to long use. Notched flint hoes, sometimes called spades, are rare. Very few

Certain types of New York harpoons. $\times\frac{3}{4}$. 1, 2, 3, 4, 6, 10 from Oneida lake sites; 5, 7, 8, 9, from Jefferson co. shore sites.

specimens that may be called flint hoes have ever been found in New York State.

Hut rings. It is believed that certain Indians excavated pits in the earth and erected dome-shaped lodges over them covering the bent poles with saplings and intertwined withes. Afterward the whole was covered with thatch earth and sod. The Eskimo and certain tribes in the United States have done this in historic times. When the pole work supporting the structure rotted away there was left a pit surrounded by a ring of earth. Hut rings of this kind have been found at Perch lake in northern New York, and at Findley lake, Chautauqua county.

Fig. 58 Rock carving, Colliers

Inscriptions. Rock inscriptions by incision and by painting are rare in New York. Some occur along the St Lawrence, the Hudson and the Mohawk. The famous Indian rock at Esopus is a good example of a rock inscription, but it is recent, as the gun held in the Indian's hand proves. A rock drawing near Colliers seems more aboriginal, and consists of an owl-like figure outlined by incisions in

the soft rock. At Cedars on Black lake are painted figures and areas on the surface of a rock that rises sheer from the water. The color is iron oxide and has withstood the weather and the ravages of time since the earliest settlers remember. The New York Indians seem to have confined their inscriptions to more perishable materials than the faces of cliffs.

Jasper. A variety of opaque chalcedonic silica. In color it varies from light yellowish to deep yellow, orange, red and brown. Some forms are greenish and may be mottled with red. Indeed, one flake of jasper may reveal several colors. This fact and its good chipping qualities made jasper a favorite material for aboriginal implements. Jasper quarries have been found in Lehigh, Bucks and Berks counties, Pennsylvania, where the material occurs in pockets. Several hundred of these quarries show evidences of aboriginal working.

Maps. For charting the locations of archeological localities collectors will find the topographical sheets issued by the United States Geological Survey particularly valuable. These maps may be purchased from the Director, U. S. Geological Survey, Washington, D. C. A request should be first made for a key map showing the various quadrangles in New York that have been mapped. From this key map, which is sent free, the particular section of the map desired may be selected.

In charting sites the characters used should be uniform with those in this bulletin. (See the county maps in part VI.)

Metates. Metates are slabs of some sandy shale, limestone or other tough rock having one or more surfaces slightly hollowed out as a grinding surface for corn or other substance. Some are regular in form or are slightly shaped but most of them follow the natural fractures of the rock, the only modification being the surface depressions. Most of them are subrectangular in form. An examination of a considerable number of metates leads to the conclusion that the substance pulverized upon them was cracked with the muller and then rubbed with it into the desired fineness. Some metates have grinding faces on both sides. Sometimes one face has a smaller and deeper hollow; in other instances it seems to have been an anvil face.

Metates were probably used in shallow baskets of bark or upon skins that caught the pulverized substance as it fell from the stone. In this manner dry foods could be reduced or powdered, paint pigments ground, burnt stone cracked for tempering potters clay and various moist foods and raw fabrics, pulped. New York State metates usually have saucer-shaped depressions, in this characteristic

being unlike certain southwestern and Mexican forms, which are elongated. In the east metate grinding thus seems to have been done with a circular motion; in the southwest with a shoving and drawing motion.

Metates were used by the New York Iroquois until quite recently. Several informants have given us instances where metates were carefully kept by Indian families and even carried on journeys for preparing hominy or parched meal. In later years one turned up as a

Fig. 59 Metate or mealing stone

weight used in a pickle jar. Mr M. R. Harrington found a metate in use by an Oneida family in Madison county. With it was a bark tray designed to hold the meal that was pulverized and fell from the stone. One metate and muller found by the writer while working with Mr Harrington on Shinnecock hills was covered with clay and cracked granite. Evidently the temper was being beaten into clay for use in pottery making. Other potter's tools were also found associated with this specimen.

Moonstones. A name applied by Willard Yager, Esq. to certain perforated disks found in the vicinity of Oneonta. These disks have a large central perforation and thirteen small holes drilled about the edge. The central hole is bounded either by circles or by crescentric

lines. Mr Yager reports these stones from various localities and as having been found by reliable persons *in situ*. The drilling, however, is modern and done by steel tools, but this need not argue against their use and even manufacture by the Indians of the Susquehanna valley, for these Indians still lingered in the vicinity sixty years ago. Figure 60 illustrates two of the Yager specimens from Oneonta plains and from Afton lake.

Fig. 60 Perforated disks or "moon stones," from Otsego county. W. E. Yager collection. $\times 7\frac{1}{8}$. The drilling appears to be modern.

Mortars. Mortars are usually hollowed-out boulders of various sizes. Some mortars were made in huge boulders and were not portable; others were hollowed out in rocks of such a size as might with some effort be carried. The cavities vary from slight saucer-shaped depressions to deep hollows with considerable capacity. As common as mortars must have been among the aborigines only a few are to be found in collections. This may be due to the difficulty of transporting them to the cabinet or to the fact that they are really rare, or to both reasons. We have seen mortars in stone walls, in barn foundations, in well tops, in barnyards and dooryards as chicken troughs, in creek beds where they had tumbled from village sites above and we have excavated them from their original positions in lodge sites.

In certain localities a century ago it was a popular thing to have dog and chicken bowls made from stone by blacksmiths. There are a considerable number of these in the Genesee valley, some of them being regarded as "Indian mortars." Most of them are easily distinguished by the signs of metal chisel strokes.

Mortars made in small cobbles sometimes resemble bowls, or even cups. Certain forms from the Hudson valley are small and no heavy pestle could have been used in them.

The people who used stone mortars very likely as frequently used forms made of wood. Wooden mortars continue in use today among the New York Iroquois.

Mortuary customs. The New York Indians had several methods of disposing of the remains of the dead. The simplest disposal was to place the corpse in a shallow pit or grave and to cover it with earth. This is simple interment. A second method was to wrap the body in skins and place it on the ground, inside of a small bark house or skin tent. A third method was to wrap the body and place it in the branches of a tree or on a scaffold. Another method was to cremate it, and still another to place it in a canoe or submerge it in the water. Secondary disposals were to remove the bones of the dead from trees, graves, or grave houses and place them in individual bundles for reburial, or in large ossuaries or pits where numerous remains were deposited.

Bodies of the dead were placed in graves according to fixed customs. Most of the earlier interments were in the *flexed* position; that is, the corpse was doubled up on one side, the knees being drawn toward the chin and the hands put together beneath the cheek. This position is a universal one employed by most primitive peoples. A few burials were made with the corpse placed in a sitting position, the skull being uppermost and near the top of the ground. Such burials are rare in New York. Many persons mistake the flexed posture for the sitting posture. Stone grave burials are usually straight, the body being extended and on the back. Some midcolonial or late colonial burials are also straight. Early burials have few artifacts with them, the exceptions being mound and stone grave interments. The early Iroquois buried little of stone or bone with their dead but after the opening of the European period lavished their material possessions upon them that the spirits of the objects might go with the departed.

