State and Local Archaeological Surveys

C. Wissler

STATE AND LOCAL ARCHAEOLOGICAL SURVEYS

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EDITED BY BENJAMIN F. SHAMBAUGH

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EDITOR'S INTRODUCTION

This *Bulletin of Information* on *State and Local Archaeological Surveys* contains suggestions in methods and technique which, it is believed, will be helpful to students of archaeology and to other persons interested in the evidences of early man in Iowa. Indeed, it is hoped that these pages will serve as a guide to all persons who may undertake archaeological surveys or investigations in the Iowa field.

The State Historical Society of Iowa is under obligations to the National Research Council and more particularly to Dr. Clark Wissler, Chairman of its Committee on State Archaeological Surveys, for permission to publish the suggestions contained in the following pages.

Dr. Charles R. Keyes, who is making a preliminary archaeological survey of Iowa for the State Historical Society, read the manuscript and made helpful suggestions relative to its publication.

BENJ. F. SHAMBAUGH

OFFICE OF THE SUPERINTENDENT AND EDITOR
THE STATE HISTORICAL SOCIETY OF IOWA
IOWA CITY IOWA

AUTHOR'S FOREWORD

In 1922 the chairman of the Committee on State Archaeological Surveys, maintained by the National Research Council, compiled a report embodying the recommendations of the committee as to the aims and methods most applicable to State archaeological surveys, and including such suggestions as were offered by contemporary field workers. These recommendations were circulated in mimeograph form by the National Research Council for criticism and annotation. The chairman was then authorized by the committee to prepare for publication a fuller statement of the subject, which is to be found herein. Unless otherwise credited, the writer assumes full responsibility for all statements made in these pages.

The early publication of this manuscript is due to the generosity of the State Historical Society of Iowa, an organization which has taken the lead in the survey of its State. It is hoped that the contribution made by this Society will stimulate greater interest in the subject to the end that this preliminary bulletin may be expanded into an authoritative field book.

It is particularly gratifying that there are on every hand evidences of a deep interest in the prehistory of our country, and that there is no lack of opportunity for investigation. Many of the Central States fall within the mound area and possess many interesting antiquities — data upon the location of which are of varying completeness. In Iowa, for example, the publications of the Davenport Academy contain a wealth of data, including a bibliography and a digest of the data to 1895. Some forty-five counties are covered in this report, vary-

ing in completeness from the bare mention of a single county site to careful abstracts of intensive surveys. The most intensive explorations were along the eastern margin in Allamakee, Chickasaw, Clayton, Dubuque, Floyd, Jackson, Johnson, Louisa, Muscatine, Scott, and Van Buren counties. Without additional information one can not judge as to the absence or presence of similar sites in the remaining counties. Hence, one of the first steps in Iowa is to bring this record to reasonable completeness. This, however, is only the first step; the real need is for someone competent enough and with sufficient time to synthesize the data as to distribution and chronological relations. This calls for real research and offers exceptional opportunities to the scientifically inclined. Incidentally, the early work reported for Allamakee County shows an interesting example of stratification, the chronological significance of which has not been considered. This points a lead to a synthetic and constructive view of prehistoric man in this State.

Again, there were once brought to light some curious elephant-like pipes and some tablets, over which raged one of the most violent personal controversies to be found in scientific literature. This whole subject should be reviewed anew with supplementary field work. In other words, there is in Iowa a problem in the antiquity of man which calls for the highest kind of research.

Since similar statements might be made for other States, it is apparent that the present need is for competent, serious students to undertake synthetic constructive work and so lead the several State surveys to a contribution of continental significance.

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NEW YORK CITY

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INTRODUCTION

In this discussion the term archaeological survey is used in a broad sense to cover all aspects of the aboriginal Indian problem; and it is taken for granted that every State is interested in conserving and investigating its archaeological and historical resources. In order to deal with these resources intelligently and to make them of real service to the State, all archaeological and historical Indian sites must be located and classified. Just what kinds of materials are found within the State must be determined, and where they occur. It follows, then, that an archaeological survey is, for one thing, an inventory of these resources, and that for practical guidance in its conservation work the State needs such an inventory.

The making of such a survey is a scientific procedure involving special techniques, the essentials of which should be acquired by all who undertake such work. As information of this practical nature is not readily obtainable, the accompanying suggestions are offered.

In all archaeological research the ideal should be to record accurately all of the pertinent facts. What is found? Where? How related to topography and to the earth strata? And lastly, what are the spacial relations of all objects? All data should ultimately be visualized in a three dimensional scheme, their places in the horizontal plane and their relative depths. The former express the geographical distribution, the latter the time-sequence. The geographical distribution is primary and also the immediate objective of the survey.

Examples of stratification are rare, but when found should be noted with the utmost care. They are also the most precious of finds, to be preserved whenever possible for future detailed study, for they will give us relative dates for the successive cultures and races.

THE CHRONOLOGICAL PROBLEM

It is this dating of archaeological remains that is of the first importance: at least from the historical point of view, the fundamental problem is the establishment of a chronology or a time-sequence for the prehistoric. This is almost equally true of race problems, because we must know the time relations for the different anatomical types. However this may be, the establishment of such a time scale for the data of culture is absolutely essential. There are two general methods for the determination of such time relations: by stratigraphy and by geographical distribution.

Method of Stratification. — The basic idea in this method is that of superposition, the field worker seeking for sites in which the debris of different cultures are imposed one upon the other by mere accumulation around the fire or shelter. The necessary conditions are that groups of people, or tribes, should accidentally have chosen in succession the same dwelling site. It not infrequently happens that by topography, or otherwise, a given spot will be the preferred dwelling place for all comers. Such spots may be rare in open level plains, but they do exist even there; yet particularly are they to be expected in rough areas where narrow valleys abound with natural shelters in their rocky walls.

The so-called cave man of Europe did not really live in caves as do the blind fishes of America, but sought shelter in the wide, open entrances to these caverns.

Not infrequently he lived under the overhang of a cliff, or in what we call a rock-shelter. Such shelters abound in America; and though in some sections they have been intensively studied, as in the neighborhood of New York City, they still present in the continent at large a virgin field. The great danger is that the most significant shelter deposits may be destroyed by enthusiastic but untrained observers before note can be taken of their possible stratigraphy. Hence, it is quite important that everyone contemplating explorations of this kind acquire a clear idea of the method of stratigraphy and its technique. Above all, the student of archaeology should be a conserver and not a destroyer.

Returning again to rock-shelters, a striking example is to be found in Finch's Rock House (Figures I and II). This is a rock-shelter near New York City in which were two layers of refuse separated from each other by a barren layer of sand. Pottery was found in the upper layer, but not in the lower. The assumption is, then, that the first dwellers in this shelter belonged to the earlier period of aboriginal occupation in the Hudson Valley; that after an interval the shelter ceased to be a dwelling place long enough for a layer of sand to accumulate; that finally again, after a time, somebody moved into it again. But these newcomers made pottery and probably raised maize, and so lived in a new culture period.

It is true that many rock-shelters that have been examined contained no such clear cut strata, but there is good reason to believe that there were in many of those excavated in the past less obvious strata that were missed. In any case, one should not tear out such a deposit without the necessary preparation and planning. Finally, it may be noted that some of the rock-shelters

around New York City yield pottery, while others do not. The value of the Finch shelter lies in the fact that its stratification gives us the key to the time relations between the pottery bearing and the non-pottery bearing shelters to be found in the surrounding country.

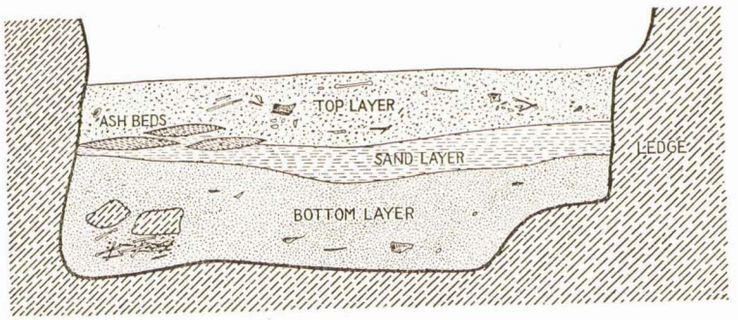


FIG. I. FINCH'S ROCK-SHELTER IN NEW YORK

Rock-shelters naturally bring to mind caves, of which there are hundreds in the Ohio Basin, the Ozark region, and elsewhere. For illustration, we may single out Mammoth Cave, Kentucky. Excavations in the entrance to this cave[1] revealed refuse; but, while it was not possible to distinguish distinct layers, there was no pottery, no evidence of maize, and the like. In other words, while scattered over the surface in Kentucky are evidences of a pottery-making, maize-growing people, something different existed when people resided in the entrance to Mammoth Cave. We can, therefore, say definitely that the earlier tribes of that locality did not know pottery or maize.

As everyone knows, the best examples of cave and shelter superimposed deposits are to be found in

[1] Nelson's *Contributions to the Archaeology of Mammoth Cave and Vicinity, Kentucky*, in the *Anthropological Papers of the American Museum of Natural History*, Vol. XXII, Pt. 1 (1917).

