ELEVENTH ANNUAL REPORT

OF THE TRUSTEES

OF THE

PEABODY MUSEUM

OF

AMERICAN ARCHÆOLOGY [illegible]IOLOGY,

PRESENTED TO THE PRESIDENT [illegible]S OF
HARVARD COLLEGE, SEPT[illegible]

VOL. II. NO. 2.

CAMBRIDGE:
PRINTED BY ORDER OF THE TRUSTEES.
1878.

ELEVENTH ANNUAL REPORT

OF THE TRUSTEES

OF THE

PEABODY MUSEUM

OF

AMERICAN ARCHÆOLOGY AND ETHNOLOGY,

PRESENTED TO THE PRESIDENT AND FELLOWS OF
HARVARD COLLEGE, SEPTEMBER, 1878.

VOL. II. No. 2.

CAMBRIDGE:
PRINTED BY ORDER OF THE TRUSTEES.
1878.

PRINTED AT THE SALEM PRESS,
SALEM MASS.

CONTENTS.

PAGE.

List of Trustees and Officers 173

Letter of the Trustees to the President and Fellows of Harvard College 175

Abstract from the Records 176

Remarks of Hon. Robert C. Winthrop at the Annual Meeting, February 18, 1878 177

Report of the Building Committee 185

Report of the Curator 191

Additions to the Museum and Library during the year . . 207

Measurements of Crania received during the year . . . 221

Second Report on the Implements found in the Glacial Drift of New Jersey, by C. C. Abbott 225

The Method of Manufacture of several articles by the former Indians of Southern California, by Paul Schumacher 258

Cave Dwellings in Utah, by Edward Palmer 268

The Manufacture of Soapstone Pots by the Indians of New England, by F. W. Putnam 273

Notes on a Collection from an Ancient Cemetery in Southern Peru, by John H. Blake 277

Archæological Explorations in Tennessee, by F. W. Putnam 305

Observations on the Crania from the Stone Graves in Tennessee, by Lucien Carr 361

On the Tenure of Land among the Ancient Mexicans, by Ad. F. Bandelier 385

Report of the Treasurer 449

PEABODY MUSEUM

OF

AMERICAN ARCHÆOLOGY 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; *resigned*, 1876.
HENRY WHEATLAND, Salem, 1867. Successor to Francis Peabody, as President of the Essex Institute.
THOMAS T. BOUVÉ, 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.

ELEVENTH 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 Eleventh Annual Report, the Reports of their Curator and Treasurer for the year ending in February last.

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

Cambridge,
September 9, 1878.

ABSTRACT FROM THE RECORDS.

MONDAY, FEBRUARY 18, 1878. The Annual Meeting was held this day at noon in the Museum Building, Cambridge. Present: Messrs. WINTHROP, SALISBURY, ADAMS, GRAY, LYMAN and WHEATLAND; also the Curator, Mr. F. W. PUTNAM.

Records of the last annual meeting and of the meetings held on Wednesday, April 11, Monday, July 23, and Monday, November 19, were read and approved.

The Chairman, Hon. ROBERT C. WINTHROP, made a Communication containing many interesting facts respecting the conception and history of the Museum.

Report of the TREASURER was read, accepted and ordered to be printed.

Report of the CURATOR, with accompanying documents, was read, accepted, and ordered to be printed.

Hon. STEPHEN SALISBURY resigned the office of Treasurer, which he has held since the organization of the Board, to take effect when a successor shall be chosen and qualified, or satisfactory arrangements made for the care and management of the funds.

The subject was referred to Messrs. LYMAN and SALISBURY to report thereupon at an adjournment of this meeting.

In answer to a question of Prof. GRAY, the Curator stated that very satisfactory returns had been made to the Museum by the Smithsonian Institution for the share taken by the Museum in the explorations conducted jointly by the two Institutions.

The BUILDING COMMITTEE were requested to prepare a description of the Museum Building for publication in the Annual Report.

The appropriations, recommended by the Curator for the year ensuing, were acted upon and adopted.

Voted, To adjourn to meet in the rooms of the Massachusetts Historical Society on the second Thursday in March, (March 14), at 1 P. M.

HENRY WHEATLAND, *Secretary*.

INTRODUCTORY REMARKS

OF

HON. ROBERT C. WINTHROP,

CHAIRMAN OF THE BOARD OF TRUSTEES.

Our Annual Meeting, Gentlemen, has been postponed for several weeks in order to allow our Curator more leisure for preparing these apartments for our reception. We meet now, for the first time, in our permanent home, over the entrance to which — carved legibly on the free-stone block above the door — is the Inscription: —"Peabody Museum of American Archæology and Ethnology." We meet, too, by a somewhat fortuitous, but certainly a most auspicious, coincidence of dates, on the birthday of our illustrious founder. Mr. Peabody was born at South Danvers, in this State, on the 18th of February, 1795, and would have been entering to-day, had he lived, on his 83d year.

I am unwilling that our meeting on this Anniversary, and in this new Hall, should pass off without a few informal words, on my part, as the permanent Chairman of the Board, which seem to be due to the memory of Mr. Peabody, if not due to myself, and which belong indeed to the history of this Institution. If our Museum shall fulfil its promise, and shall become, as I think it rapidly is becoming, one of the most interesting and important Scientific Departments of the University, a day may arrive, in some far distant future, when it shall itself be the subject of archæological research, and when its small beginnings may furnish matter for careful investigation. Let me recall, then, some dates and facts which are probably within my own knowledge only, and which may at least serve to help some future inquirer.

It was on the 1st of June, 1866, as I find by my notes at the time, that I first met Mr. Peabody, at his own request, at the Tremont House in Boston, to consult with him on his proposed endowment for Harvard University. On the 4th of June, three days afterwards, Professor O. C. Marsh, of Yale College, and Mr. George Peabody Russell, both of them nephews of our Founder, called on me at the rooms of the Massachusetts Historical Society, for further consultation on the subject. On the 17th of June following, Mr. Peabody spent an hour with me at Brookline, solely in reference to this plan for Harvard. At this interview he placed in my hands a rough sketch of our Institution, and gave me permission to consult confidentially with one or two of the friends of the University in regard to it.

For this consultation I selected, before all others, the late President Walker, and I am not sure that I sought serious counsel of any one else. Dr. Walker took the matter into consideration in his calm, wise, common-sense way, and was ready, after a few days, to pronounce a deliberate judgment. He saw, as I did, that in confining his liberality to this one scientific object, Mr. Peabody would disappoint not a few hopes and expectations at Cambridge. There were peculiar needs there at that time. The Library was greatly in need. The Museum of Comparative Zoology was not less in need. The general finances of the University were sadly deficient. Meantime, the idea of such an Institution as this had never occurred to any one, and pre-historic science was too much in its infancy to have enlisted any ardent votaries.

But Dr. Walker soon reached a conclusion, in his own mind, on these and all other points of doubt. I remember how emphatically he said to me, substantially, as the result of his deliberations: — "Mr. Winthrop, I have always been of opinion that when a generous man, like Mr. Peabody, proposes a great gift, we should accept it on his own terms, and not on ours. Even if we could persuade him to change his plans, and endow some other branch of the University, he would never take the same interest in it, or re-

gard it so much as his own. We had better take what he offers, and take it on his own terms, and for the object which he evidently has at heart. That object may not impress the College or the community, at first sight, as one of the highest interest or importance. There may be, and will be, as you say, disappointments in some quarters. But the branch of Science, to which this endowment is devoted, is one to which many minds in Europe are now eagerly turning, and with which not a few of the philosophical inquiries and theories of the hour are intimately associated. It will grow in interest from year to year. This Museum, too, will be the first of its kind in our country, and will have the best chance of securing those relics of our Indian tribes, which are now scattered in so many private collections. It is, moreover, precisely one of those institutions which must necessarily owe its foundation to private liberality. We could never hope to make it the subject of a public subscription or contribution. But if Mr. Peabody will make it his own, and endow it handsomely, and if we can get a safe, sound, accomplished person, like Jeffries Wyman, to take the charge of it, there can be no doubt of its ultimate success."

Dr. Walker, as you all know, was not a man of many words, and I may have amplified in some degree the views he expressed in our repeated comparisons of opinion. But such were his conclusions, and I should be wanting to his memory, if I did not place him foremost among those whose advice and counsel led to the unqualified acceptance of Mr. Peabody's offer, and to the establishment of this Museum.

On the 6th of July, I was able to communicate to Mr. Peabody, by letter, the result of our consultations. But it was not until the 24th of September that his plan was sufficiently matured to be communicated to others. On that day he met me again, at the Historical Rooms, together with his nephews, Prof. Marsh and Mr. Russell, and after arranging the details of our organization, I was authorized to call a meeting of the gentlemen designated as Trustees. On the 28th of September, a primary and provisional meet-

ing was, accordingly, held, — the late Francis Peabody, of Salem, Prof. Asa Gray, Prof. Jeffries Wyman, Hon. Stephen Salisbury, and Mr. George Peabody Russell being in attendance, and making, with myself, all the Trustees, except Mr. Adams who was still in London.

