REPORTS
OF THE
PEABODY MUSEUM
OF
AMERICAN ARCHAEOLOGY AND ETHNOLOGY
IN CONNECTION WITH
HARVARD UNIVERSITY.

VOLUME II.
1876-79.

CAMBRIDGE.
PRINTED BY ORDER OF THE BOARD OF TRUSTEES
1880
PREFATORY NOTE.

This Second Volume of the Annual Reports of the Peabody Museum comprises the four Reports covering the operations of the Museum for the past four years.

During this period the collections have been removed from their temporary quarters, in Boylston Hall, to the building erected for the purposes of the Museum on Divinity Avenue. A view of it is given in the frontispiece to this volume, and a short account may be found on page 185. The portion of the Museum now erected and occupied consists of one-fifth only, or the end section, of the contemplated building, which, when completed, will form one of the two great wings of the structure planned by the late Professor Louis Agassiz. The opposite wing is used to accommodate the
several departments of the Museum of Comparative Zoology, and to this purpose the main building will also be devoted.

The six large rooms, with their four galleries, of the building now occupied by the Peabody Museum, are being cased and arranged as fast as the means available and the character of the work will allow.

One room with the gallery has already been arranged, and is now open to the public, free, under proper restrictions. During the present year it is expected that two other rooms with their galleries will also be opened to the public, and next year it is probable that the general arrangement will be so far completed as to permit the exhibition of all the collections, so far as this may be possible in the limited accommodations of this first section of the Building.
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TENTH ANNUAL REPORT

OF THE TRUSTEES

OF THE

PEABODY MUSEUM

OF

AMERICAN ARCHAEOLOGY AND ETHNOLOGY,

PRESENTED TO THE PRESIDENT AND FELLOWS OF
HARVARD COLLEGE, JUNE, 1877

VOL. II. NO. 1.

CAMBRIDGE
PRINTED BY ORDER OF THE TRUSTEES
1877
TENTH ANNUAL REPORT.

TO THE PRESIDENT AND FELLOWS OF HARVARD COLLEGE —

The Trustees of the Peabody Museum of American Archæology and Ethnology herewith respectfully communicate to the President and Fellows of Harvard College, as their Tenth Annual Report, the Reports of their Curator and Treasurer for the year ending in January last.

ROBERT C. WINTHROP,
CHARLES FRANCIS ADAMS,
STEPHEN SALISBURY,
ASA GRAY,
HENRY WHEATLAND,
THOMAS T BOUVÉ,
THEODORE LYMAN.

CAMBRIDGE,
June 21, 1877.
PEABODY MUSEUM

OF

AMERICAN ARCHAEOLOGY AND ETHNOLOGY

IN CONNECTION WITH

HARVARD UNIVERSITY

FOUNDED BY GEORGE PEABODY, OCTOBER 8, 1866

TRUSTEES

ROBERT C. WINthrop, Boston, 1866
CHARLES FRANCIS ADAMS, QUINCY, 1866
FRANCIS PEABODY, Salem 1866, deceased, 1867
STEPHEN SALISBURY, WORCESTER, 1866.
ASA GRAY, CAMBRIDGE, 1866
JEFFRIES WYMAN, CAMBRIDGE, 1866, deceased, 1874.
GEORGE PEABODY RUSSELL, Salem, 1866, resumed, 1876.
HENRY WHEATLAND, Salem, 1867 successor to FRANCIS PEABODY, AS
PRESIDENT OF THE ESSEX INSTITUTE
THOMAS T. BOUZY, BOSTON, 1874 successor to JEFFRIES WYMAN, AS
PRESIDENT OF THE BOSTON SOCIETY OF NATURAL HISTORY.
THEODORE LYMAN, BROOKLINE, 1876 successor to GEORGE PEABODY RUSSELL, BY ELECTION.

OFFICERS.

ROBERT C. WINthrop, CHAIRMAN, 1866
STEPHEN SALISBURY, TREASURER, 1866.
GEORGE PEABODY RUSSELL, SECRETARY, 1866-1873
HENRY WHEATLAND, SECRETARY, 1873.
JEFFRIES WYMAN, CURATOR OF THE MUSEUM, 1866-74
ASA GRAY, CURATOR OF THE MUSEUM, PRO TEMPORE, 1874-1875.
FREDERICK W. PUTNAM, CURATOR OF THE MUSEUM, 1875
LUCIEN CARR, ASSISTANT CURATOR OF THE MUSEUM, 1877

(4)
ABSTRACT FROM THE RECORDS.

At a Meeting held on Wednesday, April 17, 1876, Prof. Gray submitted plans for the erection of a section of the proposed building for the Museum dimensions 40 by 75 feet within the walls.

A committee, consisting of Messrs. Lyman and Gray, was appointed to request the Corporation of Harvard College to grant land of sufficient dimensions to erect thereupon the proposed building for the Peabody Museum of American Archaeology and Ethnology, according to the plans submitted.

This committee was also requested to provide plans and estimates of the end section, and also the second section if it should be deemed advisable, and to report at a future meeting of the Trustees.

Meeting on Wednesday, May 31, 1876.

Mr. Lyman, of the committee on the building, mentioned that he had met a Committee of the Corporation of the College, and that they would grant the land for the building, whereupon it was ordered that the committee be authorized to make the necessary arrangements, and to receive from the corporation a written legal document.

The following copy of a vote of the Corporation has since been received:

At a Meeting of the President and Fellows of Harvard College in Boston, March 12th, 1877

At the request of the Trustees of the Peabody Museum of American Archaeology and Ethnology, and in accordance with the recommendations of the Committee appointed by this board on May 1st, 1876 it was
Voted, That while granting for the use of the Peabody Museum of American Archaeology and Ethnology the location of its building now in part nearly finished, it is hereby agreed that no new building shall ever be erected, without the written consent of the Trustees of the Peabody Museum, or their successors, upon the land lying southerly of said Museum building, within a line parallel to the southerly wall of said building, and distant seventy-six feet from the nearest part of the cut granite foundation thereof above ground, as the same now stands

A true copy of Record

Attest, E W. Hooper, Secretary

Plans for the proposed building were submitted by the committee, and after the adoption of some slight modifications it was

Voted, That the Building Committee be authorized to approve, and the Treasurer thereupon to sign, contracts for the erection of the proposed section of the Museum in accordance with the plans submitted

Annual Meeting, Wednesday, January 17, 1877.

Mr. Lyman presented a verbal report on the building. The architect submitted a report containing estimates for the cases, furnaces and other incidentals. Referred to a committee consisting of Messrs. Lyman, Gly and Bouvé.

The reports of the Treasurer and Curator were read and adopted.

Mr. Lucien Cali was appointed Assistant Curator in accordance with the recommendation of the Curator

Henry Wheatland, Secretary.
REPORT OF THE CURATOR.

To the Trustees of the Peabody Museum of American Archæology and Ethnology —

Gentlemen — Since my last report, dated January 29, 1876, the centennial year of American Independence has closed and with it the decennial of this Museum.

In relation to the first of these anniversaries, the Museum was called upon to furnish numerous articles supplementary to the National Exhibit of Archæology and Ethnology made at Philadelphia under the direction of the Smithsonian Institution, and also to add bound volumes of its reports to those of the National and State Boards of Education. Thus while its name did not appear in the list of special contributors to the great exhibition, nevertheless it did its part in showing to the world the achievements of American research.

In connection with its own anniversary, it appears appropriate to consider, for a moment, what has been accomplished during the ten years which have passed since, with such insight in regard to the wants of American science, Mr. Peabody made the foundation of what is still the only museum in America specially devoted to archæology.

During these ten years not only has the fund, entrusted to your care for the performance of the duties which you accepted, been so wisely invested and faithfully guarded that it has increased in amount to a sum over one-third larger than when placed in your charge, but at the same time a large and valuable museum has been formed, and, by an expenditure which will probably leave intact the fund originally devoted to the purpose, you will, before another year has passed, be in possession of a fire-proof and commodious building in which to arrange the archæological and ethnological treasures which have been accumulated under your direction.
In conformity with Mr. Peabody's expressed wish, much has been done, during these ten years, toward the accumulation of material for the proper understanding of the condition of the early inhabitants of America, and their relation to those of other parts of the world. For this purpose special explorations in America have been made with marked success, and large and valuable collections from abroad have been secured for the purpose of comparison.

In this brief sketch of the results obtained in ten years it must not be forgotten how much is due to one of the original members of the Board of Trustees (Prof. Jenius Wyman), who, by his labors, added to the value of the collections secured for the Museum, while they, in turn, enabled him to make his important contributions to American ethnology.

During the past year the work in the Museum has been performed by Mr. Carr and myself, and we have, principally by Mr. Carr's nearly uninterrupted labor, succeeded in properly caring for and cataloguing all the additions made during the year.

The great value of Mr. Carr's voluntary labor, and the fact that he can give nearly all of his time to the Museum while the detail work now required is more than I could accomplish unassisted, lead me to request that he be appointed Assistant Curator of the Museum, in which capacity he has acted during the year.

For a special account of the additions to the Museum and Library since January last, I refer to the reports prepared by Mr. Carr. From these it will be seen that sixteen hundred and sixty-five entries have been made in the catalogue during the year, and that seventy-eight volumes and ninety-seven pamphlets have been added to the library. It will also be noticed that, notwithstanding the fact that no large purchases have been made, the total number of specimens received (amounting to between eight and ten thousand) is in excess of previous years, and that their value is unusually great for the purposes of the Museum.

In order that ethnologists may in a general way know the characteristics of the trama received by the Museum, the principal measurements of each skull have been taken by Mr. Carr and are annexed to this report.

Mr. Agassiz has again contributed to the Peruvian Collection by the addition of an important series of articles of pottery from Chimbote, a locality farther north on the coast of Peru than heretofore represented in the Museum. An ancient bronze from the
same locality, also presented by Mr. Agassiz, is of special interest. It is also worthy of note, when taken in connection with the discoveries of Schlemm and Hassel, that the collection of parts from Peru contains several with the representation of the owl's face, which is also represented on specimens of Missouri pottery.

A small collection of articles made of gold and also of gold and copper alloy, secured by purchase through Professor Board, is of special interest, and is the only illustration in the Museum of the arts of the ancient nation of New Grenada.

To the Trustees of the Peabody Academy of Science in Salem, the Museum is particularly indebted for a large collection of stone implements, articles from the shellheaps, a few marine, and many other specimens, which they allowed me to take from the Museum under their charge, on the liberal principle of placing this valuable material where it would be of the greatest use to science. By this act, the Trustees of the Academy, the Museum receives a large accession to its Abbott collection of stone implements from New Jersey, and with this addition it will now be possible to arrange the New Jersey collection in such a manner as to make it a standard for comparison with other parts of the country. The articles from the various shellheaps in Maine and Massachusetts, received from the Academy, will also enable a better exhibit to be made of the shellheaps of New England, in contrast with those of Florida which are so well represented by the labors of Professor Wyman. To myself, this act on the part of the Trustees of the Academy is specially gratifying, as it again places under my charge many articles that I had either personally collected or paid special attention to when connected with that institution.

To Surgeon General Barnes, U. S. A., in charge of the Army Medical Museum, and to Assistant Surgeon George A. Ous, U. S. A., Curator of the Museum, the Peabody Museum has been particularly indebted during the year, not only for important assistance in scientific work, and for several small collections of interest, but especially for the finely executed and accurate life-size portrait of my predecessor, the late Professor Jellies Wyman.

Though very little has yet been done toward the formation of such a working library as it is hoped eventually to secure, still a number of important additions have been made by purchase during the year, and several gifts and exchanges have been received. To the President of the Board of Trustees the library is specially in-
debted for a copy of the rare and costly work, by Mr. Schoolcraft, on the Indian Tribes of North America, and for the continuation of several of the foreign serial publications.

As the officers of the College Library took possession of the cases in the former Anatomical Museum, for the storage of books during the alterations in the library building, the arrangement of specimens as proposed in the last report could not be accomplished, and the only additional cases occupied during the year are a few in the gallery where the crania were already arranged. It has thus been necessary to pack and store a large part of the collections received during the year in the best manner possible with the present accommodations, and prepare for the removal of the Museum to the new building during the summer.

The explorations conducted under the direction of the Museum during the past year have proved of considerable importance and have furnished valuable material.

Dr. Edward Palmer forwarded a very interesting collection obtained from mounds in Southern Utah, formed over the ancient dwellings of a nation evidently closely allied to the present Pueblo Indians, and also many articles obtained from the Mojave tribe and from Southern California. During the visit of Dr. Palmer to Cambridge, in September last, arrangements were made with him to take the field again entirely in the interests of the Museum, and at the close of the year he started for Utah with a carefully planned route and full instructions in relation to special work to be done for the Museum. The appropriation under which he is now acting will provide the means for a few months to come, and it is believed that he will be so successful as to warrant the continuance of his services in the field if the necessary funds can be spared.

Prof. E. B. Andrews has continued his explorations of mounds in Ohio, acting under the appropriations of last year, and has been very successful in obtaining important facts in relation to the formation and contents of the mounds. He has also partially examined a very interesting cave or rock shelter, from which a human skeleton and a number of articles were obtained. The collections made by Prof. Andrews have been received at the Museum and recorded in the catalogue during the past two years.

I present, as part of this report, the accounts furnished by Prof. Andrews of his investigations.
Mr. Lucien Carr, acting under an appropriation granted at the
last annual meeting, and in connection with the field party of the
Kentucky Geological Survey, stationed during the past season at
Cumberland Gap, opened a mound in Lee County, Virginia. By
Mr. Carr’s special report on this mound, hereto annexed, it will
be seen that the mound probably belongs to a different class of
structures from those described in detail in Prof. Andrews’ report.

The conflicting testimony of the mounds yet requires to be care-
fully considered, and many more of these ancient tumuli must be
examined before their story can be told, but there is much which
suggests that in these mound structures we have to deal with
widely distinct periods of time, if not with several nations. Thus
while recent investigations and historical evidence show that
mounds were formed and used by some comparatively recent Indian
tribes, history and tradition are silent in relation to the older
earthworks, and investigation of the works themselves shows how
careful we must be in drawing deductions. Just as the tumuli of
Europe exhibit marked differences, indicating distinct periods so
do those of America, and the periods when cremation and inhumation
were severally practised must be studied here in connection
with the earthworks and tumuli. From the facts now before us it
seems proper, until further deductions can be drawn, to regard
the great earthworks of the Ohio valley as a phase of develop-
ment corresponding, but not identical, with that which is shown
by the existing Pueblo Indians, while individual mounds and
many of the earthworks in distinct portions of the country are to
be attributed to more or less nomadic tribes, of which all the great
families furnish examples.

Probably the most important result attained in American arch-
æology during the year is that secured by Dr. C. C. Abbott of
Trenton, New Jersey, to whom a small appropriation was granted
to enable him to continue his researches.

As will be seen by a perusal of his special report, hereto an-
nexed, Dr. Abbott has probably obtained data which show that
man existed on our Atlantic coast during the time of, if not prior
to, the formation of the great gravel deposit which extends
towards the coast from the Delaware River near Trenton, and be-
gieved to have been formed by glacial action. From a visit to the
locality, with Dr. Abbott, I see no reason to doubt the general
conclusion he has reached in regard to the existence of man in glacial times on the Atlantic coast of North America.

I may also add that since his report was presented, Dr. Abbott has forwarded four other stone implements taken from various depths in the gravel, thus adding to the weight of the conclusions he has drawn.

At the last annual meeting the proposition to publish special memoirs relating to American Archaeology and Ethnology was favorably considered, though decided action was not taken. I therefore take the liberty of again calling your attention to this subject by offering for your consideration a paper, by Mr. Ad. F. Bandelker, entitled the "Art of War and mode of Warfare of the Ancient Mexicans." This paper is the result of very careful study of the old Spanish and Mexican authors, and materially changes the views heretofore generally held in regard to the stage of development reached by the nation which so bravely held out against its Spanish conquerors. This paper is endorsed by Mr. Lewis H. Morgan, and is in every way worthy of publication by the Museum.

With this statement I beg your early consideration of the important subject of the publication of special papers either in connection with the Annual Reports or under a distinct title.

Respectfully submitted,

F. W. Putnam,
Curator of the Museum.


1 Three of these implements have been carefully engraved and the figures are inserted in Dr. Abbott's report. Other specimens from the gravel have been also received since the annual meeting.

Prof. N. S. Shaler has visited the locality since the above report was read, and at my request has furnished a short report on the Trenton gravel deposit, which I have inserted after Dr. Abbott's account.
REPORT

ON THE ADDITIONS TO THE MUSEUM AND LIBRARY FOR
THE YEAR 1876

BY LUCIEN CARR, ASSISTANT CURATOR

Additions to the Museum

9409—9511 A variety of ornaments and articles such as are now in use among the Pah Ute Indians, illustrating their manners and customs. Among these, are musical instruments, implements of horn used in chipping arrowheads and straightening the arrow itself, baskets and the tools used in making them, fire sticks, clay pipe, beads of bone, various games and gambling devices, toys, charms, sandals, domestic utensils, corn planter, etc. Also a collection of knives, arrowheads and other implements of stone, bone awl, shell ornaments, stones for grinding corn, charcoal and human conchobs, earthen pots and numerous fragments of pottery, plain and ornamented, some in colors, from a Mound near Santa Clara in South Utah—Explorations of Dr. Edward Palmer conducted for the Museum.

9512 Photograph of a carved stone found in White-water Creek, Colorado Desert—Presented by Dr. C. C. Parry, of Davenport, Iowa.

9513—9514 Modern Venetian glass rod used in making polychrome beads, rough garnet beads—Presented by Dr. C. C. Abbott, of Trenton, New Jersey.

9515—9516 Spearpoint and knife of stone, from Sudbury, Mass—Collected and presented by Mr. Reuben Smith, through Mr. T. G. Carle, of Cambridge, Mass.


9518—9522 Photographs of ancient vases from Cyprus, Peru, and Tehamapec—Presented by the Metropolitan Museum of Art, New York.

9523—9538 Sixteen photographs of Chippewa and Sioux Indians, males and females—Presented by Mr. D. A. Robertson, of St. Paul, Minnesota.

9539—9570 Stone arrowheads, knives, drills, celt, gouges and axe from Newburyport, stone axe from North Berwick Maine, celt and sinker of stone from Byfield, Mass., sinkers and hammerstones from Rowley, Mass., stone gouge and pestle from Groveland, Mass., stone axe from Ohio—By Purchase.
9571—9577 Large oval stones, carved and resembling horse-collars in shape, axes of stone, knobs and handles of pottery, and stone implements with human face carved on them, from Porto Rico — Collected by Mr. George Lyttel and presented by the Smithsonian Institution, Washington, D. C.

9578 Comb used by a Modoc Indian (Captain Jack), with hair attached — Collected by Sergeant Thomas Eisenmills, U S A, and presented by Dr. W. J. Hoffman, of Reading, Pennsylvania.

9579-9593 Carved wood reeds, glass, earth and plated straw from a mound in Madison Co., Mississippi — Collected by Prof. B. F. Whittington, Mississippi, and presented by Prof. Asa Gray of Cambridge.