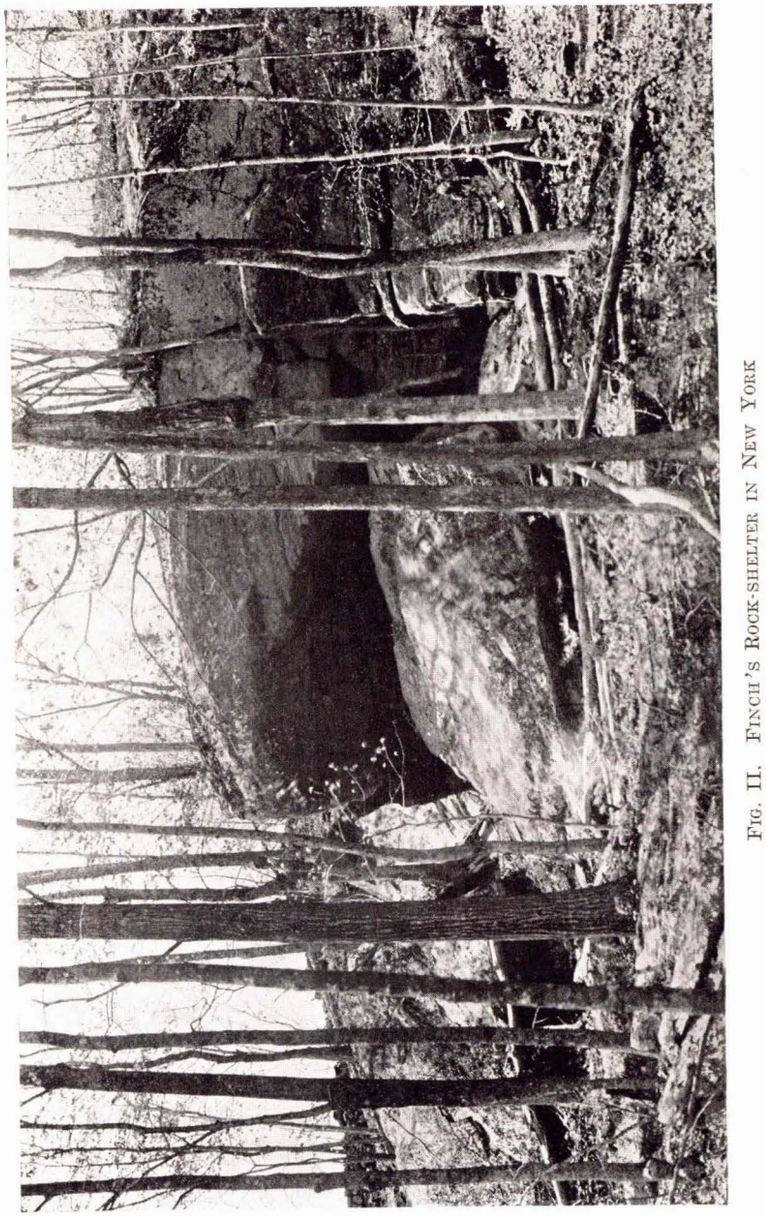


FIG. II. FINCH'S ROCK-SHELTER IN NEW YORK

Europe.[2] Owing to the occasional discovery of deposits of two and sometimes more successive layers, it was possible to piece together these superimpositions so as to reveal the entire span of culture sequence for that area. Finally, in the grotto of Castillo in northern Spain came to light a deep deposit containing layers for each of the palaeolithic periods beginning with the Acheulian.[3]

Nothing so extensive or significant as this has as yet been found in the New World, the closest parallel resulting from a long series of investigations at Trenton, New Jersey, by Charles C. Abbott, Ernest Volk, and others — here, however, not in a cave or shelter but in river terraces. Mr. Volk's determination of strata is shown in the illustrations accompanying his work.[4] Schematically the sequence may be presented as follows:

3. Black or surface soil. Pottery and other objects identifiable as Indian, immediately pre-Columbian.
2. Yellow sand. No pottery, no polished stone objects, but many chipped implements.
1. Gravel. A few random finds, fragments of human bones.

While the geological age of these deposits has long been a subject of controversy, the stratigraphic relations as given above have been verified and accepted. So while cave and shelter exploration in America has not resulted in the establishment of time-sequences comparable to those for Palaeolithic Europe, the somewhat

[2] Osborn's *Men of the Old Stone Age, Their Environment, Life and Art* (Second Edition, 1916).

[3] See Osborn's *Men of the Old Stone Age, Their Environment, Life and Art* (Second Edition, 1916), Fig. 79.

[4] Volk's *The Archaeology of the Delaware Valley* in the *Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University*, Vol. V (1911), Fig. 23, p. 116.

analogous work of Abbott and Volk at Trenton in river terraces does suggest something approaching conditions in Europe.

It is, however, not necessary to seek a cave or shelter for possible examples of stratification, or even a river terrace. Wherever a tribal group lives for a period there accumulates a heap or layer of debris, composed of bones, ashes, broken implements, and the like. Thus are built up the great shell-heaps of our coastal belts and the corresponding shell deposits found along the Ohio River and other inland waters. Again, inland village sites may yield a dump or ash heap in which layers can be distinguished. Especially fine examples of this kind are observable around many of the prehistoric ruins of southwestern United States.

Returning first to shell-heaps, an example may be taken from investigations on the coast of Florida. Many years ago Wyman[5] noted that different levels in the mounds yielded different kinds of pottery. This was later confirmed by Moore,[6] and more recently by Nelson.[7] We reproduce here Nelson's drawing of the Oak Hill shell-heap (Fig. III) from which it appears that three definite culture periods can be established for that locality, as follows:

3. Ornamented pottery.
2. Plain pottery.
1. No pottery.

All these examples suggest that pottery fragments

[5] Wyman's *Fresh-water Shellmounds of the St. John's River, Florida,* in the *Memoirs of the Peabody Academy of Science,* Vol. I, No. 4, pp. 1-94, with 9 plates, (Salem, 1875).

[6] Moore's *Certain Shell Heaps of the St. Johns River, Florida,* in *The American Naturalist,* Vols. XXVI, XXVII, XXVIII (1892, 1893, 1894).

[7] Nelson's *Chronology in Florida* in the *Anthropological Papers of the American Museum of Natural History,* Vol. XXII, Pt. 2 (1918).

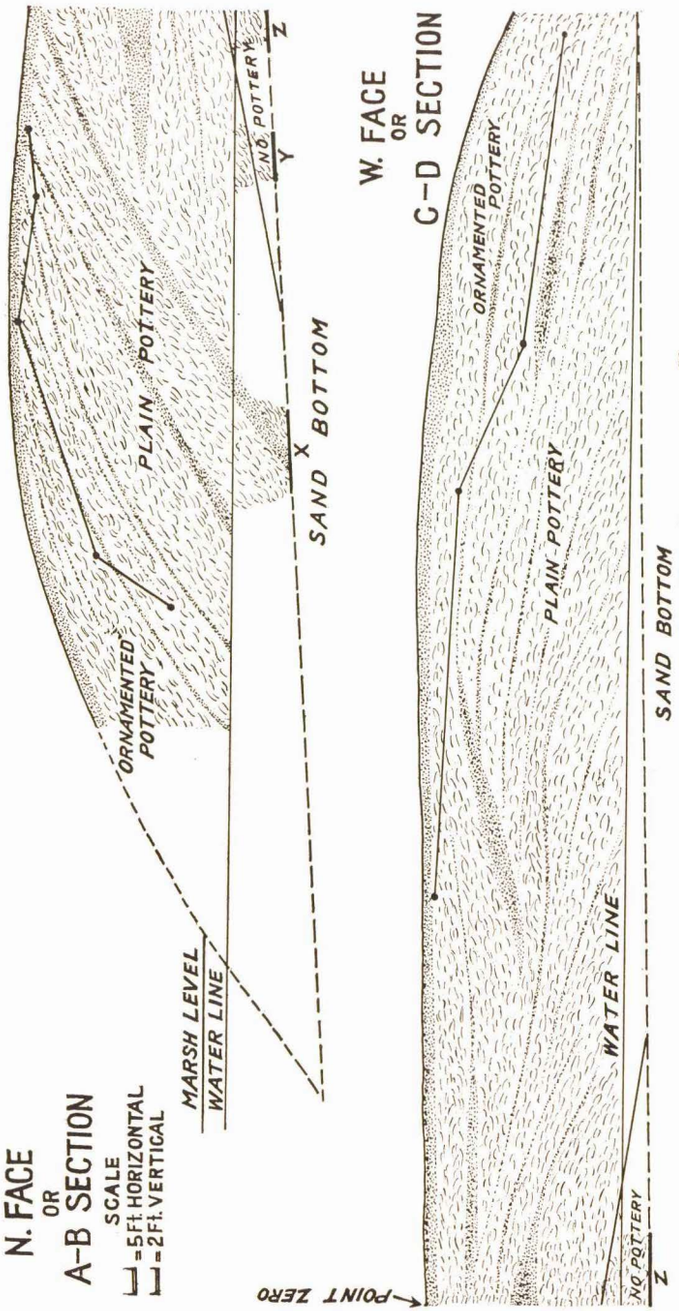


FIG. III. STRATIFICATION OF OAK HILL SHELL-HEAP IN FLORIDA

are the most tangible indices of time-sequence — especially in North America. Not only can we make the gross distinction between sites with and without pottery, but by noting the changes in form and style where pottery is present we are able to determine which is the older. Once having worked out the sequence for a locality we can proceed to arrange all the known sites chronologically. The possibilities of this method are shown in some recent explorations in New Mexico and Arizona by A. V. Kidder, Earl H. Morris, N. C. Nelson, and others. The method of working down a section of a large refuse heap is shown in Fig. III. By taking off equal layers of the debris and saving the pottery and the like from each in separate containers, the excavator brings home with him a series of known objects and sequences, which he can study at leisure and which can be preserved for future verification. The results of many such test sections have given us a chronological scheme for the Southwest as follows:

7. Historic period (1540-1923) — pottery index, two-color glazed ware, modern type.
6. Period of three-color glazed and painted ware (?-1540) — the latest prehistoric period.
5. Period of two-color glazed ware — early type.
4. Late period of two-color painted ware.
3. Early period of two-color painted ware.
2. The pre-Pueblo period — crude pottery only.
1. The initial period or basket makers — pottery generally absent.

While it is true that this is based upon pottery alone, yet when the ruins in a locality have been placed in this scheme by their pottery, note can be taken of the differences in architecture, stone work, bone ornaments, and the like — thus not only checking the data derived

from pottery alone, but gradually assembling data from which the successive cultures can be reconstructed.

Perhaps it has occurred to the reader that the foregoing examples of stratification, in so far as they are American, are confined to the Atlantic belt and to the specialized area of the Southwest. This appears to be due rather to greater zeal in the exploration of these areas; for, as we have seen, the method was applicable to Mammoth Cave in Kentucky. There is, therefore, every reason to believe that the method is also applicable throughout the whole of the Mississippi Valley. In fact, one of the earliest creditable attempts to establish a time-sequence is to be found in a geological report of Indiana for 1880 by John Collett, based upon observations near Vincennes and the town of Worthington in that State.

