

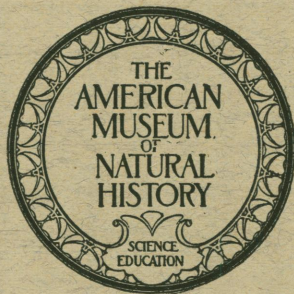
ANTHROPOLOGICAL PAPERS
OF
THE AMERICAN MUSEUM
OF NATURAL HISTORY

VOL. XXII, PART II

CHRONOLOGY IN FLORIDA.

BY

N. C. NELSON



NEW YORK
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1918

American Museum of Natural History.

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INTRODUCTION.

The following brief paper concerns chiefly a large shellmound situated, until recently, on the mainland bank of the Indian River at Oak Hill, Florida. It is a report based upon only a few days' single-handed work, resulting in but a very small collection, and as such lays claim neither to completeness nor to entire accuracy of details, but insists merely on a few important general conclusions with reference to local chronology.

Physiographic conditions of the Gulf Coast region, and particularly of the State of Florida, have from times presumably long prior to the advent of man been exceedingly favorable to molluscan forms of life; and this fact of an abundant and easily secured food supply appears to have outweighed the concomitant scarcity of other important natural resources and to have attracted early aborigines on a large scale. The evidence of this is an immense number of refuse shell-heaps, often of enormous proportions, piled up along both the fresh and salt water shores, such as the St. Johns and Ocklawaha rivers with their lacustral expansions of the interior, the Indian River on the Atlantic Coast and, for example, Tampa Bay on the Gulf Coast. The presence and significance of these mounds have long been recognized, at least by the scientific world; and they have been subject to repeated investigations by such well-known men as Brinton, Cushing, Wyman, and Moore, until it seems questionable whether further work short of prolonged systematic study can reveal to us anything new about them. Nevertheless, when Dr. E. H. Sellards, State Geologist in Tallahassee, wrote the American Museum about the middle of April, 1917, that a certain large shellmound was being rapidly removed for road-building purposes and that it afforded conditions suitable for stratigraphic observations, it seemed an opportunity not to be neglected. Accordingly, I visited Florida, inspecting among other things of antiquarian interest, a group of artificial sandmounds on the shore of Lake Jackson near Tallahassee, also the now much-discussed archaeological station at Vero on the peninsular east coast, and lastly, quite a number of shellmounds, as well as sandmounds, between that point and St. Augustine, devoting finally three days to a special study of what remained of one such mound at Oak Hill. The results appear not to be entirely new; but as they were obtained independently, while in the possession of only a hazy and fading second-hand notion of prior determinations, they seem worth placing on record.

N. C. NELSON.

May, 1918.

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SITUATION OF THE OAK HILL SHELLMOUND.

The shellmound site in question is located about one mile due east of Oak Hill station, directly on the bank of that part of the Indian River known as Mosquito Lagoon.¹ The so-called river owes its lagoon-like appearance mainly to the absence of islands which ordinarily crowd the broad channel separating the mainland and the sand-covered reef marking the present ocean shore, some four miles away. The spot will be recognizable for a long time to come owing partly to the fact that the shell material extends in places to a considerable depth below the ground water level and therefore could not be entirely removed. Specifically stated, the refuse deposit is situated on the southern extremity of a low and narrow sand bar, perhaps nine hundred yards long. A smaller shell-heap,² surmounted by a house and grove, marks the northern end of the same bar. This sand bar, it may be explained, is separated from the mainland jungle by a marsh belt about 150 yards wide. A powerful spring rises immediately off the land-side base of the mound and may possibly have had something to do with the choice of location although the water at the present time, besides being sulphurous, is decidedly salty and unfit for use. A few steps to the northwest of this spring is another smaller accumulation of shell and refuse measuring some 50 by 75 feet on the horizontal and about 10 feet in height. Some digging has been done in it and current reports are that human remains and artifacts are commonly found here. Possibly it is the burial place belonging to the settlement, although the composition does not differ noticeably from that of the main mound.

The recent history of the Oak Hill shellmound is in part suggested by the various local names applied to it, such as Sheldon Mound, Sam's Mound, and Hotel Hill. It appears to have been levelled somewhat and to have been subject to cultivation at a relatively remote historical date; in fact it was said at one time to have supported a valuable orange grove.³ Whether

¹ The site is indicated as "No. 2" on a map of the local shellmound distribution recently published by Amos W. Butler. See bibliography.

The mound was apparently observed by William Bartram about 1774 and again shortly prior to 1884 by Andrew E. Douglas, the donor of the American Museum's type collection of North American stone implements. See Bartram, 519, and Douglas, 79.

² No. 3 on the Butler map.

³ Orange groves, according to early travelers, as well as recent investigators, are commonly met with on the shell-heaps in the interior of Florida. These groves, long neglected and essentially "wild," resulted presumably from seeds of European origin either accidentally scattered or deliberately planted by the aborigines in early historic times, the fruit being apparently more or less sour perhaps in proportion to the degree of reversion. See Bartram, 97, 101, 138, etc.; Wyman, (b), 10; Moore, (a), 1894, 16.

this is true or not, the mound did within the memory of people now living serve as the site of a conspicuous hotel, visible for miles up and down the river. No actual ruins remain to prove this; but bits of glass, iron, porcelain, etc., were sufficiently evident in the upper two feet of the mound material to corroborate the tradition.

GENERAL DESCRIPTION.

On arriving at Oak Hill, only about one-seventh of the original shell-mound remained. Two steam shovels had been at work for four months and nearly two thousand carloads of shell had already gone out. However, the apparent basal perimeter of the refuse heap was easily made out and the accompanying groundplan (Fig. 1) will give an approximately correct idea of the size, shape, and orientation of the great accumulation. The small triangular portion of the mound still undisturbed ranged from the fairly constant ground water line up to a height of eighteen feet; and within the limits of this eighteen foot contour, on the north exposure, i. e., at the point marked X on Fig. 1 and on the A-B section of Fig. 5, the shell refuse extended fully four feet below the same water level with every indication of deepening in the seaward direction. On the other hand, it obviously rose in the landward direction as was proved by excavations at points Y and Z, as well as by the actual appearance of the sand bottom above the ground water line a little farther to the west. In other words, stating the case in rough terms, about one-third of the land-side portion of the mound material rested on the high median portion of the sand bar, possibly as much as a foot and a half above the ground water line, while the remaining two-thirds of the mound lay on the seaward slope of the bar, attaining progressively greater and greater depth from center to perimeter. The general facts of the situation are exhibited in the A-B section of Fig. 5.

If now we assume an approximate stability of the sea level throughout the human period and also assume that the mound accumulation was begun on dry land with only gradual growth in a seaward direction, then I did not see the original core, i. e., the oldest portion of the deposit. This of course was most unfortunate, as it leaves the stratigraphic observations somewhat incomplete.