9594 A large earthen pot from Atlanta, Canada — By Purchase.

9595—9599 Four scalpels from Trenton, New Jersey, the same that were figured in Nature for Feb. 3d, 1876, also a stone implement from the same place — Presented by Dr. C. C. Abbott, of Trenton, New Jersey.

9600—9622 Casts of fifteen grotesque faces from Mexico, rattle made of the shell of a box turtle, Ostrich, by Choctaw Indians, clay pipe and small vase from Alabama, pottery from Canstadt — Presented by the Boston Society of Natural History.

9623—9649 Rattle used by the Assiniboine Indians, collected by Asst. Surgeon J. P. Kibbaird, U S A, iron pointed arrows of the Cheyenne Indians, collected by Asst. Surgeon S. M. Horion, U S A, spoon, butcher knife, hammer and scissors, all of iron, and a glass ball showing marks of fire, from Indian graves near Fort Randall, Dakota Territory, collected by Asst. Surgeon G. P. Hackleman, U S A, "Rouse" bread made by the Nez Perce Indians, collected by Acting Asst. Surgeon Edward Storror, U S A, Apache quiver and arrows, iron pointed, and a hammerstone or clubhead from Santa Cruz massacre ground, collected by Asst. Surgeon H. R. Tilton, U S A, pottery from cemetery near Fort Wayne, Ind., collected by Surgeon B. J. D. Irwin, U S A, cupping horn and gun flint by Asst. Surgeon A. J. Comblare, U S A, horn spoons, bone scalpel for dressing skins, and a whistle also of bone, modern beads and ornaments, and stones for "fixing" arrowheads, all from a grave near the old Pueblo Agency, collected by Asst. Surgeon Geo. H. Hopkins, U S A, piece of a rattle from Pecos Church, near Santa Fe, built by the Pueblo Indians, collected by Surgeon D. C. Priner, U S A — Presented by the Army Medical Museum, Washington, D. C.

9650—9651 Photographs of Indian rock sculptures near Brattleboro and Bellows Falls — Presented by Dr. J. B. S. Jackson, of Boston, Mass.

9652 Portion of a rush mat from a cliff house on the Rio Micos, Colorado — Collected and presented by Mr. W. H. Holmes, of Washington, D. C.

9653—9667 Drills, scrapers, knives, arrowheads, spearpoints, and other implements of stone from Cumberland County, Tennessee — In all a thousand specimens — By Purchase.

9668—9704 Perforated stones, clubs, perforated stone cylinder, and stone ornaments with carved human figure, from Puntas Aenas, Costa Rica — Presented by the Museum of Comparative Zoology, Cambridge.
9763—9767 Human bones, burnt earth and clay, fragment of steatite pot, and arrowheads from mounds in Hocking County, Ohio, burnt clay and charcoal, burnt animal and human bones from mounds in Athens County, Ohio, fragments of pottery, arrowheads and spearpoints found on the surface, Hocking County, Ohio — From Explorations of Prof E B Andrews, conducted for the Museum

9728 Arrow, probably from the Sandwich Islands — Collected by the late Horace Mann, jr, and presented by Miss Horace Mann, of Cambridge

9729 Model of native boat from the Fiji Islands — Presented by Dr. Geo A Perkins, of Salem, Mass

9730—9863 The collection from the Ely mound, Lee County, Virginia, described in the special report, stone celt sharpened at both ends, stone ball with many shallow borings, found on the surface, Lee County, Virginia, arrowheads, spearpoints, drills and scrapers of flint, piece of steatite perforated and worked in squares, and three small pipes, one each of sandstone Jasper and steatite, from the surface near Cumberland Gap, Tennessee, blunt pin of coal from Turner's Mound and fragment of logs used in covering the central grave, from the same mound, Bell County, Ky, head made of camel coal, shell pin, human and animal bones from caves in Lee County, Virginia, and Claiborne County, Tennessee, pipe of steatite carved like the head of some fanged animal, the resemblance to which can only be seen when the pipe is turned up-side-down, from Bean's Station, Tennessee, cells and grooved axes of stone and a pipe of steatite, carved in the shape of a tomahawk from the surface near Russellville, Tennessee, collected by Mr Hugh Rogn, also a pipe of steatite ornamented with rings and slightly raised circles, and a perforated shell of Bysson pericosum, from a mound near the same place collected by Mr Rogn; shell and coal beads, human remains, spearpoint, arrowhead, and dagger of flint, from the Haunted Cave, Edmonson County, Kentucky, flint chips, from a Rock-house under the Indian Fort on Ivy Creek Bluff, Bath County, Ky, arrowheads, spearpoints, knives, scrapers, and a characteristic general assortment of flint implements from western Kentucky — Explorations of Mr Lucien Carr, conducted for the Museum

9864—9881 Fused copper from Indian grave near Burksville, Kentucky, collected by Mr C L S Matthews, rude flint axe from western Kentucky, pipe of steatite, from near Pymatonee, Kentucky, collected by Mr Charles B Johnson, of Gibson's Station, Va, shell pin and beads, sharpening stone, arrowheads and knife of flint, piece of steatite pot and fragments of rude coarse pottery from Turner's Mound, Bell County, Ky — Collected by Mr Lucien Carr and deposited by the Kentucky Geological Survey

9882—10002 A large and valuable collection of ancient pottery from Chimbote, Peru, comprising single and double vases and jars of different sizes and shapes, some plain, others highly ornamented and with human, bird and animal forms moulded on them, cups, bowls and ladles, plain
and ornamented, water jars, some of black pottery and among them a
whistling jar, spindles, knitting needles, thread of three colors, a small
brush, and an interesting group cast in bronze representing a woman
bending over a recumbent figure whilst in the background a serpent is
coiled with its head appearing just above a child swinging in a cradle or
a hammock stretched between two trees — Presented by Mr. Alexander
Agassiz, of Cambridge

10009—10049  A collection of spearpoints, discordal stones, axes, celts,
pipes and stone implements, principally from the Chuliseege Valley, North
Carolina  Some of these specimens are worthy of special attention. A
spearpoint of rose colored flint is of beautiful finish and measures nine
inches and two-tenths in length and four inches in breadth  A pipe of
steatite is carved to represent the body of a duck, and is seven and three-
tenths inches in length. The bowl is an inch and a half broad at the
top, two and a half deep and tapers to the bottom. The stem is five and
a half inches in length, and seems to have been originally bored out,
though an inch and a half of its length has been subsequently dug out and
much enlarged. It is probable that the bowl of the pipe was made in the
same manner. The marks of the tool used in enlarging the hole are very
plain, and instead of being perpendicular to the bowl of the pipe as they
would have been if produced by a succession of hammer-like blows are
spiral in form, somewhat like the groove in a file handle, and seem to
indicate that they had been made by a continuous pressure exerted on the
cutting tool, whilst at the same time a slight twist is given to the wrist,
the pipe, all the while being firmly held in the position by the left hand.
There is also a piece of steatite carved to represent a duck, over twelve
inches in length by four in height. The carving is very well done and the
specimen is perfect except the bill of the duck which has been broken off.
It was probably intended for a pipe and was unfinished, as were two
other specimens which are blocked out and only partially bored.— By
Purchas.

10050—10079  Petrels, scrapers, drills, "changke stone," knives, arrowheads, spearpoints, and many other stone implements of forms usually
found south of the Ohio, from Cumberland County, Tennessee

In this collection there is a pipe from Overton County, Tenn., carved
in the shape of a duck. The sides, or wings, and neck of the pipe are
ornamented with a number of regularly drawn lines. The bowl is oval
at the top, an inch and a half one way by an inch the other. It is two
inches deep, and is much drawn in towards the bottom. It shows marks
of the tool with which it was dug out. The stem was evidently bored
out. It is about three and a half inches in length and tapers from the
mouth-piece to where it joins the bowl. The pipe measures a little over
six and a half inches in length, and weighs seventeen and one-half ounces.
There is also a pipe of steatite polished all around except on one narrow
strip that extends its whole length. It is thirteen and two-tenths inches
in length by two and three-tenths in diameter. The boring was done
from each end, and was subsequently enlarged by digging. The hole or
perforation is an oval, measuring at one end six-tenths of an inch in the longest diameter and at the other an inch and two-tenths in diameter. The borings from the two ends do not meet exactly and consequently there is a bend in the perforation. Around the centre of the tube on the outside is a raised circle polished on all sides except one, seven-tenths of an inch in width — by Purchase.

10080 Photograph of stone implement from Newburyport — Presented by Mr. Arloog Osgood, of Newburyport Mass.

10081 Photograph of East Indian Idol — Presented by Mr. Frank Hild, Murphy'sboro, Illinois.

10082-10129 A collection of articles in use among the Mohave Indians, consisting of ornaments, pipes, tools, baskets, articles of food, domestic utensils, various games, devices for gambling, wearing apparel, water jars, bowls, ladles, toys, etc. — From the Explorations of Dr. E. Parmer made for the Museum.

10130-10141 Photographs of pottery from mounds in south-east Missouri — Presented by Dr. George F. Nordmann, of St. Louis.


10144 Broken stone cell from Wintu Island, Salem Mass. — Presented by Mr. D. A. Mahoney, of Salem.

10145-10211 A collection of stone implements from the surface near Trenton, New Jersey, consisting of axes, clubs, scrapers, knives, pestles, sinkers, steatite spearpoints, arrowheads and drills, fragments of pottery from Trenton, a stone knife from Charenton, France, and a pipe made of catlinite presented by Mr. C. E. Abbott. Included in this collection is a series of rude implements found in the gravel of the river bluff near Trenton, also specimens showing the natural fracture of the rocks found in the same deposit — Collected and presented by Mr. Abbott and the Curator of the Museum.

10212-10223 Rush mats, birch-bark canoe, stone pipe and Kinnibunk corn pounder, a club, sick and mat of cedar and bark rope from the Ojibwa Indians of Lake Superior — Purchased for the Museum by Mr. Henry Gillman of Detroit.

10224-10228 Hammerstones from Isle Royale Lake Superior — Presented by Mr. Alexander Agnew of Cambridge.

10229-10357 This collection, consisting of 7,300 distinct cultures and covering several thousand specimens, is composed in part of bones of animals, birds and fishes, charcoal and burnt earth, bone implements, clubs, axes, gouges, clubs, sinkers, knives, arrowheads and other implements of stone, and numerous fragments of pottery from the shell heaps of Lynn, Salem, Marblehead, Ipswich, Beverly, Newburport, Plum Island, Concord and Wellesley Mass. Goose Island in Casco Bay, Penobscotia, Maine, and Montreal, Canada collected at various times by Messrs. Putnam Cook, Morse, Sears, Osgood and others, human remains, flint arrowheads, and animal teeth from mounds near Dubuque, Iowa, and — Report Peabody Museum, II. 2
Dunloph 3d, collected by Messrs Purvyn and C Cooke of Salem, human cranium and other human bones, animal bones, limo shells, and fragments of pottery, from the fortification and the mounds inside the fortification at Metom, Indiana, collected by Mr Purvyn and party, human crania and remains from a grave in Saugus from Bessom's pasture and D R Buckford's lawn, Marblehead, from the corner of Essex and Cambridge streets, Salem, and from under the Pine Grove Shellheap, Marblehead collected by Mr Cook and other members of the Essex Institute, stone axes, celts, gouges, hammer-stones, sinkers, scrapers, pestles, knives, arrowheads, and spearpoints of different patterns but all belonging to the distinctive New England type of stone implements, collected by various persons from Saugus, Salem Lynn, Marblehead, Beverly, Ipswich, Chelsea, Peabody, Newburyport, Concord Springfield, Cohasset North Andover and Stony Brook Station, Massachusetts, a pestle from Mountebane, N Y, millers, drills, celts, scrapers, sinkers, knives, arrowheads, and other implements and ornaments of stone a bone awl, fragments of rude pottery, and a stone partly perforated, with the core still remaining showing that the boring had been done with a hollow instrument, from various places in New York, millers, grooved axes, hammer-stones, knives, arrowheads, etc. from different localities in Ohio, a fragment of cloth from a mound in Butler County Ohio, described by Dr J W Foster, stone implements of the usual Ohio Valley patterns including two large oval spearpoints of flint from Indiana, collected by Dr John Stone and Dr A S Packard, Jr., stone implements from Boone County, Kentucky, arrowheads, and two large oval flint implements found with 600 others near Bloomington, Illinois, from foot below the surface, by Dr J F symor of Virginia, Cass County, Illinois, a stone pot from Lambertville, New Jersey, collected by Dr C C Amnot, of Trenton, stone celts from mounds in Louisiana, collected by the Rev R J Broughton, a stone celt from Mississippi, two casts of this from mounds in south-east Missouri, photographs of stone idols, crania and ornaments of shell and copper from Tennessee, the originals collected by Dr Joseph Jones, drill and arrowhead of stone from Wyoming Territory, collected by Mr S W Guzman, of Cambridge, stone celts from Port Credit, Ontario, collected by Rev C J S Bririne, stone celts from Hawaii and another from the United States of Columbia, leather sandals from East Coast of Africa, "patapuau" from New Zealand, war clubs elaborately carved, and a four pronged spear from the Pit Islands paddles a shark's tooth sword, bows and arrows with wooden and bone points, from the Pacific Islands, a harpoon point of iron and bone (Eskimo) from West Peabody, Mass., and an iron tomahawk, much eaten by rust, from the site of the old Meeting House, Salem, Mass. With this collection was received a large and very valuable series of stone implements, from the surface, chiefly of peper and slate characteristic of the stone age of New Jersey and also some of the rude forms peculiar to the river gravel. These were gathered at different times by Dr C C Amnot. The interest and
working value of this series from New Jersey is much increased by
the fact that during a brief visit which Dr. Abbott made to Cambridge in
November last, he arranged and classified it in accordance with his pub-
lished accounts of the Stone Age in New Jersey. All the articles here
mentioned were presented by the Peabody Academy of Science, Salem,
Mass.

10938—10991 Knives, axes, arrowheads, and spearepoints, hammer-
stones, sick- stones, and pottery, from Trenton New Jersey. In this col-
clection there is a flint implement showing unmistakable marks of human
workmanship, probably a spearpoint or knife, that was found on the site
of the Lutheran Church in Trenton one mile from the river, and in the
gravel six feet from the surface. Also a stone implement to which the
local name "turtle-back" has been given, which was found in the gravel
twenty-two feet deep and three feet m from the face of the river bluff,
also a carved pipe of stone found on the site of Nassau Hall, Princeton
College near the supposed grave of Tammey —From explorations of
Dr. C. C. Abbott conducted for the Museum.

10992—10993 Fragments of colored pottery from ancient ruins in
Colorado, Utah and Arizona—Collected and presented by Mr. L. A
Barrie, Chekies, Penn.

10994—10995 Rude specimens, stone flakes and gun flint, from Mable
Ridge, North Andover, Mass.—Presented by Mr. A. D. Thompson, of
North Andover.

10996 A stone pipe, the bowl ornamented with carved lines, from Cum-
berland Gap, Tenn.—Presented by Mr. R. Brown, of Harvard College.

10997 A pipe stem (2) of slate elaborately carved openwork, from
the Northwest Coast.—Presented by Mr. Horace Hinsley, of Harvard
College.

10998—10999 Bulbs of a lily used for food by Indians of Southern
California, teeth of deer from mound near St. George, South Utah.—From
explorations of Dr. F. Park, conducted for the Museum.

11000—11013 Bows and iron-pointed arrows of the Utah Indians,
riding whip, coat and trousers, Ogallali Sioux Indians, model of sledge,
Canadian Indians, codger, model of canoe, sharks' teeth, sword and
two specimens of kapa or native cloth, one colored, from the Sandwich
Islands—a shell headdress from the Fiji Islands.—Presented by Mr.
Francis Parkman of Brookline.

11014—11039 Ashes and burnt human bones, copper band, a plate of
copper perforated and ornamented, a stone tube handsomely polished,
from W. Connell's mound near Dover, Athens County, Ohio, human re-
imains, piece of sandstone with markings, animal bones, fragments of
pottery shells of Limos fern leaves, corn cobs, and seeds of the Clitro-
podium album from an Ash Cave, Hocking County, Ohio.—From explora-
tions of Prof. E. B. Andrews conducted for the Museum.

11040—11041 Grains from valley of the French Broad river, above
Knoxville Tenn., and another from an island in the Tennessee river,
eighteen miles below Chattanooga.—By Purchase.
11042 Section of Cranium, showing abnormal position of the fora-men magnum, from Fort Dummer, Vermont—Presented by Prof. N. S. Cressy, Amherst, Mass.

11043—11050 Casts of eight Crania, including Australians, a negro, an ancient Peruvian, Indians from the Pampas of Buenos Ayres, and a modern Italian (Alexandre Volta)—Presented by the Museo Nazionale di Antropologia e di Etnologia in Finland.

11051 Photograph of a carved human figure in stone from Union County, N. J. Presented by Mr. W. L. Anderson, of Murphyboro, Ill.

11052—11053 Photographs of three pipes and of a stationary stone cornmill, in Trenton, New Jersey—Presented by Dr. C. C. Andrews, of Trenton, N. J.

11054 Photograph of stone ornament found in Fruitport, Michigan—Presented by Mr. W. L. Conklin, of Grand Rapids, Mich.

11055—11057 Sicklepoints and arrowheads of stone from Lebanon County, Pennsylvania—Presented by Mr. H. L. Lott, of Millbach, Penn.

11060—11073 Ornaments of gold and gold alloy from near Bogota. Eight of these are of human shape, two like serpents, and four of different fanciful patterns. One of the serpents was from the bottom of Lake Guatavita, near Bogota—By Purchase.

11074 Two implements of stone from the graves near Santa Barbara, California. Collected by Mr. Bowker and presented by Asst. Surg. H. C. Yarrow, U. S. A., Washington, D. C.

Additions to the Library


From the Smithsonian Institution Washington D C Smithsonian Contributions to Knowledge vols XX and XXI, Washington 1876 Two vols 4to Smithsonian Report for 1875, Washington, 1876 One vol 8vo, pp 422 The Empire of Brazil at the Universal Exposition of 1876 in Philadelphia, one volume 8vo pp 494 Rio de Janeiro, 1876 Annual Report of the Department of Mines, New South Wales, for the year 1875 Sydney 1876 One vol 4to pp 167 Mineral Map and General Statistics of New South Wales, Australia Sydney, 1876 Mines and Mineral Statistics of New South Wales, and Notes on the Geological Collection of


From the Author. Mounds at Merom and Hutsonville on the Wabash Archaeological Researches in Kentucky and Indiana in 1874. Description of a stone knife found at Kingston, New Hampshire. Description of a
carved stone representing a Cetacean, found at Seabrook, N H. Description of an ancient Indian carving found at Ipswich, Mass. Note on the skull of a Mound Builder from Davenport Iowa. Notes on Canna found in an Indian grave at Saugus, Mass. Description of Stone knives found in Essex County, Mass. Note on Canna from Mounds calling attention to a paper by J W Foster. Nine pamphlets, 8vo, by F W Putnam.