There it was observed that certain intrusive burials in a few mounds were clearly those of the immediately prehistoric Indian, but deeper and also intrusive were a few stone lined vaults. Similar vaults were found covered by original mounds; but the fact that in some instances they had been intruded into mounds of the ordinary type led to the assumption that they stood in respect to age between the Indian hunting culture of the immediate pre-Columbian period and the more remote builders of the unvaulted mounds. So Professor Collett concludes:

> The tumuli of this and adjoining counties have on their surface shallow, intrusive graves of the savages. At the base, remains of the ancient people, and a few cases between them, the stone graves or vaults of another race! pointing to at least three successive peoples who have occupied these mounds.[8]

[8] *Second Annual Report of the Department of Statistics and Geology, Indiana,* 1880, p. 388.

Unfortunately, this suggestive lead in the time-sequences of the Ohio Valley was never followed up. It remains for some competent local investigator to check up the results.[9]

Later instances of stratigraphic results can be found in the literature of the subject. In 1887 Cyrus Thomas[10] called attention to a site in the extreme northeastern corner of Iowa in which there were three clearly defined strata.

3. Sand — no artifacts.
2. Village refuse.
1. Earthworks and burials.

It is hoped that this site will be investigated in the near future.

From the foregoing we see what is meant by the determination of time-sequences in culture, and that it is possible to determine which of two or more types of sites is earlier, not by speculation but by the use of precise empirical methods. Every such investigation is, therefore, a serious undertaking, demanding in the aggregate a great deal of time and the most painstaking accuracy. Furthermore, since the whole surface of the

[9] It is true that I. A. Lapham, as early as 1855, proposed a time-sequence for Wisconsin, but it does not appear that he made much use of observed superpositions. For one thing, however, he sought to interpret the ages of mounds by noting the presence upon them of the little elevations resulting from uprooted trees, a doubtful method but still worthy of critical study. — Lapham's *The Antiquities of Wisconsin* in *Smithsonian Contributions to Knowledge*, Vol. VII. For recent discussions of examples of stratigraphy see also Stern's *A Stratification of Cultures in Eastern Nebraska* in the *American Anthropologist* (New Series), Vol. XVII, 1915, pp. 121-127; Shetrone's *The Culture Problem in Ohio Archaeology* in the *American Anthropologist* (New Series), Vol. XXII, 1920, pp. 144-172.

[10] Thomas's *Burial Mounds of the Northern Sections of the United States* in the *Fifth Annual Report of the Bureau of Ethnology*, 1887, p. 26 et seq.

country must be examined eventually, it is important that all local students of archaeology familiarize themselves with these methods and the requisite precautions in their use.

Distribution as an Index of Age. — In all archaeological work account must be taken of geographical distribution. There are many fine collections of stone implements and pottery without a scrap of reliable data as to where they were found. For this reason they are of little value. Nor is it enough to know that a given specimen came from the State of Illinois, for example: one should set down the county and the precise locality. The reason for such exactness in distribution will appear from what follows.

For many years zoölogists have been disposed to believe that the mammals of the world were distributed from a central area of origin in the Old World, and that the earliest forms to develop may still be found in the far outlying parts of the world — as Tasmania, Patagonia, and the like. So we are often told that the fauna of a marginal area is older than the prevailing fauna in a central area. The idea is that if a given genus arises in an area, it will in the course of time expand and slowly work its way outward as do the successive wave circles in water when a pebble is dropped into a pool. Then the next genus to form will follow upon the heels of the first, and so on.

There is some difference of opinion as to how far this idea can be applied to the distribution of mammals, but it does seem to apply with fair precision to the development and spread of traits of culture over geographical areas. For example, Nelson[11] observed that if he traveled

[11] Nelson's *Human Culture* in *Natural History*, Vol. XIX, No. 2, February, 1919. See also Wissler's *Man and Culture* (1923).

in a straight line from the vicinity of Santa Fe, New Mexico, the styles of pottery as shown by fragments scattered over the surface seemed to change every twenty-five or fifty miles. In other words, there was a series of pottery zones around a center. Previously, he had worked out the stratigraphy of a refuse heap near one of the largest ruins at the center, in which he found the different styles of pottery superimposed in the same order. Fig. V shows such a stratigraphic section, but from another part of New Mexico. In the Santa Fe district, however, he found six types of pottery superimposed. If then you draw six circles about the same center and number from 1 to 6 you will have a diagram for this pottery distribution over the surface of the surrounding country.

From the above we may safely infer that in the area enclosed by these circles there was a common center at which these types of culture developed and that the time-sequence of these could be determined by plotting the distribution of the pottery fragments, just as precisely as by digging in the refuse heap. Had the people of this area been less sedentary and more disposed to shift about, there would have been no single refuse heap from which the time-sequence could have been determined; and yet the distribution would have revealed it, for the outermost zones in your diagram are but the projecting edges of the successive strata of culture underlying the whole area.

Of course, such a diagram is schematic. No such precise circular boundaries will be encountered in actual exploration, for a mountain here and a valley there will dent the circumferences of these circles; but in the main the relation will hold. The scheme may be applied even to the world as a whole if we disregard the many variations and distinctions due to the contours of continents and their topography.

The general principle of distribution as an index to age was recognized long before Nelson's discovery at Santa Fe: it was applied even to the primitive languages of the New World. There is, however, one suggestive application of this method to archaeological data in the Mississippi Valley. In 1917 there appeared an instructive application of this principle in Moorehead's *Stone Ornaments,* where distribution maps are given for a number of special forms.[12] Granting that Moorehead's data are sufficiently complete to be representative, we find the center of origin for these special forms to lie in Ohio and Indiana. The most restricted distribution is that for the bilunate form and the most extended that for the ovate. We conclude, therefore, that the ovate is the oldest form and the bilunate the most recent. The complete sequence would be:

4. Bilunate
3. Bar-amulet
2. Gorget
1. Ovate

From the accompanying maps it appears that bird-stones have about the same range as the bar-amulet (3), whereas stone tubes correspond closely to the gorget distribution (2). We may conclude then that the oldest graves, village sites, and the like in this central part of the United States are those that yield ovate stone ornaments exclusively; that next in order are those with stone tubes or gorgets; next, bar-amulets and bird-stones; and latest of all those yielding various bilunate forms.

[12] Moorehead's *Stone Ornaments Used by Indians in the United States and Canada* (1917), Fig. 202.

Before leaving this subject we may digress a moment to consider another aspect of this sequence in ornaments. We should expect that such a sequence represents a natural development of the art of making stone ornaments in this locality and that in consequence the simpler forms would be found at the bottom of the series and the more complicated ones at the top. This is, in fact, just what we do find. The ovate forms, as defined by Moorehead, are merely oval objects of stone perforated and sometimes notched, but others are plain even to crudeness. On the other hand, the bilunate form is ornate: it is based upon the concept of a double crescent, the carving and polishing being of a high order. The contrast is so striking that one might say "that while any good workman could make the ovate form, only an artist could produce the bilunate."

Again, when we turn to the intervening forms, the bar-amulets and bird-stones, preceded by the gorgets and tubes, we see that the former is of a higher quality than the latter. So we see in the ornaments themselves evidence for the gradual development of a special art in the making of certain stone ornaments at a center whose precise boundary falls within the present States of Ohio and Indiana. Our confidence in the above time-sequence is thus increased by this check upon the original observation.

Finally, we may note another significant fact, namely, that these ornaments are not often found in mounds, but scattered over the surface and in ordinary burials. Thus, they can not be attributed to the builders of mounds in the same localities. So again we assume that a culture arose and ran its course independent of the mound culture in Ohio and Indiana. It then remains to discover whether these makers of stone ornaments preceded or followed the builders of Fort Ancient and the Serpent Mound.

It would be interesting to take the data for Ohio, Indiana, and parts of adjoining States and check out the sites according to this scheme. The chief difficulty in carrying this out may lie in the fact that most of these ornaments to be seen in collections have been picked up at random in plowed fields and are not easily associated with graves or definite sites. Nevertheless, here is a lead for a promising inquiry.

We see then why the most precise data on the distribution of finds should be kept; for by the correlation of such data with other facts the minute culture sequences for the several geographical sections of a State may eventually be determined.

ARCHAEOLOGY AND HISTORY

In all the States there are known sites of what were Indian villages during the period of colonization, and in many of the States there still remain remnants of Indian tribes once living and flourishing there. It is thus possible to connect the immediate prehistoric with the historic. The reconstruction of the original culture of these tribes at the time of their first meeting with the settlers is a most important problem. For example, the Menomini of Wisconsin when first discovered were residing about where they now are. Accordingly an intensive study of that territory would enable one to identify the prehistoric sites, to determine their culture characteristics, and eventually to distinguish between the early and the late sites.

A good example of this kind of work is to be found in Alanson Skinner's[13] *Material Culture of the Menom-*

[13] Skinner's *Material Culture of the Menomini*, Ch. VII., in *Indian Notes and Monographs, Museum of the American Indian, Heye Foundation.*

ini. But for a more exhaustive study see *The Mandans.*[14] Many other similar studies could be cited, but all of them are still deficient in archaeological data and particularly in the use of such refined methods as are now available for the determination of definite time relations.

All the States in the Union, particularly those in the Mississippi Valley, offer many such problems in the archaeology of known tribes; for throughout the length and breadth of that great area there lived, in prehistoric times, many Indians of different stocks and cultures. Whether the historic Indians were the same people or whether they were the descendants of those who held the country in prehistoric times is, of course, a question in many cases. It is often possible, however, by the examination of known historic sites of given tribes to trace those tribes back to the prehistoric period. When articles identical with those found on the historic sites occur on those of prehistoric origin, careful comparison with other sites in the locality will leave little doubt as to the identity of the people inhabiting the locality in the past.