INTERNAL STRUCTURE.

That the oldest portion of the Oak Hill shellmound had been removed already prior to my arrival will be made tolerably evident by an examination of either the accompanying sketches of the A-B and C-D sections (Fig.

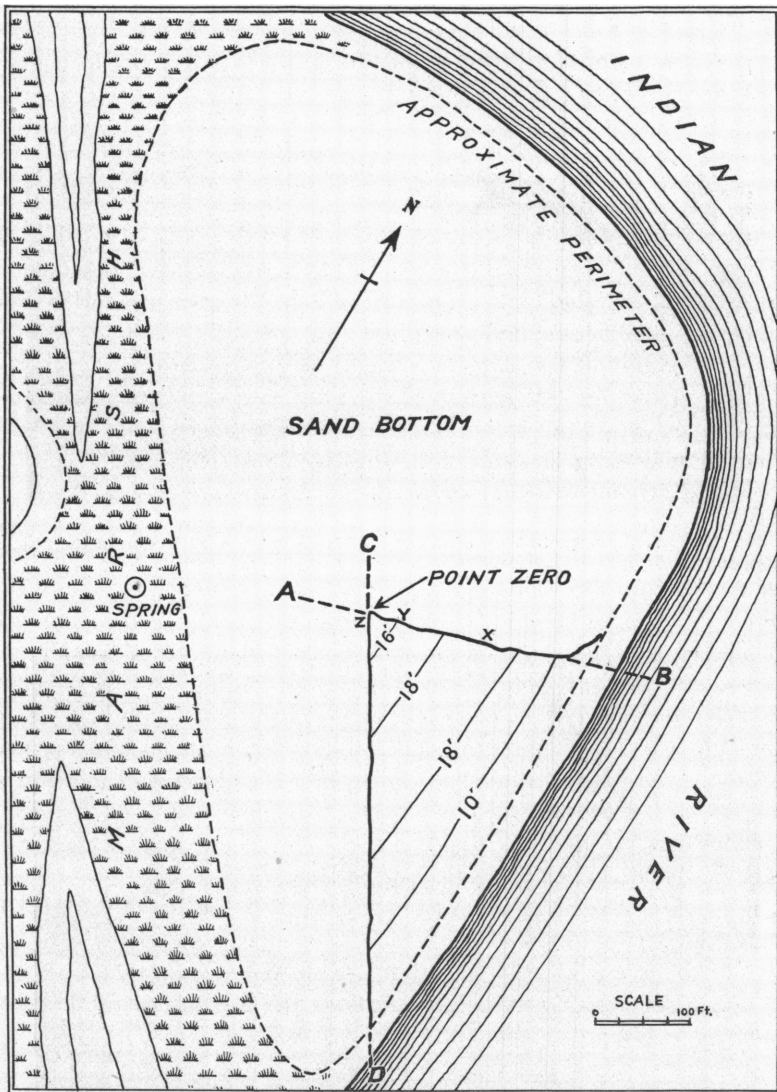


Fig. 1. Groundplan of the Oak Hill Shellmound.



Fig. 2. Nearly Complete View of the North Exposure or A-B Section of the Oak Hill Shellmound.



Fig. 3. Partial View of the West Exposure or C-D Section of the Oak Hill Shellmound.

5) or of the partial photographs of the same exposures. The plainly visible dark seams or strata, both in the transverse and the longitudinal section, all dip from the central end of the exposures towards the perimeter. This fact is best shown in the photograph of the transverse A-B section (Fig. 2) where two well-defined black layers are seen to begin at the top of the mound in the upper right hand corner and to reach the base level only about one hundred feet away, where they dip beneath the water level. The longitudinal C-D section (Fig. 3) is not quite so simple and regular, but the appended sketch-plan may be relied upon to show the essential features which tell a story of growth quite in accord with that of the companion section. Photographic illustrations of detail portions of the sections might also be submitted to show that the minor bedding planes of any and all parts of the composition conform entirely to the conspicuously outstanding stratigraphy.

These distinctive structural features, it will readily be perceived, are elements of the first importance as regards both the estimation of the period of time involved in the accumulation of the mound material and also the determination of the relative antiquity of the artifacts found in it. Comparatively speaking, the Florida shellmounds give the impression of having grown rather rapidly. Animal bones and artifacts — excepting pottery, perhaps — are notably infrequent and the same is true to a lesser degree of ashes and associable evidences of permanent settlement. In other words, by far the greater portion of the mound material is made up of absolutely clear shells, dumped out on a grand scale after having been emptied of their edible contents. Referring to the Oak Hill mound, the deposition of shell refuse was so rapid in places that there was no time for sand to blow into it or for disintegration to take place allowing vegetation to get a foothold. But a closer examination showed here and there distinct lenticular beds of calcined shells or of clear ashes and additional fine-grained refuse other than shells. These special deposits doubtless marked points of temporarily arrested accumulation of shell débris and were, besides, the repositories of most of the artifacts found in the mound. Protracted investigation of such fireside deposits would probably have revealed that many of them were actual house sites, suggesting that while the inhabitants lived on these spots shell refuse was thrown elsewhere. But in time, the houses were moved or fell into disuse and gradually the hollows marking their locations were covered up; and so the mound grew by addition, now here and now there.¹

¹ An interesting illustrated sketch of probable shellmound growth on the Florida west coast is given by Walker, 1879, 414-418.

The visibly extended black strata of nearly uniform thickness (See Fig. 2) are of a somewhat different nature. They were given no very special attention, but it is hardly to be questioned that they represent for the most part long periods of arrest in the growth of the mound during which the black matrix was formed partly by disintegration and partly by vegetal deposition, precisely as is taking place at the present surface of this and other mounds. So while the first impression regarding the relative rapidity with which these shellmounds have accumulated still holds, the closer examination cannot fail to emphasize the idea that the mounds may after all lay claim to a really respectable antiquity. Incidentally, it may be in place to remark that many of the Florida shellmounds not far from this one have been abandoned long enough to allow the growth of trees upon them estimated to be over six hundred years old.¹

The suggested relation of the stratigraphy to the age of the imbedded artifacts need hardly be dwelt upon. In ordinary geological formations of a stratified nature a given fossil specimen — barring accidental intrusions — is accepted as being at least as old as the formation itself; and under certain conditions depth is an index to age. The same rule is to be observed in shellmound investigation. But, unless we take strict account of the order of deposition, the depth at which a given artifact occurs may signify little or nothing. Thus, to illustrate from the A-B section of the present mound, the fragments of pottery found in the bottom at point X, — i. e., twenty-two feet below the mound surface and four feet below the water level — were in reality no older than other sherds found on top of the mound at point Z.