On the 18th of October, Mr. Peabody signed the Instrument of Trust, which was published in the Boston Daily Advertiser of the next morning, and on the 3d of November, 1866, the first formal meeting of the Trustees was held. The Board was organized on that day, agreeably to the terms of the Instrument; and I then proceeded, with Mr. Salisbury and Mr. Francis Peabody to the office of Blake Brothers & Co., in State Street, where we received the Massachusetts Bonds for $150,000, counted them and sealed them up, and then deposited them temporarily in the safe of the Massachusetts Hospital Life Insurance Company. From that time to this our proceedings have been a matter of record.

I have referred to the early and emphatic suggestion by Dr. Walker, of JEFFRIES WYMAN, as the man of all others for the Curator of our Museum; and I find that on the 1st of December, following our organization, Dr. Walker spent an hour with me in my library in earnest enforcement of this suggestion. It needed no enforcement, so far as I was personally concerned, and it soon proved that our whole Board was of one mind on that point. The Curatorship was unanimously assigned to Professor Wyman, who was also one of our Trustees, and he continued to discharge the duties of that office for the eight remaining years of his life.

His death, on the 4th of September, 1874, occurred while I was in Europe, and I cannot forget the deep sorrow with which I saw its announcement, accidentally, in a copy of Galignani's Messenger, while I was passing a few days in Heidelberg. As my absence from home deprived me of the opportunity of uniting with the Trustees in paying him the just tribute which is upon our records, I may be pardoned for dwelling, for a moment longer, upon his signal and preëminent services to this Institution. My relations to

him, as Chairman of the Board, brought me into very frequent consultation and correspondence with him in regard to the Museum. As we were living so near to each other, the oral consultations were more frequent than the correspondence; but I have brought with me here to-day a large number of his letters,—all of them having reference to his labors in our behalf, and many of them containing interesting and important suggestions as to the work in which we were engaged. These letters, thirty-two in number, seem to me to belong to the history of our Institution, and I propose to deposit them in our archives. The earliest bears date, November 26, 1866; and the last, July 9, 1874,—less than two months before his death. Some of them were written among the White Hills of New Hampshire, some of them in Florida, and some of them in Italy and France, while he was travelling abroad for his health. The last two—as well as a few of the earlier ones—were addressed to me while I, in my turn, was absent from our own country. They all alike bear witness to his devoted interest in this Institution, and to his untiring labor in its behalf. If my own letters to him, of which I kept no copies, shall happen to have been preserved by himself or his family, they will show, in connection with his own, the measures which were taken for securing the Mortillet Collection, the Clement Collection, the Castellani Vases, the Cushing relics from Mexico, and the grand collection of Danish Flints of Mr. Wilmot J. Rose, all of which were obtained through my intervention, with his counsel and coöperation, for purposes of comparison with the pre-historic specimens of our own land. It may well be doubted whether those collections, or any others at all comparable to them, could have been secured at a later day, or under any other circumstances than those, of which we were so fortunately in the way of taking advantage, at the precise moment when they were obtained. We should seek for them in vain now, either at home or abroad.

No more patient, persevering, skilful and thoroughly scientific person could have been designated for the work of founding and

building up such a Museum as this than Jeffries Wyman, and his name deserves to be associated with that of Mr. Peabody himself, in the history of the rise and progress of the Institution. At some future day, it may be hoped that portraits of them both may adorn these walls. The modesty of Professor Wyman was as remarkable as his merits, and he was satisfied with accomplishing his work from day to day, and from year to year, without seeking to display his own labors in organizing and developing the Institution which had been committed to his charge. All the more ought we to take care that his name should be ever remembered, prominently and preëminently, in connection with this Museum, and should be inscribed on some appropriate part of its inner walls, as its first Curator; I had almost said, its creator. His personal qualities endeared him to all who knew him, and I count my own relations with him for eight years among the most valued privileges of my life.

Under his superintending care, the Institution was rapidly developed, while at the same time, the interest in this department of science, in Europe and in our own land, was steadily increasing year by year, as Dr. Walker predicted it would do. The marvellous discoveries of Dr. Schliemann — to name no other name — have given still a new and stronger impulse, of late, to the search for whatever may be found in mounds, or barrows, or bogs, or glacial drifts,— at the bottom of lakes, in caves or in shell heaps, as well as under the débris of ancient cities,— to throw light on the history of the past. And thus, at the end of ten years since our organization, Mr. Peabody's foundation is amply justified; and nobody, I think, would now desire it to have been any other than what it was.

In entering our new Hall, to-day, we do not forget our indebtedness to our Associate Trustee, Col. Lyman, and to our friend Prof. Alexander Agassiz, for their devoted attention to the erection of this building, from its inception to its completion. We do not fail, also, to remember gratefully the faithful services

of our Treasurer, Mr. Salisbury, under whose care the fund appropriated to this purpose by Mr. Peabody was accumulated, until it had reached the amount prescribed before the edifice should be undertaken.

Nor can we omit our acknowledgments of the diligent and untiring services of our present Curator, Prof. F. W. Putnam, and his Assistant, Mr. Lucien Carr, by whom the laborious work of transferring our collections to this new building, and arranging them in its various apartments, has been so satisfactorily and successfully performed, and under whose auspices so many valuable additions have been made to the Museum. Happily these gentlemen are all with us to enjoy their best reward in witnessing the grand consummation of their labors.

And now, Gentlemen, in taking possession this morning of a Building which, we trust, is not only to outlast us all, but to be the scene of scientific labors and acquisitions in future and far distant generations, I may be permitted to invoke for the Institution not merely the favor of our fellowmen, but the blessing of God; — remembering those words of the great father of modern science, Lord Bacon, who would have had everything dedicated alike to "the relief of man's estate and to the glory of the Creator."

There are but few passages more striking among the voluminous writings of Bacon which are left to us, than the little "Student's Prayer," as he entitled it, which he seems to have composed while he was engaged on his "Novum Organum" and his "De Augmentis Scientiarum." After some formal opening phrases, he proceeds: "This also we humbly and earnestly beg, that human things may not prejudice such as are Divine; neither that from the unlocking of the gates of sense, and the kindling of a greater natural light, anything of incredulity or intellectual night may arise in our minds towards the Divine Mysteries; but rather that by our mind thoroughly cleansed and purged from fancy and vanities, and yet subject and perfectly given to the Divine Oracles, there may be given unto Faith the things that are Faith's. Amen."

Such words — these very words — might well be inscribed on the walls of every student's chamber, and of every hall of Modern Science. They breathe a spirit worthy of being devoutly cherished by all who deprecate any needless conflict, or wanton contention, between Science and Religion.

It was in this spirit, as I well know, that our illustrious Founder endowed this Institution. It was in this spirit, as I remember well, that President Walker advised its acceptance, and urged upon me the appointment of Jeffries Wyman as its Curator. It was in this spirit, as we can all bear witness, that the lamented Wyman himself pursued his work and prosecuted his investigations. And, certainly, it is in this spirit, that, having counselled and coöperated with them all, I shall maintain my relations to the Museum, agreeably to Mr. Peabody's assignment, as long as life and health shall enable me to watch over it. And may the blessing of God rest upon all our counsels and labors!

REPORT OF THE BUILDING COMMITTEE.

THE Building Committee of the Peabody Museum herewith give, as their report, the following description of the Building, furnished by the architect, with the accompanying photograph and drawings showing the elevation and interior arrangement.

Respectfully submitted,

THEODORE LYMAN,
ASA GRAY, } *Committee.*

To

THEODORE LYMAN, Esq.,

Chairman of the Building Committee of the Peabody Museum of Archæology and Ethnology, Cambridge.

DEAR SIR: — The following is the description of the New Museum Building at Cambridge.

The work was commenced early in July, 1876; the walls built and the roof finished about the middle of December; the work was then stopped, and the building closed for the winter; the plastering, laying floors and finishing were done the following spring and summer.

The outside walls are built of dark red brick, laid in black mortar, with brown stone belts, window sills, caps and main cornice, with granite steps and underpinning.

The external dimensions are 87 ft. from North to South and 44 ft. from East to West. The First floor is about 5 ft. above the ground, the main cornice 52 ft., the top of Mansard story at gutter about 61 ft., and the highest point of roof 72 ft. The view in this report, taken from a photograph, will show the external appearance of the building.

There is a Basement Story 11 ft. 6 in. high. First and Second Stories each 22 ft. 2 in., each having galleries 7 ft. wide in rooms, and 5 ft. wide in halls, and a Mansard story 11 ft. high. The plans in this report will show the arrangement of the rooms.