Two cultures may be looked for in the Mississippi Valley region and also northward toward the Great Lakes. The first of these is the Siouan culture, which is not at all well known, but which, judging by the remains found on the Upper Missouri River and in Nebraska, especially on the Mandan village sites, was rich in bone and antler implements and possessed a high development of characteristic pottery. In the lower stretches of the Mississippi Valley, there is a second culture, associated with the mounds, which was exceedingly rich in many varied forms of pottery, including necked bottles, effigy jars, and

[14] Will and Spinden's *The Mandans, a Study of their Culture, Archaeology and Language* in the *Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University,* Vol. III, No. 4.

painted ware. Neither of these cultures has received very full description, although the latter has been worked over to a considerable extent by Mr. Clarence B. Moore, whose splendid publications have been printed under the auspices of the Philadelphia Academy of Sciences. Mr. M. R. Harrington, in a recent paper, *Certain Caddo Sites in Arkansas,*[15] has produced an exceedingly valuable paper.

Two other cultures which have been identified in the east and which may be expected to occur in certain parts of the Mississippi Valley and Great Lakes region are the Algonkin and Iroquoian. The Algonkin culture has been shown to be a complex in which articles of stone predominate over those of other materials. In this complex are found polished slates, bannerstones, gorgets, tubes, and bird stones; platform pipes, micmac pipes; pottery vessels possessing conical bases; long stone pestles; grooved axes; arrow points of many types, shapes, sizes, and materials, especially the notched and stemmed varieties. Bone and antler work are weakly developed. While first identified in New York, this culture has since been found to have spread throughout New England, southern Ontario, through Pennsylvania, Ohio, Indiana, Illinois, Wisconsin, and westward as far as Minnesota. Its southern range has not yet been determined.

The Iroquois culture, on the other hand, is one in which the use of bone and clay predominates over that of stone. Iroquoian pipes are especially beautiful, and on their ancient sites vast numbers of handsome effigy pipes of clay have been obtained. Their pottery is characteristic; the jars have rounded bottoms, constricted necks, and usually, overhanging rims. Bone implements include, of course, awls, fish-hooks, harpoons, usually unilaterally barbed, combs, spoons, bowls, beads, gorgets made of human skulls, and many other articles. Triangular flint arrow-points of small size seem to be the only stone arrowheads used by these people. Celts are found, but not the grooved ax, which is a component of Algonkin culture. The

[15] Harrington's *Certain Caddo Sites in Arkansas* in *Indian Notes and Monographs, Museum of the American Indian, Heye Foundation.*

long pestles noted in the former culture are absent; so are, for the most part, gorgets and all the polished slates.

It must not be thought, however, that the mere occurrence on a site of triangular arrow-heads, to the exclusion of others, proclaims it to be one of Iroquois origin. Several or more of the component units of these complexes must be present before the culture can be definitely identified. Taken separately, they are only indications or symptoms.

Overlapping of the various cultures is to be expected; both Algonkin and Iroquoian sites sometimes occur on the same spot, though, of course, they are not contemporaneous. But, more than this, certain articles are found to be common to many different cultures. For example, the celt is found almost universally over eastern North America, and likewise certain other types of implements, so that, as mentioned above, one must take into consideration not only one, but a number of units comprising any complex before a culture can be identified.[16]

These suggestions are offered merely as hints as to how the historical problem articulates with the archaeological one, thus making it clear that both historical and archaeological students should be interested in these surveys.

[16] From notes supplied by Alanson Skinner.

II

PLANNING A STATE SURVEY

Having in mind the fundamental research objectives in the study of American antiquities, the archaeologists in a State can readily formulate a plan for the organization and support of a State survey. Such a survey may be conceived of as a distinct State department — paralleling such other departments as the Geological Survey, or the Biological Survey — under the more or less independent direction of a single official. No State has so far fully realized this ideal. In Indiana and New Jersey, for example, the director of the Geological Survey has been charged with the archaeological survey.

On the other hand, we find examples of State archaeologists as officers of more or less independent organizations to which the State gives support. Thus, in Ohio we find the State Archaeological and Historical Society, which directs a State museum and a State survey, appointing a director and a staff for the same. A somewhat similar situation exists in Wisconsin. Again, we have State museums supporting departments of anthropology which have undertaken intensive surveys, as in New York.

Thus, without going into an exhaustive review for the several States, we find that the tendency in general is for such surveys to develop either at the hands of a permanent organization, having under its control a museum, or as a part of an independent museum organization.

One notable fact is that whereas State universities

take a large interest in the geological, biological, and other scientific work of the State, they show no such tendency with respect to anthropological problems. The one exception is the University of California, which supports a well organized staff of anthropologists. This staff, incidental to its teaching and research function, has carried on and is still carrying on a survey of the State. Taking it for granted that instruction in anthropology will soon be given in all the State universities, we may look forward to the time when these institutions will lead in the researches which such a survey entails.

In the meantime, facing conditions as they are at present, the taking up of a survey brings the State agency involved face to face with the question of personnel.

Someone must necessarily be the active, responsible initiator of the work and must himself take up at least a part of the burden of field work. It goes without saying that he must have the requisite training, the breadth of view, and the scientific qualification for research. The ideal condition would be for such a man to give his entire time to the work, half being spent in field work and the remainder in working up his data. A young man just completing his graduate work in anthropology and possessed of the requisite qualifications could safely be given such a directorship, under the general direction of some appropriate agency such as the State geologist, the curator of the State museum, the conservation commission, or the State historical society.

If, however, it is not feasible to provide for full-time service, the assistance of some teacher of anthropology who can give his spare time should be sought. Although the number of men available is not great, still there are such men and institutions from whom aid and service

can be anticipated. Furthermore, in the event that this method is followed, it may be expedient to give parts of the work to different investigators according to their specific qualifications. In this way, a satisfactory high research efficiency may be attained.

Among the incidental, but by no means inconsequential, results from a survey are the reaction and stimulus of interested citizens. In each community may be found a few individuals who have more than a passing interest in the subject and who stand ready to coöperate under wise and efficient leadership. It seems probable that the survey in any given State will stand or fall according to the skill with which its leaders approach and enlist the support of this great body of amateurs. Visits to a county by the State field worker must necessarily begin with calls upon these local antiquarians and the study of private collections; and out of this contact should develop a permanent relation.

Appropriate questionnaires may be prepared for circulation among local students — such, for example, as the circular which was issued by the Indiana Historical Commission.

While it is possible to canvass a State entirely by mail, the result will be far from satisfactory because the person in charge of the survey must himself see most of the sites and meet most of the correspondents before he can evaluate their communications or intelligently follow them up. In this connection an early publication of the data for a group of counties will be serviceable in stimulating additions and corrections as well as in setting a pattern for reports from other localities.

Such considerations as the foregoing are, however, but incidental to the formulation of a plan; and it is upon the soundness and reasonableness of this plan that suc-

cess in securing support depends. To this end the following suggestions are made.

THE SURVEY PROJECT

While the ideal objective would be an organization to carry on archaeological work continuously, suggestions are offered along the lines of a survey project, the primary purpose of which is to perfect a record in a definite time, through a period commensurate with the areas to be surveyed. The work as herein outlined need not, therefore, involve great expense nor entail obligations for the indefinite future.

What is primarily needed is one trained archaeologist of some experience and the ability to draw the support of amateur collectors in the State and lead them to do team work, as indicated in the preceding section. The total budget need not call for more than $5000 to $8000 annually. It is the unanimous opinion of the committee, of which the writer is chairman, that unless the project can be entered into with the expectation that it will extend over a period of from three to five years, the results will not be commensurate, since it will take at least one year for the leader to develop the situation and establish his team. Thus, it is respectfully suggested that this be taken into consideration in formulating a State survey as a definite project. It can thus be administered under an existing State agency.

III

THE SURVEY TECHNIQUE

Assuming that the initiation of a State survey is assured, the question of method must be considered. Archaeological technique involves not merely methods of research in the purely scientific sense, but also classification and recording. It is a truism that any given science advances in proportion to the refinement of its technique. So we shall devote the remaining pages to a review of the most obvious questions in archaeological method.

CLASSIFICATION OF SITES AND MATERIALS

Archaeological specimens are described according to a conventional nomenclature, the best presentation of which will be found in the report of a committee appointed by the American Anthropological Association.[17]

Archaeological sites, or places at which archaeological data are obtainable, naturally fall into definitive classes for which a nomenclature must be adopted; and, though there is no fixed terminology for this, the following terms are usually employed:

1. *Agricultural plots, fields, old clearings, and the like.* Special attention should be given such tracts of land as have never been cleared or cultivated. They are the only places likely to reveal these sites. Of course they should be exhaustively studied for all traces of former occupation.[18] It has been asserted that the In-

[17] Moorehead's *The Stone Age in North America*, Vol. I, pp. 11, 23-30.

[18] Delabarre and Wilder's *Indian Corn-Hills in Massachusetts* in the

dians of Kentucky cleared land by burning to entice the bison; and something like this has been reported elsewhere.

2. *Burial grounds, cemeteries, graves.* (See below, p. 49)

3. *Cache.* The term cache is usually applied to a hoard or nest of stone implements and other archaeological materials, obviously deposited for safe-keeping. One of the most notable caches on record was found in a mound at Hopewell, Ohio, from which upwards of 8000 well made flint disks of large size were taken. Another remarkable cache of carefully chipped chert blades was found in a mound in Brown County, Illinois. This contained 4836 blades which are now in the American Museum of Natural History. While such striking examples of caches are rare, almost every field worker encounters small ones in the form of pits, often within house sites. It is well known that the Mandan, Pawnee, and other Indians of the Mississippi Valley living in earth lodges made such caches within the lodge, into which they put their choicest possessions.

In some parts of the country fire holes or pits were sometimes used as caches, but more frequently as places to dump garbage and other refuse. It is therefore frequently difficult to distinguish between a true cache and a pit. (See below, p. 33)

4. *Cairns.* A term used for small heaps or mounds of stones.

5. *Camp sites.* See village sites.

American Anthropologist (New Series), Vol. XXII (1920), pp. 203-225; Cook's *Milpa Agriculture, A Primitive Tropical System,* in the *Annual Report of the Smithsonian Institution,* 1919, pp. 307-326. For further explanations of this topic and others see Thomas's *Report on the Mound Explorations of the Bureau of Ethnology* in the *Twelfth Annual Report of the Bureau of Ethnology,* 1894, pp. 27-33.

6. *Canals and ditches.*

7. *Caves.* All such should be examined with great care for examples of stratification.