Many graves have pits above them, indicating watch fires. The Iroquois in some instances kept the watch fire burning for ten days. Both the Algonkian and the Iroquois believed in ghosts and in the influence of departed spirits. The spirits of evil persons were thought to become even more terrible after death. Some spirits, it was thought, entered the bodies of birds or animals. (See Ossuaries.)

Plate 129

Extended burial, Silverheels site

Mullers. Mullers were used in connection with mealing stones or metates, as their name implies. Usually they consist of discoidal stones of a size that might be conveniently held in the hand for rubbing on the mortar. Some mullers are nicely shaped and have smoothly polished surfaces. Others seem to have been combination hammers and mullers. Hammerstones, mullers and game disks grade into one another in such easy stages that it is sometimes difficult definitely to give a use name to a specimen. Plate 130 shows certain types of stone balls and mullers, all from New York.

Mutilation. Certain articles seem to show deliberate mutilation. Among the conspicuous examples are owl pipes of stone. Very few pipes having the owl effigy still have the head intact. Plate 48 shows two with a decapitation and figure 61 illustrating this paragraph

Fig. 61 Owl effigy pipe of striped slate from Black creek, Genesee county. Yager collection. The missing head is common to a large proportion of Iroquoian owl pipes. $\times \frac{7}{8}$.

shows one from the Susquehanna valley that is headless. There are too many such pipes scattered through New York collections to admit of a uniform answer of pure accident. The preponderance points out a deliberateness in the mutilation. On Algonkian sites near Iroquoian sites there will be observed numerous broken gorgets. In the Genesee valley many hundred broken gorgets have been found, the fragments of which appear to have been the result of deliberate smashing. It is quite possible that there were certain beliefs that governed the breaking of articles, especially effigies and the special insignia of enemy tribes.

We may pardon the uninstructed minds of the aborigines for breaking the relics of their enemies but what shall we say to the man in civilization, who finding a fine spear point, deliberately mutilates it by passing a blade of steel over it to see it strike sparks or who breaks a specimen to "see what it is made of," or who carves his name and date on a fine slate ornament? We can smile as we forgive the housewife who paints a spray of forget-me-nots upon a beautiful spear, or who gilds a gorget, but science can not forgive the person who cuts or otherwise mutilates a specimen.

Certain types of balls, hammers, mullers, and smoothers, $\times 1\frac{1}{2}$.

1, Pompey,—spheroidal; 2, ball with opposed pits, Glens Falls; 3, biconcave hammer, Erie co.; 4, heavy hammer or muller, Elbridge; 5, quartzite hammer, West Rush; 6, polished smoothing stone or game stone, Brasie Corners, St Lawrence co.

Needles, bone. Bone needles found in this region are thin, flat, slightly curved segments of bone 3 to 8 inches long, and one-eighth to one-fourth of an inch wide, with one, two or three holes centrally placed. They are not needles in the sense that the modern steel needle is, but rather shuttles or weaving needles, either for making coarse fabric or sewing the warp over rushes or husk. Bone needles of the sort we have mentioned are frequent in Iroquois sites, as at Cayadutta, Ripley, Richmond Mills, LeRoy, Sheldon Pompey, St Lawrence, Watertown, Atwell's and Christopher. The same forms have been found in Algonkian sites, as at Sag Harbor and Brewerton island. Identical forms were used by Ohio mound-building Indians.

New York State Archeological Association. An organization formed for the purpose of promoting the study of the archeology of the New York area. The founders were E. Gordon Lee, Alvin H. Dewey and A. C. Parker. Organization plans were completed in 1915 and early in 1916 a chapter named the Lewis H. Morgan Chapter was instituted in Rochester, with Mr Dewey as president and Mr Lee as secretary. In April 1918 Leatherstocking Chapter was instituted at Cooperstown. Chapters conform to a general code of laws and set of objects, but in all their affairs are self-governing. The general headquarters of the organization are in the Archeologist's office, State Museum, where records of the members are kept.

The stated objects of the association are as follows: (1) to promote the study of New York State archeology, ethnology and aboriginal history, and to record the results of such study for the benefit of science; (2) to preserve and protect the ancient mounds and localities connected with the Indians who formerly inhabited this State, and to prevent the destruction of these monuments, so far as possible; (3) to encourage the formation of scientific collections of aboriginal artifacts and to cooperate with the various museums within the State in the diffusion of archeological knowledge; (4) to establish a uniform system of records and standard catalog of New York State archeology, to establish a register of collections and collectors, students and sources of information; (5) to prevent the manufacture and sale of fraudulent specimens and to prevent the spread of erroneous statements concerning matters of archeological interest.

Ossuary. The term *ossuary* is applied to large deposits of human remains, especially those found in pits. In most cases the bones in ossuaries are neatly arranged, with the skulls arranged in a ring, the larger bones, as femora and humeri, piled in bundles, and the smaller

bones grouped in separate deposits. Frequently there is no external evidence of the presence of an ossuary; plowing deeply, trenching, excavations for foundations, or deliberate archeological research being the only means by which they may be found. Few have mounds over them. There are good historic accounts of the making of ossuaries. At certain periods of time the graveyards and other places for the disposition of the dead, were opened and the bones gathered to be placed in one spot. In this way, as the Indians expressed it, "the bones of those who knew each other in life will mingle in common dust."

Ossuaries have been found in the counties of Jefferson, Livingston, Monroe, Ontario, Onondaga, Genesee, Erie, Cattaraugus, Chautauqua and Niagara. In New York most of them seem to be Iroquoian, but some in Chautauqua county seem to belong to certain branches of Algonkian or mound-building tribes.

There is little of importance in ossuaries for archeologists. Few contain any relics. The bones may be of use to a student of anatomy or osteology. In opening an ossuary the earth should be removed and a trench dug entirely around the deposit before any bones are removed. A very careful drawing or a photograph from several angles should then be made. If possible expert archeologists should be invited to be present; where this is not possible the work of digging should be carefully done and some of the skulls and larger bones sent to some standard museum, preferably the State Museum, the American Museum of Natural History or the National Museum.

It is needless to advise the experienced collector that the bones should never be dug into with spades and scattered in a broken condition over the surface. This is neither scientific nor decent.

Patina. The term *patina* is applied to the weathered surface and the corrosion on the surface of archeological articles. Patination is due to the disintegration of the surface of the stone through contact with moisture, acid soils, gases, air, and other chemical and physical agencies. Articles of shell frequently have a brown patina, copper a light bluish to dark greenish patina, and various stones have soft chalky surfaces due to exposure and the action of acids or of leaching.

All specimens covered by patina should be carefully preserved. The patina should not be disturbed and every effort should be made to keep it.