SHELLMOUND COMPOSITION.

The composition of the Oak Hill shellmound cannot be given except in very general terms. No effort was made at exact determinations although deliberate attention was given to the subject. Roughly stated, then, probably all of eighty-five percent of the material in the mound was shell. Of the remainder considerably over fourteen percent was made up of ashes, charcoal, sand, rock, and other mineral substances; while the balance, less than one percent, would suffice for the volume of fish and animal bones.

Shell Remains. Referring to the molluscan remains alone, it cannot be far from the truth to state that about ninety percent of the whole mass was made up of oyster shells with perhaps five percent of clam shells and one half of one percent, more or less, of additional species to complete the

¹ Wyman, (b), 81-85.

total volume. The shell collection brought home (Cat. No. 20.1-225) includes at least all the more obvious forms and it has been identified by Curator L. P. Gratacap as follows:—

1. Common oyster (*Ostrea virginica*, Gmelin)
2. Common hard shell clam (*Venus mercenaria*, Linn.)
3. The heavy ark shell (*Arca ponderosa*, Say)
4. Cockle shell (*Cardium muricatum*, Linn.)
5. Large cockle shell (*Cardium magnum*, Born)
6. Cross-barred Venus shell (*Chione cancellatum*, Linn.)
7. Wedge shell (*Donax denticulatus*, Linn.)
8. Tulip band shell (*Fasciolaria tulipa* Linn.)
9. (*Fasciolaria distans*, Lamm)
10. Pear conch (*Fulgur pyrum*, Dillwyn)
11. Short razor shell (*Tagelus gibbus*, Speng)
12. Plaited horse mussel (*Modiola plicatula*, Lamm)

For the sake of completeness there might be added to the list one or more species of crab (not determined) and also isolated finds of *Fulgur perversa*, Linn.; *Oliva litterata*, Lamm; and *Ampularia hopetonensis*, Say (fresh water). The mere naming of these invertebrates must suffice in the present case. Perhaps instructive results might have been obtained by investigating their relative frequency in different levels of the mound; but this was not done chiefly because the possible variation was not immediately obvious. One could not fail to observe that, e. g., *Venus mercenaria* and *Donax denticulatus* occurred generally in special pockets and minor intercalated strata; but a closer examination revealed that the former of these and at least most of the other species were represented from top to bottom of the refuse. Moreover, Curator Gratacap assures me that the cited forms are all representative of living species.¹

Mineral Substances. In addition to ashes and charcoal, there may be mentioned such occasional items as smooth pebbles of undetermined rocks and also fractured chunks of limestone. But objects of this nature, inasmuch as they form no part of the local environment, are naturally infrequent. Of interest, perhaps, was a workman's detailed description of what would seem to have been a lump of ambergris, found and disposed of before my arrival. Intercalated strata of what was probably wind-blown sand were not so noticeable here as in neighboring shellmounds, but traces occurred. In the lower three feet of débris nearest the mound center, a great deal of

¹ The cited literature appears to give no similar lists of the Florida coast shell species suitable for comparison; and the isolated references that occur are mostly to those forms only which happen to have been used for artifacts.

sticky mud or clay adhered to the outside of the shells, which were in addition somewhat cemented together. A thin film of mud had also been deposited on the inside of the same shells, presumably through the action of the extra high tide waters rising and falling through the mass, as indeed there were evidences of wave action elsewhere in the débris at points four to six feet above the present ground water level. The presence of the mud on the outside of the shells may possibly signify that the early mollusc-gatherers did not take the trouble to wash their bivalves before opening them.

Vegetal Substances. Under this heading nothing in the way of agricultural products such as corn, beans, and the like, was observed. In all probability, they were not present. The only possible remains of food substances were a small collection of what appears to be charred palm berries (20.1-227) such as may still be seen on the common cabbage palm growing in the vicinity, and which I was told are sometimes eaten even at the present day. The occurrences were recorded in both sections, the sample brought away being taken from the west face, 245 feet from zero and nine feet below the surface.

Animal Bones. Osseous vertebrate remains (Cat. No. 20.1-226) were comparatively scarce in the mound composition. This was to be expected because the aborigines who accepted the conditions of Florida seacoast life evidently came primarily for molluscs. Fish remains, in the form of bones and scales, were by far the most plentiful, commonly occurring in pockets or in isolated seams of the shell matrix, as if the waste of great catches had been disposed of at once. Among the few bones of the collection Assistant Curator John T. Nichols has identified a shark and a catfish. Occasional bird bones of medium and large sizes were found, but they have not been identified. The remaining bones, according to Dr. F. A. Lucas, include a whale, one or two turtles, a deer, and the black bear, *Ursus floridanus*.¹

Human Bones. No evidences of human burials were observed; and the

¹ Wyman, (a), 457 and (b), 78, gives a partially determined list of the local shellmound fauna including a bear, raccoon, hare, deer, otter, opossum, turkey, birds (undetermined), alligator, hard-shelled turtle, soft-shelled turtle, box turtle, gopher, catfish, gar-pike, whiting, and other fishes not determined. These forms were more or less common to practically all the mounds investigated by him on the St. Johns River a few miles to the west and northwest of Oak Hill. Moore, here and there in his extensive publications covering the same field, verifies Wyman's determination and in (a), 1894, 23, adds a dog and a lynx to the list. Several species such as the beaver, the bison, etc., though historically at home in Florida have seemingly not been recovered from the shell-heaps in identifiable form.

All the above vertebrates, it will be observed, are modern species, but Wyman, (b), 81, cites the occurrence, in four widely separated mound deposits of fragments of extinct fossil forms such as a horse, an ox, a mastodon, an elephant, etc., all of which he expressly recognizes as intrusive, i. e., as not properly to be regarded as contemporary with the list of species above cited.

intelligent workmen engaged in removing the mound material were unanimous in reporting that none had been found prior to my arrival. Human bones were present, however, as I found myself a section of an adult humerus (20.1-226) about six feet below the surface in the north exposure. It was a matter of common report also that there was discovered in the mound some years ago a single skull remarkable for the fact that a bone arrow point was fastened in the eye socket.

ARTIFACTS.

According to practically all accounts, the Florida shellmounds, unless actually used for burial purposes, contain few articles of human manufacture such as tools, weapons, and ornaments. Several explanations might be offered for this state of affairs. Thus, if our observation is correct that the shell refuse accumulated at a comparatively rapid rate, we should expect proportionately fewer artifacts. But while this is probably a real factor in the case, the environmental conditions are also to be considered. No rocks suitable either for hammering or cutting tools are present in the country. If the shellmound people lived permanently on these sites instead of coming to them seasonally from the interior piedmont region where rock could be obtained, they would have had to barter for some of these necessities and for the rest make substitutes of shell, as was done in the Pacific Islands. It is conceivable that a mere clam digger might have gotten along with very little in the way of weapons and utensils, but there is no reason for regarding the early Florida native as having lived on such a low plane. He used fire from the beginning; he managed somehow to take both fish and game; and he made pottery, which if not particularly ornamental, was of good and serviceable quality.