8. *Enclosures, walls, embankments, fortifications, and the like.*

9. *House sites, hut rings, tipi circles, and the like.*

10. *Mounds.*

11. *Mines.* We usually distinguish between *quarries* and *mines* by limiting the former to stone. But in archaeological work it seems quite unnecessary to draw sharp distinctions. In addition to the materials mentioned under *quarries,* the aborigines sought copper, hematite, paint materials, mica, and the like. Probably most of the important mining sites have been noted in the literature, but these will bear new investigations — for example, mica mines in North Carolina, hematite mines in Missouri, turquoise mines in New Mexico, and copper mines in Michigan. In addition to these famous sites, there no doubt remain many still undiscovered small ones from which paint and other materials were taken.

12. *Miscellaneous finds.* Since no scheme of classification will fit everything, place must be made for the exceptional.

13. *Pits.* Holes filled with refuse, and the like, are often encountered in the Mississippi Valley. They may be expected around village sites.

14. *Pictographs and inscriptions.* On boulders, ledges, and other suitable rock surfaces may be found incised figures and designs. No doubt most of these are known and recorded; but as many of them are almost weathered away, some may thus have escaped detection. Particular attention should be given to the walls of caves and shelters. If perchance one finds what seems to be the drawing of the aborigines, a careful copy

should be made at once, because our own people have a habit of marking up all such surfaces and would thus soon obliterate any such true pictographs.

15. *Quarries.* Defining quarries as sites from which usable stone is taken, our present knowledge leads us to anticipate that each State contains some such sites from which chert and other chippable stones were sought. Flints usually occur as nodules in limestone. Hence, all limestone outcrops should be examined for traces of these nodules. If abundant, evidences of ancient workings may be expected. Once the geological facts as to the distribution of flint-bearing strata are available, the archaeologist can proceed with an important group of problems. For one thing, he can seek out the places where it is certain that prehistoric man worked these deposits. Then, he can determine the varieties of flint and possibly distinguish the sources of each. Now, if the distribution of these over the State is worked out, one can speak positively as to prehistoric commerce, knowledge of geography, and the like, among the aborigines. Thus far such a study for even one State has not been completed, though in Ohio and possibly elsewhere such investigations are under way.[19]

When steatite vessels are found one may expect quarries for that material. Likewise the stone materials used in the making of pipes, ornaments, and the like should be classified and the sources of supply sought. No doubt many interesting discoveries will be made along this line.

16. *Refuse heaps.* (See shell-heaps)

17. *Reservoirs.*

18. *Rock-shelters.* One of the most widely distributed types of archaeological remains and also of the first importance, because wherever an overhang, however slight, affords protection from wind and rain, man would sooner or later come to camp. Thus, in the course of centuries there would accumulate the remains of many successive camp-fires. (See above, pp. 11, 12, 13)

[19] Holmes's *Handbook of Aboriginal American Antiquities* in *Bulletin of the Bureau of American Ethnology,* No. 60, Pt. 1, pp. 157, 173.

19. *Ruins.*

20. *Shell-heaps.* Found not only on the seacoasts but occasionally along streams where the fresh water clam abounds. These should be carefully searched for any objects of interest.

21. *Shrines and sacred places.* Pioneer observers of the Indian have left us records of rocks, springs, and other unusual objects that were looked upon as sacred and to which offerings were made. The location of many new finds of this character is still possible in such States as now have within their borders the descendants of the original occupants, or concerning which living Indians have definite knowledge. For example, the Pawnee recognized a number of such sites in Nebraska and could no doubt locate them if taken to the vicinity. Something could be done with other tribes and in other States, and while such investigations partake of the nature of historical research, the sites once located should be carefully examined archaeologically for traces of offerings. In a few instances springs have been found to contain stores of stone implements and the like as if thrown in as offerings.

22. *Salt fields.* There is some reason to believe that some tribes east of the Mississippi manufactured salt. The saline deposits of the country need special study for new traces of such aboriginal industry. The best known sites where traces of aboriginal salt-making may be observed are near Lincoln, Nebraska; Saline River,

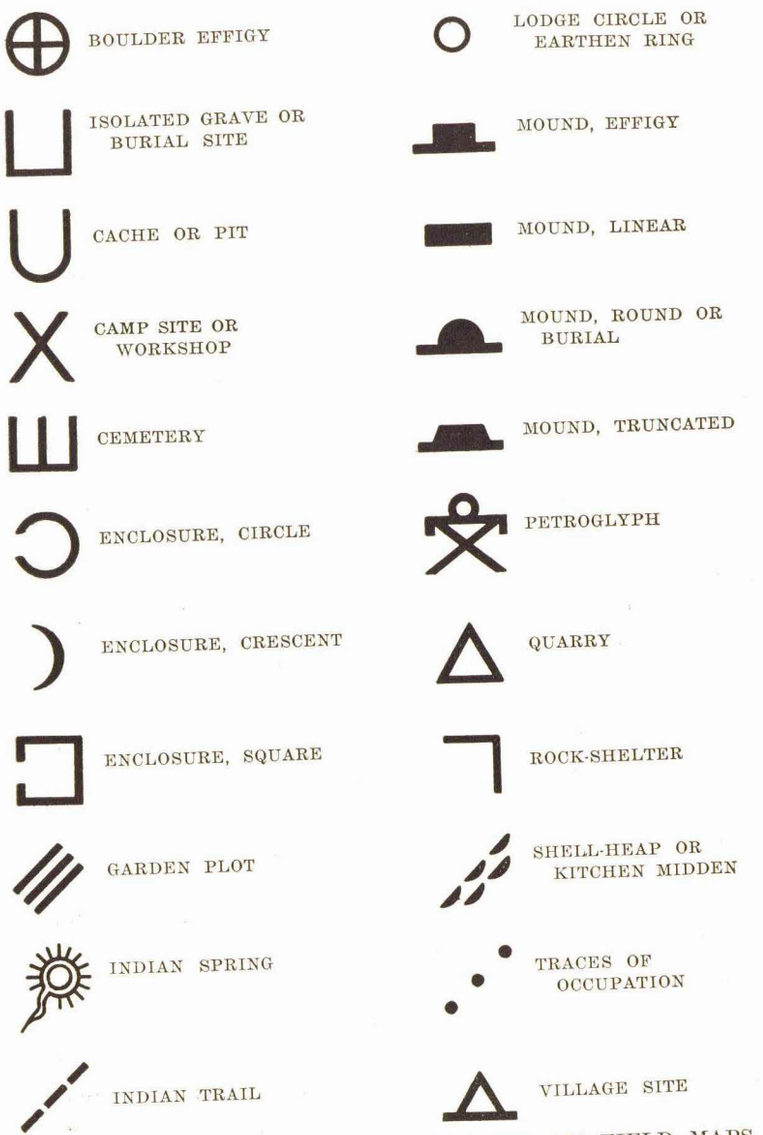


FIG. IV. — CONVENTIONAL SIGNS FOR USE ON FIELD MAPS

ADAPTED, WITH ADDITIONS, FROM MILLS' ARCHAEOLOGICAL ATLAS OF OHIO AND PARKER'S ARCHAEOLOGICAL HISTORY OF NEW YORK

Illinois; the mouth of the Arkansas; and Kimmiswick, Missouri.

23. *Trails.* While the tracing out of old trails, fords, and the like is usually pursued by historical students, the subject should receive attention in State archaeological surveys because of its intimate bearing upon the distribution of the aborigines. At least all sites of this character should be shown upon the maps of historic Indian villages for each State. Since few States have been so mapped, there is great need of work along this line.

24. *Village sites.* (See below, pp. 45-48)

25. *Workshops.* Having once located quarries from which stone could be taken, especially for chipping, a search should be made for the places where the materials were worked. These will be revealed by the accumulation of flakes and broken implements. Some of the best known workshop sites are those at Flint Ridge, Ohio. Once such a site is located the investigator should proceed to study it with the greatest care, for from its debris can be recovered many details of the culture of the workers.

For convenience in mapping, each of the above should have a symbol. (See Fig. IV). Then when an archaeological site has been detected, its place in the above scheme should be determined and so reported upon as to give full information upon the following essential points:

1. Class and location.
2. Extent, plotting, and the like.
3. Description, archaeological characteristics.
4. Notes on collections made.
5. History of the site (former surveys, excavations, etc.).

Complete and definite information on these points will be extremely valuable.

DATA UPON PRIVATE AND PUBLIC COLLECTIONS

The distribution of artifact types is important. Thus, grooved stones of a specific type may occur in one section of the State and not elsewhere. If notes are taken of the types in collections and the localities from which they come, such facts of distribution will ultimately appear. Incidentally, such inquiries will stimulate collectors and local students to give more attention to the precise locations of their finds.

Special attention should be given to pottery as well as to the several types of stone artifacts. Collectors often neglect sherds, or fragments, because they consider them of no value; when the fact is that all the distinguishing characteristics of the pottery for a given area can be determined from the small samples gathered from the surface or found in the ground. For each site, too, special note should be taken of the decorations upon the pottery, the structural character of the sherds, and similar matters. Also, the presence or absence of pottery at a site is of itself of the greatest significance.

For the classification and nomenclature to be used in listing specimens see Moorehead's *The Stone Age in North America,* Vol. I, pp. 23-30.

FILING SYSTEMS

The most practical method of filing original data is by the envelope system. The logical unit for the State is the county. Sites and other information can best be tabulated on cards, by counties, each site being given a serial number which then stands as its index throughout. Here, or in the file, should be recorded all bibliographic references. For a published bibliography see Harlan I. Smith's *Memoranda Towards a Bibliography of the Archaeology of Michigan* in the *Michigan Geological and Biological Survey Publication,* No. 10.

MAPPING

Presumably for each county (except in a few of the Eastern States) there is available a map showing all the section lines. All sites and finds should be carefully placed on such a map. Preferably all highways, towns, and streams should be indicated on the base map, as these will greatly facilitate precise entries by the field worker. For examples of such mapping, see publications of the Ohio, New Jersey, and New York surveys.

Furthermore, it is suggested that arrangements be made whereby every new State map, in whole or in sections, records archaeological sites just as other important topographical features and public buildings are located. State topographers especially should be encouraged to record such data on their field sheets.