Pendants. This term is applied for want of a better one. The pendant stone is shaped much like certain gorget forms but is much thicker and heavier. Some resemble celts, and indeed may have

been mounted as ornamental hatchets. One type has a small perforation drilled in at one upper corner. This type is always thick and rather too bulbous to be called a tablet. Other types have the hole either near the top or in a central position and part way down. The position varies from 2 millimeters from the edge to a point half way down. Plate 131 illustrates some of these pendant stones which, after all, may have been merely ornamental weights. All the specimens in plate 131 are in the Yager collection.

Pestles. Pestles are stones used for crushing or pounding substances in mortars. A true pestle is an elongated hammerhead. It is a shaft or handle with a pounding or pulverizing face and used in conjunction with a wood or stone mortar. Pestles are of two principal types: (1) long cylindrical shafts with grinding face at one end; (2) shorter shafts or handles with expanded grinding faces (sometimes called "bell pestles").

Cylindrical pestles are worked out by a chipping, pecking and abrading process. Some are more than 2 feet in length, others not more than 8 inches. Some are well rounded and polished and others only roughly chipped to form. Diameters vary from $1\frac{1}{2}$ inches to 3 or even 4 inches. One class of cylindrical pestle has the upper end carved in the shape of some conventionalized animal head. These have been found in the Seneca River region, the Hudson valley near Albany and near Glens Falls.

Cylindrical pestles are found almost entirely on Algonkian sites of all periods. A few very early Iroquoian sites in the State have cylindrical pestles but they do not appear in later sites. To the contrary, pestles are found on the most recent of Algonkian sites and frequently old colonial families still have in their possession pestles that were found in the cabins of Algonkian Indians on their estates, or given them with the stone or wooden mortar. Mr M. R. Harrington has collected several such specimens.

Bell pestles are comparatively rare and most specimens have come from the Genesee valley above Mount Morris. A considerable number were found by Mr F. C. Crofoot at Sonyea. Bell pestles are generally found on old sites that may or may not be Algonkian. They seem to belong in some cases to the mound-builder culture.

Pigments. The Indians of New York without doubt had many kinds of paints and pigments. We can not attempt to describe the vegetable dyes and stains from the viewpoint of archeology, for none has survived burial and the reductions of time. The ethnologist will describe many that have survived and some that are still in use by the New York Indians. Of mineral pigments we can speak more certainly, as these belong to the realm of the archeologist

Heavy pendants of polished stone. $\times 7/8$.

1, Great Bend, Susquehanna river; 2, Mount Upton; 3, Oneonta creek;
4, Old Fort, Sidney.

Types of New York pestles. 1 and 2 are forms of the familiar cylindrical pestles; 3 and 6 are bell pestles from Livingston county and are from early Algonquin sites; 4 is a phalloid pestle from Brewster, where they have been numerous; 5 is a specially well formed bell pestle from Oswego county; 7 is the upper portion of an animal headed pestle from the Seneca river region. Other localities are Albany, Rensselaer and Otsego counties.

Among the minerals that have been found in graves and in refuse heaps and which by their condition show use as sources of color pigments, may be mentioned the following: sedimentary iron oxide, limonite of iron, hematite, red and yellow ocher, graphite, cannel coal, copper, charcoal, burned bone, clays.

Paints were much used by the aborigines and were frequently articles of intertribal commerce. After the coming of Europeans much brighter colors were obtained and commanded good prices.

Pipes, smoking. Pipes have in general been described in another portion of this work (see pages 73-113). Pipes found in New York are of stone, pottery, fossils, bone and wood, and combinations of these materials. Stemmed pipes may be divided into the following classes: tubular, bent tubes, bowls at a slight angle, flat-stemmed bent tubes, monitor or platform, effigy etc. Bowls may be vase-shaped, effigies, ovoid etc.

Fig. 62 Onondaga stone pipe with a skin-wrapped handle, suggesting the manner of fastening the stems on heavy bowled pipes of the vase type. The stitching may have suggested the dash decorations found on certain clay pipes. $\times\frac{1}{2}$

The most highly developed art of pipe-making was in the Ohio mound and Iroquoian areas. The mound-building peoples carved fine effigies in stone; the Iroquois modeled similar effigies in clay. When the Iroquois made stone pipes most of them were bowls without stems. Iroquoian stemmed forms seem to copy their clay pipes. On the other hand, certain decorations on the stems of clay pipes seem to resemble the stitching on the skin covering of the wood stem used on stone bowls (see figure 62). The manner of holding the ovoid or vase-shaped bowl, which generally had a large

conical opening, seems to have been to fit the socket to the hole and then secure the stem to the bowl by covering it with green rawhide which went around the bowl and again to the stem. The rawhide was stitched upon the stem, these stitches being more or less ornamental in some cases. Where the pipe bowl was thin the rawhide was in danger of being baked or burnt. It is quite probable, therefore, that there was a wooden projection at the back of the bowl holding the rawhide away from the bowl. With a flat stem this would produce the prototype of the monolithic monitor pipe, or at least a substitute for it. The Iroquois used pipes thus secured, in all probability. The specimen shown in the figure (figure 62) shows a large, heavy bowl needing no posterior projection. It is an Onondaga pipe and a very old one.

Fig. 63. Conical tube of birch bark stitched and bent upward. This may be the prototype of the Algonkian elbow pipe.

The tubular pipe may have been derived from prototypes of hollow cane. In northern climes wood was used. More durable tubes were made of stone and clay. Some tubes may have been derived from cones or tubes of thin bark (see figure 63). The tobacco may have been thrust in the larger end, which was bent, and the stem may have been flattened. Such a prototype seems to have given rise to the flat-stemmed stone pipe having its bowl at a slight angle from the bowl. It also seems to have been the pattern of certain Algonkian pipes where the bowl shows a distinct angular bend instead of a curve.

Phalanges. On nearly all sites yielding bone articles numerous phalanx or toe bones of various large animals, as the deer and elk, will be found. Many are in their natural state but others are worked in many different ways. The following are the principal forms:

- 1 Hollowed out and perforated at the smaller end for suspension (sometimes worked into cones)

2 Perforated at the smaller end and in several other parts for use in the "cup and awl" game (a use not yet obsolete among Indians)

3 Flattened on the surface naturally flattest, being frequently rubbed very smooth

4 Ground off on each side leaving only the sides to form a sort of open-work wedge

5 Hollowed and perforated like pipe bowls

6 Slit like whistles, still an incision being cut the length of the bone

Form 1 is still used by some Indians and as late as 1908 M. R. Harrington collected two strings containing fifty or one hundred specimens used as necklaces by the Canadian Cayuga. Flattened phalanges seem to have been wedges in some instances and show marks of binding thongs. Some look very much like the sliding orifice regulator used on Iroquois flutes, and these also frequently show the marks of the thongs that passed over them (see plate 40).

Polished slate culture. Three striking polished slate articles with their associated forms found in New York and contiguous territory indicate a definite cultural horizon, distinct from all others on the continent. These articles are the banner stone, the bird stone and the gorget. Associated artifacts are the barstone and the boat stone.