The Oak Hill mound appears to have formed no exception to the rule, so far as artifacts are concerned, unless we except broken pottery. To be sure, the negative verbal reports of workmen who have handled the mound material with steam shovels is of doubtful value. Nevertheless, it agreed with my own observations, which it must be admitted involved little more than a fairly thorough inspection of the two illustrated exposures, amounting to some three thousand square feet. At a few points only, nearest the center of the mound, was any actual digging done, and that in the practically sterile lowest horizon of the refuse. Besides, there were small areas in the upper horizons which could not be satisfactorily examined owing to the danger of caving. The results of picking the surface of the two exposures may be grouped as follows:—

Bone Objects. The only artifact under this heading taken out in my presence was a worked deer antler found in the bottom of the mound at point X on the north exposure. A well-defined groove had been cut around one of the secondary prongs about three inches from the tip, for some such purpose as a spear point. The specimen forms no part of the collection because the finder was unwilling to part with it. Another authentic find was a fine dagger-like object of hollow bone, about twelve inches long and

now preserved in the collection of Miss Zelia Wilson of New Smyrna.¹ Finally, we may mention again the "bone arrow point" found inserted in the skull referred to in the preceding section.

Shell Objects. Only three pendant-like objects were recovered and two of these are even doubtful. The two uncertain specimens are perforated *Arca* shells, one (20.1-222) found near the top and the other (20.1-223) near the bottom of the mound. The perforation has been made by removing the small cone projecting back of the hinge; but whether it is of artificial origin or not, there is no appreciable wear on either object.² The third specimen (20.1-221) is a flat oblong form cut out of a *Fulgar* shell and notched at one end for attachment (See Fig. 4). This object was found lying under an inverted earthenware food bowl to be described later, and the idea that it may have been used for opening bivalves is at least conceivable.

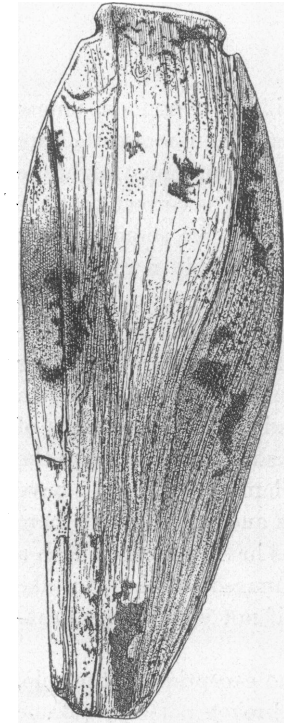


Fig. 4 (20.1-221). Pendant of Shell, found with Fig. 6.

Stone Objects. A thin artificially smoothened fragment of rock (20.1-224), resembling quartzite, less than two inches square, is all that the collection affords under this heading. This specimen was found in company with the preceding oblong shell pendant underneath a broken bowl at a point in the

west section 150 feet south of the center and nine feet deep.

¹ The specimen is somewhat suggestive of the one figured by Moore, (b), X, 59, though neither perforated nor made of human bone.

² Cushing and Moore both found this type of perforated shell in considerable numbers on the west coast of Florida, and both regard them as artifacts employed for different purposes such as tools and net-sinkers. See Moore, (b), XIII, 470, for illustrations and text.

Ceramic Objects. Of the data gathered at Oak Hill, the earthenware or pottery alone seems to possess any really appreciable scientific value. Pottery of one sort or another was found at all levels in the mound except in the lower two feet or so nearest the original core of the deposit. Whether it was positively absent here cannot safely be affirmed on the basis of the small amount of work done, but the probabilities are strong in view of the repeated findings of Moore and Wyman in the St. Johns River shell-heaps.¹ Moreover, personal examination of an exposed twenty-five foot section through the Port Orange shellmound (No. 20 on the Butler map) some twenty miles to the north of Oak Hill, revealed pottery in the upper fifteen feet, but none in the lower ten feet. In other words, the range of evidence seems conclusively to show that the earliest stage of shellmound culture in east-central Florida was devoid of ceramics; and it is hardly to be doubted that the fact could have been fully proved by the present Oak Hill mound if it had been studied a few weeks earlier.

The ceramic specimens found projecting from the solid vertical walls of the two shell exposures, beginning at the angle of junction and ending at the ten foot contour, include both isolated sherds and several more or less complete, though crushed, vessels. One such vessel referred to in connection with the notched shell pendant was found in an inverted position in the west exposure 150 feet from the center and nine feet deep. Another and similarly inverted bowl, perhaps two-thirds complete, was located in the same exposure at ninety-five feet from the center and fifteen feet below the surface. Several less complete vessels were obtained elsewhere, some with drilled perforations, showing that the customary way of mending by tying the pieces together with cords was in use here also. Only a representative fragment of each of the noticeably incomplete specimens was taken and these were placed with the isolated sherds to be considered presently.

The one practically complete vessel brought home (20.1-218), on being mended, turns out to be an ordinary bowl, presumably used for food, but not to any appreciable extent for actual cooking. The specimen is indicated in Fig. 6 and may be roughly described as hemispherical, though the bottom is considerably flattened and the plain rim drawn in. Its inside dimensions are: height, $5\frac{3}{4}$ inches; extreme body diameter, $11\frac{1}{2}$ inches; and rim diameter, $10\frac{1}{2}$ inches. The wall thickness averages $\frac{1}{4}$ of an inch. A heavy buff-colored clay wash or slip has been applied to the inside of the vessel, but not to the outside, which latter shows a crackled surface as if the paste had not

¹ See e. g. Wyman, (b). 53, 55, and Moore, (a), 1892, 916; 1894, 26; (b), X. 48, 102, 103, 209.

been thoroughly kneaded. The two surfaces of the vessel have been very roughly smoothened by scraping and rubbing with a small tool, leaving marks from one to three-sixteenths of an inch wide. The paste is an even dark gray or slaty color, fairly hard and well knitted, but at the same time slightly porous and seemingly stringy or laminated. Of tempering material, there appears to be at least a trace of finely ground shell.¹

VERTICAL SEQUENCE OF POTTERY TYPES.