PUBLICATIONS

The formulated data on sites and the like seem best segregated under the heads of counties. Thus:

Wayne County
New Garden Township
Rectangular Earthworks

One mile northeast from Fountain City, on level ground, between Noland's fork and a small tributary — Buck run — is an embankment inclosing eleven acres. The figure (Plate C) of this earthwork is a square with curved corners. The length on the inside of the embankment is 780 feet. The embankment has been plowed over for years, yet can be plainly traced. A gateway is discernable on the west side, and hollows are found in the vicinity, which some suppose were made by the builders when collecting material for the embankment. Since the accompanying map was made, a more careful survey has discovered the fact that the direction of the embankment is not

due north and south, but at an angle, with the west side nearly parallel with the road.[20]

A further example may be cited from the report on certain sites in Gloucester County, New Jersey:

Woodbury. — Many scattered finds have been made in the fields adjacent to Woodbury Creek on both sides from its mouth to its source, as well as along Mathew's Brook. Objects, although not abundant, are more plentiful on the south side of the creek. (31-11-4,5,8.)

Mantua Creek. — Along Mantua Creek, on the bluffs on both sides, from Mt. Royal to Hee's Branch and along Monongehela Brook, relics have been found. These are chiefly arrow points, occasionally a grooved axe is found. It is probable, however, that all the sites on this creek have not yet been reported. (31-11-7-7, 8; 31-21-1, 2, 3.)

Swedesboro. — Objects of aboriginal manufacture, such as arrow points, flaked blades and axes, are found on the sandy bluffs on both sides of Raccoon Creek between Swedesboro and Bridgeport. The upper reaches of this creek, where the banks are quite high, would repay further investigation on the part of local collectors. (24-4; 30-23-3, 6.)

The hill rising immediately south of the mill pond at Swedesboro is the site of a large camp or small village. Here a sandy loam overlies gravel, in which pebbles of quartzite are abundant, but none of argillite are to be seen. Several large springs are located on this hill. This site is now occupied by a cemetery, where many objects have been found while excavating for graves. Mr. C. D. Lippincott reports pitted hammer stones, grooved axes, a pestle, and a rubbing-stone, flat with long usage. Arrow points are fairly abundant, approximately equal numbers of these are made of hard stone (flint, quartz and jasper) and argillite. The degree of finish exhibited by the hard stone points is equal to that of the argillite blades, both displaying crudity of form and polish. (30-24-4-9-4.)

[20] *Eighth, Ninth and Tenth Annual Reports of the Geological Survey of Indiana*, 1879, pp. 219-221.

Scattered objects are to be found on the tributaries of Raccoon Creek near the mill pond, as well as on the upper reaches of the creek east of Swedesboro.

Remains of those types common to this region occur in such abundance as to indicate a camp site on Raccoon Creek south of the confluence of two of its branches 1 mile east of Swedesboro. This site, occupying several acres, is on a sandy bluff near several good springs. Quartzite, flint and jasper pebbles abound: no argillite pebbles were to be seen. The arrow points from this site are essentially of the same characteristics as those found south of the mill pond. (30-24-5-4-9.)

Workmen engaged in building the Bridgeport road excavated several skeletons, reputed to be Indian, about one-half mile west of the West Jersey R. R. on a brook tributary to Raccoon Creek. These were at a depth of 3 feet in sandy soil. The bones were black. Only the skulls were taken out intact, but these soon crumbled on exposure to the air. Scattered finds have been made nearby, but no signs of occupation were visible when this site was visited in August, 1913. (30-24-4-4-9.)

Indications of a camp site are found on the north bank of Raccoon Creek 1¼ miles below the West Jersey Railroad trestle at Swedesboro. Several grooved axes, a pitted hammer stone and many arrow points have been picked up here. The preponderance of arrow points are of flint and jasper. (30-24-4-1-5.)

Harrisonville. — A camp has been located on the flat bluff overlooking a tributary of Oldman's Creek 1 mile east of Harrisonville. The site is a small one, the objects found in it being typical of those from other Oldman's Creek sites, except that potsherds are absent. Three very fine pestles, about 14 inches long, have been found here. (30-34-3-5-4.)

Harrisonville Station. — Mr. David Bassett reports a camp site containing a mound on the south side of Oldman's Creek, one-half mile east of the railroad bridge. He has found many objects here, notably a bird amulet. Shells are also found on this site, an unusual feature in this region. (30-34-1-5-3.)

Signs indicative of occupation are found on the Bassett farm

one-quarter of a mile west of the West Jersey Railroad. Potsherds have been found scattered about this camp. The arrow points collected here are for the most part of quartz, flint and a few of jasper and argillite. These are all of the same degree of finish, but their crudity is apparent when comparison is made with specimens from the great village sites in other parts of the state. With the exception of the objects from one or two sites, finely finished stone implements are conspicuous by their absence from this region. (30-34-1-1-6, 9.)

Scattered remains are found in the fields immediately north and west of this site.

Three-quarters of a mile due west of the West Jersey Railroad on the south side of Oldman's Creek is the highest bluff on the creek. The bluff is sandy and convenient to several springs. A small village was located here, where a great abundance of specimens have been found. Arrow points, grooved axes, hammer stones, both plain and pitted, pestles, etc., have been picked up on this site. It is noteworthy that about half of the arrow points from this tract are made of quartz, and that the majority of pebbles near the site are also quartz. Potsherds are found here in abundance. There is said to be a mound, about 12 yards square, at this site, but it could not be located in the timber growth which covered the greater part of the site, when it was visited in August, 1913. (30-34-1-1-4, 5.)[21]

These examples are offered merely as suggestions. Since the boundaries of a State are rarely of geographical significance they can not be expected to coincide with the distribution of archaeological data. It will, therefore, be of the greatest possible value to have the data for the several States comparable. This we believe can be secured without unduly hampering the freedom and initiative of the individual investigators. In any case, it is standardization of records, maps, and forms of publication that is recommended to the end that data for the several States shall be comparable.

[21] Spier's *Indian Remains near Plainfield, Union Co., and along the Lower Delaware Valley* in the *Bulletin of the Geological Survey of New Jersey*, No. 13, (1915), pp. 88-91. The numerals in this text refer to the New Jersey State topographical sheets used in this survey. Maps for these sites will be found in the original.

PRESERVATION OF ANTIQUITIES AND THE ESTABLISHMENT OF STATE PARKS

The idea of conservation is now uppermost in the organization of State surveys of whatever kind. There also seems to be an awakening as to the need of such conservation of the State's historical assets, and it is in this group of assets that archaeological objects fall. Such a survey as is contemplated here is the first necessary step in the conservation and preservation of the State's antiquities. Its logical end is the establishment of State parks in which are to be found typical mounds, hill forts, and the like and also the encouragement of State and local museums. The development of automobile travel has brought the need of State parks which shall have in themselves some worthy intrinsic interest. The State of Ohio has shown what an asset such parks can be — for example, the Serpent Mound and Fort Ancient. The survey herein proposed is essentially to take stock and to see what the State possesses in the way of antiquities so that it may take the proper steps to preserve such of these as possess great public interest.

Many States are now enacting laws on the preservation and protection of antiquities. Eventually every State will be confronted with this problem and its handling will require data from such a survey as herein proposed, for without exact knowledge of what the State possesses intelligent action can not be taken.

As stated above, Ohio has maintained a number of

historical and archaeological parks for years. Many other States are now establishing them. The experiences of these States is that, if someone makes it his business to lead in the undertaking and the step is once taken, many desirable sites will be donated to the State.

COLLECTING

As a large part of the data for the survey will be gathered by enthusiastic collectors for the localities in which they reside, collectors should acquaint themselves with the methods experience has shown necessary to the proper recording of data. By taking such precautions everyone interested can contribute to our knowledge of the past. And so it comes about that the making of an archaeological collection, when properly done, is a real service.

In the first place, a collector should give chief attention to one locality or section. A desultory collection is too scattering to be of scientific value; but one confined to a restricted area will stand as a distinct unit and an index to the culture of its prehistoric inhabitants. One of the most satisfactory collections ever noted by the writer was from a single farm of three hundred and twenty acres, the precise locations in which were recorded for each specimen.

Although a number of suggestions are offered here as to the exploration of mounds, graves, and village sites it is our firm conviction that the ordinary, untrained collector would do better not to attempt the excavation of a given site. On the contrary, let him write to the director of his State survey and perfect some arrangement whereby the site may be properly explored. Much valuable archaeological evidence is lost because men who have had no training in excavation attempt that difficult and technical work.