The material out of which these objects are formed is usually some form of slate, such as banded olivaceous slate; more rarely the material is steatite, marble, limestone, sandstone, quartzite, syenite and granite. Finished specimens are usually highly polished and indicate that they have been regarded as valuable articles. As no white explorer has left a record of having seen any of these polished slates in actual use, they have been termed "problematical forms" or "ceremonials." What they are we may only conjecture, but our attempts to guess must be within the bound of probability, guided by a more or less detailed knowledge of ethnology as well as of prehistoric archeology. Just when or how these articles originated we can not say but recent discoveries seem to indicate a greater age than at first supposed. If we are uncertain as to the time of origin we need not be so uncertain as to the time when they passed out of use, for that time seems to have been just after or co-incidental with the entrance of Iroquoian tribes in this general area.

It is most important to observe that two divisions of the Indians used polished slates, one that indefinite branch that may have embraced branches of several stocks, known as the mound builders,

and the eastern Algonkian. This coincidence is significant and points out an interrelation of cultural factors. One might conclude that the Algonkian people were an offshoot of the mound builders, for Algonkins not only used polished slates, but used grooved axes, corded pottery and occasionally monitor pipes. At the same time there is a marked difference between a pure Algonkian site and a pure mound-builder site, and there was likewise a corresponding difference between the habits of the two peoples. The known Algonkins were less sedentary and culturally poorer.

It may be suggested that this close similarity of artifacts, despite a difference of degree of culture in other things, may even yet indicate that some unknown Algonkian tribe or tribes were mound builders, and that from a cultural center these hypothetical Algonkins radiated a cultural influence upon their less developed kinsmen. To this suggestion we may reply that, granting that some Ohio Algonkian tribe did build mounds and had the mound culture, there is yet good evidence that divisions of other stocks were also mound builders and users of the polished slates. It may be that certain Iroquoian tribes and certain branches of the Muskhogean people were also mound builders, which, then, would make the polished slates the mark of a cultural status and not a distinguishing tribal evidence.

Pottery. This term is used to include all articles made of baked clay or terra cotta. In a narrower sense the term is used to describe jars, pots or vessels of this material. Some have called soapstone "pottery," but in this work such a term is not applied.

In the production of pottery, the New York Indians dug the clay from natural sources, carried it to their workshops or places of manufacture and then proceeded to prepare it for molding. From facts supplied by ethnologists, supplemented by archeological evidence, the clay seems to have been pounded, mauled and kneaded on stone slabs. The tempering material was then mixed into the mass. Tempering material consisted of coarse sharp sand, pulverized mica schist, burnt granite, cracked shells, and other similar substances. Cracked chert has been found in pottery. When these substances had been thoroughly intermixed the clay was rolled into ropes and coiled into the shape desired. The clay was kept moist and the ropes were united by paddling the outside and scraping the inside with a stone spatula. Some pots were built up at the bottom within a gourd bowl. Others seem to have been hung in grass basket-bags or nets during the drying process, and show the impressions of the cords, as for example the pot in plate 107. Many of the smaller Iroquois pots of the later period seem to have been molded over gourds or calabashes and baked with the dried calabash inside, this

Plate 133

Polished stone articles from central New York. Otis M. Bigelow collection in State Museum. $\times\frac{1}{2}$.

burning in the process. The later Iroquoian pots seldom show any cord markings. Most of the Algonkin pots are covered with cord lines or an ornamentation made in imitation of cordlike impressions stamped in with a cord wrapped or a notched paddle (see plate 13).

The various types of pottery are described under the subjects of Algonkian and Iroquoian occupation (which see). Mound-builder pottery in New York is much like the Algonkian forms but the bowls are not so tall and the mouths and necks appear more nearly Iroquoian than Algonkian in some instances.

The most highly developed pottery in New York is that of the Iroquois. Iroquois pottery pipes are by far the best of any from any section of North America, revealing in general a more skilled craftsmanship.

Potters' tools. Tools found in such places as to indicate their use as potters' tools are shown in plate 134. They include bone smoothers and graters, bone stamps, stone smoothers and shell scrapers. Other tools were metates, anvils, mullers, hammerstones (perhaps the kind that show no battering), and slicking stones. Tools that have perished are cord-wrapped paddles, checkered wooden paddles and other implements of wood, cords, twigs etc.

Consult Holmes, Pottery of the Eastern United States, Report of the Bureau of Ethnology, No. 20; Beauchamp, Earthenware of the New York Indians, N. Y. State Museum Bul. 22; Wren, North Appalachian Indian Pottery, Wyoming Historical Society, 1914; Harrington, Last of the Iroquoian Potters, N. Y. State Museum Director's Report.

The red paint culture. The term *red paint culture* is one applied to evidences of a certain type of prehistoric occupation different from others. The name has been used as a descriptive term because of the deposits of red iron oxide or red ocher found in the graves of this culture.

Excavations of certain ancient burial places in Maine by Willoughby, Moorehead and others, have afforded the data by which this type of culture is differentiated. The artifacts associated are plummetts (so-called), native copper beads, gouges, adzes, celts, (some) slate arrow points, a few chipped stone arrows (notched), and stone knives. Other characteristics are certain flat and spatulate pebbles, nodules of iron pyrites, and quantities of red ocher. To quote Willoughby, "The use of this pigment seems to have been universal among the Indians whose remains are found in these cemeteries. It varies in color from pink to deep red. In some graves only a small quantity had been deposited which the percolating water had mixed with the surrounding sand and gravel. In other graves a

Plate 134

Potters' tools and stamps. With the cord wrapped stick at the bottom (a reconstruction) the cord impressions found on certain Algonkian pottery can be exactly imitated.

quart or more of pure dark red ocher was found with various implements lying upon it or buried within it."

Not many "red paint" localities have been examined in New England outside of Maine, but there are probably other sites extending westward to the shores of Lake Champlain, where plummets and gouges of this culture have been found.

In New York no graves have as yet been described. The implements associated with this cultural horizon occur all along the Seneca river, near Oneida lake, along the Oswego river, follow the coast of Lake Ontario north to the St Lawrence, and along the St Lawrence until it passes out of the State. Still farther eastward the occurrences are along the west shores of Lake Champlain and about the headwaters of the Hudson. In all these localities plummets occur, but not so abundantly as about Oneida lake. Grooved axes and polished slates, as gorgets, do not occur on "red paint" sites, except intrusively.

Just who the red paint people were it is not possible to state definitely. They do not appear to be Algonkian or even Eskimoan. In the Maine localities they are regarded as the most ancient of all aboriginal occupants, antedating the coming of the Algonkian tribes. It has been suggested that the culture is that of the Boethuck.

We have just enough of the red paint culture in New York to suggest its further study. More than likely many specimens of its artifacts have erroneously been associated with those of Algonkian or so-called Eskimoan origin.