The South Basement room is finished and fitted up as a work room; the North room is for fuel and storage; the Hall contains steam boiler of the Heating Apparatus, the floor over this being made of iron beams with

brick arches turned between them. The Elevator runs in a brick shaft, from Basement to Attic, having an opening at each floor and gallery. The closets marked on plans are fitted with wash bowls and water closets; and in these closets runs a stand-pipe, with hose couplings at each floor and gallery.

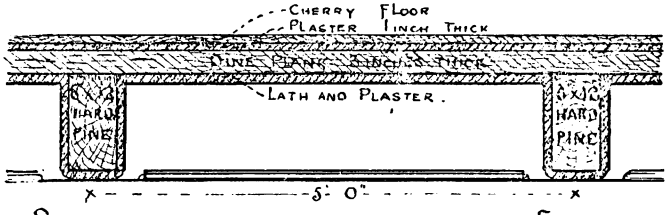
The Vestibules between elevator and closets at each floor, have arched doorways in external brick walls, now closed up, but to be opened whenever an addition shall be put up on the West side.

The foundations are unusually strong, the bottom course of stone being about 7 ft. wide. The brick walls of Basement being 2 ft. 4 in. thick. First Story walls, 2 ft. thick. Second Story walls 1 ft. 8 in. thick; all being hollow walls, having a 4 in. air space between the inner and outer walls. The walls of the Mansard story are 1 ft. thick. All the inside partition walls are brick, built up to the roof boards. All the walls are plastered directly on the brick, leaving no spaces for fire to draw through, or to lodge vermin.

The floor of First Story Hall is formed of iron beams and brick arches, and on these is laid a pavement of Baltimore red tiles 8 in. sq., with a border of light colored New Brunswick free stone and Vermont green slate.

All the other floors are formed with girders 12×12 and 8×16 and floor joist 6×12 in. all hard pine; the joists placed 5 ft. apart; on these are laid 3 in. white pine plank, matched; on this planking is spread a coat of lime, hair and sand, mortar and plaster of Paris, 1 in. thick; the finished wood floors are laid over this. Cherry in First and Second Stories and their galleries, and Hard Pine in Basement and Attic.

On the under side of the 3 in. floor plank and all around the floor timbers, "furrings" half an inch thick are nailed, and on these lath are laid ½ in. apart to allow the plaster to pass freely between them and fill the space between the lath and plank or timber. The corners of the timbers of the First and Second Story timbers are moulded. The construction of these floors show panelled ceilings. The floors are perfectly solid, of wood and plaster, having no air spaces in them through which fire can draw, as shown in the following section showing construction of floors.



SECTION SHOWING CONSTRUCTION OF THE FLOORS

The roof timbers are placed about 4 ft. apart, covered with 2 in. thick white pine plank, matched, and furred, lathed and plastered on under side in the same way as the ceilings.

On the Roof, strips 1½ in. square, 3 ft. 8 in. apart, extending from the ridge to gutters are nailed; the roof is covered with copper turned up against the sides of these strips and capped with copper; this allows for the expansion and contraction of the copper caused by changes of the weather.

The Stairs from the First floor to the Attic are iron; from the Basement to First floor, stone steps built in between brick walls; from the Attic to the floor above, the under side and partition at the side being lathed and plastered in the same manner as the ceilings, and the space under the steps filled with plaster.

All the inside doors are made of two thicknesses of board, with an air space between them, covered on both sides and on the edges with sheet iron.

The Building is heated by steam; and in addition to this, each of the principal rooms has a large open fire place.

STATEMENT OF THE COST OF THE BUILDING.

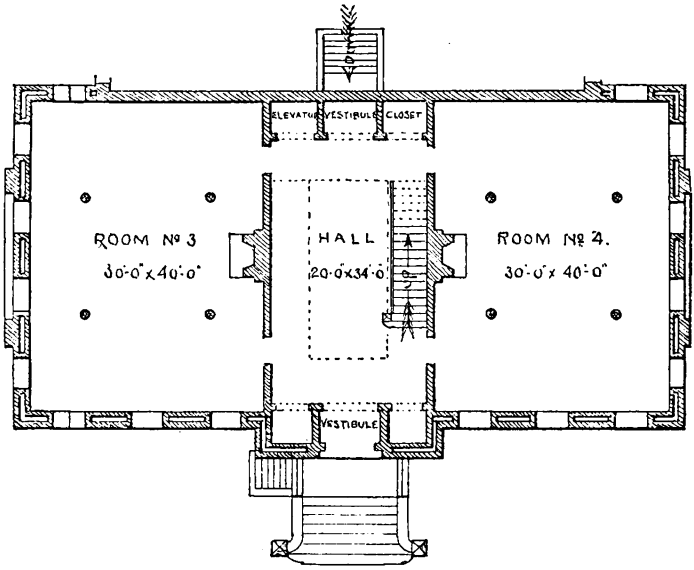
Mason work.	William C. Poland & Son.	$27,900 06
Carpenter's work.	Hancock & Greely.	10,462 79
Iron work.	G. W. & F. Smith.	4.220 30
Plastering.	John Mack.	2,642 50
Roofing.	John Farquhais Sons.	2,193 93
Elevator.	F. P. Canfield.	500 00
Plumbing.	William Lumb & Co.	470 12
Steam Heating.	Walworth Mfg. Co.	1,918 12
Tablet and Lettering.	E. F. Meany.	116 90
Tiles.		338 43
Bells and Tubes.	Seth W. Fuller.	34 00
Architect		2,500 00
		$53,297 15

The above contains, I think, all important points in regard to the building and its construction.

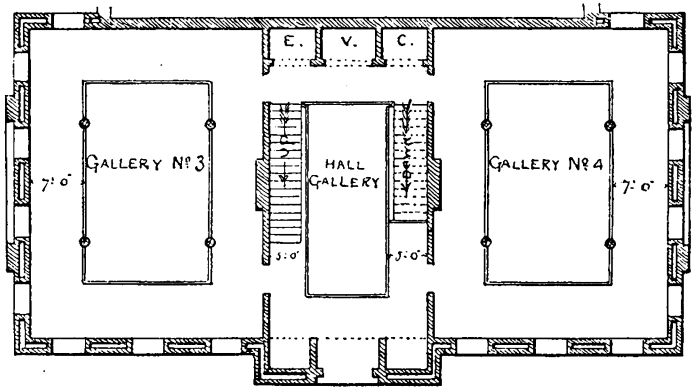
Very Truly Yours,

ROBERT H. SLACK,

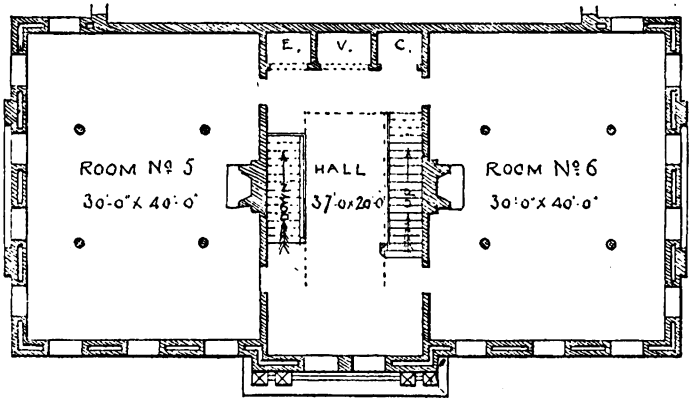
Architect.



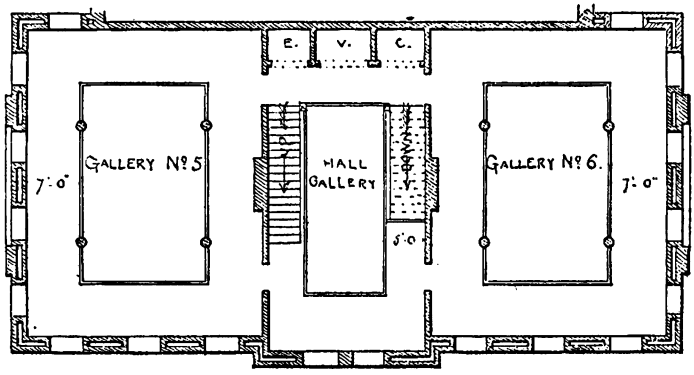
FIRST FLOOR.