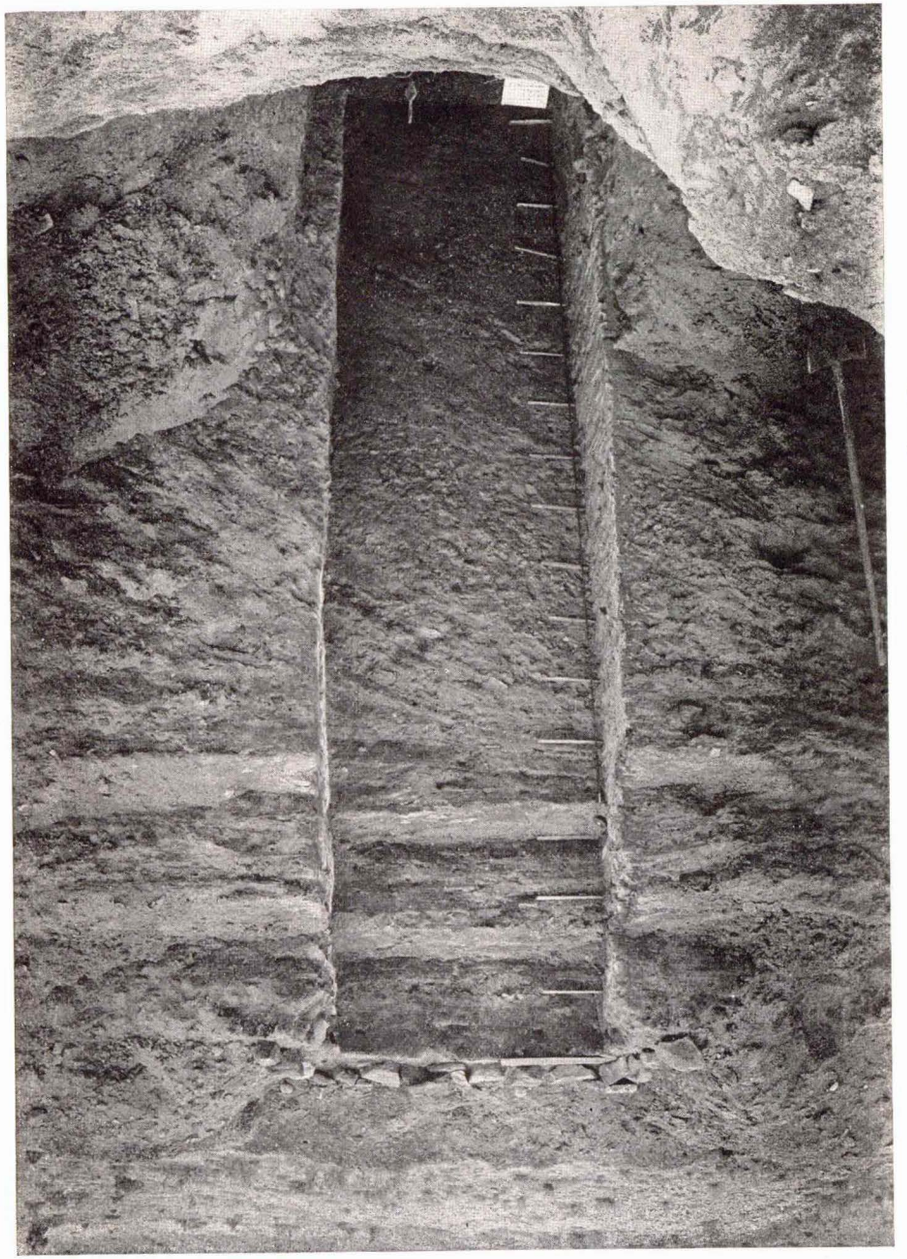


FIG. V. STRATIFICATION AT PUEBLO BONITO, NEW MEXICO

Finally, in an archaeological survey it is important to list all of the village sites, mounds, caverns, and other prehistoric remains in the State. Independent of what remains have been found in these places, it is of the greatest importance that their location should be known and properly recorded. Such sites are quite as important in archaeology as the specimens found in them. Thus, collectors can be of the greatest assistance to the survey if they will report such sites and prevent their exploration by ignorant persons.

A special service which collectors can render is to be on the look-out for fraudulent antiquities and to expose those engaged in their distribution. Some States have passed laws making such traffic illegal, and where it exists the vigilance of collectors will count for much.

LOCATING SITES

What to look for is in the main obvious; but some of the less noticeable of archaeological materials call for special methods. Among these are village sites, camping places, and graves. In this connection, the following statement should be noted:

> In considering the Indian village and campsites of the Mississippi Valley and Great Lakes Region, we may first note certain general characteristics not only well nigh universal throughout the entire region under consideration, but throughout all the vast territory of the Mississippi River and probably also the western part of the region. Two things were absolutely requisite to every aboriginal community. One was the presence of fresh water, the other, situation in a sheltered spot, preferably on the northern bank of a river, and if possible on a sunny knoll. The searcher for Indian sites may therefore, as a rule, ignore all localities where the soil is not light and dry and that are not located within easy reach of an everlasting supply of pure fresh water. Important village sites may be

expected at the forks of important rivers, or where tributaries join the main waterway. They will generally be on the first terrace above the river and not on the flood plain, where they are open to inundation in the spring of the year. Along the Great Lakes, where the shores are sandy, sites occur on the second ridges, i. e., the sand dunes which are separated from the cold blasts which come from over the water by another ridge between them and the lake. This is true all along the west shore of Lake Michigan from a point a few miles north of Milwaukee practically up to the Straits of Mackinaw.

Campsites resemble villages but are very much smaller in area and more sparsely covered with indications of former occupation. They are also found scattered along the main waterways and are quite prevalent in the interior of the country in remote places. On them the searcher is less apt to find rare or unusual specimens.

The most prominent criteria of the camp or village sites are, first, quantities of burnt stone that have seen use in aboriginal fires. In locations where the light sand is apt to be blown away by the prevailing winds, sometimes the burnt stones marking the fireplaces of the wigwams may be found in the original circles. Black earth, i. e., earth full of carbonized animal matter and charcoal is also a very sure criterion of former Indian occupation. This discolored earth occurs in large patches, ordinarily known as kitchen middens and is, as a rule, full of burnt stone, flint chips, implements, fragments of charcoal, animal bones, decayed unio or fresh water clam shells, and potsherds, all of which, even when found without the accompanying black earth, are invariable indications of former Indian occupation.

In some localities, especially in the southern part of the area, Indian villages are often marked by low circular mounds which were erected as foundations for the wigwam. In the northern part of the territory under discussion are found somewhat similar mounds which have a central depression. These are the remains of earth-houses which have fallen in and decayed in former years. The domiciliary mounds just mentioned,

are not apt to have any particular objects in them unless they have been made use of as a secondary burial place. The fallen dirt houses are often full of camp debris and sometimes contain specimens of particular interest. The old earth-house sites are especially abundant from Wisconsin westward through Minnesota and occur again on the upper waters of the Missouri River, being found abundantly in the States of North and South Dakota, and in Nebraska.

Many Indian village sites are often marked by the occurrence of caches or fire pits. The Indians frequently dug bowl-shaped holes in the ground for many different purposes. Sometimes these occupied the center of the wigwam and in the bottom of them a fire was built, the depth of the hole preventing the sparks from flying upward and setting the lodge on fire. Such fireplaces, in the course of years, gradually filled with ashes and accumulated camp debris, such as potsherds, discarded or broken implements, lost articles, and the bones of animals. They were cleared from time to time by throwing fresh earth over the foul smelling debris, or the ashes and garbage were scraped out and left along the sides. Often in winter when the ground was frozen and it was hard for Indians to dig with primitive tools, the bodies of their dead were buried in the fireplace and the lodge removed. Sometimes pits were dug outside the wigwam at a little distance, to receive the camp garbage, and very often similar holes lined with mats or bark were used to store wild rice and corn or other articles until they should be required for use. When the ground has not been plowed, especially in the forested regions, traces of these pits may often be identified as small round dimples in the soil measuring from two to three feet across and a few inches in depth. When dug open, however, the disturbed earth will often be found to run down for several feet, marking the outline of the pit. Usually this earth is readily distinguishable from that of the surrounding undisturbed virgin soil because of its darkness and mixed color. Sometimes traces of the mats or bark with which the pits were lined are plainly visible and occasionally pieces of some value, such as perfect pottery ves-

sels and entire implements are found in these places, where they were stored away or lost. They are far more apt to yield articles of interest than are the middens or the surface soil of the village, and because of their depth, perishable materials are more apt to be preserved. They rank next in importance to graves in the estimation of an archaeologist as repositories for valuable specimens.[22]

PLOTTING A SITE

While it is sufficient to locate small sites on a county map by numerals and letters, the more important of them call for plotting upon a large scale. In every case excavations should be preceded by plotting and the establishment of levels and sectional lines, in order that the depths and transverse locations of all finds may be precisely recorded. To do this accurately requires some technical training; one without such training should seek the advice of a person experienced in surveying or building.

Cemeteries and village sites are usually on level ground so that all one need do is to run a base line, taking care to have it level and to record its position by a compass. From this base, run lines parallel and at right angles, in the same plane, thus marking off squares or rectangles by which all finds can be accurately located.[23]

Before digging, plot the lines on section paper to scale, letter, and number so as to make identification sure. Subsequently, all trenches and pits should be drawn in accurately. Remember that digging destroys the evidence forever; hence, the record should be as complete and accurate as possible.

[22] See also Parker's *The Archaeological History of New York* in the *New York State Museum Bulletin*, Nos. 235-238, 1920; Skinner and Schrabisch's *A Preliminary Report of the Archaeological Survey of the State of New Jersey* in the *Bulletin of the Geological Survey of New Jersey*, No. 9 (1913).

[23] From notes supplied by Alanson Skinner.

THE EXAMINATION OF GRAVES, CEMETERIES, AND VILLAGE SITES

Allow us to repeat here that the person interested in the Indian remains of a given locality should proceed carefully and cautiously in his work. The essentials of technique are in the main as follows:

Graves are found singly or in groups, and there are seldom surface indications. No grave should be explored unless it can be done thoroughly — that is, photographs taken as the work proceeds, the skeleton, whether whole or fragmentary, carefully dug into relief by use of hand trowels, and notes written as to the position of all objects. The bones should be carefully preserved. They will seldom break unless carelessly handled. If a bone is decayed, dig its entire length under it and take it out adhering to the clay and wrap it up carefully. If all the fragments of the skull are there save them all, as the skull can be restored later. Where one grave is found there may be others, and so a trench should be run in the direction in which the cemetery exists, a ground plan made, and all graves numbered. If it is a village site one should look for the ash pits. Ashes have a wonderful preservative quality, and carbonized food, corn, seeds, cloth, mattings, and the like are frequently found. The ashes and black soil of fire pits should be most carefully examined.

One of the best published statements of detailed procedure will be found in Arthur C. Parker's *Excavations in an Erie Indian Village and Burial Site* from which we quote the following:

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. The archaeologist 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 any one 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 that 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, and 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 of 3 feet by 16. Excavations were continued until signs of deeper disturbance 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 as compact again as originally and even if there were no intruding substances in the sand its very looseness as distinguished from the rather compact sand surrounding it was a sign of its disturbance. The top soil 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 each other.[24]

MOUND EXPLORATION

Mounds make a strong appeal to the historical interest universal in man. No one looks upon a mound without experiencing a desire to dig into it. We have dwelt elsewhere upon the inadvisability of careless and reckless digging. In fact, one of the greatest services a local student can render is to discourage all such tampering with prehistoric remains. Then, when he himself feels ready and competent to undertake the investigation of a mound, he should note carefully the following recommendations:[25]

In the first place anyone with a general knowledge of the topography of the country will be able to distinguish between a mound and a small hill. For the most part a mound is round or conical and small hills are seldom in this form. If in doubt the only solution to the problem would be to dig into the mound from the edge until rewarded by finding the floor of the sacred place for which the mound site was used before the mound was erected over it. If this floor is not perceptible to the untrained eye, it may be detected by the general character of the soil. The usual way to excavate is to begin upon one side of the mound on a level with the surrounding country and carry forward the excavation, taking down every part of the mound. In due time the floor of the mound will be found, and as soon as it is found it

[24] Consult Parker's *Excavations in an Erie Indian Village and Burial Site at Ripley, Chautauqua Co., N. Y.*, in the *New York State Museum Bulletin*, No. 117, 1907, pp. 478-480. The entire article should be read.