From the Author On the Remains of Population observed on and near the Lomax Plateau of North Western New Mexico, by E D Cope, read before the American Philosophical Society June 15 1875. Pamphlet 8vo.


From the Society The Wiltshire Archeological and Natural History Magazine for June, 1875. No XLIV Vol XV.

From the Society Proceedings of the Literary and Philosophical Society of Liverpool during the sixty-fourth session, 1874-75. No XXIX, 8vo pp 355 London and Liverpool, 1875.

From the Academy Memoirs of the Peabody Academy of Science, Salem, Mass. Vol 1 No 4 "The Fresh Water Shell Mounds of the St John's River Florida" by James Wam in 4to 91 pp with plates.

From the Society Archivo per l'Antropologia e la Ethnologia organo della Società Italiana di Antropologia e di Ethnologia pubblicato dal Dott. Paolo Mantegazza, Professor ordinario di Antropologia Nel R Instituto Superiore in Firenze Sesto volume Fascicolo I, II Firenze 1876. Pamphlet 8vo.

From the Society Boletin de la Sociedad Geografica de Madrid Tomo I Num 1 Julio, 1876 Madrid, 1876.


From the Association Minutes of the Indiana State Archeological Convention, held at Indianapolis, Sept 29th and 30th, 1875. Pamphlet 8vo.


From the Museum Second Catalogue of the Ancient and Modern Works of Art given or loaned to the Trustees of the Museum of Fine Arts Boston 1876. Pamphlet 12mo pp 74. Proceedings at the Opening of the Museum of Fine Arts, with the Reports for 1876, a list of Donations, etc. Boston, 1876. Pamphlet 8vo pp 43.

From the Author Columbus and the Geographers of the North by the Rev B F De Costa. Hartford Conn, 1872. Pamphlet, 4to, pp 23.

From the Author Le Valkylla des Sciences ou 1 Galerie Commemorative de Blors, par le Cte Leopold Hugo. Pamphlet, 8vo Paris, 1875.

From the Author On the Stone Mining Tools from Alderley Edge, Cheshire, by Prof. W. Boyd Dawkins Pamphlet, 8vo, pp. 5 with plate.

From the Author The Prehistoric Remains which were found on the site of the City of Cincinnati, Ohio, with a vindication of the "Cincinnati Tablet," by Robert Clarke Cincinnati, 1876 Pamphlet, 8vo, 34 pp., with plate.

From the Author Observations upon the Form of the Occupant in the Various Races of Men, Observations upon the Cranial Forms of the American Aborigines, based upon specimens contained in the collection of the Academy of Natural Sciences of Philadelphia, The Mensuration of the Human Skull, Description of a deformed fragmentary Human Skull, found in an ancient quarry-cave at Jerusalem, with an attempt to determine, by its configuration alone, the ethnical type to which it belongs. 4 pamphlets, 8vo, by J. Aiken Reeves, of Philadelphia.

From the Author Remarks on the Centres of Ancient Civilization in Central America and their geographical distribution. Address read before the American Geographical Society, July 10, 1876. Bulletin of the American Geographical Society, special meeting July 10, 1876, for the reception of Dom Pedro d'Ancantara, Dr. Aug. Peterman, Prof. N. E. Nordenskjöld and Dr. C. H. Berendt. Analytical Alphabet for the Mexican and Central American Languages. Cartilla en Lengua Maya para la Enseñanza de los Niños Indígenas. 3 pamphlets, 8vo, by C. Homann Berendt, M. D.

From the Author Cenni sopra una caverna della Palma con resti d'animali e umani dell'età della pietra in essa trovati. Su Depositi Antropologici nella caverna dell'isola Palmata, Ricerche paleontologiche. Ricerche in Grotte dei Dintorni della Spezia e in Toscana. Sulle Variazioni della distanza spino-alveolare. 4 Pamphlets, 8vo, by Ettore Regalia Florence, Italy.

From M. Gerhard Gade, United States Consul, through the Hon. Robert C. Winthrop, The Ancient Vessel found in the Parish of Tuna, Norway, translated by Gerhard Gade.

From the Authors Memoirs of the Geological Survey of Kentucky, N. S. Shaler, Director Vol. I. Part. 4—On the Prehistoric Remains of Kentucky, by Lucien Carr and N. S. Shaler Pamphlet, 4to, 31 pp., with 7 plates.

From the Author Über altgriechische Schädel aus Graben der verschwundenen alten Stadt Cumana unter-Italien von Carl Gustav Carus Pamphlet, 4to, 134 pp.

From the Society Proceedings of the British and American Archaeological Society Rome, Season 1875-6 Pamphlet, 8vo.

From the Society The Colonial Intelligence, the organ of the Aborigines Protection Society, November, 1875.

From the Author Archaeological Fasts, by Charles Whittlesey Pamphlet, 8vo.
From the Author. An Historical Address, Bi-Centennial and Centennial, delivered at Groton, Mass., July 4, 1876, by Samuel A. Green. Two copies one each first and second editions. Pamphlet, 8vo Groton, 1876.

From the Boston Society of Natural History. Report on the Geological Map of Massachusetts prepared by W. O. Congreve, Assistant in the Laboratory of the Boston Society of Natural History. Prof. Alpheus Hyatt in charge.


From the Author. Geographical Distribution of Plants, by Charles Pickering M. D. Salem, 1876. One vol. 4to, pp. 524.


From the Museum. Bericht des Museums für Volkerkunde in Leipzig 1875. Pamphlet, 8vo, Parts 1, 2, and 3.

From T. W. Putnam. A framed steel engraving of George Peabody, the founder of the Peabody Museum.

From the Army Medical Museum Washington. An enlarged photographic portrait painted in color, of Jedediah Wynn, the former Curator of the Peabody Museum.

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REPORT
ON THE CRANIA RECEIVED DURING THE YEAR

By Lucien Carr, Assistant Curator

In explanation of the subjoined measurements, it may be stated that by length is meant the greatest longitudinal diameter, measured from the glabella to the most prominent part of the occiput, that the breadth signifies the distance between those points of the parietal bones that are widest apart, that the height is taken between the middle of the anterior border of the foramen magnum and the highest point on the inter-parietal suture, that the width of frontal is measured at the narrowest point on the temporal ridge above the external angular processes, and that the internal capacity is obtained by measuring with carefully selected peas in the manner adopted by the late Prof. Wyman after repeated experiments with other materials. The metric system is used for all the measurements, length, breadth, height and width of frontal being given in millimetres and the capacity in cubic centimetres.

No 8,329 Cranum, imperfect Adult, probably male Length 178 Breadth 146 Height 142 Width of Frontal about 92 Index of breadth 820 Several small Wormian bones developed in the lambdoidal suture. Posterior portion of the right parietal and the adjoining portions of the occipital much flattened or pressed forward, with a corresponding projection of the right frontal. From a cave near Gibson’s Station, Lee County, Virginia, Collected by Mr. Charles B. Johnson of that place, and deposited by the Kentucky Geological Survey.

No 8,330 Cranum, imperfect Probably a male, adult Length 172 Breadth 140 Width of Frontal 89 Index of breadth 813 Posterior portion of the right parietal and the adjoining part of the occipital much flattened. The frontal natural, both sides being equally well rounded and arched. From a cave near Cumberland Gap, Tennessee. Collected by Mr. Lucien Carr, and deposited by the Kentucky Geological Survey.

No 9,740 Cranum. Adult male Capacity 1,393 Length 172 Breadth 140 Height 140 Width of Frontal 91 Index
of Breadth 813. Right parietal very slightly compressed. A small and round supernumerary tooth projects from the inner edge of the superior right maxillary between the first and second molars. From grave No 3, four feet below the surface, in the side excavation of the Ely Mound, near Rose Hill, Lee County, Virginia - Exploration of Mi Lucien Carr


No. 10,249 Cranium, imperfect. Adult, probably a male. Length 196. Breadth 135. Height 148. Width of Frontal 95. Index of breadth 692. By reference to a Table of Measurements of Skulls, given by Prof W. B. Dawkins (Cave Hunting, p 236), it will be seen that in length and breadth this skull closely approximates the Engis skull, though it is a fraction narrower, the index of breadth in the latter being 700. In the thickness of the su-
pracitaly ridges, however, it rather resembles the Neanderthal skull. Its length, as given above, measured through the glabella and the most prominent part of the occiput, is 196\text{mm}, but measured through the depression just above the glabella, it is only about 188\text{mm}. The difference between the two, amounting to about 8\text{mm}, shows the extent of the protuberance of the supraclavicular ridges. From an excavation on the corner of Essex and Cambridge streets, Salem, Mass. Presented by the Peabody Academy of Science, Salem.

No 10,279 Calyma, imperfect Length 178 Breadth 141. Height about 130 Width of Frontal 88 Index of breadth 792. The sagittal suture is nearly obliterated. This skull was found beneath a shellheap at Pine Grove, near Salem, Mass., and is believed by Mr. Putnam to be the oldest ever found in New England. It is interesting from its resemblance to Crania from the Burial Mounds of Florida. Collected by Mr. Calle Cooke, and presented by the Peabody Academy of Science, Salem.

No 10,273 Calyma Aged male Capacity 1,534. Length 171 Breadth 150 Height 150 Width of Frontal 96 Index of breadth 877. Epactal or "Inca" bone developed. From a mound inside the fortification at Mecum, Indiana. Collected by Mr. E. W. Putnam, and presented by the Peabody Academy of Science, Salem, Mass.


No 11,011 Calyma Adult male Capacity about 1,367. Length 163 Breadth 143 Height 144. Width of Frontal 90. Index of breadth 877. Epactal bone developed. Left parietal and adjoining portion of the occiput flattened. The frontal also compressed, the left side slightly projecting. From an island in the Tennessee River, 18 miles below Chattanooga. By purchase.
REPORT
ON THE DISCOVERY OF SUPPOSED PALEOLITHIC IMPLEMENTS FROM
THE GLACIAL DRIFT, IN THE VALLEY OF THE DELAWARE
RIVER, NEAR TRENTON, NEW JERSEY

BY CHARLES C. ABBOTT, M.D.

I hereby report the results of my investigations in the valley of the Delaware, made with reference to the occurrence of supposed paleolithic implements in the gravel beds facing that stream, based upon a series of careful examinations of the deposits, in question, made at different points, together with a study of the surface soils, so far as these, of themselves, and by then contained relics, bear upon the question of the origin and character of the specimens of stone implements taken from the underlying gravels.

The chance occurrence of single specimens of the ordinary forms of Indian relics, at depths somewhat greater than they have usually reached, even, in constantly cultivated soils, induced me, several years since, to carefully examine the underlying gravels, to determine if the common surface-found stone-implements of Indian origin, were ever found therein, except, in such manner as might easily be explained, as in the case of deep burials, by the uprooting of large trees, whereby an implement lying on the surface or immediately below it, might fall into the gravel beneath and subsequently become buried several feet in depth; and lastly, by the action of water, as where a stream, swollen by spring freshets, cuts for itself a new channel, and carrying away a large body of earth, leaves its larger pebbles and possibly stone implements of late origin upon the gravel of the new bed of the stream.

By all such means, I have found that the most elaborately wrought Indian relics have occasionally been buried at considerable depths. I also found, however, that there did occur in these underlying gravels, certain rudeely shaped specimens of chipped stone, which have all the appearances of the stone implements of paleolithic times.

Nearly the entire series of the specimens referred to have been forwarded to you, and very many of them pronounced by com-
petent judges to be unquestionably 'chipped implements.' In this opinion, I concur. I find, on comparing a specimen of these chipped stones with an accidentally fractured pebble, that the chipped surfaces of the former all tend towards producing a cutting edge and there is no portion of the stone detached which does not add to the availability of the supposed implement as such, while in the case of a pebble that has been accidentally broken, there is necessarily all absence of design in the fracturing.

Although the portions detached from a supposed stone implement are chipped with reference to the natural cleavage of the stone—with some few exceptions, an indurated clay-slate, the other specimens being of phonolite, and other trappaean rock, both of which occur in place, in the valley of the Delaware, some thirty miles north of where these specimens were found—these larger surfaces the results of single cleavages, are supplemented by minor chippings along the edges, thus giving every indication of the original zigzag edge having been made comparatively straight by more careful work subsequently put upon it. This, of course, does not appear on a naturally fractured pebble. These characteristic chippings obtain in the large Jasper hoes and hatchets of the Indians, and a comparison of these with the rude forms found in the gravel shows that identical means have produced the two forms, the variance being only that which want of skill in flint-chipping will explain.

There exists, also, a similarity in the series of these supposed implements which would scarcely occur in the case of naturally broken pebbles, whatever the force brought to bear upon them. They admit of classification into a primitive form, which I have elsewhere ("American Naturalist," vol. x, p. 331) designated as a "turtle back" Celt, and modifications of this form, into hatchet, spear and scraper. Now while naturally broken pebbles may often approach in shape any of these forms of stone implements, it may at once be seen that it is, in every case, but an accidental resemblance. The outline is obtained, but not that subsequent chipping that gives the implement such finish as would make it desirable for use. The gravel bed, in which these "turtle back" Celts and their modifications have been found, contains a small percentage of angular pebbles that have not lost all trace of the peculiar surface of a recent fracture, and therefore are not as smooth and uniformly polished as an ordinary pebble. Such specimens, when
bearing marked resemblance to those clearly of artificial origin, may in fact have been fashioned by man, and only partially lost, by the polishing action of water and sand, those indications of artificially produced fractures, such as characterize the specimens here figured, but as a rule, the angular pebbles are of natural formation, and then imperfectly ground and polished surfaces give evidence of the possibility, that, under favorable circumstances, a chipped implement might be associated with such gravel, from the time of its deposition, and yet escape the obliteration of those features that demonstrate its artificial origin. The deposit may be described as largely made up of ordinary smooth, water-worn pebbles varying in size from half an inch in diameter, to boulders estimated to weigh from one to twenty tons.

Convinced that the so-called “turtle-back” cells, which are the most primitive form of the chipped implements of the gravels, really are of artificial origin, many of which are identical in shape with the ordinary forms of European drift implements, and furthermore that among the specimens found, is one unquestionable spearhead-like implement, there can, I think, be little doubt but that these specimens, unassociated as they are with the common forms of surface-found relics of the Indians, are in reality traces of an earlier and a ruder people, who occupied the eastern shores of this continent prior to the advent of the latter race.

Figure 1, a, b, represents a specimen of these rude implements, which, unlike the so-called “turtle-back” cells, is distinctly chipped upon both sides, and has but a slight amount of secondary chipping. The cutting edges, however, are comparatively straight. This and other examples of the supposed stone implements have been submitted to Prof. M. E. Wadsworth of Cambridge, to determine their mineralogical character, as this has an important bearing on the question of the fracturing being of natural or artificial origin. Mr. Wadsworth remarks of this specimen, “It is an Arglilite. It is highly indurated, with a conchoidal fracture, without cleavage, and fuses to a yellowish green or white glass which is poorly magnetic. The weathering which it shows could hardly have taken place except before it was covered with soil, it might possibly, but I think not probably, in a loose, open gravel. It is not at all likely to be of natural formation.” The specimen is figured of natural size, and requires no further description, other than to remark that it was found in the undes-
turber gravel of the bluff facing the Delaware, at a depth of six feet from the surface.

I have purposely emphasized the word "undisturbed," as much as in all cases of the finding of these chipped implements, on the face of a bluff, it is necessary, as Prof. Pumpelly has kindly pointed out to me, to determine that such specimens occur in the gravel as it exists when first exposed, and not in a talus that may have formed at the base of the bluff and in some cases extended upwards, nearly to the top. For in a talus, it will be readily seen, that a chipped implement might have very recently fallen from the surface, and be now buried several feet from the face of the bluff. This possible occurrence has been duly considered in every instance, and no such displacement evidently had taken place, in

\( \text{Fig 1} \)

Celt from the gravel, \( a \), face, \( b \), side view. Nat size. Mus No 10990
the instance of the specimen here figured, or in that of many others found by me, both before and since. Specimens, identical in every characteristic feature with fig. 1, have been frequently found in the extensive talus at the foot of the bluff, and have been labelled as thus found, when forwarded to you, and the pos-
sibility of their not having been originally associated with the
gravel noted. But a talus, if carefully examined, will show
whether it is likely to contain much of the soil proper. In the
case of the bluff facing the Delaware, there is a shallow deposit
of light sandy soil, of about fifteen inches in depth, and then the
gravel in a slightly stratified condition in some limited spots, but
usually in the unassorted condition characteristic of glacial drift.
In the talus which now covers much of this bluff, there is nothing
but the uniform mass of rounded and angular pebbles, and with
them such chipped implements as the specimens here figured. As
already pointed out, why should this recently displaced material
only yield the rudest forms of chipped stone implements, when
the surface is literally covered, in some places, with ordinary
Indian relics, not a specimen of which has, as yet, occurred in
this gravel? But the fact remains that in gravel, where no dis-
placement has occurred, many of the well marked forms of un-
questionable stone implements have been found.

Figure 2, a, b, represents a more carefully wrought specimen of
these rude implements, measuring nearly five inches in length, by
two and one-half inches in average breadth, and less than two
inches in greatest thickness. It is an excellent example of that
form that I have previously referred to, as a "tulip-back" celt.
Of this specimen Mr. Wadsworth remarks: "as far as can be told
from examining its external surface, without any fresh fracture. I
should consider it to be made of very compact argillite. It shows
weathering, and also a more recent fracture, which has weathered
to some extent. I should consider it very doubtful if this could
be formed naturally." This specimen, like the preceding came
from the bluff facing the river. It was taken out from a newly ex-
posed surface, after making an excavation of fully three feet
from the exposed face of the bluff, which was itself evidently the
undisturbed gravel.

Figure 3, a, b, represents the spearhead-like implement previously
referred to. The illustration shows at a glance, the artificial or-
igin of the specimen. It is made of flint, and is the only instance,
as yet, of the occurrence of a drift implement of this mineral.
This specimen was taken from the gravel, at a depth of six feet
from the surface, on the site of the Lutheran Church, Broad
street, Trenton, N. J. It was found lying in situ, in a shallow
stratum of coarse pebbles, and clearly showed by its surroundings
that it had not gotten in its position, where found, subsequently to the deposition of the containing layer of pebbles.

These three specimens clearly show the general character of the entire series of these gravel bed implements, and the careful drawing of the artist renders further reference to them unnecessary.

![Spearpoint from the gravel](image)

If the conclusions, at which I have arrived, concerning the specimens themselves, be correct, we are brought at once to the more difficult question; in what manner and when came these stone-implements in this gravel? Are they as old as the containing bed, and therefore fashioned at a time preceding and during its deposition?