Runtees. Runtees are discoidal ornaments of sea shell having

Fig. 64 Shell runtee from an Ontario county, Seneca grave

two parallel holes drilled from one edge through the object diametrically to the other edge. They are sometimes found with plain surfaces but generally have an incised or picked-in ornamentation of some kind. The ornamentation may consist of a cross, a star, circles or other figures. The name, runtee, is first mentioned by Beverly in his History of Virginia, but it is probably derived from the French *arrondi*.

Runtees are rather rare in New York and occur almost entirely in the Iroquois sites of the late seventeenth and early eighteenth centuries. Among the Algonkian tribes it is said that they were highly valued.

Certain types of shell effigies from New York localities. $\times \frac{7}{8}$.
28

Shell pendants. The midcolonial Iroquois used shell pendants of various forms in great numbers. Grave discoveries indicate that these were used mostly on strings of shell wampum. Usually they were shaped in the effigy of some bird, fish or animal. A few take the human form, especially the face, and some resemble the beaks or claws of birds and animals. A few have the form of serpents. The drilling of most specimens indicates that they were made after the coming of the whites, by the aid of steel tools. It is even possible that commercial manufacturers of wampum made some runtees and shell pendants for there is a remarkable similarity and almost mechanical likeness of certain patterns.

Shell pendants of the kind described have been found in the colonial Onondaga county sites in large numbers, not only in graves but in refuse dumps. Among the Seneca they were used in all the midcolonial and late colonial villages, and numerous specimens have been found on such sites. Large numbers have also been found on Cayuga sites. Good specimens, however, are rather uncommon, since exfoliation gradually has destroyed many that otherwise would have remained. The Heye expedition found shell pendants of unusual form and in a fine state of preservation in a Minsi cemetery in New Jersey. For types found in New York see plate 135.

Sinew stones. The so-called sinew stone is a pebble or fragment of sandstone having its edges so seamed and worn as to resemble a flat piece of shoemaker's wax. Specimens appear to have been purposely shaped by having the incisions sawed in by flint knives. The subsequent smoothing seems to have been done by the rubbing of sinews as in smoothing a bowstring or in sizing sinew thread. Sinew stones are usually of sandstone, though certain harder stones sometimes were used. Most sinew stones are broken when found and complete specimens may be considered among the rarer of aboriginal tools. There are instances where a broken celt or even a perfect specimen has been incised as to resemble a sinew stone. The New York State Museum possesses more than a dozen fine specimens of this type of abrading implement.

It may be seriously questioned whether or not sinew stones were used as their names suggest in all cases. An examination of certain types of broad-based projectile points shows that the bases are rubbed smooth, all the sharp edges being ground down. By taking a broad-based point and sawing the base into a sandstone pebble, grooves in the sandstone similar to those of a sinew stone can be made, and the arrow point base becomes smoothed as in actual ancient specimens.

Plate 136

1

2

3

4

5

6

7

Certain types of "sinew stones" from N. Y. Localities. $\times 1\frac{1}{2}$.

1, Monroe co.; 2, Chenango valley; 3, Catskill; 4, Schoharie co.; 5, Chenango valley; 6, Seneca river; 7, Seneca river.

Skeletal remains. When Indian graves are found, especially those that appear to be precolonial, care should be taken to preserve the bones from wanton or careless destruction. An experienced investigator will carefully expose the skeleton in its entirety and will not pull out each bone as it comes to view, and thus dismember it and break the brittle bones. With the skeleton scientifically exposed the entire grave may be studied and the relative position of the accompanying objects noted. In this way nothing will be lost in the back dirt. When the general situation has been noted and recorded and drawings or photographs taken, the bones should be carefully removed and wrapped in some absorbent material. Great care should be taken to preserve the skull and to prevent the dropping out of the teeth. Skeletal remains are always of interest to the larger scientific museums, and should not be sent to historical societies. If there is scanty facility for taking all the bones, the skull should be taken together with any of the larger bones that exhibit any interesting features, as fractures, diseases or morphological characteristics. The investigator should look for evidences of platycnemia, platymeria and the perforated olecranon, illustrated in plates 137-142. If an investigation of the grave and the removal of its cultural contents alone is possible, common decency directs the respectful redeposit of the bones and their reburial. Only those of defective sensibilities will smash and scatter the bones as they root after relics. Such persons indeed are grave robbers of a very cowardly sort and have no understanding of either the purposes or the ethics of science.

Spearheads, flint. Spearheads are points designed to be placed on the end of shafts or handles and are used for piercing the bodies of human or beast enemies or game. A chipped stone or flint spearhead was tied to its shaft and probably also secured by a slot into which it fitted.

Stone spearheads are of varied shapes and sizes. Many so-called arrowheads in reality are spearheads or knife blades. While it is not always easy to judge the difference between a large arrow point and a small spearhead, a good general rule is to study the specimen as to its adaptability to the several probable purposes to which it could be applied. A heavy head takes the power of flight from an arrow. Arrow points are therefore relatively small, as all specimens found in shafts will show. Heavy, thick-stemmed points would not fit into shafts of arrows. Thick, broad stems therefore must have been employed for other purposes. If they would fit into a larger shaft, say an inch in diameter, the point may be a spear point or possibly the spike of a war club. Some specimens, however, are plainly spears of some sort. It must be remembered that there were several

Two views of skull 4503, from grave 6, McCullough site. Breadth index, 71.6.

Plate 138

Two views of skull 4548 from ossuary. Index, 77.7. Gerry site.

Plate 139

Platynecemic tibiae from the McCullough site. The fourth tibia has an index of 54. From pre-contact site, Gerry, N. Y.

Plate 140

Platymeric femora. The third trochanter is especially noticeable in the third and fourth specimens. From McCullough site, Gerry.

Humeri from the Dennison site. All but the last two have the olecranon fossa perforated.

Plate 142

Humeri from the McCullough site, Gerry, Chautauqua county. Note the perforated olecranon cavity in all but the first specimen.

kinds of spears, one for game, one for fish and one for ceremonials. These varied also in their notching, size and shape.

Some of the finest work of the stone flaking art is found in spearheads. Some reveal the hand of a master craftsman in their delicate chipping, symmetry and beautiful notching. The kind of material used regulated to a large extent the size and form of a point. Thus expert workers would obtain material from traders or go on expeditions to the best quarries for it.

Specimens. All archeological specimens must receive proper care. They should be handled gently to prevent their breaking and the more delicate objects should be wrapped in soft paper or cotton. Bone, shell and clay articles should be allowed to dry before handling to any extent. As each object is found a label should be prepared and an entry made in a notebook kept as a field record. Reference should be made to the site and the exact spot where found. Topographic maps for this purpose may be secured from the Director of the United States Geological Survey, Washington, D. C. All specimens should be neatly numbered and a corresponding index card (see figures 65 and 66) or catalog entry prepared. Specimens protruding from river banks or from gravel beds, where they are deeper than 4 or 5 feet, must be photographed *in situ*; that is, before removal from their original position.