[25] From notes supplied by Warren K. Moorehead.

can readily be traced by carefully watching the indications always found upon the floor.

As you proceed you will find little masses of very dark earth, probably caused by the decay of skins, and the like. Upon striking these, go carefully, as they indicate the immediate presence of skeletons, and with the skeletons will frequently be found specimens. Sometimes the dark masses are deposits of ashes in which little is found. Do not pick into soft masses, or try to dislodge skeletons with the shovel and pick. The hand trowel is better for that kind of work.

About the skeletons look for beads. They are at the wrist and neck. The soft frail shells must be handled carefully. Do not try to get the earth off from them, but preserve them as they are and clean them several weeks later. About the arms, copper bracelets may be found. These are green in color, having oxidized through age.

The pottery is often soft when first taken out. Set it aside carefully, and do not try to take out the earth until it is dry. Whatever pottery you secure, pack carefully in excelsior or sawdust in a strong box. Do not put stones or heavy things with the pottery. The shells and fragile objects should be packed in sawdust (or better still in tissue paper) in cigar boxes.

Too great care can not be exercised when taking the earth away from about the bones. Do not use shovels, as you may throw aside stone pipes or ornaments. Save the skulls entire if possible, as the skeletons of prehistoric peoples are needed by anatomists for study.

Keep your work to yourself, since finds excite people, and many visitors interfere with operations. In case you do not have sufficient leisure or funds to explore a place or site properly, do not undertake it at all. Graves,

mounds, and caves unexplored are of more real value to American archaeology than when either partially or superficially explored. It frequently happens that one digs in a site, secures a few objects and abandons the site. It becomes known in the community that "Indian relics" were discovered. Curiosity seekers flock to the place and soon ransack it. Therefore it is better to leave a site unexplored unless, as has been stated, the work can be properly carried to a successful end.

THE SOUNDING ROD AS AN AID IN FIELD EXPLORATION

For locating objects and burials below the surface, as well as for detecting former disturbances of the soil, the use of the "sounding rod" is recommended. The following statement by Reginald Pelham Bolton should be noted:

This implement consists of a slender steel rod, 3/16 inch in diameter and about three to four feet in length, provided with a wooden handle such as is commonly used on bench tools. The end is ground to a point and the tool is used to penetrate the soil giving indication of its density and of the existence of objects below the surface. Its material should be spring steel, and care must be exercised not to buckle it by undue pressure.

It was developed as a means of avoiding much heavy labor involved in digging trial holes and to discover the presence of shells and waste debris in Indian, Colonial, and military sites, and it has proved most effective and informing. Mr. W. L. Calver, who perfected the instrument, has, with the writer, used this tool for upwards of twenty years in exploration in and around New York City. The writer has tried various modifications such as grooving the point, using a triangular rod, and extending the length, but the simple form above described has been found to answer all practical requirements. Its continued use is rather hard on the palm of the hand unless the handle be made well rounded, or a glove is worn. In soft and wet soil it can be thrust down with a single motion, but in dry ground it should be forced down in a series of short advances, and should be turned slightly on the down thrust. Practice gives considerable sense of the character of object with which it may come in contact. Thus wood or roots can be distinguished from stone, and such objects as shells or bone are recognizable by their penetration, while it becomes possible to recognize glass and crockery.

It is very helpful in determining buried stones, lines of brickwork, or hard floors. The size of a stone can be outlined on the surface by the position of the holes pierced around it, a wall can be followed by successive proddings, and a hard surface like a floor can be traced and its level decided by a series of equidistant penetrations.

In excavating or in trenching, the rod is thrust in sidewise to determine the lay of debris in any direction, and is very useful in giving advance notice of delicate objects such as pottery, glass, etc. The rod can be mounted inside a hollow cane for convenience in traveling.[26]

SUMMARY

Finally, for convenience and reference these recommendations may be formulated as rules. The first and most important rule is: *do not dig until you have in mind the technique,* then observe the following rules:

1. Photograph (or draw accurately) the site or mound before commencing excavation.
2. Stake off the spot (or mound) in squares of three or five feet each.
3. Small hand trowels or broad dull knives, and whisk brooms are indispensable.
4. In case of a mound, run a trench tangent to its base as previously stated, to at least three-fourths of the diameter. Dig down slightly below the original surface, or the "floor". In some mounds there is a "sod line" or dark streak at the base; in others, a hard burned

[26] From notes supplied by Reginald Pelham Bolton.

floor. In many others you can not determine the bottom positively and must continue on down until the undisturbed clay or gravel is reached. Note with extreme care the face of the cut. Scale it down in narrow sections.

5. Throw the earth behind and keep a clear space of four or five feet between the earth and the front wall or face of the trench. When through, the excavation will be nearly filled and little damage have been done to the structure. Mounds should not be opened by means of an irregular pit sunk from the summit (or center).

6. For village sites and grave groups the rules 4 and 5 must be somewhat changed. Long narrow trenches, sunk down as far as charcoal and ashes occur, must be run. Throw earth behind as you proceed. Excavate all ash pits carefully, as interesting objects are frequently found in them.

7. Enter all finds on a map or ground plan, and note in the squares (by numbers or letters) the skeletons or objects found.

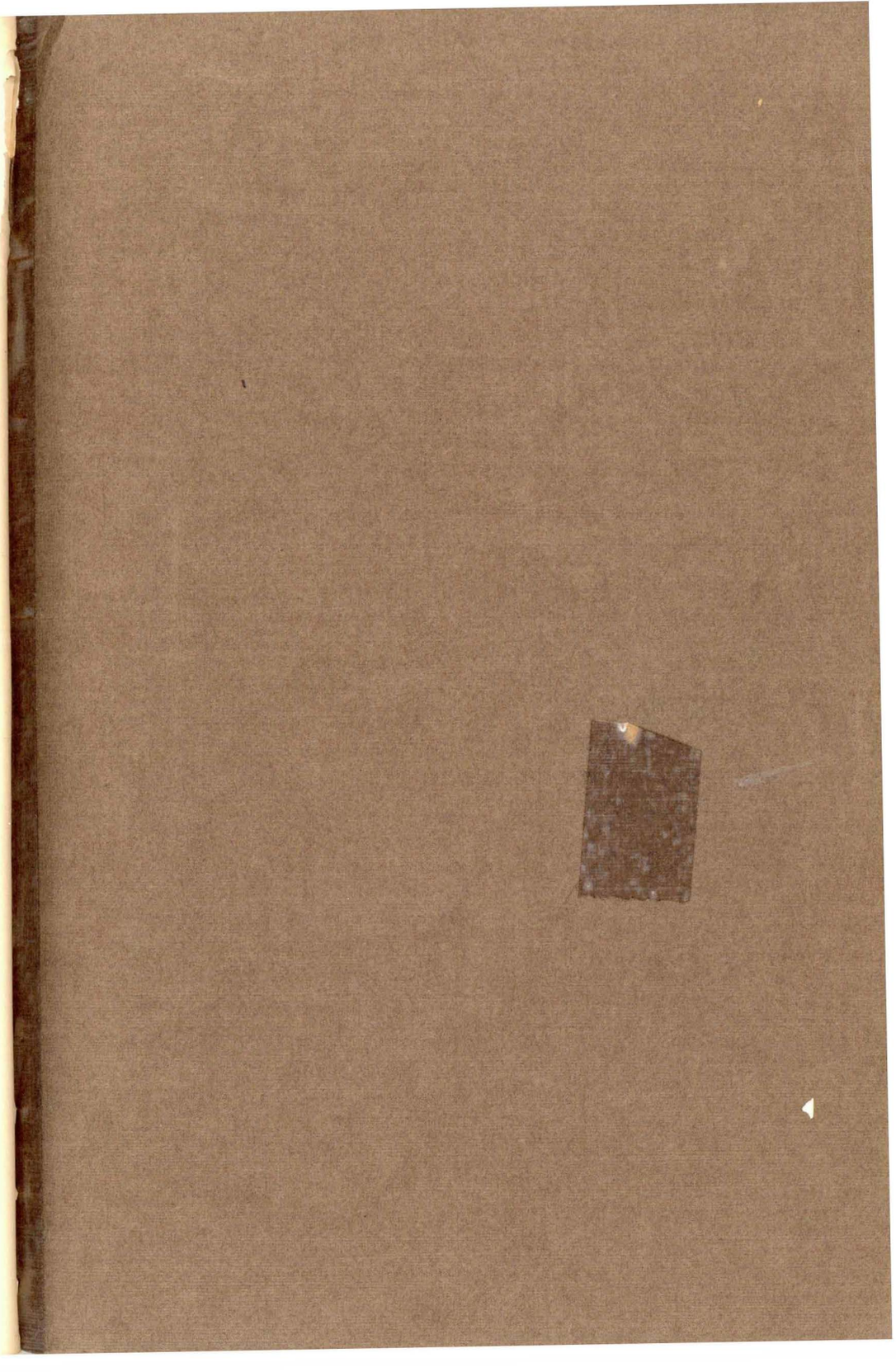
8. Photograph skeletons or objects *in situ*.

9. Number or letter the objects or crania (or entire bones), and also designate the mound or site so that it and its contents may not become confused with the results of explorations in other monuments.

10. Keep a careful field catalogue or diary and retain the same series of numbers or letters in the packing boxes.

11. Pack specimens for transportation so that there is no danger of breakage.

12. Provide shellac, or a light solution of glue, or other good preservatives for bones, pottery, or soft substances, as well as strong packing boxes, cigar boxes, paper, excelsior, cotton, and string.



State and Local Archaeological Surveys

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