We come finally to the miscellaneous potsherds of which the collection contains 190 examples. The given figure represents by no means the total number of pottery fragments found, but instead merely so many localities in the two sections at which one or more specimens occurred. The list falls into two groups or classes, namely, plain ware and ornamented ware. To the class designated plain ware belong 113 sherds (20.1-219) taken from all levels of the exposures (excepting the lower two feet nearest the mound center), though they are most abundant in the middle and lower portions of the mound. The remaining 77 sherds, belonging to the ornamented class (20.1-220) were taken exclusively from the upper level of the refuse. Tables might have been constructed to show the exact distribution of the individual fragments; but, as previously intimated, the investigation was not sufficiently complete to warrant this, and the essential facts of the case have been approximately indicated on the two sectional sketch plans (Fig. 5). The broken lines crossing the upper and outer face of each of the two exposures connect the deepest occurrences in the refuse of ornamented ware; and while the general trend of these lines need not be taken as more than approximately correct, they will be observed to be in close agreement with the stratigraphy. The probable absence of pottery in the original core of the mound has also been indicated at the base of the center ends of each of the two sections.

This general fact of ceramic stratification, coupled with the total absence of pottery in the lower mound horizons, is of first importance and as such has been more or less evident to several prior investigators. Thus Wyman,² fifty years ago, clearly inferred that something of the sort was true

¹ This vessel and in fact most of the fragments to be described later on seem to agree quite closely in regard to paste composition as well as to form and appearance with the characterization of one of the local earthenware types as made out long ago by other investigators. Thus Wyman, (b), 55, refers to the St. Johns River pottery as being generally "made of pure clay"; and Holmes, (a), 111, also (b), 117, recognizes in the same area what he calls a "chalky ware," or a pottery having a paste "exceptionally free from tempering ingredients."

² Wyman, (b), 53, 55.

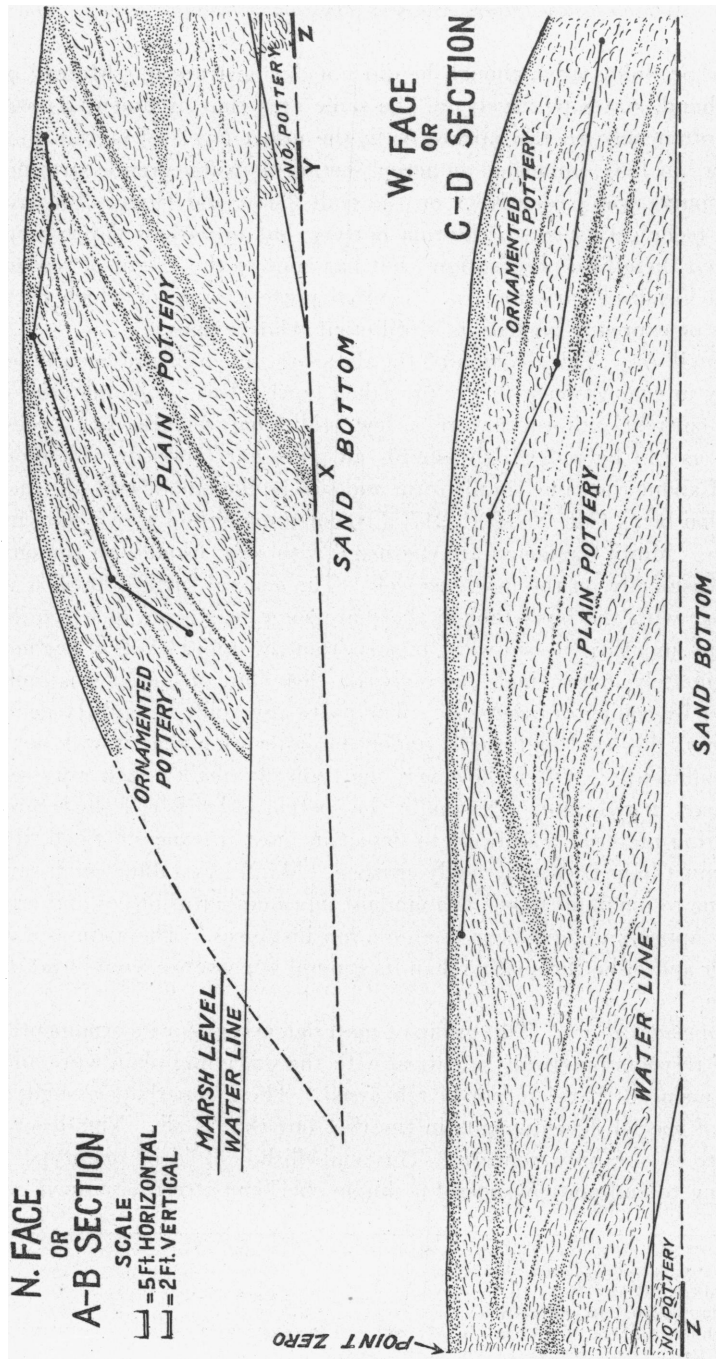


Fig. 5. Sectional Sketch Plans of the Oak Hill Shellmound showing the Stratigraphic Occurrences of Different Types of Pottery.

for the St. Johns area, though he did not demonstrate it. Moore,¹ on the other hand, states positively for the same area that ornamented potsherds occur often only on the surface or in the upper levels of certain mounds. Walker,² in 1881, published an actual section showing ceramic stratification in a mound near Cedar Keys on the Gulf Coast and Holmes,³ in treating of the technical aspects of Florida pottery, has in various papers not only accepted these field observations, but has gone to the extent of recognizing several localized variations of decorated pottery some of which he either tacitly or expressly regards as of different relative ages.

Plain Ware. This division of the data has in a measure been described already in connection with the preceding bowl. But as the material is not of an entirely uniform nature a few additional remarks are necessary. So far as can be judged, the sherds all represent bowls or wide-mouthed pots of about the same simple form and size as the one described,⁴ the only exception being Cat. No. 20.1-217, a fragmentary vessel with a flat circular bottom. Many fragments are encrusted with soot, usually on the outside, but occasionally on the inside as well. The general surface finish is about on a par with the bowl though there are some fragments of exceptionally thin and smoothly rubbed ware, mostly from the upper levels of the mound. Unfortunately, not a single piece gives a clear hint of how it was built up, whether by coiling or otherwise. The paste also conforms pretty generally to that of the bowl and one is under the impression that it was not fired quite sufficiently. Often, however, the typically chalky dark gray section is encased in red, and occasionally the section is brick red clear through. Tempering material is difficult to detect in most instances. Shell, if used at all, must have been very finely crushed. White crystalline sand, ranging from fine to medium coarse, is abundant in a number of pieces and crushed pottery appears to have been used in a few instances. The ware as a whole is firmer and of better quality than its general appearance would lead one to suppose.

Ornamented Ware. This group of material, except for its ornamentation, is in all respects practically identical with the preceding plain ware and the characters need therefore not be rehearsed. There is perhaps a slight indication of special developments in the rim, but that is all. The decoration therefore is our only concern. This embellishment is of one type from beginning to end and consists of a simple checker pattern, stamped on the

¹ Moore, (a), 1892, 916; (b), 156.