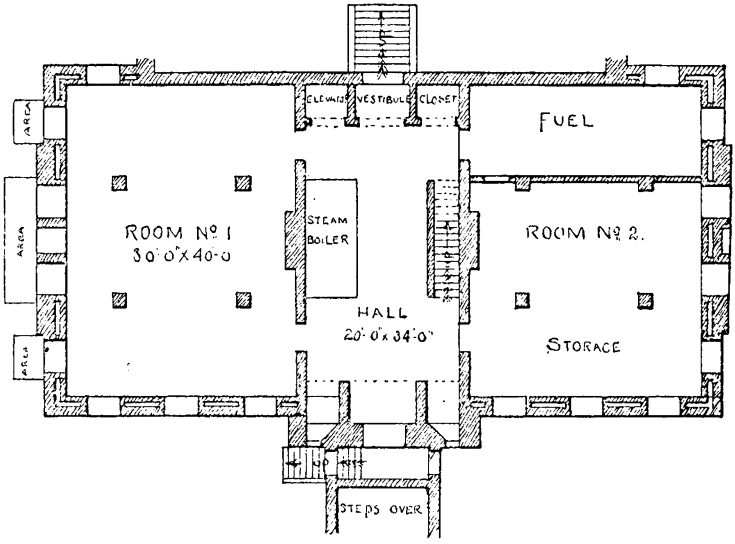
FIRST GALLERY



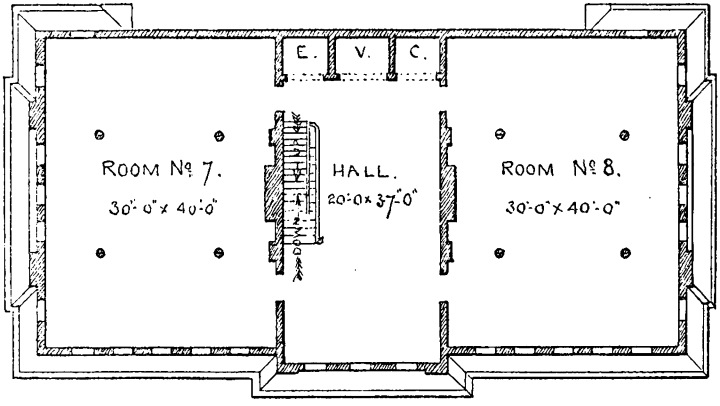
SECOND FLOOR.



SECOND GALLERY.



BASEMENT.



ATTIC.

REPORT OF THE CURATOR.

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

GENTLEMEN:—With a deep feeling of satisfaction that the valuable collections forming the Museum, are at last placed in a building in every way suitable for their proper arrangement and safe keeping, and congratulating you on the accomplishment of so desirable an object, I have the honor to inform you briefly of the work done in connection with the Museum since the last annual meeting, which was held on the seventeenth of January, 1877.

During the months of June and July last, the collections were safely removed to the upper rooms of the present building. Recently the old cases, which were removed from Boylston Hall, have been placed for present use in some of the rooms, and certain portions of the Museum have been temporarily prepared for exhibition. As it was also found practicable to have the several rooms, hereafter to be provided with cases, shelved in advance of the building of the cases, we are enabled to exhibit upon these shelves such articles as will not be injured by dust, while the present trays and drawers will enable the arrangement of the smaller and more delicate specimens to be carried towards completion, so that when the new cases are finished in each room they can soon after be filled with the specimens they are to accommodate. In this way, as will be readily understood, the collections will be so distributed that they can be used for study and comparison and, in part, exhibited.

Following this plan there have been temporarily arranged, in the northeastern room of the second story, the several collections illustrating the Ethnology and Archæology of Peru, Bolivia and Brazil and, in a more limited manner, some other portions of South America. There have thus been brought together, for the first time since their reception, the several large collections made by

Professor Hartt[1] in the ancient shell heaps and burial mounds in Brazil; the articles received from the Thayer expedition conducted by the late Prof. Agassiz; those presented by Mrs. Agassiz, Mrs. John Dixwell, and a few other contributors to the Brazilian collection. By the side of these are placed the mummies and the collection of pottery and other articles made by Mr. Alex. Agassiz about Lake Titicaca, which, as they show marked differences from the coast Peruvians, have been separated from the collections made by the late Professor Louis Agassiz, and by Mr. Alex. Agassiz, at Ancon, Chancay, Pisagua and other places near the coast. These last and most extensive collections fill several cases in the room, while one corner is devoted to the articles illustrating some of the arts and customs of the present Indians of Peru, received from Mr. Alex. Agassiz. The Blake collection, of which mention will be made, is also arranged in cases in this room; the whole forming a very important Archæological and Ethnological collection in relation to South America. On the shelves in the gallery of this room have been arranged the vases, carvings in stone, and various other articles from Central America and Mexico, including the Cushing collection from Mexico, and several small lots from Central America. In this gallery also have been placed the large articles of the extensive collection from Alaska.

In the opposite room, in temporary cases and on shelves, are now displayed the important collection of pottery from the old mounds and graves of various parts of America north and east of Mexico, the large stone implements, pots and mortars from California and other places, with various articles made and used by the present Indians of North America. There are also temporarily arranged in this room, in several of the old cases, a selected portion of the New Jersey collection made by Dr. Abbott, including the interesting stone implements obtained from the gravel beds at Trenton. Other cases are filled with series of articles from the graves, mounds and caves of Ohio, Tennessee, Kentucky, Utah, etc., while two cases are devoted to an exhibition of the series of pipes from North America. The drawers under the cases

[1] Since this report was put in type the sad news of the death of Prof. C. F. Hartt, by yellow fever, has reached us from Rio Janeiro. By his death science has lost a devoted worker, and the Museum one of its faithful friends. At the time of his death Prof. Hartt was engaged in the performance of his duties as Director of the Geological Survey of Brazil.

contain arrowheads, spearpoints, knives, celts, small axes, and other specimens illustrative of the Stone Age of North America.

In the gallery of this room a temporary arrangement is made of the various large articles from the Pacific Islands, Africa and Asia.

For the present, the collection of pottery from Etruria, and the large articles from the Swiss Lakes and other European localities, are placed on the shelves in the first southern gallery, and it is proposed to reserve the room itself (the one in which you are now assembled) as a Trustees' room, library, general office and reception room. It is also the room best adapted to class instruction and other similar purposes.

The northeastern room on the first story, with its gallery, has been kept free of specimens in order to allow of its being the first to be furnished with the new cases. When this room is cased, it is then proposed to arrange a series of collections made by selecting, from all portions of the Museum, such articles as will illustrate the development of Man toward civilization, as shown by his inventions, arts and manufactures from remote times.

In such a series of collections it will be the object to show, as nearly as may be, the sequence of inventions; while in the several ethnological arrangements, in other rooms, all that relates to the past and present condition of each nation will be exhibited as far as possible.

In the northern room of the third story the osteological collection is in process of arrangement. This now consists of about seven hundred crania of various races of man, several perfect skeletons and many human bones from various places. Particularly rich is this collection in crania and bones of the North American Indians, of comparatively recent times, from California, Florida, New England, etc.; of the Stone Grave race of Tennessee; of the mounds of Kentucky and Tennessee; of the Peruvians and Sandwich Islanders; also in crania from the ancient graves in Italy, being the collection presented by Col. Lyman; and, in addition, many important crania from other parts of the world. This collection also contains a very interesting series of bones illustrating diseases, malformations, etc.

The southern room of the upper story is the work room of the Curator, and will contain the articles received from the unpacking and general work room in the basement, preparatory to their final distribution to the cases, or during their special study.

From this hasty review of the contents and adaptation of the seven rooms and four galleries, which have been mentioned, to the various purposes of the Museum, a general idea of the building has been conveyed. It only remains to be stated that the building is heated, throughout, by steam, while open fire places for ventilation and special heating are in five of the rooms.

A special feature in the construction of the building, is the method by which it has been made fireproof by enclosing all the wood work, from the basement to the roof, in plaster and cement, the light wood floors of the rooms also being laid on plaster.

From the care that has been given, by the Building Committee and the Architect, to the important subject of cases, it is believed that these will, when completed, prove as perfect and durable as can be expected at a reasonable expense.

Much work on the collections has been accomplished during the year by Mr. Carr and myself, and for a few weeks we had the assistance of Mr. Lucien Carr, jr., who devoted himself to repairing broken pottery in a skilful manner, and to painting, very neatly, the catalogue numbers on several hundred articles. The time taken for this essential labor is very great and can be exemplified by the fact that an entry under one number in the catalogue often involves the painting or writing of the number, now made up of five figures, on one or two hundred specimens.

Among the objects that we have felt it important to accomplish, has been that of arranging and cataloguing the collections made by the former Curator during his examinations of the various shell heaps in Florida and New England, which, as I mentioned in my first report, have been kept in bulk, as Professor Wyman was about beginning their arrangement at the time of his death. I am glad to be able to state that after several weeks of our united labor, the Florida collection, consisting of many thousand articles, has been properly entered in the catalogue and is now arranged in drawers. The smaller collection from the shell heaps of New England will, we hope, be likewise arranged during the present year.

We are indebted for special assistance in the Museum, to Dr. C. C. Abbott, of Trenton, New Jersey, who, during a visit of several weeks in the past autumn, selected and arranged, in temporary cases, series from the large collection of stone implements he has, at various times, made for the Museum, including those received from

the Peabody Academy of Science at Salem, and mentioned in the last report. To Dr. Abbott the Museum is also indebted for several lots of specimens which he collected during the year, as will be seen by the items in the list of Additions to the Museum.

To Mr. T. G. Cary, we are under obligations not only for the several articles he has personally presented to the Museum, but also for the interest he has induced others to take in its objects, which has resulted in the addition of valuable specimens.