**Convinced that the specimens are all of artificial origin, I have endeavored to determine, if possible, how they came to be associated with the gravel at such great depths, varying from five to over twenty feet below the overlying soil.** My first impression was that they must have worked down gradually from above, yet I could not see how this could take place, and there was not a trace of indication that the gravel had been at all disturbed since its
deposition Also, if these rude forms were of identical origin with common Indian relics, then rude and elaborate alike, jasper, quartz, porphyry and slate together, axes, spears, pottery and ornaments, all of which are found upon the surface, should have gradually gotten to these depths Any disturbance that would bury one, would inume alike the various forms of neolithic implements Such, however, is not the case, and this one fact is, I think, of itself sufficient to show that there is a distinction to be drawn between these roughly chipped implements and the skillfully wrought productions of the Indians

If I have now succeeded in setting aside the several objections that may be urged in advance, of these supposed implements not being such, and, also, of there being a comparatively recent addition to the containing bed, it is obvious that the same forces that spread the gravel over the wide area that it now covers, carried also these productions of an early race, once inhabiting this continent when its physical geography differed materially from the present In this case, it may be asked, ought not these implements to be distributed equally throughout the area of the deposit I have carefully considered this, and hoped to give a satisfactory reply by finding these same forms in widely separated localities, but in this I have failed, unless the exception of a single rude spearhead be accepted as indicative of a comparatively wide distribution of these paleolithic relics, this single specimen being taken from gravel, some distance from the river shore, and a mile from the bluff where the bulk of the collection was discovered 1

It must be remembered, however, that the gravel generally, has not been systematically examined, and we do not know that these same implements are not abundant even elsewhere, although this I consider doubtful, inasmuch as they were probably not as numerous originally as the stone implements of the Indians subsequently were, and the majority would, I suppose, be broken and worn to ordinary oval pebbles, in the rubbing and grinding together of these and other fragments of rocks, while being transported either by ice or water But may not the fact that the Indian relics of the surface are not abundant everywhere be adduced as partially

1 Since the above was in type I have been successful in discovering several well marked specimens, in many and widely separated localities, and am now led to believe that they will be met with in the gravel beds wherever occurring in Southern and Central New Jersey
explanatory of the irregular occurrence of the paleolithic implements of the gravel? We know that frequently many hundreds of acres in extent may be carefully searched and not a fragment even of a relic be discovered, while near by, a scanty area of half an acre may yield hundreds of specimens. In times preceding the formation of this gravel bed, now, in part, facing the Delaware River, there were doubtless, in the same way, localities once the village sites of pre-glacial man, where these rude stone implements would necessarily be abundant. May not the ice, in its onward march, gathering in bulk every loose fragment of rock and particle of soil, have held them loosely together, and, hundreds of miles from their original site, left them in some one locality, such as this we have been considering, where the river has again brought to light, rude implements that characterize an almost primitive people?

But assuming that the various stone implements fashioned by a strictly pre-glacial people have been totally destroyed by the crushing forces of the glacier, and that the specimens forwarded to you were not brought from a distance, may they not be referred to an earlier race, that, driven southward by the encroaching ice, dwelt at the foot of the glacier, and during their sojourn here these implements were lost?

You will have noticed that I have uniformly spoken of this gravel bed as one of glacial origin. I will now report to you, in detail, the more marked characteristics of the deposit, upon which I have based my conclusion that such is its age and origin. At the point most carefully examined, the eastern bank of the Delaware River, at the head of tide water of that stream, this deposit forms a bank varying from thirty to eighty feet in thickness, measuring from low-water mark upward. To what additional distance beneath the bed of the river the gravel may reach, I have not determined; that it may be many times this depth in places is very probable. Prof. Cook mentions, in the "Geology of New Jersey," page 341, that "in the Azoic and Paleozoic regions of the state, the denudation has been very extensive, but it is not so easy to measure its amount, as it is not at all probable that the surface was smooth when the denudation, whose marks we now see, was in progress. That it must have been very great we may safely infer from the immense quantity of material which we can identify from the gneiss, the Potsdam sandstone, the Magnesian
and Fossiliferous limestones, the Oneida conglomerate, and the whole series of Upper Silurian rocks, which are now scattered all over the state quite to Cape May.” Elsewhere, speaking “of this wear and movement of earth, gravel and boulders,” the same writer remarks, “in some localities, as along the highlands from Boonton to Pompton, every notch in the mountain has a hill of drift opposite to it, on the open plain to the south-east,” and again, “the rounded surface of the rocks, in the highland, the Paleozoic and the Trap ridges, the regular and parallel scratches upon these surfaces, and the deep furrows worn in the softer rocks, all prove that some more rigid force than that of water has been in operation all over the country.” These effects, as well as the carrying of boulders point to ice as the effective agent in producing them. Two skulls of the walrus, an animal living only in polar seas, have been found in the gravel near Long Branch. They indicate a period of cold more severe than any that now prevails.”

Inasmuch as the drift deposits throughout New Jersey, are thus ascribed to the action of ice, and as this that I have described, in all respects accords with the description of those above mentioned, the remarks of Prof. Cook are equally applicable to it. Let me here mention, in passing, that the bank lies directly south-east of the rocks in situ, and highlands of the Delaware Valley, down which a glacier doubtless moved, if indeed it was not a portion simply of that great glacier that extended “from New England to the Rocky Mountains,” and here, or very near this point, terminated in the Atlantic. If so, we have in this extensive deposit of gravel, sand, and boulders, a terminal moraine.

Since the original draft of my report was written, I have profited by the experience of Professors Shaner and Pumppelly, who have kindly visited the principal localities, and examined them carefully. Both remarked on the absence of ice scratches on the pebbles and boulders forming the deposit, and consider it as one originally of glacial origin, but subsequently modified by water action, whereby more or less stratification has taken place. Inasmuch as such subsequent action may have occurred long after the final deposition of the gravel, as true glacial drift, the antiquity

2 Prof. Snook, Assistant State Geologist, informs me that the gravel at Long Branch is of the same age as that at Trenton, so far as one can determine. Nothing, as yet, goes to indicate that it is of later or earlier origin. It may be mentioned, too, in this connection that rolled fragments of reindeer horns have occasionally been met with in these same gravels.
of the contained stone implements is proportionately lessened, and may be wholly unconnected with the glacial period, although the latest possible date that can be assigned to the deposition of the gravel in its present condition, gives an antiquity to the implements found therein, far greater than can be asserted of any previously found traces of man in North America, other than the discoveries of Prof. Whitney in California.

I am not, however, disposed to entirely dissociate the gravel beds more particularly described in this report from the era of the close of the glacial epoch proper, for the following reasons: If, as the general topography of the country south and south-east of this bluff indicates, this glacial débris was deposited in open water, on the bed of a shallow sea. The entire absence of clay in the bluff shows that it has been washed out, as the mass became freed from the ice, and floated off, the gravel and sand immediately sinking. While it cannot be shown that the gravel and boulders might lose their scratches before being freed from the ice, may it not be that the ordinary agitation of the waters of a shallow sea would polish the pebbles strewn over its bed, and thus the connection of the gravel in its present condition with the glacier be necessarily close? There can be no doubt that the locality here treated of, i.e., South and Central New Jersey, marks the termination of the glacier on the Atlantic coast. The débris brought from the north and north-west was not, as far south as Trenton, caught by the inequalities of the surface, and valleys thereby filled up with accumulations of typical glacial drift. In such cases, the material forming the deposit bears the marks of the crushing, scratching and polishing action of the ice. This is a characteristic feature of the drift as seen in the northern hilly portion of the state. At Trenton, and southward to Cape May, this same glacial débris is free from all such ice-scratches, but, it must be borne in mind, it was not originally left upon the surface of the ground, but, carried to the open waters, was gradually deposited by the slow melting of the ice. Here, exposed to strong currents and more or less violent beach action, and intimately associated with coarse sharp sand, would not the tendency be to obliterate uneven surfaces, and polish every pebble?

In such a case, it would be reasonable to suppose that a chipped stone implement, becoming associated with this sand and gravel, would likewise lose every characteristic feature that marks its
artificial origin. I have already called attention to the possibility of certain angular pebbles in the gravel, bearing much resemblance to stone implements, having been such, and can only add that there does exist in the Trenton gravels sufficient instances of irregularly shaped pebbles, that are not polished or rounded upon their edges, to indicate the possibility of the preservation of such specimens, as we have seen, do occur in the gravel beds in question.

In this connection, let me call attention also to the fact, that the glacier was associated with a marked depression of the whole southern half of the state. The mouth of the Delaware, if, indeed, the river then existed, was here at Trenton, and not, as now, at Cape May, one hundred and twenty miles distant. Since the retirement of the ice, as a glacier, the land has again been elevated, and while slowly gaining its present height the Delaware and other southern flowing rivers of the state have worn away the valleys they now traverse and cut the channels they now occupy.

Now, the fact that these supposed relics of a glacial people occur at different depths in the gravel must, too, be considered. This, of itself, seems confirmative of the opinion that man dwelt at the foot of the glacier, or at least wandered over the open sea, during the accumulation of this mass of sand and gravel. There is no evidence of any violent overturning of the entire mass long subsequent to the original deposition by the glacier, and if the implements were made, used and lost after the deposit ceased forming, but prior to its elevation, then they would necessarily occur only in or very near the top or surface of the bed.

At that point where I have gathered the majority of specimens, there is a want of stratification, but at several points, I have found, extending over limited areas, a marked separation of the material generally, into fine sand, coarse gravel, and again fine sand, seeming to show that the floods of the succeeding period reasorted the deposits, in some few places, but that the deposit generally was protected from them.

I have frequently referred to the presence of boulders, both in the gravel bed and upon the surface of the ground. Many of these are eight and ten feet in diameter, some more than twice this size. Mineralogically they vary considerably. Prof Genkie has described as characteristic of all the river valleys in England, that the upper levels consist of coarser material than the lower, "and
frequently contain large blocks of stone which could only have been transported by river-ice,” while the lower level gravels are usually of finer grained character, and that these “seemed to point to a milder condition of things—to a time when the rivers were less liable to flood, and the ice-rafts were uncommon” (“Great Ice Age,” American Ed., p. 435) From an examination of the bed as now exposed on the bank of the Delaware River, I do not find that any such distinction can be here drawn. By actual count, in a section I measured off, there did not occur more large boulders above the line equally dividing the bluff, than below it, but on the contrary three more beneath, not counting those that had rolled from the bed down to the water’s edge. This of itself would be by no means conclusive, but I found, upon frequent enquiry of men who had sunk wells and excavated cellars, that these boulders were usually met with in greater abundance, at considerable depths, than near the surface. This irregularity of their occurrence and position is, I think, indicative of the glacial origin of the deposit. These large boulders are also met with upon the surface. I have very carefully examined many of these, in situ, and am convinced that these were not deposited with the gravel beneath them, and that the latter has been subsequently removed by rapidly running water, for I find in nearly every instance, a foot or more of soil between the lower surface of the stone and the gravel, and this layer so extended beyond the limits of the boulder, that it unquestionably was slowly accumulated prior to the depositing of the latter, and in such a stratum, immediately beneath a stone that would weigh at least half a ton, I found a well chipped, spear-shaped implement. These surface boulders I believe to have been dropped from ice-rafts, together with sand and gravel, the ice then floating over a broad expanse of country, in comparatively quiet waters, from which slowly settled the fine sand and other material that subsequently became the surface soil.

The presence of these boulders upon the surface bear upon the fact of the occurrence of rude implements identical with those found in the underlying gravels, as much as the same ice-raft that bore the one, with its accompanying sand and gravel, might well gather up also, stray relics of this primitive people, and redeposit them, where they are now found.

I will now, in conclusion, briefly summarize the several facts to
which I have called your attention, together with the deductions I have drawn.

Having shown, as I think, that the deposit examined is glacial drift, and that the stone implements found therein could not have reached their present position at any time subsequent to the formation of the deposit, and having placed beyond doubt, I think, the question as to whether these rudely chipped stones be of artificial origin or not, by the discovery of an unquestionable speareponting (3,) associated with them, I am led to conclude that the rude implements found in the gravel were fashioned by man during the glacial period, and were deposited with the associated gravels as we now find them.

That the similar surface relics may also be glacial in age, and were dropped from melting ice-rafts during the retreat and destruction of the southern limit of the ice, and finally, that much as it is probable that this early race was driven southward by the ice, and returned northward, following the shrinking of the glacier, that many of these surface-found implements were made by this same people, when re-occupants of the country.
REPORT

ON THE AGE OF THE DELAWARE GRAVEL BEDS CONTAINING CHIPPED PEBBLES

BY N. S. SHALER

I have hastily examined the deposits of gravel on the shore of the Delaware River below Trenton, New Jersey, with a view to ascertaining the geological relations of the various specimens of apparently worked flints first made known by the researches of Dr. Abbott. It will require the further and detailed study of these deposits to fix with certainty all the geological circumstances of these singular specimens, but their general conditions are such as to make it possible, even on a cursory examination, to establish certain points with an approximation to accuracy.

The specimens in question are found in a deposit of drift material which constitutes the first or lowest terrace on the north side of the river. This terrace is of indefinite width, being apparently identical in height and structure with a good deal of the country to the north of the river valley. The top of the terrace is probably between twenty and thirty feet above the highest freshets of the stream. The tide rises and falls several feet at the foot of the bank.

There is, as is usual along our rivers, more or less undermining of the gravel cliffs. None of these sections are so complete as to show the beds in their unchanged position. Even the freshest looking exposures have had a certain slacking action of the material exposed, so that it is not possible to say that any fragment found thereon is in just the place where it lay before the retreat of the cliff brought the escarpment to its present position.

The general structure of the mass is neither that of ordinary boulder clay nor of stratified gravels, such as are formed by the complete rearrangement by water of the elements of simple drift deposits. It is made up of boulders, pebbles and sand, varying in size from masses containing one hundred cubic feet or more to the finest sand of the ordinary sea beaches. There is little trace of true clay in the deposit. There is rarely enough to give the least trace of cementation to the masses. The various elements
are rather confusedly arranged, the large boulders not being grouped on any particular level, and their major axes not always distinctly coinciding with the horizon. All the pebbles and boulders, so far as observed, are smooth and waterworn, a careful search having failed to show evidence of distinct glacial scratching or polishing on their surfaces. The type of pebble is the sub-ovate or discoidal, and though many depart from this form, yet nearly all observed by me had been worn so as to show that their shape had been determined by running water. The materials comprising the deposit are very varied, but all I observed could apparently with reason be supposed to have come from the extensive valley of the river near which they lie, except, perhaps, the fragments of some rather rare hyogene rocks. My acquaintance with the archean rocks of the Delaware basin is too limited to enable me to determine whether the origin of certain peculiar granite rocks represented in these deposits must be sought beyond its area.

The specimens of supposed implements are found in great plenty along these escarpments facing the Delaware. A search of three hours enabled us to find two of the most artificial character, and my companion, Dr. Abbott, had previously searched the whole cliff with great care. Although the whole face of the escarpment is in motion, creeping slowly under the influence of frost and gravity towards its base, it was difficult to believe that these specimens found about twelve feet below the top of the bank had travelled down from the superficial soil. At other points Dr. Abbott has found those remains under conditions that make it quite unquestionable that they were deposited at the depth of many feet below the soil, and are really mingled with the drift matter that forms the section before described.

Along with the perfectlooking implements figured by Dr. Abbott, which are apparently as clearly artificial as are the well-known remains of the valley of the Somme, there are all grades of imperfect fragments down to the pebbles that are without a trace of chipping. All that I have seen, with a single exception, both of the perfectly and the imperfectly chipped fragments are made of a curious granular argillite, the like of which I do not know in place. Thinking it proper to examine into the question whether this chipping had resulted from any natural action, which seemed the more possible since the supposed implements are often clearly natural pebbles that have been chipped on their edges. I sought
in the gravel for the fragments which would have been made in the process, but failed to find any such fragments. This fact, together with the general condition of the chipped surfaces, satisfies me that the pebbles were chipped before the waste which constitutes this mass was brought into its present position.

The origin of these terrace deposits is a matter that cannot be readily explained. I have been studying the beds of this general character for eighteen years without gaining a sense of certainty as to their origin. The general nature of the problem can be briefly stated. First as regards their distribution we may say that they occur from Virginia northward to Labrador and probably beyond, though, owing perhaps to the more rocky nature of the shores beyond Portland, Maine, they are less conspicuous on the northern part of the shore than in the district between the Chesapeake and Boston. Whenever found these masses are in structure uniformly such as we find them here, scarcely if at all distinctly stratified, yet wanting the scratched pebbles and without the cement of clay which is so characteristic of the till or the unchanged glacial waste left by the ice sheet. The water-worn character of the pebbles, the approximation to a level of the upper surface of the mass, make it plain that these beds were laid down beneath the water. The entire absence of organic remains in the mass proves that it was essentially a lifeless sea in which they were laid down. I am disposed to consider these deposits as formed in the sea near the foot of the retreating ice-sheet when the sub-glacial rivers were pouring out the vast quantity of water and waste that cleanly were released during the breaking up of the great ice-time. There is good evidence in the little pits that cover this table land drift to show that masses of ice were often built into the gravel and melting slowly left a depression where then water had slipped away through the gravel. These small floats of ice probably dropped the greater boulders, while the smaller bits were carried to their resting places by the currents of outflowing glacial water or by the tides. The rising of the land after the passing away of the ice-sheet has lifted these masses of semi-stratified materials to their present height above the sea.

Constructing a hypothesis for the condition of these pebbles on the assumption that they owe their form to forces that antedate the deposition of the beds in which they are found, I am driven to the following suppositions: —
That they were made in a region where water-worn pebbles greatly abounded as they now do all along our shores, and that pebbles of a peculiar composition were selected that these pebbles were then removed by forces connected with the operations of the glacial sheet, by running water or floating ice, or perhaps both cooperating, and deposited with great rapidity in their new positions. In this action the pebbles were not carried far.

If these remains are really those of man, they prove the existence of interglacial man on this part of our shore.

I hope hereafter to finish a detailed account of the geology of these gravel beds, and to support these preliminary statements by evidence in the way of sections and maps.
REPORT
ON EXPLORATION OF ASH CAVE IN BENTON TOWNSHIP,
HOCKING COUNTY, OHIO

BY PROFESSOR E. B. ANDREWS

This cave is simply a large recess under a high sandrock (of the Waverly sandstone series) bordering a small stream. The top of the ledge is perhaps 100 feet high above the stream. A little distance up the narrow valley, the valley proper ends in a semi-circular cliff, over which the water falls in a single unbroken sheet. The work of erosion of this and similar valleys has been chiefly done by the action of spray from the falls, as shown in "American Journal of Science," Oct., 1876, p. 304.

The shelter of the overhanging rock at the "Ash Cave" appears to have been a very perfect one, since the ashes are very dry and appear never to have been wet. The recess opens to the east and driving storms do not come from that quarter.

The ash-heap is about 100 feet long by about 30 feet wide, and where our trench was dug, nearly 2½ feet deep,—an enormous pile of ashes to be gathered in one spot.