To the amateur collector let it be said that each specimen is a part of the record of some human activity. It is important that these records and evidences be carefully kept. Each specimen is a letter or a word from the book of man's prehistory and our duty is to gather all these lost words and missing letters and place them where those best able to translate and piece together such things will be able to have access to them. Specimens from each site examined should thus be kept together in order that the objects of one particular place may be properly correlated. To place all arrowheads or potsherds or other special objects together regardless of the sites from which they came, fails to tell the story that archeology would unfold. To collect in this manner would be like trying to restore a book that had been torn apart and scattered, by collecting all the letter *a*'s or letter *z*'s in boxes apart from each other. Nothing could be determined by such a method. The collector, to group the elements of his story as he digs it from the earth, must put his notched arrowpoint, properly numbered and recorded, with the potsherds, hammerstones, axes, and other implements from the identical site. In this way he will be able to determine the material culture of the site. This information with its illustrative material then affords the reconstruction of a page of prehistory. It is the constructive, scientific method.

No.	F	FIELD RECORD
EXPEDITION OF 1908	18	Object 3 rude flints
	19	Site High Banks, Erie Co.
	20	Lodge pit, tr 6 at 48 ft on W. side
		Dimensions 12x16 Depth 21 in.
		Remarks Lodge heap 4 Found by E.R.B. Packed by A.C.P. Box 6

June 6 1910		<p>Burial no. 1 Site Westfield</p> <p>Depth 31 Dimensions 48x30</p> <p>Face toward E Head top N.</p> <p>Skeleton on left side</p> <p>Position flexed</p> <p>Condition disintegrated</p> <p>Soil Gravel</p> <p>Objects One biconcave disk of stone, small</p> <p>Record and date</p> <p style="text-align: right;">Field notes 1910</p>
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Fig. 65 Specimen field cards used for recording archeological data

In seeking to make a scientific collection of archeological specimens, every article showing the work of human hands or of agencies subject to human control must be regarded as a specimen. Thus fire-broken stones, broken pottery, flint chips, animal bones cracked for the marrow, charred corn and beans, and other apparent refuse must be regarded as of some importance. If all are not actually gathered for the collection, the precise quantity noted must be placed on the record of the site as kept by the collector. A background is thus provided for the more attractive specimens.

Mus. no.	Col. no.	ARCHEOLOGY
MUSEUM 34027	Tk 1	<p>Object Pipe of baked clay 2 faces, one on front; one on back.</p> <p>Locality Belmont. Lot 20 Amity s. of Philip Cr. Fortification</p> <p>Collector GEORGE L. TUCKER</p> <p>Record and dates Museum acquisitions 1918. Donation. Other specimens in Museum of Buffalo Consistory, A.A.S.R.</p> <p>Remarks Illustrated: Arch. Hist. N.Y. Displayed: Case Q. Type. Early Iroquoian</p>
Number Sept. 1918	ed 18,	

Fig. 66 Specimen museum catalog card used for recording data of specimens

It should be religiously remembered that the first duty of a collector is to mark his discoveries in such a way that both he and others may be able to know from whence they came. Place, whether grave, mound, refuse heap or surface, should be mentioned. These facts are far more important than the name of the finder and the date. The distinguishing mark on the specimen should be small but legible and be on the most inconspicuous part of the object. If the specimen is exhibited a separate label may be prepared, but this should be entirely aside from the catalog card or entry record. A collection carefully cataloged may become of considerable importance, but a collection simply gathered because the objects are "Indian

relics," is a monument to a crime against knowledge and truth. We can not emphasize this fact too strongly, for the relics left behind by primitive man and his descendants of the earlier ages are all too few. Important clues and a complete chain of evidence may be forever obliterated by the careless and ignorant collector. Collectors have no moral right to destroy the records that ancient man took centuries to write into the soil, through his enduring artifacts. They do have a heavy moral obligation to preserve every circumstance concerning their finds.

The amateur collector should early get in touch with recognized museums and scientific societies and subscribe to the various archeological periodicals. Such museums as the New York State Museum at Albany will always welcome correspondence from collectors and will freely give advice. Nearly all museums issue bulletins and guide books of value to collectors. Archeological associations, such as the New York State Archeological Association, with headquarters in the State Museum, the Ohio State Archeological Society, the Wisconsin Archeological Association, and others, issue interesting publications. General works such as Handbook 30 of the Bureau of Ethnology, Washington; Moorehead's "Stone Age"; Wissler's "American Indians"; and Fowke's "Archeological History of Ohio," will be found of considerable value to students.

The moral of this "word with amateur collectors" is that no one should be a mere collector of aboriginal artifacts. The collector must likewise be a student who carefully records the information that chance or diligence unfolds. By means of a little care and study the whole subject will appear in a different and higher light; the collector while satisfying his instinct of acquisitiveness will at the same time become a contributor to the science of archeology, and thus a real benefactor.

Spoons, bone and antler. Bone and antler spoons have been found in Iroquois sites, especially in graves. The bowls are capacious but seem small compared with the Iroquois wooden spoons. There were three or more bone spoons found on the Dann site near Honeoye Falls. One had the figure of a swimming beaver in relief on the back of the handle.

Antler spoons have been found on the Marsh, Gandagaree site near Victor, at Boughton hill and at St Lawrence. One came from an early Algonkian site near Brewerton (Beauchamp, Horn and Bone, 315-16). Spoons of this kind may be considered rare.

State Museum. The New York State Museum is the outgrowth of the Natural History Survey originally authorized by the State Legislature in 1836. The Museum has two functions: first, that of

the collection and display of the natural resources of the State and second, the prosecution of scientific research along the several lines of natural history, so far as these subjects pertain to the area within the boundaries of the State. These embrace geology, paleontology, mineralogy, entomology, zoology, botany, archeology and ethnology.

The present housing of the Museum is in the State Education Building in Albany. Here are the offices of the Museum staff, and here in the longest and largest exhibition halls in America are displayed the various collections of objects illustrating the geology, the animal, insect, plant and the aboriginal phenomena of the State. The Museum is a free institution devoted entirely to public instruction. It belongs to the people of the State and constitutes a unique index to the natural products of the Empire State.

Many thousands of citizens and indeed travelers from all over the world have visited the exhibits. As many as six or seven thousand have visited the halls on a Sunday, the yearly total of visitors being from 200,000 to 300,000.

The popularity of the institution is attested by the numerous gifts it has received from public-spirited citizens. Among the notable gifts since 1912 have been the Indian habitat groups, the Dewey Iroquois Collection, the Fuertes bird paintings, the Clark Reservation, the Cryptozoon Ledge, the Stark's Knob volcano, the Squaw Island in Canandaigua lake, the Arnold bird-eggs, and the Peck memorial collection of mushroom models. There have been many smaller gifts, including individual specimens in all the various departments.