Mrs. John Dixwell, of Boston, has most liberally presented to the Museum a very interesting and valuable collection of weapons, ornaments, pottery, etc., from the Pacific Islands, Australia, Africa, India, China, and North and South America. This collection was made, as opportunities offered, by her husband, Dr. Dixwell, and was finally presented to the Museum, in the name of Mrs. Dixwell, at the same time with several stone implements given by himself. Now that the rapid spread of commerce is causing the disuse of the rude weapons and ornaments of savage tribes, especially on the islands and sea coasts, it is yearly becoming more difficult to obtain such articles as those presented by Mrs. Dixwell, and as it will soon be impossible to secure similar articles of savage workmanship, a boon is conferred on science whenever a private collection of this character is placed in a public Museum.

To Mr. Percival L. Everett, of Boston, we are under obligations for a valuable collection of coins and medals, made several years since by Mr. William G. Hunter, of Canton. This collection consists of coins and medals from China, Corea, Cochin China and Japan, dating from the second and third centuries B. C., to the present century.

Among the most important additions, during the year, is that of the well known collection from Peru, made by John H. Blake, Esq., of Boston, about forty years ago. This collection for several years has been on deposit in the Warren Museum. From it has been derived the data of much that has been written on the interesting mummies of Peru and the articles associated with them. Morton studied the crania of this collection and he figures one of the mummied heads in his great work; while the two elongated skulls of children have not only been figured by Wilson, but have been the subject of remarks and controversy by Wilson, Davis, Wyman, and others. Many of the articles have been particularly described by Professor Wilson, in his "Prehistoric Man." Thus the collection

has a double value, and the care that should be given to its preservation cannot be overestimated. Mr. Blake has added to the interest of this important collection by furnishing notes and drawings which I herewith submit as a special paper to accompany this report.

From the Imperial University of Tokio, Japan, we have received a very interesting collection of fragments of pottery, a few implements of bone, and other articles, from a shell heap at Omori, near Tokio. These articles were collected by Prof. E. S. Morse and other gentlemen connected with the Imperial University, and are of special interest as being the first obtained from the shell heaps of that country.

The Smithsonian Institution has presented to the Museum a very interesting series of burial jars, and smaller vessels of pottery, beads made of various substances, etc., all obtained from old burial places on the Island of Omotepec, in Lake Nicaragua, by Dr. Bransford, of the United States Navy, who has been making extended explorations on the Island, under the direction of the Smithsonian Institution. There have, also, recently been received from the Smithsonian Institution, eight large boxes of specimens containing a valuable collection of articles from the burial places and shell heaps of Southern California and the Islands off Santa Barbara. These specimens, mentioned in detail in the list of additions to the Museum, were in part collected at the joint expense of the Museum and the Smithsonian Institution, and are in return for the aid given by the Museum to the work of exploration conducted by the Institution.

Among the specimens of peculiar interest, which have been received during the year, are two human crania with a tibia and a humerus from Mr. Manly Hardy, of Brewer, Maine. These were found in a shell heap on the coast of Maine, under such conditions as to indicate cannibalism. Professor Wyman has fully established the fact that the early inhabitants of Florida were cannibals, as shown by the remains in the shell heaps there, and has, by historical evidence, shown that the custom existed among the Northern Indians. Fragments of the human skeleton have also been found sparingly in the shell heaps of Massachusetts; but this discovery of human remains in the shell heaps by Mr. Hardy is, as yet, the only evidence we have received of cannibalism among the shell heap people of New England. With the statement that Mr.

Hardy is to make further investigations of the deposits in question, in behalf of the Museum, to ascertain, if possible, that the position of the bones was not due to secondary burial, which their number suggests, I quote the following from his letter accompanying the gift of these interesting crania.

"Aug. 31, 1877, I examined a shell heap near south end of Great Deer Isle, Penobscot Bay. This heap was about three feet in depth and extended from forty to fifty feet on the front or exposed side. We found a number of pieces of earthen vessels, all ornamented, the most having rows of deep cuts or grooves on them in parallel lines. One piece had two holes about an inch apart, evidently to fasten a handle by. We also found the corresponding piece, one of the holes in this being broken through the centre. I found by striking a circle which just corresponded with the curvature of these pieces that the diameter was exactly six inches. There were the bones of many kinds of sea fowl and fish, intermixed with numerous evidences of fires, also various sea shells and many shells of the common land snail, these last being found all through the entire extent examined. Some beautiful pieces of quartz were found, evidently brought from a long distance and used to strike fire, also a flint arrowhead and part of a bone needle. After digging some twenty feet horizontally, I found a human bone, a femur, and near by some twenty or thirty more bones of legs and arms, a sternum, and portions of a pelvis, but no vertebræ or ribs. The long bones nearly all lay in a slanting position, many of them broken, and the corresponding parts either missing or not near enough to them to be identified as belonging together. They had no more apparent connection with each other as the bones of skeletons, than any heap of bones among kitchen refuse would have, and were mixed with bones of moose and beaver, whose teeth were found in considerable numbers, and were mixed with ashes and remains of fires. Below all these I came to a lower human jaw lying upon the top of a skull, the jaw was lying teeth side up, but contained but one tooth. In working carefully round the skull, which was placed crown up, I found another skull laid upon its side with the part which joined the neck pressed so close to the first that a knife blade could hardly be placed between them; on taking them out, the jaw fitted to the one on which it lay and this had but one tooth in the upper jaw. The under skull was without a lower jaw, neither could I find any near it. This skull had nine teeth in the upper jaw. These skulls rested on virgin, yellow earth, which showed no traces of fire or of ever being disturbed. A piece of granite projected on one side of the upright skull and the skull was hard against it. The second skull touched this on one side, and on the other was another rock. The two skulls being so closely wedged between the rocks that it was very difficult to remove them. Above them on one side, I saw several more long bones projecting from the shells; but not having time for more extended search I carefully reinterred all the bones exhumed except the

skulls and the bones sent you with them as specimens. I have been thus minute in describing the exact position of things that they may afford reasons for the conclusion, which both myself and the Indian who assisted me, came to independently. His first remark after we had examined everything was, "these people eat each other." No one, looking at the bones as we found them, mixed with kitchen refuse, lying without any connection, many of them broken and parts gone, and especially the two skulls underneath the whole, with the lower jaws detached from each and placed in such a position as they never could have been if buried in connection with the rest of the body, could come to any other conclusion."

For further information in relation to the Additions to the Museum during the past year, I must refer to the list annexed, which contains a summary of the two thousand eight hundred and sixty entries that have been made in the Museum catalogue during the year.

In regard to the Additions to the Library I must also refer to the annexed list, as with the exception of the continued receipt of several serials and other publications from the President of your board, no special mention need be made of the addition of forty-two volumes and eighty-one pamphlets to the small though important reference library of the Museum.

The Special Explorations made under direction of the Museum during the year, have resulted in more than ordinary success.

Dr. C. C. Abbott has continued his investigations in relation to the stone implements found in the glacial deposits at Trenton, New Jersey, and has been rewarded by the discovery of numerous specimens of rude, but unquestionable implements made by man. The notice of these implements of great antiquity, the oldest yet found on the Atlantic coast, given in the last published report, has caused considerable comment, and special interest in the locality, by both archæologists and geologists, and there is now no doubt that the disputed points, as to the exact relation of the deposit to the glacial period, will be carefully investigated. For a full statement and discussion of the subject, I refer to the elaborate second report by Dr. Abbott, hereto annexed.

Dr. Edward Palmer, acting under the special appropriation for explorations made at the last annual meeting, has made a careful examination of several mounds in Southern Utah, from which numerous articles of pottery, bone and stone were obtained. The notes and descriptions furnished by Dr. Palmer, show that most

of these mounds in Utah are in reality, the remains of adobe or mud houses, and that in some instances new houses have been successively erected on the remains of the old. In other instances the mounds are formed by the decay of a collection of houses built in such a way as to form a nearly continuous wall about an area thus enclosed, on the same principle as that suggested by the Hon. Lewis Morgan in his discussion of the probable use of the great artificial embankments in the Ohio valley. The only difference being, that in Utah the walls of the houses formed the protection to the area enclosed; while in Ohio, according to Mr. Morgan's theory, an earth wall was first raised, upon which houses were erected. It is evident that the latter method would give far greater protection to the inhabitants than the former. From the character of the articles found in these mounds in Utah, and especially from the pottery, we have some evidence that the people were the same as those who lived in the cliff houses of the Colorado region, and in the ruined Pueblos, and are probably represented at this time by the Moqui, Zuñi and allied tribes. These adobe houses of the plains of Utah may possibly have been temporary residences of some of these tribes during portions of the year, or they may have been the locations of out-lying bands until the inroads of other tribes forced the people to the cliffs for protection. In this connection it is of interest to note the discovery, by Dr. Palmer, of a skeleton in one of the mounds, and that the cranium, the measurements of which are given in another place, is remarkably broad and low. Dr. Palmer also had the fortune to discover a cave in Kane County, Utah, in which were two perfect vessels of the Ancient Pueblo type of pottery, one of which was filled with small coils of cord finely made from some kind of bark or strong vegetable fibre. In this cave was also discovered a unique article in the form of a spade, made by flattening a piece of horn and fixing it to a long handle of wood. At what Dr. Palmer believes to have been an old camp of the Pah Utes, in the mountains, he discovered several interesting articles, among which was a pair of shoes made of the fibre of the *Yucca*, which, in shape, style of braiding and several details, very closely resemble those made of the leaves of the *Typha*, which I had the good fortune to find, a few years ago, in a cave in Kentucky. Dr. Palmer also obtained a very instructive and important collection of articles made and used by the Pah Ute Indians, while the notes, which accompany

each article, stating the particular use to which it is put, the method of its manufacture, or the material from which it is made, etc., add materially to the value of the collection.