A trench was dug upon a point a little east of the ash belt to the back wall of the shelter as shown in the diagram, little was found at first except ashes with an occasional fragment of a food-bone and chip of flint, but as the wall-rock was approached we came upon a well defined refuse heap of bones, etc. It was a confused mass of sticks for arrows, stalks of coarse grasses, food-bones in great variety, bits of pottery, flints, nuts, corn-cobs, etc., etc. This layer of refuse was from 4 to 6 inches below the surface, and covered with ashes. Below this refuse layer was the chief deposit of ashes from 1½ to 2 feet in depth according to the inequalities of the sand floor underneath. About 3 feet from the back wall of the "cave" and at the bottom of the ashes, we found a skeleton in a fair state of preservation, evidently that of an Indian. There were traces of bark over it to protect the body from ashes, but the bark was much decayed.

The body, doubtless, had been buried in a sitting posture, as the
bones were found compactly together, the head resting upon the others. Apparently the body had been placed against a small loose rock and in a cavity in the sand.

There were no traces of clothing about the skeleton, and no implements of any kind. On one side of the skeleton and quite near it was found, in a pocket in the sand, about three pecks of small black seeds, most carefully stored away. They lay directly upon the sand, which is perfectly clean, but above they were carefully protected from the ashes by a mat of ferns, grasses and coarse cloth. A portion of this covering was removed as it lay and is sent with the seeds. Professors Gray and Watson pronounce the seeds to be those of *Cheiropetalum album*, doubtless an indigenous plant, although not so regarded by some botanists. The seeds have lost their vitality and crumble to powder under slight friction. The fibres of the overlying cloth may also be easily rubbed to a fine brown powder between the fingers. It must be remembered that the ashes are dry and dusty and have probably never been wet, hence the decay of the cloth and seeds is a dry-sort such as would take place in a dry cabinet. The alkali in ashes so dry has probably had no effect upon them. On the other hand, some of the bones of the burned body are decayed from the effect of the ashes; the moisture of the body making the action of the alkali possible. The seeds never came in direct contact with the ashes, the ashes in those sent to Cambridge having been introduced in the form of flying dust at the time the digging was done by company.

On the rock in the rear of the cave are cut some grooves and dots, which from the weathered appearance of the surface must be quite ancient. They are approximately shown in the drawing sent I can detect no connected design in them. They are perhaps tally registers of some sort.

On a projecting point of the rear wall are several artificial vertical holes in the rock.

The largest hole is 6 inches in diameter and 2½ feet deep to loose stones evidently thrown in. Its full depth is unknown. Another is 4 inches in diameter and several feet deep. The earliest settlers found these holes as they now appear. Near the holes are some artificial lines and dots on the front of the rock.

I am inclined to consider the skeleton and seeds found in this ash cave relatively quite old. There are, so far as I can learn, no tra-
ditions of its occupancy by any Indians since the settlement of the country.

There are now no traces of ancient paths leading to the cave, and in its immediate vicinity the forest is as ancient as elsewhere in the primeval woods of the State. Furthermore, the decay of the fibres of the cloth over the seeds must have been extremely slow in the condition of dryness necessitated by the dry and dusty state of the ashes which covered it. Without doubt, the age of the sticks, pottery, etc., in the refuse layer near the top of the ashes is more recent.

In the visit to the Ash Cave, I was accompanied by Judge Silas H. Wright of Lancaster, a friend who takes a most intelligent interest in archaeological matters, and by Mr. A. Freed whose tastes are botanical rather than ethnological. They rendered me valued aid in many ways.
REPORT
OF EXPLORATIONS OF MOUNDS IN SOUTHEASTERN OHIO

By Professor E. B. Andrews

The mounds examined are in Fairfield, Perry, Athens and Hocking counties. In Fairfield County, the mounds opened were found upon hills. They command extensive views, and if such views were deemed desirable by the builders we readily perceive the reason for the locations. There are known to me only a few mounds in the immediate valley of the Hocking. One of them, at Sugar Grove, is a very pretty mound, perhaps 15 feet high. A trench was dug through it two or three years since, but the result of the exploration I do not know. At Rock Mill about seven miles northward of Lancaster, where the Hocking River—there a small stream—flows over a ledge of the Waverly sandstone, are two circles or "forts" as they are popularly called. They are upon an adjacent hill, a short distance from the falls. One of the circles has a conical mound in the centre, the base of the mound reaching the edge of the ditch outside of which is the circular wall. This is the only case I have found in which the entire central space of the circle is filled with a conical mound.

The fine mound in the cemetery at Marietta is in a similar circle, but there is considerable space between the base of the mound and the ditch. The great majority of these circles are without any central mound.

The mound in the circle near Rock Mill was opened many years ago, what was found in it could not be ascertained. A small mound, on the opposite side of the Hocking River, on a hill, was opened. A very few fragments of bones were found, nearly crumbled to a white powder. They could all be held in the cavity of the hand. The mound was very wet, and, except a mere trace, the skeleton it once contained had disappeared.

On a high hill, about one and a half miles north of Lancaster, is another circle with a small mound near by. The circle has a diameter of about 140 feet. It is not on level ground but in a slight depression at the head of a valley, its western edge is within
10 feet of top of the ridge. If the circle were a fort and designed for defence it was not well located. If for the storage of food supplies it was poorly located. If designed for religious purposes it was perhaps well enough. The entrance was from the west side. The mound near by is on a little higher ground and commands a very wide prospect. It is more than 300 feet above the Hocking River which flows in the valley on the west. The mound has an elevation of 5 to 6 feet and a diameter at base of about 30 feet. Nothing was found in the mound except charcoal which in places was abundant. Not a fragment of flint was found although flint arrows were picked up in the adjacent field. It is my belief that the moundbuilders had a settlement on this hill.

On Mount Pleasant, a bold isolated rock 285 feet high above the valley, situated in the suburbs of Lancaster, is a ca in of stones which is probably referable to the moundbuilders. The point has a fine view. It is reported that some years ago bones were found under the stones of this stone-mound.

About two and a half miles northeast of Lancaster, on the top of a high hill, on the land of Mr. Wilhelm, is a small mound about 5 feet high with a diameter at base of from 40 to 50 feet. It commands a wide outlook. It was carefully explored. A finely wrought flint arrowhead was found about 2 feet below the top, and a greenstone wedge-shaped implement (Fig. 1), popularly called "skin dresser," handsomely wrought, was found perhaps 18 inches below the surface in another part of the mound. A little southeast of the centre and about 2 feet below the surface, was a confused pile of burnt sandstone rocks, none of which, however, were very large. Charcoal in small pieces was found with them.
but nothing else, and nothing whatever was found lower in the
mound. Fires had been built on the mound at different stages
of its growth, but so far as I could see, they were either signal
fires—the prominent and slightly location favoring such purpose—
or fires for the comfort of persons stationed there. The ashes
from such open fires on such a wind-swept point would almost
necessarily be blown away.

On a hill a mile southeast of Lancaster are two mounds. They
command extended views. One on the land of Mr. Stalter was
opened. This is a small mound not more than 4 feet high with a
base of perhaps 30 feet diameter. Burnt clay and pieces of char-
coal and a single half wrought flint arrowhead were found. The
earth of the mound was remarkably compact and hard. The other
mound on the same hill a little farther west and on somewhat
higher ground had been opened, with what results I do not know,
and no examination was made of it by me.

On a spur of a ridge about two miles east of Lancaster is
an earth-wall, evidently intended for defense. The ditch is on
the outside of the wall where it should be according to modern
ideas of defense. In this particular the earth-work differs from all
the circles and so-called "forts" either circular or square, which
I have seen, these having the ditch on the inside. The wall cuts
off about an acre of ground of the extreme point of the spur.
The top is comparatively flat, but the sides are very precipitous,
there being a vertical ledge of sandrock for most of the distance.
It is certainly a defensible point. I saw no signs of any excava-
tion for water. The land is still covered with the original forest,
and shallow excavations might in the course of ages have become
filled with leaves, decayed logs, etc. Water is abundant in the
valleys on each side. No mound was found in the vicinity of this
defensive wall.

In Perry County, three mounds were opened, all situated upon
hills or elevated ground. Two were near each other about three
miles northeast of New Lexington on the land of Mr. Selby.
Neither of them was on very high ground, certainly not on ground
sufficiently elevated to make them desirable signal points. Nor
was the land around them such as would be naturally chosen by
the moundbuilders (who were evidently good judges of the soil)
for purposes of cultivation. Some bits of charcoal were found,
and a few fragments of flint, and a half-formed arrowhead, but
very careful search revealed no bones and no indications that the mounds were burial places. I could find no reason why these mounds were constructed. They were small mounds about 5 feet high. I saw no traces of "kitchen refuse" as a constituent of either.

Another small mound, one and a half miles from those last mentioned, situated on the south side of Rush Creek, about two miles east of New Lexington, was partly investigated, by making a single trench through the centre. It was a low mound much reduced in height by the long cultivation of the field in which it is situated. It is upon a fine bench of land and it is quite possible that there might have been a permanent settlement at this point. Many fragments of flint and charcoal were found and some evidences of "kitchen refuse." It is probable that further search would have revealed bones and relics.

At New Lexington, on a knoll near the railroad station, are many ancient flint diggings. The flint here constitutes a regular layer or stratum in the coal-mesanes and is about 4 feet thick. It is well exposed in the railroad cut on the side of the knoll. Geologically speaking the flint is a local modification of the Pat-nam Hill limestone, a well defined stratum of wide extent in southeastern Ohio. Many of the pits must have been from 6 to 8 feet deep.

The flint is fossiliferous and much of it is not compact enough for arrowheads, and around the old excavations are heaps of the rejected material. These excavations are now largely re-filled with earth and débris. I had no time to re-open any of them in search of the tools by which the flint was quarried. I have little doubt that these pits were sunk by the moundbuilders. They are now covered by the old forest trees and certainly could not have been deserted to by any of the later Indians. I sometimes find arrows and knives, the material of which I think came from these old quarries.

There is in the western part of Perry county, about two and a half miles east or southeast of Rushville, a large pile of stones on the top of a hill, which has the appearance of having been once an enclosing wall rather than the usual stone mound. The stones are large and angular, such as could have been built into a wall, and not the miscellaneous collection such as are thrown together in mounds. Although boulders of the drift are abundant in the region, no boulders are in the heap so far as I now recollect.
On a hill near Glenford Station, north of Somerset, in the same county, is a "fort" formed by a stone wall enclosing many acres. I have never visited it.

Athens County. My researches in this county have been as yet chiefly confined to a group of mounds found on what is termed Wolf Plain, situated in Athens and Dover townships. This is a terrace or drift plain, formed by the waters of the Hocking River bringing northern drift sand and gravel, and filling its ancient channel. Afterwards the river broke through a low gap in the range of hills between Salina and Chauncey into the old valley of Sunday Creek and now flows east of this range. The rough map which I send will show this. The Plain is probably not less than 80 feet above the present bed of the river. The northern and southern portions of the plain, where the small streams afford good drainage, are dry and the soil, being rich, afforded a desirable location for a large settlement of moundbuilders. Everywhere along the edges of the terrace perhaps 30 to 40 feet below the general level, are springs which afforded ample supplies of excellent water. Near these springs are marshy and many places, and I know of no place in Ohio more likely to contain the bones of the mammoth and mastodon. Unfortunately ditches have never been dug by which my supposition might be tested. I find twenty-three separate earthworks on this plain, of which seven are circles or "forts" and sixteen conical mounds. They are located on the map, as nearly as I can do it without measurements of courses and distances.

The Circles are generally large and are all built after the same plan. There is a circular earth-wall, inside of which is a ditch. The earth from the ditch afforded generally the material for the wall, excepting in one or two cases where the irregularities of the surface required more earth than the ditch furnished.

The most perfect of these circles, or the one with the highest wall and deepest ditch, is that marked 20 on the map 1. In many places the elevation of the wall above the bottom of the ditch is from 11 to 12 feet. The field has been cultivated for a great many years and the plow has both lowered the wall and partly filled the ditch. When first made, the distance from the bottom of the ditch to the summit of the wall must have been from 15 to 18 feet.

1This map is not reproduced, but will be preserved at the Museum for consultation in connection with these references — F W P.
The opening is on the east side, toward an open level space containing four or five acres. The circle is on the extreme western point of an outcrop of the plain, separated from the rest of the plain by a small valley eroded by a little stream. It was located where there was not sufficient space for it, and on the north side the wall is upon an embankment by which the terrace is widened.

Perhaps this location was a little more defensible, with a very steep artificial bank on one side and one less steep on the other, but so many of these circles are on the open plain removed from the brow of the terrace, that I can hardly believe that any of these circles were designed for forts. If the circles were for some religious use, the priest or ruler might have merely consulted his whims in locating them. The circle just described, measured 312 feet (104 paces) in diameter from the outer limit-wall, and 120 feet diameter of the level area inside of the ditch. A large tulip tree (Lavendendron tulipifera), a veteran of the original forest, now grows from the ditch.

The circle numbered 19 on the map, has lost its wall on the south side, from the removal of the terrace bank near the edge of which it was doubtless originally placed. The terrace bank here is a sloping one, and the little run in the valley below is so far away that no currents of water could reach it. It could only have been removed by the action of rains during long ages, carrying down the sands, etc., particle by particle. There is no evidence that the waste was limited to the spot where the wall was. It was uniform along the whole brow of the terrace, the smooth line of contour being everywhere beautifully preserved. I think we have here proof of the very great antiquity of the mounds. The entrance to this circle was on the southeast side, very near the present edge of the terrace.

No explorations have yet been made in the circles in search of proof of the use of upright posts or palisades. If used for "forts" we should expect to find somewhere traces of such posts.

Mounds. There are seventeen conical mounds on Wolf Plain. The largest is that of George Connell on the northern part of the Plain. It is marked No. 6 on the map. This mound is 40 feet high, by a hasty determination with a Locke's level, and about 170 feet in diameter of base. The original forest trees are removed, but there are many apple trees and a few peach trees growing upon it, especially near the summit. No excavation has ever been made.
My friend Wyndham C. Jones, Esq., Civil Engineer and Secretary of A. and E. Railway Co., has computed the cubic contents of this mound to be 437,742 cubic feet. As will be hereafter seen, the mounds here were built by the adding of small quantities—about a peck in the average—to the growing heap. It would require for this mound 1,405,152 such loads of earth. Since the earth was taken evenly from the surface of the plain, there being no depressions or excavations anywhere to be found, it will be seen that the average length of the journeys to and from the mound must have been considerable. From these facts we can see how much human labor entered into the construction of the mounds.

The Beard Mound—No. 8 on the map. This mound is the second in size on the Wolf Plain, being about 30 feet high and with a diameter of base of 114 feet. The highway passes over one side of it and a considerable excavation has been made, leaving a nearly vertical bank of perhaps 15 feet in height. With the kind permission of Mr. Beard, I dug away more of this bank deepening the excavation to the original surface of the ground. Although I found no place of burial, and no human bones, yet I was able to study, to very good advantage, the method of constructing the mound. The clean vertical face presents a mottled appearance from the different colors of the materials used. The dirt was thrown down in small quantities—averaging about a peck—as if from a basket, and the outline of each deposit is generally very distinctly discernible. These outlines of each pile, or basket full, are somewhat oval, exactly what we should expect in a dump-heap made up in this way, of earth of different shades of color. The materials are yellow clayey earth, light loam, gravelly earth, and a black earth, which I call "kitchen refuse," the latter sometimes becoming lighter in color and composed of gray ashes. There is nowhere to be seen anything like stratification, from placing the materials in regular concentric layers as has been claimed in the structure of mounds. It is rather a vast pile of dirt thrown down without order or system, the sole object being to increase the magnitude of the heap. There was apparently no plan of working except to build up a conical mound in the most simple and convenient way possible. In the earlier stages of the Beard mound, the surface was very uneven, at one time it was lowest in the middle. The dirt was scraped up from the surface
of the plain, doubtless wherever it could be obtained most conveniently. The builders probably had no tools for excavating, at least no holes or pits were dug anywhere on the plain from which to take the earth for the mounds.

On the southwest side of the Beard mound I find large quantities of the dark earth which I have called "kitchen refuse." This is made up of blackened soil, ashes, charcoal, bits of bones some burned and some not, fresh-water shells, among which are several species of the Unionidae and sometimes land snails, the Helices, bits of broken pottery and of broken flints, and small stones generally burnt, such as might be in fires built on the ground. This refuse was gathered from near the dwellings which were doubtless not far off. It was removed from the vicinity of the dwellings, possibly because it was in the way there, but more probably because it was a convenient material to throw upon the growing mound-heap. The quantity of this refuse would indicate a considerable population. But conceding this, I am nevertheless led to believe that the large Beard mound was a long time in building, for we find at many different levels, the proof that grasses and other vegetation grew rankly upon the earth heap and were buried by the dirt. This is more often noticed near the base of the mound where the area to be covered was so large. Whether in the summer the grasses, etc., grew over a part of the area while work was going on elsewhere, or the work was intermitted altogether for longer or shorter periods of time it may be difficult to determine. But I am confident that many years elapsed between the commencement and completion of this mound. It may have been the work of several generations of men. The explorations did not reach the centre of the mound and nothing was found to show why it was built, although the method of construction is apparent.

I found a polished green stone wedge-shaped implement (Fig. 2)
near one side of the mound a few feet beneath the surface. It had evidently been accidentally dropped, and subsequently buried. This mound deserves additional exploration. The centre can best be reached by a tunnel or drift way. The "kitchen refuse" should receive a much more careful search than I have been able to give it, for from it much might be learned of the domestic life of the people.

The George Connett Mound — No. 7 on the map. This is a low mound about 6 feet high, with a broad base, perhaps 40 feet in diameter. It has for years been plowed over and its original height has been considerably reduced. My attention was drawn to this mound by the burnt clay upon its top, and Mr. Connett cheerfully consented to my exploring it. A trench 5 feet wide was dug through the centre. On the east side much burnt yellow clay was found, while on the west end of the trench considerable black earth appeared, which I took to be kitchen refuse. About 5 feet below the top we came upon large quantities of charcoal, especially on the western side. Underneath the charcoal was found a skeleton with the head to the east. The body had evidently been enclosed in some wooden structure. First there was a platform of wood placed upon the ground, on the original level of the plain. On this wooden floor timbers or logs were placed on each side of the body longitudinally, and over these timbers there were laid other pieces of wood forming an enclosed box or coffin. A part of this wood was only charred, the rest was burnt to ashes. The middle part of the body was in the hottest fire and many of the vertebrae, ribs and other bones were burnt to a black cinder and at this point the enclosing timbers were burnt to ashes. The timbers enclosing the lower extremities were only charred.

I am led to think that before any fire was kindled, a layer of dirt was thrown over the wooden structure, making a sort of burial. On this dirt a fire was built, but by some misplacement of the dirt, the fire reached the timbers below, and at such points as the air could penetrate there was an active combustion, but at others where the dirt still remained there was only a smothered fire like that in a charcoal pit. It is difficult to explain the existence of the charred timbers in any other way. There must have been other fires than that immediately around and above the body, and many of them, because, on one side of the mound, the clay is burned even to the top of the mound. In one place three feet
above the body the clay is vitrified. It is possible that fires were built at different levels—open fires,—and that most of the ashes were blown away by the winds which often sweep over the plain. I have stated that there was first laid down a sort of floor of wood on which the body was placed. On the same floor were placed about 500 copper beads forming a line almost around the body. Of course the string (in another mound in the neighborhood copper beads were found strung on a buckskin string) was burned and the beads were more or less separated by the movement of the timbers and earth. Sometimes several were found in contact in proper order.