² Walker, 1881, 678.

³ Holmes, (b), 116, 120-128.

⁴ Holmes, (b), 121, including Fig. 57, comes to the same conclusion for the wares of the St. Johns River area. See also Wyman, (b), 53, 55.

outside of the bowl, presumably with a carved wooden paddle, such as is still used by the Cherokee.¹ But while the ornamentations are all of the straight-line order, a closer scrutiny reveals considerable variation. The normal pattern would result, let us say, from cutting into the face of the paddle two sets of equidistant parallel grooves so as to cross each other at right angles. By varying either the distance between the lines or the angle at which they cross, appreciably different results would be obtained. Thus the enclosed spaces between the crossing lines would become either square

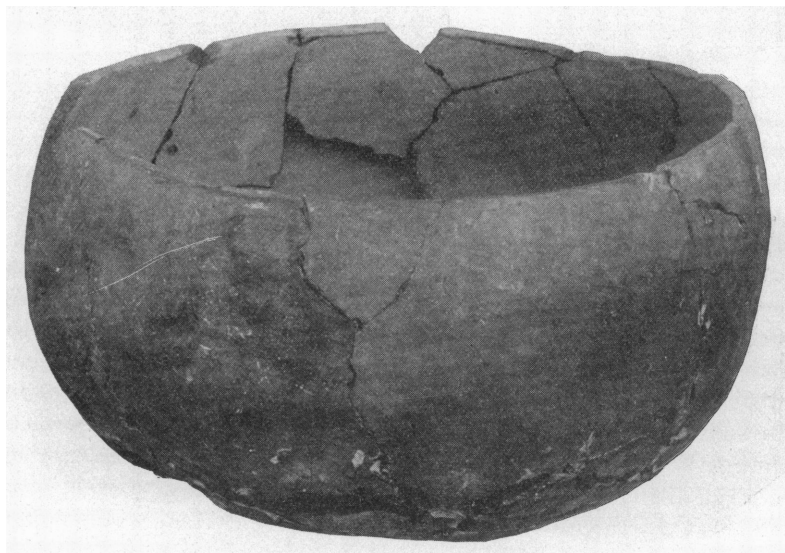


Fig. 6 (20.1-218). Common Unornamented Food Bowl.

or oblong or lozenge-shaped, and their size might vary almost indefinitely. That the Oak Hill shellmound people appreciated this fact will be seen in Fig. 7 which gives the approximate range of variation in the material collected. All the suggested possibilities of form will be seen to occur and the size ranges from three to twelve elements (i. e., interlineal spaces) to the inch.²

Since the first draft of this report was written, the brief paper on some Indian River shell-heaps by Butler, already cited, has been issued. On page 106 the author states that he observed on the pottery from these

¹ For illustrations of the Cherokee checker stamp see Holmes, (b), Fig. 46 and Pl. 113.

² For additional illustrations of the checker-stamped ware see Holmes, (a), 115 or (b), Plates 85, 109.

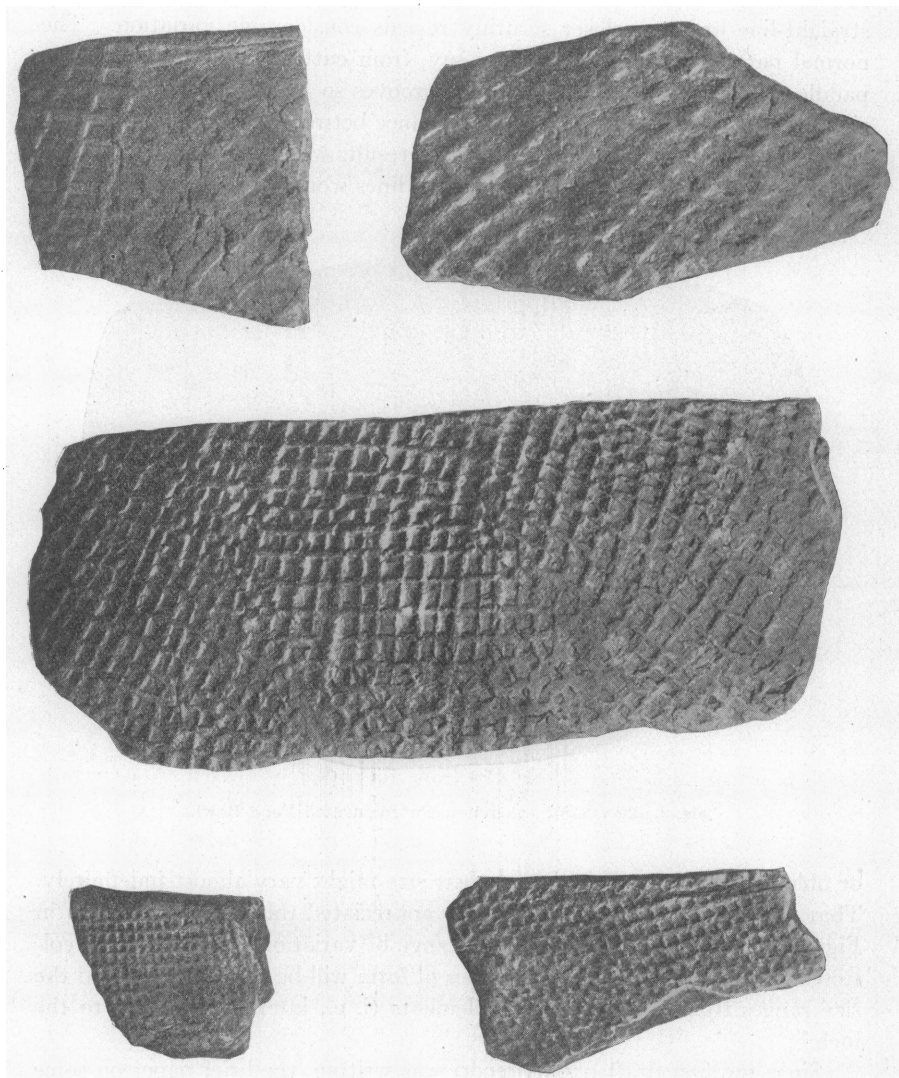


Fig. 7 (20.1-220, 219). Varieties of Stamp-Decorated Pottery from the Oak Hill Shellmound.

mounds "the impressions of basketry, wickerwork, mat-work, and wattle-work." This led to some correspondence, and also to a re-examination of both the collected specimens and the literature, with the result that I found Wyman¹ to state that he discovered three fragments of pottery — in as many different places on the St. Johns River — which had been moulded inside of baskets. Holmes also quotes authorities² for the use of basketry moulds in the United States, but cites no instance of it from Florida and expressly concludes³ that the practice in that region has been greatly overestimated, the checker-stamp pattern often having been mistaken for basketry impressions. He does not deny its occurrence, but says it is the exception rather than the rule; and with this opinion I am inclined to agree. At any rate, the material — a hundred samples or more — collected by myself at Oak Hill and other neighboring sites shows only rectilinear stamp impressions.