Mr. Paul Schumacher, who, probably, of all collectors has made the most extended and important investigations of the old shell heaps and burial places on the coast of Oregon and California, has, during nearly four months of the past year, devoted his attention to the Islands of San Clemente and Santa Catalina, acting under a special appropriation which you made for the purpose in July last. The returns from this exploration have been large, and many of the articles are of peculiar interest. These islands when discovered by Cabrillo in 1542, were settled by numerous tribes similar to those of the main-land. About forty years ago, the remnants of these tribes were removed from the islands.

In connection with this collection I have the pleasure to state that the officers of the freight department of the Pacific Rail Road Company made liberal concessions for its transportation.

The collection secured by Mr. Schumacher from the shell mounds and burial places, consists of mortars and pestles, made from hard stone; cooking pots, small vessels and other articles cut out of steatite; pipes, perforated stones of various sizes and material; a number of fine daggers, knives and arrowpoints; a single stone axe of same shape as those from the Atlantic coast; and very many other forms of implements; several interesting carvings in stone; various articles made of bone and shell; a great quantity of shell beads; about thirty human crania in good condition, the perfect or nearly perfect skeletons of two or three individuals, and parts of many others. Besides the collection of articles of Indian manufacture, numerous things of European make, of which the Indians obtained possession, were found in the graves, particularly on the Island of Santa Catalina. Mr. Schumacher has given an account of the method of manufacture of several of the articles, which I here annex as a special paper, and has written as follows in regard to the investigations made for the Museum:—

"Permit me to give you an outline of the results of my investigations of aboriginal remains, on the islands of San Clemente and Santa Catalina, off the coast of California, undertaken at the expense of the Peabody Museum, during the months of August to November of this year.

On San Clemente, where we had to work under great disadvantages, on account of the extreme dryness in this year of drought, and the lack of

drinkable water caused by the negligence of the captain of the schooner, our small party spent twenty-five days. The island, which is of volcanic formation, rose gradually from the ocean, attested by distinct sea-levels which are especially remarkable on the southwest side where they rise in well defined terraces to a plateau, increasing in number where the elevation is higher, or the formation such as caused intermediate watermarks. It is barren, without any water in streams or springs. The plateau, on which some light sandy depressions and rising ground occur, is, at intervals towards the southeast end, intercepted by deep fissures or *barrancas* in some of which water, derived from the rains in the winter, is stored in rock-worn basins, lasting even in dry seasons, but is so difficult of access, and for a stranger almost impossible to find, that no reliance can be placed on a water supply from this source. The southwestern shore is a rough coast which affords but few places in which a landing can be effected; while the northeastern or inner shore is high and abrupt, and although easily reached by boat, is only at a few places of practical access. For this reason we did not rely on a boat for transportation, but brought along with us pack-animals to move our collection to a convenient landing. As no feed could be found this season—the sheep, which overrun the island, dying rapidly—we always had to carry along on our expeditions, both feed and water for the pack-animals.

The shell mounds are principally located on the plateau, on inclines and such places of sandy nature whence the shores are easily accessible; but by far the best results were obtained on the extended dunes which enclose the northwestern end. The lower end of the dunes, where the shell deposits are especially abundant, it was noticed, is at the drainage of a large area, and I was informed that springs existed in early times on several places in the low depression, of which, however, none can be traced now, being likely covered by the encroaching sand. Similar favorable indications for a natural supply of water exists further towards the northwest and near an isthmus where a good landing can be made, especially in the northeast bight. Where ever the access is easy, we found the shell mound destitute of relics, and only on those distant from any landing place did we make valuable collections.

I did not notice any difference in the mode of burial on San Clemente from that observed at a previous time on San Nicolas Island; it being single graves occurring at short intervals in sand, without any other covering, or partitions. None were found in wrappings covered with asphaltum. As on San Nicolas, the greater portion of our collection was obtained on the surface of the shell mounds; and here too we found to our sorrow that the larger utensils, the well worked, and often rare articles were broken by vandals and scattered about. It is said it was done at the request of the priests at the time of annexation of the last of the inhabitants to their missions; surely, it must be admitted the destruction was done with some design, for else nobody would have taken the trouble of doing the work so thoroughly.

About the southeast end, in the faces of steep declivities and along the

bluffs of *barrancas*, many natural caves exist in the basaltic formation, some of which had served for abodes, as proven by the abundance of kitchen-middens which manifests itself for a long distance by light shining color. These caves, often difficult of access and requiring much exertion in reaching, are now the resort of sheep, where they, too, find protection against the scorching sun during the summer, and the rains in the winter. The caves added very little to our collection, nothing of which was of peculiar interest.

From here we sailed to Santa Catalina Island, where we arrived about the middle of the month of September, and remained two months.

We pitched our first camp at our old station, the Isthmus. This locality with its once populous rancheria, was prominently mentioned in the narratives of chroniclers, since the discovery in 1542. At our previous short visit the remains of the rancheria were readily found, but this time we succeeded also in the discovery of the graves which contributed so largely to our treasure. We have also traced, I believe, the water source mentioned by Padre de la Ascencion, in Little Springs, located about two miles and a half to the southeast, by trail, no doubt the trail of old, which still leads pass some sites of former huts.

The subject of the manufacture of pots, which I have followed up during several years past, was solved by the discovery of the quarries of pot-stone, at Little Springs, Pots Valley, and other localities, of tools and pots in all stages of finish. I consider this discovery the very interesting feature of the collection herein equalled by no one made on this coast. My observations thereon and the mode of manufacturing some other articles, I give in a special paper.

Some shell mounds succumbed to the incroaching ocean, as for instance at Little Harbor, on the southwestern shore, where only the two ends remain, indicating the extensive area it formerly covered; another near the southeast end on the eastern shore, and one in front of the house of Mr. Whittley, have suffered by the action of the ocean, yet some interesting results were obtained, especially at the latter station. On this island, too, we found shell mounds in the interior, mostly located near springs, small streams, passes and localities in which pot-stone was quarried.

The remains are in the main like those found on the other island and the adjoining mainland, the people of which were no doubt of the same race and in close connection. In striking variance, however, is a grooved stone hatchet exhumed in Pots Valley, the only one thus far found on the California coast, to my knowledge.

I cannot account for the scarce occurrence of the cooking pots, on Santa Catalina where they were extensively manufactured, especially of the large ones so frequently found on the southern California coast. This singular fact seems to invite us to comparison with modern notions according to which the home manufacture is considered of less value than the foreign commodities received in return. The scarcity of stone knives is in part explained by the absence of the material of which they consist, and moreover by the adoption of knives made of bones, which we frequently found."

After the meeting of the American Association for the Advancement of Science, at Nashville, I was enabled, by the kindness of many friends, to make very extensive explorations among the mounds and old burial places in Tennessee. A large earth mound, twenty feet in height by about one hundred and fifty in diameter, was carefully opened. A large burial mound containing between two and three hundred graves was completely explored, and several small groups of graves were also examined, all in the vicinity of Nashville. At the same time Major Powell was engaged in making equally extensive explorations in close proximity to my own, so that we had the advantage of each other's work.

The interest which was taken in my work by friends in Nashville, and the great kindness and liberality with which I was everywhere welcomed, enabled me to accomplish very much more than would otherwise have been possible during the month I had for the investigations. It is with pleasure that I take this opportunity of returning my thanks to the many who so kindly welcomed me and gave me such generous help; and while it is impossible to mention all by name, I must return my particular acknowledgments to Governor Porter and to Colonel Gibbs, the Secretary of State and acting Governor during most of the time of my stay in the state; also to Dr. J. B. Lindsley, Mr. and Mrs. John M. Overton, the Rev. Mr. Matthews, the Rev. Mr. Hargrove, Colonel Cochrane, Prof. Lupton, Colonel Morgan, Dr. Summers, General Thruston, Mr. Edward Cross, and Mr. Edwin Curtiss, to all of whom, as well as to many other friends in Nashville, I was under great obligation. To Miss Gertrude Bowling, the owner of the large estate upon which much of my work and that of Major Powell was done, we were much indebted for the permission to make the extensive excavations which we there accomplished with a united force of about fifty workmen during nearly two weeks. To the Proprietor of the Maxwell House and to the Editors of the "Nashville American," I am indebted for many acts of kindness.