Several beads were completely rusted away. Where the timbers were not burned to ashes but only charred, the beads were found lying upon the lowest layer of charred wood with another layer resting upon them. From the small diameter of the concentric or growth rings in the charcoal in the bottom layer, I infer that there was nothing more elaborate than a platform of poles for the resting place of the body. Where the wood was burned to ashes the beads were found in the ashes.

The beads (Fig 3) were made of narrow strips of copper rolled together in the form of a tube. They are not welded but were rolled up when cold. Two or three were warped and unrolled by the heat to which they had been subjected. The copper beads found in the School-house mound on the same plain were oval, a much more difficult form to make (see fig 6). The distribution of the beads in the Geo Connett mound leads to the supposition that they were not worn upon the person of the one buried (except perhaps a few found near the neck), but were deposited as the property of the man. When we remember that the copper of the moundbuilders was obtained from the veins of native copper near Lake Superior (a long way off from Southern Ohio), where it was quarried in the most laborious manner, that it was hammered into thin sheets and divided into narrow strips by no better smith's tools, so far as we know, than such as could be
made of stone, and then rolled into beads, it is evident that the aggregate amount of labor involved in the fabrication of the beads in this mound would give them an immense value.

The shell beads of which there were perhaps fifty, are handsomely made of some thick shell. They are of different sizes and form, some being as large as a hazel-nut and oval in form, others a mere flat disc like a joint of a cinnabrid stem. The holes are smoothly bored, and in the larger beads the drilling was from each side. This is seen very distinctly where the beads are broken. When smaller, the holes have a regular taper from one side to the other.

The most interesting of the relics found in this mound is an instrument of copper (Fig. 4), found lying among the ashes and burnt bones of the middle of the body, where it had been subjected to great heat. It has the general appearance of a caulk-er's chisel. It is cylindrical at one end and flattened at the other. It is hollow throughout, with a hole in the flattened end. Length, 141 mm., width at flattened end, 52 mm., diameter of the cylindrical part, 20 mm. It was made from a single piece of copper, the outline of which is indicated in the figure. The copper was hammered out into so smooth and even a sheet that no traces of the hammer are visible. It would be taken indeed for rolled sheet-copper.

The edges are brought together and united very closely by a slight overlap. It has the appearance of being welded but it probably is not, the welding of copper in our day being a difficult matter. The implement taken altogether is a remarkable sample of smith's work. Many a village blacksmith of our time could not take a

"See figure and description of similar beads from a mound in Virginia on p. 54."
lump of metallic copper and fashion a tool as symmetrical and perfect. He would utterly despair if he had no better shop and tools to work with than had the moundbuilder artisan. As to the use to which the instrument was applied, I am unable to form any worthy conjecture.

Neither flint arrows, nor stone implements of any kind were found in the mound.

Some of the bones are pretty well preserved. The skull was crushed and broken. It was evidently brittle from the effects of the heat, and the fragments show a sharp angular fracture like broken porcelain. The absorption by the bones of fatty animal matter at the time the body was subjected to so great heat, doubtless contributed to their preservation. The skeleton undoubtedly belonged to a veritable moundbuilder

Woodruff Connett's Mounds. Nos. 3, 4, and 5 of map. There are three mounds on the farm of Mr. Woodruff Connett on the north part of the plain. They are quite near each other and are not very far from the two mounds of Mr Geo. Connett (Nos. 6 and 7). Mound No. 3 is a very low mound and has been long plowed over. Mr W. Connett reports that many years since he plowed up two skeletons, with one of which he found copper beads. The skeletons were on opposite sides of the mound not very far from the margin, lying with their heads to the north. Mr C. reports that subsequently a party from Athens dug into this mound, near its centre, and found ashes and burnt clay but nothing else of interest. I doubt whether the exploration was thorough. I hope at some future time to reexamine this mound. It is quite possible that the skeletons plowed up by Mr C. were those of Indians, and the original place of the burial of the moundbuilder has not yet been discovered. Mr. Connett's large mound No. 5, has never been opened. It is, I think, one of great promise.

With the kind permission of Mr Connett, a pretty careful examination of the mound No. 4 was made by means of a trench. The mound is a little more than 6 feet high with a base of perhaps 40 feet diameter.

Nothing was found for 5 feet from the surface except the natural dirt of the plain generally homogeneous with occasional small deposits or baskets full of black earth which I call "kitchen refuse." About 6 feet down and on or very near the original surface of the plain, I found ashes, charcoal, bones, etc. The bones were considerably scattered over a space of from 8 to 10 feet.
There was evidently some sort of wooden structure of timbers placed longitudinally east and west. Most of this was burnt, but on the west side pretty large pieces of charcoal, or more properly charred wood, showed that the fire was less complete in that direction. In this direction the bones were found baked rather than burnt. The few ribs and a humerus found on the extreme east were not burnt. If they belonged to the same body, they had fallen or been thrown by the displacement of the timbers to the east, and were found lying in a depression of the bottom.

How the bones became so scattered it is difficult to conjecture, if they belonged to a single body. It is possible that they were in part scattered by the falling in of the timbers, but more probably by the rude stirring of the fires by those who had charge of the cremation. The bones were evidently not burned before burial, as I have found the case in some other mounds. Many of the bones were well preserved, having apparently in the baking process absorbed much animal fat. The skull was broken in by the weight of the superincumbent mass, the baking having rendered it brittle.

**Fig 5.**

*Fig 5.*

**TUBE OF CLAY, W CONNETT'S MOUND** 1 Nat size  Mus No 5985

but, as in the case of the skull in the Geo Connott mound, the fracture was sharp and distinct like that of broken porcelain. I have never seen any bones of *undoubted moundbuilder* so perfectly preserved as those in this and in the Geo Connott mound.

No beads of any kind were found and no stone implements. The pottery "whistle" (Fig 5) was the only thing found with the bones. This is a cylinder of soft yellow clay, but slightly baked, if at all. One end is closed except a small circular opening. It is 186 mm long and 29 mm in diameter.

*The Zenne Meadow Mound.* This mound is No. 13 on the map. It is a large flat mound 8 to 9 feet high with a diameter of base of
80 feet  It is a little south of a large circle or fort, marked No. 12 on map. The mound was a very wet one and thorough trenching was not attempted; instead, a pit 12 x 5 feet was sunk exactly in the centre. It should be here stated that Mr. Zenner, a merchant of Athens, generously consented to our opening any of his mounds. No burnt earth was found. Near the top there was considerable "kitchen refuse." On the bottom of the original surface we found ashes and in connection with the ashes burnt human bones. They had evidently been burned before burial, and had been gathered in miscellaneous confusion, and placed in a narrow space 5 or 6 inches wide and from 2 to 3 feet long. The ashes were doubtless brought with them, at least there appeared to be no evidences of a local fire in the reddening or hardening of the clay or in remnants of charcoal. No traces of beads or implements.

The Zenner Large Mound  This mound is one of a group of three mounds and four circles or "forts" numbered, on the map, 21, 22, 23 (mounds) and 16, 17, 18, 19 (circles). The Large Mound (21) is 14 feet 8 inches high, with a base of 50 to 60 feet in diameter. On the east side, two-thirds of the way to the top, we found a depression showing former digging, and there is a tradition that the mound was opened many years ago and stone pipes found. From the surface appearance we inferred that the former excavation had not reached the bottom of the mound, and we concluded to trench it. Much labor was expended on it, unfortunately with negative results. Ashes in considerable quantity was found on the bottom near the middle and in the earth a little above we found a jaw and some bones of a small animal. On the bottom on the line of the ashes we worked under the walls as far as we could, but found nothing. On the east side we came into the old excavation, which had evidently reached the bottom not very far from the middle of the mound. Considerable "kitchen refuse" was found, but less than in the Beard Mound. The mound is very dry and well preserved, human bones were expected but none were found. It caved in on the side weakened by the old excavation the night after we had completed the trench, and we gave up further search.

Near the large mound are two small ones (Nos. 22 and 23 of map) through each of which trenches were dug, but nothing of value found. In one of them there was much "kitchen refuse."

These three Zenner Mounds, being close by four forts or circles,
were supposed to be very promising ones, and it is to me a little strange that nothing should have been found in any of them.

Two other mounds (Nos 24 and 25 of map) on Mr. Zemer’s farm were opened with no better results. No. 25 is a very small mound in the woods. No. 24 is about 8 feet high. It proved very wet and troublesome to dig. Ashes were found at the bottom but nothing else. I think a very few traces of bones were noticed, but the mound is a poor one for the preservation of bones.

The School-house Mound — No. 10 of map. This mound was originally a pretty high one (probably not less than 18 feet in height) before the top of it was removed to secure an elevated site for a distinct school-house. The work was done in the fall of 1875.
and the house built in time for the winter school. The mound was ploughed and scraped and the dirt placed in the street.

There was considerable "kitchen refuse." Neither bones nor stone implements were noticed, but the lower 4 feet of the mound were not removed. At a point near the northwestern corner of the school-house, and perhaps 15 feet from the centre of the mound, there was plowed up, in extremely hard and dry dirt, a large piece of what I suppose to have been ornamented dress. It was according to report, 8 or 10 in. wide, and perhaps equally deep. It was covered with copper beads and so great was the desire of the many bystanders to obtain portions of it, that it was torn in pieces and distributed. It was found at a point probably 8 feet below the surface, estimated vertically, and 12 to 15 from the surface, estimated horizontally. It was in extremely hard dirt, which had never been disturbed, and the distance from the surface forbids the idea that it was of Indian origin. I am indebted to the kindness of Peter Martin, Esq., for a fragment of the curious relic, represented in figure 6. The beads were strung on a buckskin string and placed on four layers of the same skin. The skin is remarkably well preserved. It was probably never wet after it was placed in the mound. The fibre is so well preserved as to give the whole a slight degree of toughness. The beads were of a more elaborate character than those found in the Geo. Connett Mound, being oval in form. I regard this relic as a genuine one and belonging to the age of the moundbuilders. The exact place where it was ploughed up has been pointed out to me by several trustworthy persons who were present. It is much to be regretted that the bottom of this mound had not been explored before the erection of the school-house.

Judge Jewett's Mounds. A little east of Wolf Plain, on the judge, are two mounds on the land of Judge Jewett, who consented to their being opened. They command good views. One overlooks the lower part of the plain and the other overlooks the valley of the Hocking River. These mounds are numbered 27 and 28 on the map.

No. 27, in the open pasture, is the larger mound, being 10 feet high, with diameter of base of 50 feet. This mound was trenched. Nothing was found in it. It proved to be very wet. On the west side, about 3 feet below the surface, was a large stone of sandrock measuring 24 X 16 X 8. This is the first and only time we have found a stone of considerable size in an earth mound. It was examined for markings or inscriptions, but none were found. The
earth of the mound was quite homogeneous and no kitchen refuse was noticed. There were occasionally bits of charcoal, but no defined line of ashes. It was in all respects a very disappointing mound.

The other mound (No 28) is in woods. It is 8 feet high with 40 feet diameter of base. There had formerly been a shallow excavation made in the top, about 3 feet deep. The lower 5 feet of the mound was largely composed of burnt earth red and black, but with a large preponderance of red. Small bits of charcoal were found but no large pieces and no proofs of any structure of timber. Near the bottom and mixed with the red burnt earth were human bones in small fragments, probably remnants of a body after cremation. They were scattered over an area of about 3 feet square. No defined line of ashes was found. No grave could be found below the original surface of the ground. No flint arrowheads nor implements of any kind were seen. The mound was only characterized by the large quantity of burnt earth found in it.

At the foot of the range of hills on the east and not far from the Hocking River, on a gravel terrace, are a circle and mound, quite near together. They are on the farm of Mr. Alanson Courtenay, who kindly permitted us to open the mound. The circle is rather a small one perhaps 60 feet in diameter. The mound is about 100 feet from the circle to the west and nearer the hill, and is 3 feet high and of 25 feet diameter of base. It has been considerably reduced by the plow. At or very near the bottom, a little northeast of the center, was found a skeleton lying with the head to the west. The bones were badly decayed and only unsatisfactory fragments were obtained. No traces of ashes or burnt earth were visible. Not far from this mound on the east, on the railroad, many skeletons were brought to light in making an excavation with a steam shovel. The bones were broken by the shovel and I have only heard of a single skull in tolerable preservation. With the skeletons was found an earthen pot holding about a quart. No sufficient investigation has been made as yet to determine whether the skeletons were those of Indians or of mound-builders. I had supposed them Indian bones.

Hocking County. In company with Judge Silas H. Wright, I explored a mound on the Wright farm in Greene township, Hocking Co., about three and a half miles southeast of Logan. There were two mounds on the farm, one of these has recently been re-
moved and the other we opened. The first mentioned being in the barn-yard was in the way, and it is now altogether removed and a weighing scale has been constructed on its site. In preparing the scale pit, an excavation had been made to the original level of the ground. Near the original centre of the mound, and at the bottom of the scale pit, a hole was dug 5 to 6 feet deep and in the bottom of this hole resting upon a gravel stratum, which there greatly facilitates the under drainage of the soil, was found a human skeleton. Many of the bones were in tolerable preservation and a considerable part of the skull was obtained. The body was buried at full length with the head to the north. The mound was originally about 10 feet high. These bones I obtained through the kindness of Mr. Wm. Wight, the brother of the Judge. No traces of burnt earth, ashes or charcoal were found in the mound. The bones of the skeleton had never been buried. It was exactly like a modern grave with an earth mound over it. The mound is not on one of the drift terraces, but on an alluvial terrace perhaps 30 to 35 feet above the Hocking River, and more than one-half a mile distant from it.

A few rods from the mound last mentioned and on the same low terrace is the other mound previously alluded to. It is from 9 to 10 feet high. A road had been graded along one side, causing the removal of perhaps one-quarter of the mound, and on the other side an excavation had been made for a sort of milk cellar. All the exposures showed much burnt earth or clay, of buck color, and boarings with a post auger at different places also revealed much red earth.

A wide trench was dug through the mound from the road to the milk house. In the centre of the mound, perhaps 5 or 6 inches above the original level, with a layer of brown loam between, we found a large and mixed collection of bones, all burnt and in very small fragments. See a section represented in figure 7. They rested above some ashes, a very thin layer, but were themselves embedded in a dark brown dust. These bones were spread over a surface of perhaps 5 feet long and 2 feet wide. They evidently had been burned before burial in the mound. In the clay and dust perhaps 3 inches above the layer of burnt bones, we found a part of the bones of a body which had been evidently buried without cremation. Unfortunately the bones were decayed past recovery, except a few fragments. The body lay with its head to the north.
as in the other mound near by. No traces of fire could be detected either upon these bones or upon the brown earth connected with them. Above the stratum of brown earth, which was from 4 to 6 inches thick, we found a thin layer of earth black with charcoal, perhaps 2 inches thick. Above this layer was another of a brown loam, slightly reddish, as if it had felt the fire somewhat. Above this reddish brown loam was a horizon of charred wood, although the wood was gone in places, while in others it was 6 inches thick. There were indications of pretty large timbers or logs forming a structure something like a "cob-house" of children, or a small con-cub of the western farmers. These timbers were in places only charred, and the charred ends were preserved. The direction in which the charred wood lay was for the most part from north to south. The unburned body also lay in the same direction. Over the charred wood horizon was red burnt earth and clay. The amount of this burnt clay was very great. Directly over the burnt body it was nearly 3 feet thick, and elsewhere it was from 1 to 2 feet in thickness. Some of it is hard almost like brick and of a bright brick red. Much of it although equally burnt was not compacted, but was soft and flowing like kiln-dried sand, or like Indian meal. Sometimes we found some black burnt earth, very compact and hard. Why it remained black, retaining apparently much carbonaceous matter, I cannot explain, unless possibly the heat was not sufficiently intense. This black earth was evidently kitchen refuse. No fragments of charcoal were found in the heavy mass of red burnt earth extending.
over the centre of the mound. How such a large mass of clay could be burnt by a fire on the top, I cannot understand, and it is more difficult to suppose that the comparatively small fire on the line of the charred wood (b) under the clay could have oxidized the iron in such a large mass of earth. In the burning on the level of b, the fire must in part have been a smothered one, producing as it did charred wood. Could this burnt clay have been burned elsewhere and afterwards brought as a sacred earth and placed over the buried bones? In favor of this supposition is the fact that we occasionally found isolated lumps and small deposits of the same burnt clay in higher portions of the mound. These were apparently brought as burnt clay and were not burned on the spot.

In the brown unburnt clay over the bones were some pieces of vessels made of steatite, or soapstone. This is the first time I have found this material. No stone of this kind is found nearer than eastern Pennsylvania and Maryland. One of the names of this mineral is potstone. It appears that the ancient mound-builders had learned its value. In the fields between this mound and the Hocking River I found abundant fragments of pottery of the usual texture, but I found no fragments of soapstone ware.

The mound had, scattered through it, a large number of fragments of flint and occasionally a finished arrowhead. These had either been dropped in the earth of the mound while in progress of its construction, or were already in the earth when it was gathered up from the surface of the ground.

Two miles and a half below the Wright mounds are two others in the rich valley. They have never been opened. On the hills to the west and southwest of the Wright farm are four mounds, one of earth and three of stone. The earth mound is peculiar in shape, being apparently two mounds united. The height of the larger mound is from 9 to 10 feet. The diameter of the chief mound is 45 feet, while that through the two is 65 feet. This mound has never been opened. It is on a ridge directly overlooking the valley of the Hocking, on a farm belonging to the heirs of Aaron Young, in Greene township, Hocking Co.

The three stone mounds are on the same ridge but farther south. One of these is on the land of J. D. Longstreth, Greene township, Hocking Co. It is 5 feet high with a base of 48 feet diameter, composed of large angular stones of coarse sandrock from the lower portion of the coal-measures. Heavy bodies of this sandrock are
found in these hills. This mound was formerly opened and there
is a circular pit in the centre, roughly walled up like a well.
Whether anything was found I could not learn. I do not think
the pit went below the surface of the earth.

The other two stone mounds are about a quarter of a mile from
the one just mentioned, and are on the land of Christopher Kleitz
in the same township. They are only 15 feet apart. The larger
one is 10 feet high with a base of 60 feet diameter. The smaller
is 6 feet high and 54 feet in diameter of base.

The smaller one was once opened by a pit in the centre. This
opening disclosed the fact that the mound was composed of about
one-half dirt and one-half stones. No mixture of earth was seen
in the larger mound. The report is that nothing was found in the
opened mound. The stones are large and angular and were evi-
dently brought from the adjacent fields. The very largest would
probably weigh 200 lbs. The average weight would be perhaps
from 40 to 50 lbs.

It is difficult to explain these mounds unless we consider them
simply burial mounds. The stones show no oxidation or reddening
as if signal fires had been built upon them, and indeed, they are
not well located as signal points or as points of outlook. My
impression is that the people who built them found the stones
abundant on the ridge, and thought it easier to construct the
mounds of them than of the clayey earth. If the land on the ridge
was cultivated, the removal of the stones from the surface would
be an agricultural improvement.