Geographical Distribution of Checker-Stamped Pottery. We have now considered in a descriptive way all the essential facts brought to light in our shellmound. By checking up with the available literature it has turned out that nearly every important point in our discovery has been, if not always demonstrated, nevertheless more or less clearly apparent to several prior investigators. The single new fact seemingly brought out here for the first time concerns the isolated occurrence along a considerable stretch of the Indian River of the checker-stamped type of decorated pottery.

This checker-stamped pottery, according to Wyman,⁴ has also universal distribution over the greater part of the St. Johns River area, directly to the west; but associated with it here and there is pottery decorated with a curvilinear stamp, with cord markings and with incisings. These new types have, however, only independently limited ranges of distribution within the particular area concerned, their various centers of dispersal lying presumably elsewhere. Thus the type decorated with the more or less complex curvilinear stamp, according to Holmes,⁵ is clearly indigenous to Georgia and parts of the immediately adjoining states and forms the basis for his so-called South Appalachian ceramic province. Moore, who has a much wider acquaintance with the ceramic phenomena of the St. Johns region, seemingly agrees⁶ with Wyman regarding the general distribution of the checker ware; but at the same time he lays much more stress on the time range, if not on the spatial range, of the other types of decoration, including

¹ Wyman, (b), 54.

² Holmes, (b), 36, 58.

³ Holmes, (b), 69, 134.

⁴ Wyman, (a), 451-452; (b), 54-55.

⁵ (b), 130.

⁶ Moore, (a), 1893, 709.

even painted ware,¹ which however, occurs in only one mound and is regarded as of relatively late date. Farther west, on the Ocklawaha River, Moore also found the checker-stamp ware to be quite common,² but its occurrence was evidently overbalanced by the other types, painted ware being here quite prominent.³ In addition he mentions the occurrence of raised or modeled embellishments⁴ as well as a punctate type of decoration.⁵ If we turn to Holmes, who has published several studies of the pottery in the eastern and southeastern United States, we find him to state⁶ that the simple stamped ware of the St. Johns area is common throughout the Florida peninsula and that it extends west into Alabama and north to North Carolina and Tennessee. We might extend the range by adding that Moore⁷ has since found examples of the same type of pottery as far west as Louisiana and that Smith⁸ observed it even in northeastern Kentucky, near the Ohio River. In the same paragraph Holmes adds the significant statement that "it is not likely that it [the checker-stamped pottery] was characteristic of any particular people or culture group," an opinion with which the data embodied in the present paper seemingly warrant us in taking issue. In other words, according to the evidence now available, it seems that of the various decorated types of pottery found in the southeastern United States such as simple checker-stamped, complex or curvilinear stamped, cord-marked, pinched, punched, stippled, incised, engraved, modeled, and painted, the first-mentioned has possibly the widest geographical distribution. Moreover, its center of origin would seem to be located in east-central Florida because here it occurs in isolation; while, as we move out from this center to the west and the northwest we find it to be slowly thinning out quantitatively, being gradually replaced in different localities by one or more of the great variety of decorative types above mentioned. The remarkable exception to this rule is a small area in North Carolina where a few surviving Cherokee still practise — or did until recently — this same simple type of pottery decoration.⁹

Having pointed out the probable center of origin for the checker-stamped pottery and also its geographic distribution, let us turn, finally, to the question of its historical range. Wyman,¹⁰ it seems, was of the opinion that the

¹ Moore, (a), 1893, 709, 723; but see also (b), X, 102.

² Moore, (b), X, 535, 539, 540, and Plate 86, Fig. 2.

³ Moore, (b), X, 520, 521, 522, 530, 536, 543.

⁴ Moore, (b), 530, 542.

⁵ Moore, (b), X, 541.

⁶ Moore, (b), 122.

⁷ Moore, (b), XVI, 11.

⁸ Smith, Plate 25.

⁹ Holmes, (b), 56, 134.

¹⁰ (b), 53.

traced or incised ware of the St. Johns region being cruder, was older than the simple stamped ware. Holmes, working presumably for the most part with second hand data and therefore at a disadvantage, appears to take the same view.¹ But, at the same time, in referring to the relatively simple decorative ideas most common in the St. Johns region as a whole, he seems to accept the current supposition that they were characteristic chiefly of the *middle period* of mound accumulation, "the early stage being without pottery and the later having several varieties of ware" of a more elaborate and highly differentiated character.² The actual time order of the checker-stamped pottery along the St. Johns is therefore at best a matter of doubt and it is not worth while risking any offhand opinion on the subject. However, at our tentative center of origin for the checker-stamped pottery, along the Indian River, the situation is perfectly clear. Here the ware in question lies stratigraphically directly on top of the crude unornamented ware which latter in fact develops side by side with it to the end of the local shellmound occupation. Along the St. Johns River, a few miles to the west — whatever be the stratigraphic conditions — we have the same ceramic types, viz., plain and checker-stamped as on the Indian River, with the addition of several new types such as incised and painted wares. The question before us is: are these new types of earlier or later date than the type isolated on the Indian River? One can hardly afford a dogmatic answer, but the impression certainly is that they are later. For one thing, as already stated, the checker-stamped pottery has extremely wide distribution, which of itself argues for its relatively great antiquity. Again, while it is conceivable that the great variety of decorative ideas mentioned above may have originated in as many different places in the west and northwest, it is difficult to believe that in an area no larger than Florida the contemporary ceramic products should not be associated throughout. In other words, the presumption is that since no painted or incised or curvilinearly stamped ceramics are found mixed with the checker-stamped ware of the Indian River country, they were not in existence. The fact that they do occur in association on the St. Johns River would then signify, among other things, that the Florida shellmound people at that date had left the Indian River. But the whole subject of Florida's aboriginal history must be worked out in the field. I have merely sought to indicate that there is such a history and that, as Walker wrote,³ nearly forty years ago, "the key to the whole matter is a critical study of ancient pottery."

¹ (b), 121.

² (b), 120-121.

³ Walker, 1881, 680.

SUMMARY AND CONCLUSIONS.

We have outlined briefly the main facts bearing on the situation, size and mode of growth of a large Florida shellmound, by this time already passed out of existence; and have considered at somewhat greater length the nature of its contents. The Oak Hill mound is only one of many similar deposits near and far, and it appears to agree with the neighboring sites in all important respects save one or two. Thus, the apparent absence of pottery in the extreme bottom layer, together with the presence of plain ware in the middle horizons and, finally, checker-stamp decorated ware in the upper level, is a corroboration of prior determinations by Wyman and Moore in similar mounds throughout the adjacent St. Johns River district. The one outstanding new fact of importance brought out in this brief study is the stratigraphic and geographic isolation of the simple checker-pattern type of decoration. The probabilities are therefore that this type of pottery first came into use here and that in view of the extensive distribution it is one of the very oldest ceramic traits to be found in the southeastern states. There remains to state in conclusion, that the tremendous diversification of ceramic traits evident in this general region of North America, both as regards form and decoration, furnishes an ideal basis for a splendid piece of research.