The section of archeology has undertaken a survey of the archeological localities of the State and has conducted many excavations of various important sites. The collections occupy both mezzanine halls running the entire length of the building. The west hall is devoted to the ethnology of the Indians still living within the State. Here are exhibits of the costumes and clothing of the Iroquois and Algonkin, cases containing specimens of their domestic utensils, weapons, games, textiles, silver work, bead work and ceremonial articles. Here also are the official wampum belts of the Iroquois league. In the Myron H. Clark Hall of Iroquois Ethnology are six habitat groups consisting of actual life casts of Iroquois and other Indians. Each group represents some activities connected with the culture of the aborigines. They are viewed through large glass windows and the impression is that of looking directly out of a large window and at a natural scene. These groups represent: hunting,

warfare, council, ceremony, industry and agriculture and quickly give an impression of New York Indian life not possible to obtain in any other way. At the east end of this hall is a bark cabin fully furnished and of the type once occupied by the Indians of our State.

In the east mezzanine hall is the collection of archeological specimens. There are more than 12,000 articles displayed, including about 40 pottery vessels, 680 pipes, 250 polished slate objects, and all the varied forms of stone, bone, shell and copper articles that characterize the ancient material culture of the New York natives. The collections are arranged in several ways, as follows: (1) by localities to show the various parts of the State from west to north and south to east; (2) by types of implements in a classified order; (3) by cultures, as Iroquoian and Algonkian; (4) by methods of manufacture in which the processes of making aboriginal articles are illustrated; (5) by uses, in which the use of articles is explained.

The study collection consists of about 100,000 specimens, stored in drawers and cataloged. Most of the archeological material has been acquired since 1911, the old collections having been destroyed in the Capitol fire in March of that year. By gift and purchase the archeological section has added largely to its own field collections. Among the notable collections now on exhibition are the following: the Museum field accessions, the Raymond Dann, the Fred H. Crofoot, the Joseph Mattern, the Alvah Reed, the C. A. Holmes, the R. Van Valkenburg, the Vanderveer-Auringer, the Otis M. Bigelow, the L. D. Shoemaker, the Ward E. Bryan, the D. W. Thompson, the C. P. Oatman, the R. S. Loveland, the R. W. Amidon and the Alvin H. Dewey.

Each specimen is so cataloged as to give credit to its collector, but in a scientific museum such as this, specimens are placed in exhibits to which they logically belong, regardless of the collection of which they once formed a part. The object is to make an intelligent display of naturally related material and not to mass together unrelated curiosities. All the pages of each book of nature though found scattered over the surface of the land must be brought together, sorted and placed in order, that the story may be correctly read. Each specimen is a letter, a page or a chapter, important to our problem, and each is therefore placed where it belongs.

Several notable men of science have served the archeological section of the Museum in various capacities, among them Henry R. Schoolcraft, Lewis H. Morgan, Frank H. Cushing and William M. Beauchamp.

The archeological and the ethnological exhibitions of the State Museum have attracted many students of science, the methods of display and the arrangement of the specimens have been pronounced as scientifically correct as it is possible to make them.

The State Museum holds out a permanent invitation to all the people of the State to cooperate with it in making its exhibits a complete course of instruction in the natural sciences with which it deals.

The Museum maintains a staff of men, as well as special experts employed from time to time. The Director of the Museum is also the State Geologist and the State Paleontologist, having assistants in each of these branches. Other members of the staff are the mineralogist, the botanist, the entomologist, the zoologist, the taxidermist, and the archeologist.

Stone age. The term "stone age" is applied to the long period in the history of human culture during which the most durable tools made by mankind were of stone. With tools for pounding, bruising, pulverizing, scratching, sawing, cutting and scraping, man was able to reduce softer material and even rocks to desired forms. Thus man made hammers, mullers, flint knives and scrapers of stone. With his stone hammer he knocked out a spear head; with an edged flint, sawed away on a sapling and made a spear shaft.

It must not be supposed that during the so-called stone age there were no other articles beside those of stone, for in fact early mankind used bone and antler tools and ornaments, used articles made of shell and wood, and probably dressed in the skins of various animals. To the race-mind, physically endowed as it was with hands, the simple use of one instrument with which to pound and one with which to cut, be the processes ever so laborious, proved a wonderful stimulant to further progress.

The earliest evidence of man's use of stone tools dates back into a period thought to be nearly a million years ago. The rude flints found in the strata lying between the tertiary and the quaternary, are called eoliths (dawn stones) in allusion to the dawn of material culture. With the further development of man's manual ability, after thousands of years came an advanced type of flint implements, known as paleoliths (old stone). As progress continued chipped stone implements improved until polished chopping blades or hatchet heads were made. In Europe this period is called the neolithic (new stone). The neolithic period in Europe is divided into several sections each characterized by the types of blades found. So far as

the New York area is concerned, we can not use the same terms employed by European archeologists, for no evidence has yet been discovered to prove the presence of paleolithic man. Our "stone age" is, however, comparable with the European "neolithic" without being susceptible to the same subdivisions.

It must always be kept in mind that what we know of the stone age culture of any people is only a knowledge of certain durable stone artifacts, the use of which may or may not be obvious. Stone implements may have been and probably were the least in number of all objects possessed by ancient man. We know nothing of his clothing, articles of wood and of thongs. On rare occasions we do find some article of worked bone, but as a general thing all things less durable than stone have rotted away. We must therefore use caution in attributing extreme poverty of possessions to the ancient race whose stone implements we find; when we look at his hatchet head and his spear point we must vision all that these things imply. The hatchet had a handle, the spear a shaft. These were of wood and the thongs of the deer or shreds of tough bark bound the heads to the handles. Our stone age men had skin robes, footgear, head dresses, pouches, utensils of bark, objects hewn out of wood, and they had dwellings where they lived with their women and children.

While the advanced races of Peru, Central America and Mexico made articles of molten and cast silver, gold and copper, the numerous tribes to the south and to the north, at the time of the Columbian discovery, were living in the stone age. The aborigines of the New York area were all stone age people. Cartier, Verrazano, Hudson and Champlain all saw the American stone age man.

Civilized man of today still depends upon stone for many useful and ornamental purposes, but has abandoned it as a material for cutting and pounding in industrial purposes. For mulling and for abrasives, stone is still used in ways not entirely different from those employed before the "age of metals."

Trade articles, European. With the coming of Europeans to America there was a great change in the material culture of the New York Indians, and in the culture of the American aborigines in general. Among the evidences of European contact and trade may be mentioned glass beads of many sorts; brass articles, as kettles, bracelets, beads and other ornaments; iron articles, as knives, hatchets, tools, scissors, chisels, chains, tomahawks, spikes, guns, swords etc.; lead articles, as bullets, seals, effigies etc.; glassware, as bottles, sheet glass, ornaments etc.; earthenware, as glazed pottery, white clay pipes, dishes etc.; stone articles, as European flint, chalk

etc.; certain articles of gold, silver, pewter, zinc, tin. Articles of fabric of European origin are sometimes found in graves, preserved by contact with copper or copper salts.

Articles made by Europeans, while interesting in a general way, have little value in assisting our understanding of aboriginal culture. For this reason we have not described the numerous articles and materials of European origin found on historic Indian sites. They have little bearing on archeology save to mark the presence of the white man and to point out the beginning of the decay of native material culture.