Woodruff Connett's large mound, Dover, Athens Co., Ohio—This
mound is one of many found on the plain in Dover and Athens
townships, Athens County, Ohio. It is on the farm of Mr. Wood-
ruff Connett, and is quite near a small mound which we were
kindly permitted by Mr. C to open last winter, and of which a
detailed report is given on page 62.

This large mound is by estimate from 16 to 18 feet high, with a
diameter of base of about 85 feet.

The exploration consisted of driving a tunnel about 4 feet wide
and 4 feet high to a point beyond the centre. We found the dirt
sufficiently firm and no timbering was needed. The tunnel fol-
lowed the level of the original surface of the ground. At no
point had the original soil been disturbed by excavations. The
structure of the dirt pile was found to be as in other mounds.
The pile grew by the addition of small loads, or baskets full, and the separate loads may be distinguished. No kitchen refuse was observed as in the Beard Mound.

At the centre of the mound, on the original surface of the ground, we found a small pile of ashes, burnt human bones, etc. The pile was nearly circular in outline, its diameters being about 2 feet and 2.5 feet, and the depth in the centre was from 3 to 4 inches.

Under this pile of ashes and bones there were no traces of fire and the ground had not been burned. The earth above the bones was also in its natural or unburnt state. It was evident that no burning of a body could have taken place there. About 15 inches over the bones last named was another small collection of burnt human bones, a carefully prepared pocket of them enclosed in bark. This deposit was from 12 to 15 inches in length by 6 inches in width. The bones were free from ashes and had been picked up and carefully placed in the growing mound. No implements of any kind were found with the upper bones.

In the lower pile of ashes and bones were found two plates of copper and a stone tube. They had been burnt with the body and were burned with it. One of the copper plates was much corroded and a part of it had disappeared, but the outline of the original form can be easily inferred from the figure. It is a flat thin plate with serrated edges, and with two holes about an inch from each end, respectively. It is represented in figure 8 of natural size, as it now exists. The other (Fig 9) is a thin plate of copper about 65 mm long by 28 mm wide, curved, with the ends brought...
neatly together, and four small holes at the corners, evidently for the insertion of strings. It is too small for a whistle, but might have been an ornamental band for the hair.

Perhaps the most interesting thing found is a stone tube, about 180 mm long and 27 mm in diameter at one end, and 33 mm at the other. It is evidently modeled after the copper tube found in a mound in the adjacent field of Mr. George Connell. Like the copper ornaments previously described, it passed through the fire and the flattened end was cracked off by the heat leaving the implement imperfect. The material appears not to be pottery.

Fig 10

TUBE OF STONE, W. CONNELL'S MOUND 1 NAT. SIZE MUS. No. 11018

but a kind of oolitic limestone. In this I may be mistaken. The form is remarkably regular and graceful, and the surface is very highly polished. It is the best piece of work of this kind I have ever seen taken from our mounds.

This mound is of much interest and of great scientific value, because by it we prove that the moundbuilders sometimes practised cremation. The lower pile of bones was brought there with the burnt ornaments, etc., and with more or less of the ashes of the fire. The bones were in the confusion to be expected from being gathered up and thrown into a small pile. The abundant ashes would imply that they were not brought for. On the other hand, the upper deposit of bones contained no ashes and these bones might have been brought from a distance where the cremation

*These tubes of stone, clay and copper discovered by Prof. Andrews, approach so near to the long tube like pipes made of stone and still used by the Utes that I can hardly refrain from classing them with pipes. The principal difference consists in these tubes having what would be the mouth piece made by the termination of the pipe itself, while in the stone tubes that are unquestionably pipes the mouth piece is probably made by inserting a hollow bone or a reed. These tube like pipes have been found in number in the old burial places of California, and there has recently been one received at the Museum, which was collected in Massachusetts. Dr. Abbott has also found fragments of similar pipes in New Jersey. In Squier and Davis' 'Ancient Monuments of the Mississippi Valley' several of these stone tubes are described one of them identical with figure 5 of this article, and the authors of that work also suggest that these tubes may be pipes—F W P.
took place. As before stated, these bodies could not have been burned within the mound, for there are no traces of fire near either deposit of bones. To one familiar with these explorations the traces of fire in mounds are apparent enough. I have reported other cases of the burial in mounds of bones already burned, besides some interesting ones in which the body was laid in a wooden structure, which afterwards took fire, by which a part of the body was burned. The latter was an accidental burning, but in the mound in question the bones were burned before burial.

I may add that I am much pleased with the method of tunneling adopted in the exploration of this mound. It is a capital way where you wish to leave the mound in its original symmetry of form. My friend, Thomas Black, Esq., of New Lexington, who is familiar with mining and underground work, accompanied me to Dover and took charge of the tunneling. We found the method adopted by him perfectly safe without resort to timbering. I wish here to record my great obligations to Mr. Black.
REPORT

ON THE EXPLORATION OF A MOUND IN LEE COUNTY, VIRGINIA,
CONDUCTED FOR THE PEABODY MUSEUM

BY LUCIFN CARR, Assistant Curator

HAVING been enabled, through the appropriation made by the Trustees of the Peabody Museum, to avail of the permission given by Mr. Robert Ely, to open a mound situated on his farm, near Rose Hill, Lee County, Virginia, I have the honor to submit a report of the discoveries made during the course of that exploration, with some conclusions drawn from a comparison of the formation of that particular mound with the historical account, given by the early chroniclers, of the origin and use of such structures.

The mound in question—a truncated oval in shape—stands alone, on a gentle slope, and having been in cultivation for many years, the wear and tear of the plow and the gradual weathering away of the summit made it impossible to get at its exact measurements. A careful examination, however, showed it to be about three hundred feet in circumference at the base, and nineteen feet in height, as measured in the excavation of shaft, sunk through the centre. On the top there was a level space, oval in shape, the diameters being respectively about fifteen and forty feet. At a distance of eight to ten feet from the brow of the mound, on the slope, there were found, buried in the earth, the decaying stumps of a series of cedar posts which I was informed by Mr. Ely at one time completely eneuncled it. He also told me that at every plowing, he struck more or less of these posts, and on digging for them, some six or seven were found at different places, and in such order as showed that they had been placed in the earth at regular intervals and according to a definite plan. On the top, in the line of the greatest diameter and near the centre of the mound, another and a larger post or column, also of cedar, was found. The wood of these posts was much decayed, in many instances being but little more than dust, though we were fortunate enough, in one case, to secure a fragment in a very good state of preservation. The location and regularity of these posts and their
position with reference to the central column would seem to show
that the summit of the mound had at one time been occupied by
some sort of a building—possibly a rotunda or council chamber—as the ground-plan answers to the description of one which Bartram found in the town of Cowe, on the "Tanase" River, among the Cherokees, the very people who formerly held all this section of country, and which that author thus describes

"The Council or town-house is a large rotunda capable of accommodating several hundred people. It stands on the top of an ancient artificial mound of earth, of about twenty feet perpendicular, and the rotunda on the top of it being above thirty feet more, gives the whole fabric an elevation of about sixty feet from the common surface of the ground. But it may be proper to observe, that this mound on which the rotunda stands, is of a much ancient date than the building, and perhaps was raised for another purpose. The Cherokees themselves, are as ignorant as we are, by what people or for what purpose these artificial hills were raised; . . . . .

"The rotunda is constructed after the following manner, they first fix in the ground a circular range of posts or trunks of trees, about six feet high, at equal distances, which are notched at top, to receive into them, from one to another, a range of beams or wall plates, within this is another circular order of very large and strong pillars, above twelve feet high, notched in like manner at top, to receive another range of wall plates, and within this is yet another or third range of stronger and higher pillars, but fewer in number, and standing at a greater distance from each other, and lastly, in the centre stands a very strong pillar, which forms the pinnacle of the building, and to which the rafters centre at top, these rafters are strengthened and bound together by cross-beams and laths, which sustain the roof or covering, which is a layer of bark neatly placed, and tight enough to exclude the rain, and sometimes they cast a thin superincumbent earth over all. There is but one large door, which serves at the same time to admit light from without and the smoke to escape when a fire is kindled, but as there is but a small fire kept, sufficient to give light at night, and that fed with dry small sound wood divested of its bark, there is but little smoke, all around the inside of the building, betwixt

"1 The Cumberland Mountain may be considered as having been then boundary on the North. " Arch Amer, Vol II, p 90
the second range of pillars and the wall, is a range of cabins or sophas, consisting of two or three steps, one above or behind the other, in theatrical order, where the assembly sit or lean down, these sophas are covered with matts or carpets, very curiously made of thin splints of Ash or Oak, woven or platted together, near the great pillar in the centre the fire is kindled for light, near which the musicians seat themselves, and round about this the performers exhibit their dances and other shews at public festivals, which happen almost every night throughout the year."

As the size of the mound made its removal out of the question with the time and means at my command, it was determined to sink a shaft, six feet by four, though its present centre, and at the same time to carry along a side excavation, four feet wide, extending from the centre to the circumference. This would not only expose an additional section of the mound, but it would also give us a platform or rest on which to throw the earth taken from the central excavation. This earth was found to be composed almost entirely of loam, homogeneous in character, and similar to that found on the surface of the surrounding field, and as it was very mellow and friable we were able to make good headway in our digging. About 4 p.m. of the first day, at a depth of ten feet, the laborers in the central shaft announced that they had found human remains, and Mr. Charles B. Johnson, of Gibson's Station, Va., immediately descended into the shaft and began in person the work of disentanglement. These remains were subsequently found to belong to two children, but as they had been evidently buried together in one grave, we shall for the present classify them as grave No. 1. In a few moments the announcement was made of a similar "find." No. 2, in the side excavation at a depth of six feet from the surface. To this point Prof. Lucius H. Cheney of Cape Girardeau, Missouri, a student in the Harvard Summer School of Geology, at once repaired, and as he had had some experience in opening mounds in the south-eastern portion of his own state he was placed in charge of the excavation. The remains at each place were found to be in such a state of decay that it required the utmost care to extirpate them from their earthen mound. To one who has had experience in this delicate work it is needless to say that the spade and shovel have to be

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2 Brinton's "Travels through North and South Carolina, Georgia, etc., etc., etc., page 367 et seq., Philadelphia, 1791
discarded, and that prone upon the ground the conscientious
workman must be content to pick out the bones one by one, or as
is far more frequently the case, piece by piece, with a pocket knife
or some other instrument of equal delicacy.

Whilst lying in this unprotected attitude, and just as Prof.
Cheney had declared with great earnestness his belief in the pos-
sibility of saving the entire skeleton, a sudden rush of spectators
to the brink of the side excavation, to see what was going on,
caused a section at the top of the wall, along its entire length, to
give way and fall upon those who were at work below. Prof.
Cheney and Mr. Johnson were completely buried by the falling
earth, one or two others were caught, and although not entirely
covered up, yet they were held fast until relieved by outside
assistance. All hands at once sprung to the rescue of our imper-
illed comrades, and in about twenty minutes, the lifeless body of
Prof. Cheney was reached. Every effort, guided by the advice of
a neighboring physician, was made to resuscitate him, but in vain.
The mass of earth had fallen on his neck and the back of his
head, and the blow had doubtlessly caused instant death. Mr.
Johnson, who was at work in the central shaft, was buried some
four feet deeper, and was not reached until five or ten minutes
later. He was severely bruised but fortunately suffered no other
injury from his painful and dangerous imprisonment. This sad
accident of course put an end to our work for the time being, and
it was not until the next week, after the last sad offices had been
paid to our friend, that Mr. Johnson, in nowise daunted by his
narrow escape, returned with me to the mound for the purpose
of finishing the excavation, at least, to the extent of the original
plan. This was done after two days more of steady digging, dur-
ing the course of which the central shaft and side excavation were
carried down to the original soil at the bottom of the mound, on
a level with the surrounding earth, and the walls were sloped back
after the fashion of a railroad cut. This method of proceeding
opened up a much larger portion of the mound, and we felt our-
seives amply repaid for the extra labor by the discovery of another
skeleton No. 3, lying in the side excavation near the angle formed
by its junction with the central shaft and only four feet from the
surface. This closes the list of our discoveries of human remains
as nothing of importance was found at or near the bottom of the
mound. In fact all of our "finds" were made in the first ten feet.
—the upper half as it were—of the excavation. It must not be
supposed, however, that our researches have by any means ex-
hausted the treasures of the mound, or that human remains may
not hereafter be found even nearer the centre than those discov-
ered by us. At the outside not more than one-sixth of the entire
volume of the mound was removed, and as that was found to be
unusually rich, as mounds go, it is but fair to assume that the re-
mainning five-sixths will prove equally remunerative to some future
explorer. But whilst freely conceding this point, it is important
to bear in mind that below the level where the two children were
lying in the whole of the nine or ten feet through which we had
to go in order to reach the bottom, nothing at all of importance
was found in either the central shaft, or the side excavation.
Here and there a piece of charcoal was turned over by the spade,
and in one instance a thin layer—in fact a mere line—of ashes
and burned earth, of small superficial extent, was passed through,
but with these exceptions nothing else was found that could throw
any light upon the customs of the people who built the mound, or
the purpose for which it was erected, unless, perhaps, the absence
of any vestige of interment at its present centre, on a level with
or even a little below the surface of the original earth, should be
taken as an indication that this was not a typical burial mound,
\( \text{v.e.} \) that it was not thrown up as a memorial over the dead.
Yet even this statement must be accepted with many grains of
allowance for the reason, that the present centre of the mound
may not correspond with its original position. A tree suffered to
stand upon the slope, after the rest of the mound had been cleared,
as was the case here, would undoubtedly retard the process of
weathering in that particular quarter, and so in the long lapse of
years the relative position of the centre might be materially
altered. It is not believed, however, that any such change has
taken place in this instance. The present contour of the summit
of the mound, corresponding, as it does, with the circle of cedar
posts, and the position of each with reference to the central col-
umn, of which Brinton speaks, would seem to indicate that there
has been little or no change in the relative shape of the mound
since it was last occupied, and hence partially sustain our nega-
tive conclusion as to its origin and use.

But whilst, as we have seen, the lower half of the mound was
characterized by the almost total absence of all evidences of human
occupation, the upper portion, composed of the same kind of earth, contained more or less of all the articles that are usually found about an Indian Encampment. Besides the graves and their contents, there were found scattered about everywhere, throughout the whole of the upper half of the excavation, in different places and at various depths, beds of ashes, burnt earth and charcoal—usually cedar or chestnut—sometimes one above and overlapping the other, with an intervening stratum of earth of greater or less thickness. Some of these "hearths" were of large size and the layer of ashes was several inches in thickness. Animal and bird bones too were found, those of the crane, turtle, deer, elk, caribou, wolf, fisher and black bear being among them. Some of these had been broken after the fashion usual among savages, some had evidently been subjected to the action of fire whilst others still were without any marks whatever. Arrowheads, some of exquisite form and finish, small disks of stone, pottery and hematite; shells of Melania, converted into beads by grinding off the spine, a quantity of Indian corn and fragments of the cob with the grain still in place, all very much charred, implements of horn, and numerous fragments of the common coarse pottery such as was used by the modern Indians, were found scattered promiscuously throughout the mass, seemingly just where they had been lost or thrown by the savage who had last used them, and evidently without any special reference to the dead bodies buried in them. Of these, those numbered 2 and 3, and found, the former on the slope of the mound, six feet from the surface, and the latter 2130 on the slope and four feet from the surface, occupied separate graves and belong to the class called "intensive" burials, i.e., burials made after the mound was erected. The two children, found together, somewhat nearer the centre than either of the other two and about half way between the top and bottom of the mound, also occupied a separate grave and probably belonged to the same class of burials. Nowhere was there seen any evidence of a

1 I am indebted to Mr. J. A. Allen, of Cambridge, for identifying these bones and he also informs me that this is farther south than bones of the Carbon have hitherto been found.
2 The charred corn was found subsequently to the date of my exploration, and was kindly sent to me by Mr. Wm. P. Bales and the Rev. S. B. Campbell of Rose Hill, Va. The latter gentleman writes me that it was found by digging into the face of the southern wall of the central shaft about fifteen inches, and "on a level with the bottom of that shaft, as it was on the day the mound caved in," i.e., about ten feet from the surface or in the upper half of the mound.
common or tribal burial, such as took place among some of the Southern Indians, when all the remains of the dead of a village were collected together, at regular intervals, and buried beneath a general mound, but each grave was separate and distinct, as would probably have been the case if the interments had been made singly and at different times. Indeed, it is hardly possible that they could have been made at the same time, as the bones were found to be in about the same stages of preservation. Those of the children, which under ordinary circumstances, all things being equal, should have been the first to decay, were as well preserved as those of the warrior found in No. 3, and therefore presumably of later burial. These evidences of occupation, by the living as well as the dead, found at different levels, but always in the upper part, taken in connection with the absence, below a certain plane, not only of all traces, structural or otherwise, of a central interment either communal or single, but of almost all articles of human workmanship of every kind whatsoever, point unmistakably to the conclusion that this mound was originally thrown up as a place of residence and that it had been occupied as such, at different times, through a long series of years, anterior to and down to the period when its summit was crowned by some building, which may have been the rotunda or council chamber of the village. Under no other conditions does it seem possible to account for the fact that all the articles, with the exceptions named above, showing evidences of human occupation, were confined to one portion of the mound and that the upper. That this conclusion is not without a basis of historic probability is shown by the testimony of Gareilasso de la Vega who, speaking of "the town and house of the Caand Ossadhle" which he says "is like those of all the other chiefs of Florida," gives a description of the Indians' mode of building a town which may be translated as follows: "They themselves" (the Indians) "build up high places in this manner. They choose a spot to which they bring a quantity of earth, which they throw up into a sort of platform two or three pike's length in height, and of which the top is capable of holding ten or twelve, fifteen or twenty houses to lodge the Caand with his family and all his suite. Afterwards, at the foot of this elevation they lay out a square, proportionate to the size (conforme à l'idée) they

6 Bartram's Travels, p. 517, Philadelphia, 1791
6 Histoire de la conquête de Floride, etc. p. 135 A la Haye, 1755.
wish to make their town, and around this the principal men build their dwellings. The common people build in the same manner and thus they surround the house of their chief.” Elsewhere, in the town of “Guachoule,” on the headwaters of the Coosa River and near the country of the “Achalaqué” (Cherokees) the house of the chief is represented as standing upon “a mound, with a terrace around it, where six men could walk abreast.”