On leaving Nashville I made arrangements with Mr. Edwin Curtiss to carry on the work for some time, and he visited several other localities where he was permitted to make excavations, particularly on the farm of Mr. Edmonson, to whom and to Mrs. Edmonson, he was placed under particular obligations. Mr. Edmonson also gave to the Museum, through Mr. Curtiss, a very large and fine stone dagger, which was taken from one of the stone graves on

his place. The continued work of Mr. Curtiss resulted in obtaining a large addition to the collection of articles, especially of pottery and of crania from the ancient graves. Leaving Nashville, I accepted the kind invitation of Mrs. Lindsley, of Greenwood, to visit her and explore the very interesting group of mounds and earthworks on the Lindsley estate. Here I was most hospitably entertained at the Greenwood Seminary, presided over by Mrs. Lindsley, who gave me every facility in the prosecution of my work, and with the permission of her nephew, Dr. Samuel Crocket, the representative of the present proprietor of that portion of the old estate on which the mounds are located, I made, with the assistance of a large gang of negro workmen, very extensive explorations of the earthworks, during the following week. To Mrs. Henry Lindsley, who was indefatigable in her efforts, and, with Mrs. Putnam, helped to oversee the workmen and take care of the numerous articles found, I am under great obligations. While to Dr. Crocket, Dr. Thompson, Professor Buchanan and several other residents, I was indebted for assistance and for specimens collected in the vicinity. To Professor Buchanan I owe the opportunity of presenting a careful plan of this interesting group of mounds, which will accompany the special report I am now preparing. It is sufficient in this place to allude to a few of the more important conclusions to which I am led by these explorations in Tennessee.

First. The people who buried their dead in the singular stone graves in Tennessee, were intimately connected with, or were of the same nation as, those whose dead were buried in the mounds and cemeteries in Missouri, Arkansas and Illinois, and who made the pottery of which such a large amount has been taken from the burial places in those states. This is shown by the similarity of the crania, by the identity in material, patterns, and finish of the pottery, and by the shell carvings, etc.

Second. This people sometimes buried the dead in cemeteries extending over large areas, and sometimes in mounds, but always, in this section of Tennessee, in graves made by placing slabs of stone so as to form a well made stone cist or coffin. The burial mounds are here formed by the accumulation of these stone graves in irregular tiers.

Third. What have been called the graves of pygmies, as already shown by others, especially by Professor Jones, are simply

the graves of children, or of persons whose bones have been removed from a former grave and re-buried in a small grave.

Fourth. The examination of the mounds at Greenwood, near Lebanon, which were inside an earth embankment enclosing an area of several acres, proves conclusively that in this case (and by inference in all other similar earthworks of which several have been described in the state), the earthwork with its ditch was the remnant of a protecting wall about a village, inside which the houses of the people were built, and their dead buried. Also that the large mounds similar to the one in this enclosure (which is 15 feet high by about 150 feet in diameter) were for some purpose other than that of burial; possibly connected with the religious rites or superstitions of the people, or the erection of a particular building, as shown by the fact that before this large mound was erected a very extensive fire had been built upon the surface, over which the mound was raised; while the remains of burnt bones and other evidences of a feast were apparent: also from the remains of a stake of red cedar. Again, after the mound had been erected to the height of seven feet, another similar and extensive fire had existed, leaving the same evidences of burnt bones, etc., with the addition of burnt corn-cobs. The mound had then been completed, and my removal of probably about one-third of it did not reveal any evidence of its having been used for burial or for an ordinary dwelling, though it is very likely to have been the location of some important building, and the extensive fires, which had twice nearly covered its whole area, might have been owing to the destruction of such a building by fire.

Fifth. The houses of the people were circular in outline, from fifteen to forty feet in diameter, and probably made entirely of poles covered with mud, mats or skins, as their decay has left simply a ring of rich black earth, mixed with refuse consisting of bones, broken pottery, etc.

Sixth. In the Greenwood enclosure the children were always buried within the house, while the graves of the adults were together, forming a low mound.

Seventh. This nation, known as the Stone Grave people in Tennessee, and the Mound Builders in Missouri, were advanced in the primitive arts, and probably cultivated the land to some extent. Of all the people of America, east of the region of the Pueblo race of New Mexico, they were the farthest advanced in the ceramic

art, and were good workers in and carvers of stone and shell. Judging by their earthworks, they were not so numerous a people as the Mound Builders of the Ohio valley. Judged by their works in pottery, their carvings in shell and stone, and their chipped implements of stone, they were in a period of development corresponding with that of their neighbors on the Ohio. They did not burn their dead, as was undoubtedly the custom to some extent among the Ohio Mound Builders. They were workers in copper which they must have obtained by trade or by long excursions. They also had shells from the Gulf or southeastern coast, and used them very extensively in the manufacture of beads and ornaments. They also understood the method of perforating pearls, of which seven were found in the grave of a child. To their children they were evidently attached, as exemplified by the care with which they were buried within the house, and the value of the articles placed with them.

Eighth. The Stone Grave people of Tennessee, judging by the entire absence of articles of European make in the hundreds of graves that have been opened, never came in contact with the white man.

The people may have been the ancestors of some of the numerous Southern nations that existed at the time of the discovery of the country; as suggested by the similarity in the customs given in the early accounts of the Southern tribes having a similar geographical distribution, further than this there is nothing by which to prove the identity of the Stone Grave people with any of the Southern tribes known to history, though it is probable that in some of them their descendants existed.

In concluding this report I have the pleasure of presenting a second paper of the important series on the Ancient Mexicans, by Mr. Bandelier.

Respectfully submitted,

F. W. PUTNAM,

Curator Peabody Museum.

CAMBRIDGE, MASS., Feb. 18, 1878.

ADDITIONS TO THE MUSEUM AND LIBRARY FOR THE YEAR 1877.

Additions to the Museum.

11075. Necklace of a medicine man from Alaska.—Collected by Lieut. BELKNAP, U. S. N., and presented by Prof. CHARLES E. MUNROE, Annapolis, Md.

11076. Coat of chain armor from Japan.—Collected by Mr. JOSEPH HECO, of Hiogo, Japan, and presented by Mr. THOMAS G. CARY, Cambridge, Mass.

11077. Stone axe found near the old Fort on Putnam Avenue, Cambridge.—Presented by Mr. THOMAS G. CARY, Cambridge, Mass.

11078. Fragments of crania from the banks of the Tennessee River near Chattanooga, Tenn.—Collected and presented by Mr. F. A. STRATTON, Chattanooga.

11079. An animal shaped stone pan, usually called "Metate," from a grave in Chiriqui, Panama. This pan is perfectly horizontal, stands upon four animal shaped legs, is 117^{mm}. high, and to it is attached the head and tail representing a panther. The legs, head and tail, which is curved over and joined to the right hind foot, are all ornamented with geometrical figures and dots. The outside of the four upright sides of the pan or body of the animal is similarly ornamented. The pan itself is a parallelogram 214^{mm}. long, 185 broad, and 20 deep at the centre. The sides are thin at the top, wider towards the base and gradually curve into the bottom which deepens towards the centre.—Collected and presented by Commodore FOXHALL A. PARKER, U. S. Navy.

11080. Human head, carved from dolerite and covered with two coats of paint, the inner one red and the outer, black. The figure represents the head and neck of a man, and around it the skin of a puma, or "American lion" is so arranged that the upper jaw of the animal rests on the forehead of the human face. A pendant hangs from the top of the head down to the shoulder just behind the left ear.[1]—Found in a cave near Acapulco, by Dr. SHARP, about 1856, and presented by Commodore FOXHALL A. PARKER, U. S. Navy.

11081—11082. Chinese calculating machine and a set of Japanese chessmen, with a book of games.—Collected and presented by Mr. THOMAS G. CARY, Cambridge.

[1] This interesting sculpture has been described by the Curator in the Bulletin of the Essex Institute for 1877.

11083—11193. A collection of coins and medals from China, Corea and Japan, but chiefly from the former country. They were issued at various dates and under different dynasties, ranging from the 3d century B. C. under the Han Dynasty, to that of Ta Sing in the year 1850 of the Christian era. The inscriptions on some of the Temple Medals are expressive; for instance, on one we find the legend "Drive off evil thoughts," on another "Peace and Tranquility, together enjoy."—Collected by WILLIAM C. HUNTER of Canton, China, and presented by Mr. PERCIVAL L. EVERETT, Boston, Mass.

11194—11246. A collection of pottery from the mounds in southeastern Missouri, consisting of most of the well-known forms that have given to the pottery of that region its distinctive character. Many of these were figured and fully described in the Eighth Report of the Museum, to which the reader is referred.—By PURCHASE.