ADDENDA CONCERNING THE VERO DISCOVERY.

Without wishing here to enter upon a discussion of any one of the various phases of the difficult problem presented by the anthropological discoveries at Vero, I shall record merely a few of my own personal observations, made on May second and third, 1917.

On the day of my arrival, Mr. Isaac M. Weills, the resident gentleman who has done a good deal of the collecting, had just begun to search for some material for Dr. Hay. Naturally, therefore, I remained, not as long as I could have wished, but for a day and a half or long enough to form some opinion on the merits of the site. Mr. Weills and I inspected and tested both canal banks at various places between the railway bridge and the spillway, settling down to work, finally, on the north bank near his "500 foot" mark, i. e., just below the entrance of the small north gully, where specimens of all kinds seemed exceptionally frequent.

The general nature of the formations observed has been described a number of times by competent geologists and others and need not be rehearsed.¹ The special features of the particular section worked by us were seemingly fairly representative; but if not, the variation lay on the side of simplicity. Briefly stated, the conditions were as follows: About five feet below the general level of the surrounding country there ran a seemingly extensive deposit of "marine shell marl" of undetermined thickness, designated by Dr. Sellards as stratum No. 1. With this we have nothing to do so far as the stratigraphic position of archaeological data is concerned. Resting on No. 1 were two additional successive deposits each about two and one half feet thick and known respectively as stratum No. 2 and stratum No. 3, counting from the bottom up. Stratum No. 3, the top layer, was a disorganized mass of dead roots, leaves, pieces of wood, bark, etc., enclosed in a rather attenuated matrix of whitish sand — wind-blown sand it seemed to be. It is a deposit which is still in process of formation and which at this point is simpler and more homogeneous than it is on the south side of the canal where an irregular bed of marl-like substance is introduced some four inches below the surface mulch. Stratum No. 2 was composed of a rather homogeneous fine sand, colored blackish at the top (due presumably to moisture seeping through from the peat-like formation above) but ranging through brownish and slightly stained to pure white in the lower third of the deposit. The upper three or four inches of this sand was slightly cemented and the hardened surface was rather uneven.

The only irregularity in the section to which it seems worth while to call attention was the distinct occurrence in the discolored part of stratum No. 2 of more or less vertically winding passages — perhaps root holes, one to five inches in diameter — which had been filled with whitish sand presumably sifted down from the stratum above. In one place also the underlying marl formation ran out, but possibly it had been removed by the creek.

We worked our section altogether for the better part of one day and found our specimens, both paleontological and archaeological, rather numerous. Most of our material came from the sand layer, i. e., stratum No. 2, and all the archaeological specimens — five of them — taken out in my presence, were found lying directly on the hardened surface of this formation. They consisted of one complete and three incomplete bone awls together with a bit of flint — all comparable to the specimens figured by Professor MacCurdy.²

Unfortunately, potsherds were not met with; but Mr. Weills kindly

¹ See e. g., Sellards in *Science*, vol. 44, 615-617.

² *American Anthropologist*, N. S. vol. 19, 1917, 255, 257.

gave me a few samples and he has since sent me others, both from the section and from the surface of a neighboring "grove," in addition to two fragments from a shellmound in the vicinity. Interestingly enough, the shellmound samples are of the plain and checker-stamped sort comparable in every way to the predominating wares found at the Oak Hill shellmound. The sherds given me as coming from the Vero section and from the neighboring grove are very nearly identical and differ from the shellmound pottery in having a decidedly gritty instead of a "chalky" paste. The gritty type of ware does occur, however, in the mounds of Florida as Holmes and others have stated. This gritty ware found at Vero is perhaps on the whole of a coarser nature than the other, and, so far as my information goes it is not ornamented. Without going into the subject at length, therefore, it would seem not impossible from a cultural standpoint that the Vero section belongs to the middle period of shellmound occupation along the Florida East Coast.*

BIBLIOGRAPHY.

The literature relating to the archaeology of Florida is quite extensive and no attempt has been made to examine all of it. The following citations are believed to cover the most important authors:—

- BARTRAM, WILLIAM. Travels through North and South Carolina, Georgia, East and West Florida, etc. London, 1792.
- BRINTON, DANIEL G. Notes on the Floridian Peninsula. Philadelphia, 1859.
- BUTLER, AMOS W. Observations on Some Shellmounds of the Eastern Coast of Florida (Proceedings, Nineteenth International Congress of Americanists, 1915, Washington, 1917.)
- CUSHING, F. H. Exploration of Ancient 'Key Dwellers' Remains on the Gulf Coast of Florida (Proceedings, American Philosophical Society, vol. 35, pp. 329-432, plates 25-35, Philadelphia, 1896.)
- DOUGLAS, ANDREW E. Earth and Shell Mounds on the Atlantic Coast of Florida. (American Antiquarian, pp. 75-82, 141-148, March and April, 1885.)
- HOLMES, WILLIAM H. (a) Earthenware of Florida (Journal, Academy of Natural Sciences of Philadelphia, vol. 10, second series, pp. 105-128, Philadelphia, 1894-1896.)
(b) Aboriginal Pottery of the Eastern United States. (Twentieth Annual Report, Bureau of American Ethnology, Washington, 1903.)
- MOORE, CLARENCE B. (a) Shellheaps of the St. Johns River, Florida. (American Naturalist, 1892, 1893, 1894.)
(b) A long list of Papers covering mound investigation in all of the southeastern states. (Journal, Academy of Natural Sciences of Philadelphia, vols. 10, 11, 12, 13, 14, and 16. Philadelphia, 1894-1915.)
- SMITH, HARLAN I. The Prehistoric Ethnology of a Kentucky Site. (Anthropological Papers, American Museum of Natural History, vol. 6, part 2, 1910.)
- WALKER, S. T. Various papers relating to shell-heaps on the Florida west coast. (Smithsonian Reports for 1879, 1881, and 1883.)
- WYMAN, JEFFRIES. (a) On the Fresh-water Shellheaps of the St. Johns River, East Florida. (American Naturalist, vol. 2, pp. 393-403, 449-463. Salem, 1869.)
(b) Fresh-water Shellmounds of the St. John's River, Florida. (Memoirs, Peabody Academy of Science, vol. 1, no. 4, pp. 1-94, with 9 plates. Salem, 1875.)

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