Nor is this conclusion inconsistent with the fact that human remains were found buried here, since the recent Indians not unfrequently utilized these mounds as burial places just as the whites have done in later times. But testimony even more to the point is furnished on the authority of Bartram and Adam, from the former of whom we learn that several of the Southern Tribes were in the habit of burying their dead “in a four square deep pit under the cabin or couch which the deceased laid on, in his house” whilst the latter author speaking of the funeral customs as practised among the “Chickasah” and “Cheerake” Indians, gives a description of the burial of a chief belonging to the former tribe which conforms so exactly to the facts as developed in the course of these explorations, that after making due allowance for the ravages of decay and the difference in the character of the articles that would naturally have been buried with persons of different ages, sexes and occupations, it may be taken almost without modification as an account of the interment of the very people whose dried and withered remains we had exhumed. After mentioning, among other details of the ceremony, that they carried the body three times around the house in which it was to be buried, he says: “They laid the corpse in his tomb in a sitting position, with his face towards the east, . . . , he was dressed in his finest apparel, having his gun and pouch, and trusty hickory bow, with a young panther’s skin, full of arrows, along side of him, and every other useful thing he had been possessed of . . . His tomb was firm and clean inside. They covered it with thick logs, so as to bear several tiers of cypress-bark, and such a quantity of clay as would confine the putrid smell, and be on a level with the rest of the floor. They often sleep over those tombs, which with the loud wailings of the women at the dusk of the evening, and dawn of the day, on

7 History of Alabama by Albert James Pickett, Vol 1, p 8 Charlesown, 1851.
8 Histoire de la conquête de Floride, etc., p 294. A. la Haye, 1755.
9 Bartram's Travels, p 515, Philadelphia, 1791.
benches close by the tombs, must awaken the memory of their relations very often; etc., etc."

In the graves opened by us the above account, with one or two trifling exceptions, was curiously verified; in fact the exceptions, inasmuch as they probably resulted from natural causes may be said to confirm the account. Thus, although the bodies had been doubled up and probably buried in a sitting posture, it was not possible to say in what direction they "faced," for the reason that the bones were found in a confused heap, just as they might have fallen when the ligaments, which held them in place, finally gave way. Nor were there any traces of the "bark lining," or "the covering of logs," but this may well have been owing to decay. The fact that fragments of "logs" that had undoubtedly been used in the manner indicated were found by the officers of the Kentucky Geological Survey, in the central chamber or grave of a mound, situated on the Kentucky side of Cumberland Gap, leaves no room for doubting the accuracy of the early chronicle.

But it is unnecessary to pursue this branch of the subject farther. The interments themselves, not less than the manner in which they were made, harmonize with the other evidences of occupation, and both are found to be in accord with the historical account of the origin and use of such elevations. In fact, within certain limits the chain is believed to be complete. Garcilasso asserts positively that in the time of De Soto the Florida Indians, among whom were the Achalaqué or Cherokees, did build such mounds, and in 1775, two hundred and thirty years later, Bartram found the Cherokees inhabiting substantially the same region that they did in the time of De Soto, and using one of these mounds as the site of the council chamber in their town of Cowee. Side by side with this historical résumé, if we arrange what may be called the "facts of the mound," we shall find that the internal evidences of its occupation as a place of residence are conclusive, that the mode in which the interments within it were made was similar to that practised at one time among the Cherokees, that the circle or oval of cedar posts surrounding the top corresponds with the account given by Bartram of a council chamber built and in use by the same people, and if to this be added the fact that the mound stands on the headwaters of the Tennessee, formerly known as

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10 History of the American Indians, p. 182, London, 1775
"the river of the Cheraqui," and in a region of country that, so far as we know, was always held by them, it will be seen that a strong presumptive case is made out in favor of the known origin of this particular mound.

That the Cherokees, in the time of Bartram, were "ignorant by what people or for what purpose these artificial hills were raised," may well have been true, and yet not weaken the force of the argument. The recollection among savages of events that happened in past generations is admitted to be, at best, a very unsafe criterion, and as the Cherokees were among the first of the southern group of Indians that were brought into contact with the whites, it is probable that they lost the habit of building mounds at a very early day, just as in later times they abandoned some of their cherished customs connected with the burial of the dead. The habit once discontinued, the memory of it would soon fade, even if their "wandering, unsettled disposition, then so frequently breaking up their old towns and settling new ones" had been better calculated than they were to strengthen and preserve the recollection of past events or the purity of their customs. These facts go far towards explaining the ignorance of the Indians, in Bartram's time, of what their ancestors may or may not have done fifty or a hundred years before, but even if the explanation should not be considered satisfactory, it will hardly justify us in offsetting the ignorance of a band of savages, of events in which their progenitors are supposed to have taken a part, against positive evidence of the fact. For these reasons, among others, it is not believed that this negative testimony is entitled to any weight when balanced in the scale against the historical evidence and the facts of the mound, nor can it, in any way, invalidate the conclusion that in this particular instance, it is not necessary to look beyond the historic epoch, or the Cherokee Indians, in order to find a mound-builder.

As to the precise age of this mound, or the date of the burials, nothing farther will probably ever be known. The evidence of the remains themselves is vague and uncertain, and there seems to be nothing else left on which to base a conjecture. At the time of our visit the mound was in cultivation, as it had been, "off and

11 See Maps in Charlevoix, Du Plat, Adair and others.
on," for a quarter of a century or more I was told by Mr Ely that a "large" black walnut tree once stood upon its slope, but that it had been cut down many years ago to make way for the plow. Not a vestige of it remains, not even the roots. From only one point does there come a ray of light, very faint and uncertain it is true, and bearing upon the date of its abandonment rather than the time of its erection. The mound stands in Powell's valley, on the line of what is known as "Boone's path," and is probably near the route traversed by that adventurer when, in 1767, he first made his way through Cumberland Gap into what is now known as the State of Kentucky. As that beautiful valley soon became a thoroughfare, it is hardly probable that the mound was ever permanently occupied after that time.

The accounts quoted above of the manner of interring the dead, as practised among the southern Indians, leave but little to be added save in the way of a detailed description of the articles found in the different graves, all of which differed among themselves, as was to have been expected, with the age, sex, and occupation of the person with whom they were buried. Thus, in grave No 1, containing the bodies of the two children, aged respectively about two and seven years, were found among other things the upper cannie of a black bead, showing undoubted marks of fire, and two quarts of shell beads of different sizes and shapes, made chiefly

**FIG 1**

**SHELL BEADS, LIA MOUND, VA. NATURAL SIZE MUSEUM No 5737**

from the columella of the *Strombus gigas* and the *Busycon per-\_version*, though other shells were undoubtedly often used. The figures which are given above afford a very good idea of the different forms of the beads found, though they by no means represent the extremes in size. In this particular they range all the way from 1 mm to 18 in thickness, and from 2 to 16 in diameter, and even this does not reach the limit of similar beads, as there
are specimens in the Peabody Museum at Cambridge, obtained from mounds in this same section of country, more than double the size of the largest figured above. Many, perhaps a large percentage of these beads, and among them some of the smallest in size, show indisputable marks of having been drilled from opposite ends, thus confirming the observations of Professor Wyman; and in those cases in which the columella may have been bored in blocks and subsequently cut into pieces of the desired length, as the two grooved specimens seen in the background of the engraving would seem to indicate was sometimes done, there is evidence that each specimen was worked separately and the ends and sides ground down into the required sizes and shapes. This itself was not a small undertaking, and when we consider the extreme minuteness of many of the specimens, and the almost incredible numbers in which they are found it will readily be seen what a vast amount of patient labor, and what a high degree of skill and delicacy in manipulation were necessary to the production of these treasures of Indian art. Upon this point, not less than with regard to their general distribution and great value the early writers do not leave any room for doubt. From New England to Louisiana, and throughout the whole of the Ohio Valley they were everywhere found in more or less abundance, and were either worn as ornaments or used as money. As money it was known as Wampum, Peak, or Roanoak, and was as potent for good or evil then as now. “With it,” according to the old chronicler, “you may buy skins, furs, slaves, or anything the Indians have, it being the Mammon (as our Money is to us) that entices and persuades them to do anything, and part with everything they possess, except their children for slaves... With this they buy off murders; and whatsoever a man may do that is ill, this Wampum will quit him of, and make him in their opinion good and virtuous, though never so black before.” It was made of a “vast great shell... ground on stones and other things... smaller than the small end of a tobacco-pipe, or a large wheat-straw.” The boring was done with a “nail stuck in a cane or reed... and rolled continually on the thigh with the right hand, holding the bit of shell with the left.” 14 In earlier times implements of stone and perhaps others equally primitive were doubtlessly used. This Peak was of two sorts, or rather of two colours, for both are

made of one shell, though of different parts, one is a dark purple cylinder and the other a white, much resembling the English Buglas, being one-third of an inch long and about a quarter in diameter. The dark colour is the dearest," it being according to Lawson, of twice the value of the white. In view of this fact and of the general distribution of both sorts of beads, it is perhaps a little singular that in the whole of this collection which numbers many hundreds, there is not one colored specimen. In fact, during a somewhat lengthened experience in rummaging the mounds and caves in Kentucky and East Tennessee, it has never been my lot to find one made of purple shell, or indeed of any other colored material, except on two occasions when two beads of cannel coal were found, one in a cave on Station Creek, Claiborne County, Tennessee, and the other in Haunted Cave, Edmonson County, Kentucky.

There were also found two shell-pins, one of which, made from the columnella of the Busycon percarinum, is 51 mm in length and has a comparatively sharpened point, whilst the other is blunt, and measures 93 mm in length. In the latter the spiral groove is still...
preserved. But the most interesting of the articles taken from this grave was an engraved shell made from the most dilated portion of the Strombus gigas, and carved on the convex side into the likeness of a human face. It measures 138 mm in length by 120 in breadth. It is perforated with three holes, "the two upper of which are surrounded with circles and represent eyes, between these is a raised ridge of shell in place of the nose, and below this is a third hole," which is just above a series of lines that were probably intended as the mouth. Four lines parallel to each other during three-fourths of their length, begin at the outer corner of the eye and are zigzagged to the lower jaw, where they are drawn to a point. The concave side of the shell is perfectly plain and still preserves its high polish, though the right portion of the face on the carved or convex side shows the sad effects of time and exposure.

Ornaments of the above material and the same general style of workmanship are not uncommon, and are described with some exactness in the early writers. Lawson,\(^\text{17}\) says the Indians, "sometimes make of this Shell a sort of Gorge, which they wear about their Neck in a string, so it hangs on their Collar, whereon sometimes is graven a Cross, or some odd sort of Figure, which comes next in their Fancy," and Beverly\(^\text{18}\) gives an engraving of an Indian in summer dress, of whom it is said, "At his Ear is hung a fine Shell with Pearl Drops. At his Breast is a Tablet or fine Shell, smooth as polished Marble, which sometimes also has etched on it, a Star, Half Moon, or other Figure, according to the maker's fancy. Upon his Neck and Wrists hang Strings of Beads, Peak, and Roenoke," and Adair,\(^\text{19}\) who, aside from his wild notions about the identity of the American Indians with the lost tribes of Israel is a trustworthy guide, says: "the American Archi-magus, wears a breast-plate, made of a white conch-shell, with two holes bored in the middle of it, through which he puts the ends of an otter-skin strap, and fastens a buck-horn white button to the outside of each." But it is useless to multiply quotations in order to give an idea of what can be much better understood by an examination of the engraving given above or of those which may be found.

\(^{15}\) Fifth Annual Report of the Peabody Museum of American Archaeology and Ethnology, p. 16, Boston, 1872

\(^{16}\) History of Carolina, p. 199

\(^{17}\) History and Present State of Virginia, Book III, p. 3

\(^{18}\) Adair, History of the American Indians, p. 84, London, 1775
in the work of Col C. C. Jones, p. 526, on the Southern Indians. At page 502 of that work, by way of illustrating a most interesting chapter on shell ornaments he has represented two of these gorgets. One of them is rather small and perfectly plain, whilst the other is somewhat larger and highly ornamented with lines and dots carved on the concave surface of the shell, which are to be "regarded rather as the expressions of the rude fancy of the workman, than as indications of any intelligent designs or photographic idea." In the Peabody Museum, there are several similarly carved shells, obtained from mounds in Eastern Tennessee. On some of these a rattlesnake is carved, others are almost fac-similes of the one here figured, whilst on others a still ruder attempt is made at representing the human face. In all of the specimens examined it is a peculiarity worthy of note, that the convex side of the shell is used when the human face is represented, whilst in other styles of ornamentation the figures are carved on the concave surface. These articles were all found mixed up with the bones, in close proximity to the crania.

By reference to the engravings it will be seen that many of the articles are in an imperfect condition. The lapse of years and exposure in shallow graves and moist earth have caused the decay of the polished surface of the shell, so that nothing remains but a soft white material something like chalk. Fortunately, however, there are enough left to show how they were made, and to justify by their beauty the high appreciation in which they were held, and the patient labor necessary to bring them to perfection.

These were all the articles saved from this grave, though there were others of the several different sorts, among them two more gorgets and several additional pins. Unfortunately, however, they were so extremely soft that many were lost in the mere act of picking them out, and the caving in of the wall before we had exhausted the contents of the grave, mashed all that were left into one indistinguishable, dough-like mass. These beads and pins do not differ, either in material or workmanship, from those found some years ago, in the same section of country, by the Rev. E. O. Dunning, and fully described by Professor Wyman in the Fifth Annual Report of the Museum. The shells of which they were made were all brought from the Gulf of Mexico or the Atlantic shores of the Southern States, and represented in those early days a value that cannot be too highly estimated.

The more important bones of these bodies, including the upper and lower jaws, having been dried and thoroughly saturated with a weak preparation of glue, were found to be in a very good state of preservation, though the crania were unfortunately broken to
pieces at the time of the accident, and cannot be put together. There is nothing peculiar about any of them, and for all that appears to the contrary, they might have belonged to any healthy white children of the same ages. It is, perhaps, a matter worthy of note, to find such a wealth of ornament buried with children, as it seems to show that the Indian mothers then, as now, did not hesitate to lavish upon them little ones all that they had that was rare and beautiful.

Grave No. 2 contained what is believed to have been the body of a woman. A few shell beads only were found with these remains, which were much decayed. The skull, catalogue Number 9,746, very much flattened from behind, was fortunately preserved and its measurements will be found elsewhere, tabulated with those of other crania that have been received during the year. The human were perforated, but the tube showed no signs of flattening.

Grave No. 3 seems to have been the tomb of a warrior, as the remains indicated great muscular development. With them were buried a beautiful spear point of quartzite 129 mm in length including the tang and 52 mm in breadth, also a gracefully shaped lance head or dagger of chalcedony, 136 mm in length and 38 mm in breadth, and a polished bi-concave discoidal stone made of sandstone. This specimen is not exactly symmetrical, though prob-

“CHUNKLE STONE” OF SANDSTONE, ELY MOUND, VA

Fig 6  

NU. SIZE MUS NO 9744
ably as near as the refractory nature of the material and the imperfect character of the tools at the disposal of the ancient workman would permit. It measures 111\text{mm} through the longest diameter, 107\text{mm} through the shortest, and 44\text{mm} in thickness. The concavities, also circular in form, are sunk in the centre of each side, and are about 68\text{mm} in diameter with an average depth of about 11\text{mm}. The partition wall between the two, is about 22\text{mm} thick. The sides are bevelled from the circumference of the concavity down to the outer or rolling edge which is about 20\text{mm} broad. These stones are generally known as "chunke stones," and are supposed to have been used by the Indians in playing that game. The perfect polish of the edges of some of them, it is true, weighs against this conclusion, but the objection loses much of its force in consideration of the fact that the ground on which the game was played was carefully prepared, so as to offer the least possible amount of resistance to the rolling stone and thus reduce the chances of clipping or breakage to a minimum. In giving an account of the game Adam says that it was played on "a square piece of ground well cleaned, and fine sand is carefully strewn over it, when requisite, to promote a swifter motion to what they throw along the surface. Only one, or two on a side, play at this ancient game. They have a stone about two fingers broad at the edge, and two spans round each party has a pole of about eight feet long, smooth, and tapering at each end, the points flat. They set off abreast of each other at six yards from the end of the play-ground, then one of them throws the stone on its edge, in as direct a line as he can, a considerable distance toward the middle of the other end of the square when they have ran a few yards, each darts his pole anointed with bear's oil, with a proper force, as near as he can guess in proportion to the motion of the stone, that the end may lie close to the stone—when this is the case, the person counts two of the game, and, in proportion to the nearness of the poles to the mark, one is counted, unless by measuring, both are found to be at an equal distance from the stone. In this manner, the players will keep running most of the day, at half speed, under the violent heat of the sun, staking their silver ornaments, their nose, finger and ear rings, their breast, arm, and

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21 Ancient Monuments of the Mississippi Valley, p 222 Washington 1848

22 Antiquities of the Southern Indians, p 142
wrist plates, and even all their wearing apparel, except that which barely covers their middle. 24

The Indians were much addicted to this game, and in some one of its different forms it seems to have had a most extensive range. The Cherokees, Natchez and other tribes belonging to the Southern group of Indians, as we have seen, indulged in it to great excess. It prevailed among the Ohio Indians under the name of Tchung-Kee, Mr. Catlin found it existing among the Mandans and other tribes of the Missoum 24 the Mohave Indians of to-day have it in a very similar form which they know as the game of the "hoop and pole," and under the name of miuki it prevailed in the Sandwich Islands. 25 Of the stones with which it was played we have different descriptions, some of which may, perhaps, be sufficiently close to establish their identity with that class of implements to which custom has affixed the name. Du Pratz seems to have had one specimen in his eye when he describes it as being "round and flat, about an inch thick, with the edge somewhat sloping." 26 Lieutenant Timberlake says the stone used by the Cherokees was "round, with one flat side, and the other convex," and other writers speak of it as "a bowl," or "being in the shape of a truck." 27 Later and more satisfactory evidence is furnished by the Rev. J. B. Finley, who states that among the tribes in Ohio, "with which he was acquainted, stones identical with those above described," i.e., in ancient monuments of the Mississippi Valley "were much used in a game resembling the modern game of ten-pins. The form of the stones suggests the manner in which they were held and thrown, or rather rolled. The concave sides received the thumb and second finger, the forefinger clasping the periphery." 28 This witness is endorsed by Mr. Squier, and his evidence would seem to be decisive of the matter. Adam bears testimony to the value of these "hurling stones," as he calls them, in the following strong language, which would perhaps be entitled to more weight if one of these very stones which we have attempted to describe, had not been found in a mound buried with

25 Smithsonian Contributions to Knowledge, Vol. II, Note to p. 130.
29 Quoted in Antiquities of the Southern Indians, p. 48, of seq.
30 Ancient Monuments of the Mississippi Valley, Note to p. 223.
Speaking of the stones used in his day he says: "they were time immemorial rubbed smooth on the rocks and with prodigious labor, they are kept with the strictest religious care, from one generation to another, and are exempted from being buried with the dead. They belong to the town where they are used, and are carefully preserved." There were also found in this grave a wine-glass full of white quartz pebbles, about the size of a small pea, lying in a little pile by themselves, the use of which can only be conjectured. The cranium, number 9,740, of the Museum catalogue was in an excellent state of preservation, as were many of the important bones of the body. Aside from the strongly marked indications of the muscular attachments there was nothing abnormal about these remains, save, perhaps, a small bony excrescence on the fibula and tibia of the same leg, which looks as if, at one time, it might have extended from one to the other.

30 History of American Indians, p 402 London, 1775