Consult Beauchamp, *Metallic Ornaments, Metallic Implements of the New York Indians*, *Bulletins of the N. Y. State Museum*; Parker, *Origin of Iroquois Silversmithing*, *American Anthropologist*, Vol. XII, No. 3.

Tubes, stone. There are several types of stone tubes found in New York. One type is a short flattened tube with rather thick walls and drilled with a uniform hole throughout. Some specimens

Fig. 67 Slate tube from Randolph, Cattaraugus county

look much like a bicycle handle grip with one end smaller than the other. A second type is cigar-shaped and longer than the former. These have flaring mouths, reamed out, leaving thin lips. The hole at the smaller end is much smaller than any other part of the tube, suggesting that this type was a smoking pipe. The third form is a nearly uniform tube with a reamed out orifice at one end and an outward flaring flat end pierced with a small hole at the other.

The cylindrical cavity is large and the walls of the tube thin, so thin, in fact, that many have collapsed in places due to weathering and the natural rotting of the stone. A few of this type were made of a stone that would take a high polish, but most of them are of dull lime or sandstone. Tubes are comparatively rare in New York. They have been found on the surface and in graves, particularly, stone box graves. Their range in this State is coextensive with the bird stone and gorget.

Like all other polished stone "problematicals" we may only conjecture what tubes were used for. It has been suggested that they were used for smoking pipes, drinking tubes, sucking tubes for drawing blood from incisions, shaman's paraphernalia, whistles, medicine cases, and for several other purposes. On the Pacific coast cigar-shaped stone tubes are used for smoking pipes; tubes of bone and horn were used in historic times for sucking blood or in shamanistic practices. These stone tubes have been found in graves filled with red or black pigment, and others have had internal clay plugs so placed that by blowing at one end a loud whistle was emitted. Tubes may have had various uses according to type. When we try to guess the uses of the Indian's creations and to fix one specified purpose upon one of them we must remember the humble hairpin of today and then challenge archeologists of the eons to come to determine even a dozen of its manifold purposes, and we may likewise prepare our ghosts to rise and confound him if he dares to say that only one use, as that of removing coins from a crack, or that of picking a lock, was the sole and only correct one.

Use name. A name applied to an object in conformity with some known or assumed use of the object. There are three general types of names applied to archeological materials: (1) a descriptive name; (2) a use name; (3) an applied name. Thus, a stone hatchet head may be called (1) a petaloid artifact of polished stone having one cutting edge at the wider, thinner end; (2) a chopping blade; (3) a celt. As a rule descriptive terms are longest, use names shorter and applied names shortest. Use names, however, ought not to be employed when the use is not evident. A wrongly applied name becomes a source of constant confusion. To call a hatchet head a "skinning stone" is to employ a use name that may be utterly erroneous and confusing. Though the term *celt* may be less intelligible it is preferable to "skinning stone" because it conveys no erroneous impression as to the use of the article, but on the other hand may suggest a cutting blade of some kind.

Use names, such as ceremonial stone, surgical stone, and the like should be avoided, unless the person employing the terms can justify them by an appeal to facts.

Wampum. The various sorts of shell beads used by the eastern Indians were generally termed wampum. Properly speaking, however, wampum beads are the small cylindrical beads made from both the shell of the *Venus mercenaria*, or common round clam, and from *Pyruia carica* and *P. Canaliculata* (formerly

called Busycon). From the purple spot in the clam shell flat pieces were broken and ground into long octagons. Drilling was then commenced and afterward the tube ground into a cylinder which was cut into segments that were finished as beads. Great care and skill was exercised to make purple wampum and its value was from two to ten times that of white wampum. The columellae of the *Pyrula* furnished a natural tube for beads. It was perforated and ground down, then cut into beads, and finally the beads were made uniform and given a polish. Frequently individual beads were drilled from the small cylinders cut from the shell. White beads being easier to make were valued at only one half that of the purple. In aboriginal times before the coming of Europeans wampum was much scarcer than after the dawn of the colonial period. As the middle period approached (1687), wampum manufacture by both whites and Indians had reached its maximum. There were bushels of it in use both for the manufacture of ceremonial belts and for coin. Wampum in strings was used as currency both by the whites and the Indians, and as late as 1712 was receivable for goods and for ferry fare between Manhattan island and Brooklyn.

With the aid of simple machinery from five to nearly a dozen strings of wampum, each a span in length, could be produced by a workman in one day. Each white span had a value of about 12½ cents. Discoidal wampum consisted of several sizes of discoid beads, each size conforming to a certain standard, and drilled in the center. Many small discoid beads, some quite perfect circles, have been found in graves that appear in every way to be prehistoric. Discoidal wampum varied from sizes having a diameter of one-fourth to three-fourths of an inch. Cylindrical wampum varies from less than one-eighth to more than three-sixteenths of an inch in diameter.

The name wampum comes from the New England Algonkin *wampumpeak*. Both parts of this word were used, wampum and peag or peak. The entire original word means "a string of (white) shell beads." Other terms were used, as, for example, "sewant." Some traders imitated shell wampum by making or obtaining counterfeits of porcelain. Bad wampum caused considerable trouble in the New Amsterdam money markets and rigid laws were passed governing the use, condition and value of the beads. Much has been written on the subject of wampum. Consult Beauchamp, Bulletin 41, New York State Museum; Bulletin 30, Bur. Am. Eth., Vol. 2, Hewitt, page 909; Woodward, Wampum: Weeden, Johns Hopkins

Univ. Stud., s. viii-ix, 1884; Holmes, 2d Rep't, Bur. Am. Ethnology; etc.

Wood. Articles made of wood were far more common among the Indians than were articles of more durable substances. This is so far true that the stone, bone and clay articles found on sites constitute only a small fraction of the material objects made and used by the natives. Houses were of wood and bark, dishes were of wood, and there were spoons, clubs, baskets, bowls, mortars, cups,

Fig. 68 Top of wooden comb, from a grave in Ontario county

rattles, masks, arrow and spear shafts, game sticks, boxes, and numerous other things of wood. Bark likewise supplied a useful material for ropes, string, nets, fabrics, dishes, barrels, houses and numerous other purposes. A traveler in an Indian village in colonial New York might never have noticed a stone implement. These facts point out that the finding of even a single stone object on a site may indicate a degree of occupation of greater intensity than at first thought. Everything else save the stone implement has crumbled away.

In some graves and in the bottoms of swamps and lakes articles of wood have sometimes been found. Colonial Seneca and Onondaga graves where there have been articles of brass to act as a preservative frequently have yielded spoons, bowls, small images, and parts of arrow shafts, all of wood. Figure 68 shows the top of a comb of wood found in an Ontario county Seneca grave.

Workshops. Places where aboriginal implements, such as flint points, were made are called workshops. These may be located near village sites, on camp sites along trails or near sources of supply. Evidences of workshops are places covered with large numbers of flint chips or partly blocked out stones. In workshop sites or nearby many implements in process of completion may be found. Caches of blank forms have occasionally been unearthed in the vicinity of these places of industry.

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