11247—11248. Rude stone implements and specimens of natural fracture from the gravel near Trenton, N. J —Collected and presented by Dr. C. C. ABBOTT, Trenton, N. J.

11249—11250. Human cranium and bones found with it, probably Indian, from a grave at Peter's Falls, West Andover, Mass.—By PURCHASE.

11251. Photograph of the foot of a Chinese lady, artificially deformed. —Presented by Col. THEODORE LYMAN, Boston.

11252. Human cranium from a mound near Lynxville, Wisconsin.—Collected by Judge SAMUEL MURDOCK and presented by Mr. B. W. PUTNAM, Jamaica Plain, Mass.

11253—11261. A drum, models of *baidarkas* with one and three holes, *parka* of reindeer skin, fur coats, with and without hoods, boots of seal skin, a throwing stick and a spear, all from the Pribiloff Islands.—By PURCHASE.

11262—11263. A wooden mask from British Columbia and stone arrowheads from Cotuit, Mass.—Presented by Mr. HOLMES HINCKLEY, Boston, Mass.

11264—11266. Rude stone implements from the gravel of New Jersey. —Collected and presented by Dr. C. C. ABBOTT, Trenton, N. J.

11267. Sketches of the methods of silk production, from China.—Presented by Mr. THOMAS G. CARY, Cambridge, Mass.

11268—11278. Hammerstone, muller, grooved stone axe and fragments of ornamented pottery from Cumberland Gap, Tennessee; pyrites and mica from an Indian grave, stone lined, in Lee County, Va., collected by Mr. CHARLES B. JOHNSON, of Gibson's Station, Lee County, Virginia; burnt bones, flint chips and broken arrowheads and a hammerstone from Turner's Mound, Bell Co., Ky.; fragment of a tube of steatite from Claiborne Co., Tennessee.—Explorations of Mr. LUCIEN CARR, conducted for the Museum.

11279—11280. Rude stone implements from the New Jersey gravel.—Collected and presented by Dr. C. C ABBOTT, Trenton, N. J.

11281. Stone implement from Newburyport, Mass.—Collected and presented by Mr. ALFRED OSGOOD, Newburyport.

11282. Photographs of the "Gass Tablets," the originals of which were

found by the Rev. J. Gass in a mound near Davenport, Iowa.—By PURCHASE.

11283. A mummied fish, *Muræna flavomarginata* Rüppell, from Egypt. —Presented by Dr. JOHN DIXWELL, Boston, Mass.

11284—11321. Rude stone implements from the gravel; stone arrowheads, spearpoints, knives, drills, scrapers, sinkers, chips and unfinished implements from the surface near Trenton, N. J.—Collected and presented by Dr. C. C. ABBOTT, Trenton.

11322—11333. Stone arrowheads, spearpoints and knives, a perforated stone, and a stone tube, probably a pipe, from Lawrence, Mass.; a metal button found with cranium No. 11249, at Peter's Falls, West Andover, Mass.; an Indian pipe made of wood, from the Rocky Mountains.—By PURCHASE.

11334—11337. Four human bodies from Ancon, Peru.—Collected in 1875 by Mr. S. W. GARMAN and presented by Mr. ALEXANDER AGASSIZ, Cambridge, Mass.

11338—11361. Calvaria and human bones from Haunted Cave, Edmonson Co., Ky., from rock house near Hardinsburgh, Ky., and from mound in Bell Co., Ky.; fragments of pottery, stone flakes and arrowheads from the banks of the Ohio River.—Collected by Prof. N. S. SHALER and LUCIEN CARR, and deposited by the KENTUCKY GEOLOGICAL SURVEY, N. S. SHALER, Director.

11362—11376. Fragments of crania and pottery and shells from caves in Lee County, Virginia, and Claiborne County, Tennessee; fragment of copper band, from a grave near Gibson's Station, Lee County, Va., collected by Mr. CHARLES B. JOHNSON of that place; fragment of cranium showing three fractures from Haunted Cave, Edmonson County, Ky.; stone arrowhead and animal bones from a mound in Bell Co., Ky.; a worked bone somewhat charred, and a flint arrowhead from near Pleasant Hill, Ky., collected by Miss PAULINA BRYANT of that place.—Explorations of Mr. LUCIEN CARR, conducted for the Museum.

11377—11378. Charred Indian corn and a piece of the antler of a deer from the Ely mound, near Rose Hill, Lee Co., Va.—Collected by Mr. WM. P. BALES and presented by the Rev. S. B. Campbell of that place.

11379—11383. Sketches of scenes in Tokio, of wrestlers, fishes, birds, flowers and animals from Japan.—Collected by Mr. JOSEPH HECO and presented by the MUSEUM OF COMPARATIVE ZOOLOGY, Cambridge, Mass.

11384—11387. Sketches of hawking, of foreigners and their customs, and of different subjects and scenes, some colored, from Japan.—Collected by Mr. JOSEPH HECO, of Hiogo, Japan and presented by Mr. THOMAS G. CARY, Cambridge, Mass.

11388. Rude stone implement from the New Jersey gravel.—From explorations conducted for the Museum, by Dr. C. C. ABBOTT.

11389—11450. Earthen pots for cooking and fragments of pottery, plain and ornamented, some in colors; stone drills, celts, scrapers, arrowheads, spearpoints, disks, pestles and metates; hammer and slickstones and a rude stone axe, with chips and unfinished implements also of stone;

chips and cores of obsidian, and bone awls, from a mound near St. George, Utah; specimen of salt from a mine one hundred miles south of St. George, worked by the Pah-Ute Indians; seeds and plants used as food, or medicine, or in the domestic arts by the same Indians.—Explorations of Dr. E. PALMER, conducted for the Museum.

11451. Fragment of a carved stone from Newburyport, Mass.—Collected and presented by Mr. NATHANIEL LITTLE of that place.

11452. Skull of a Yankton Sioux Indian.—Presented by the ARMY MEDICAL MUSEUM, Washington.

11453—11462. Hammerstones, flat, round, and oval; spearpoints, arrowheads and scrapers of stone from Reading, Penn.—Collected and presented by Mr. A. F. BERLIN, Reading, Pa.

11463—11465. Grooved stone axes and a stone knife from Maryland.—Collected and presented by Prof. CHARLES E. MUNROE, Annapolis, Md.

11466. Photograph of stone implements.—Presented by Mr. H. L. ELLIG, Lebanon Co., Penn.

11467. Photograph of a cranium, imperfect, from a mound near Iowa City, Iowa.—Presented by Prof. FRANCIS E. NIPHER, St. Louis, Mo.

11468. Six grooved stone hammers from Ontonagon, Lake Superior.—Presented by Mr. ALEXANDER AGASSIZ, Cambridge, Mass.

11469—11484. Stone disks, one of them bi-concave and 86 mm. thick; hammerstones, oval and round, with and without finger pits; stone muller, pestle and celts, and one small grooved stone from Marion Co., Tenn.; stone hoe and piece of hematite from Jackson Co., Alabama.—By PURCHASE.

11485—11486. Stone pipe with animal head carved on it, and a carved and perforated polished stone ornament from Bales' Mills, Lee County, Va.—Collected and presented by Mr. J. H. BALES, Bales' Mills, Va.

11487—11505.—Fragments of pottery; bone awls; stone muller, disks, knives, arrowheads, and spearpoints of different patterns from Lee County, Virginia.—Collected and presented by Mr. CHARLES B. JOHNSON, Gibson's Station, Lee County, Va.

11506—11535.—Grooved axes of stone and hematite; stone celts, disks, hoes, scrapers, drills, spearpoints and arrowheads from Gasconade County, Missouri.—By PURCHASE.

11536. Small earthen cone, perforated, found in Athens, Greece, near the old wall.—Collected and presented by Prof. CLEMENT L. SMITH, Cambridge, Mass.

11537—11611. Large oval flint implements found, in a deposit with one thousand others, while digging a cellar on Main St., Beardstown, Illinois, and described by Dr. J. F. SNYDER, in "Report of the Smithsonian Institution" for 1876, p. 438; rude stone implement from the gravel; grooved stone axes; celts, pestles, hammerstones, round and oval, slickstones, hoes, drills, knives, scrapers, arrowheads and spearpoints from the surface near Trenton, N. J.; fish spears from Croswell's creek, Burlington Co., N. J.; human face carved on stone from an Indian burial ground near Vincentown, Ocean Co., N. J.; rude flint implements from Jeffersonville,

Indiana, collected by Mr. ORLANDO HOBBS; rude flint spearpoint, one of a deposit of forty, found three feet below the surface in Isle of Wight County, Va., by Mr. C. B. HAYDEN, of that county.— Presented by Dr. C. C. ABBOTT of Trenton, New Jersey.

11612—11619. Rude and broken stone implements from Reading, Pa.; Indian corn, a spindle, ball of thread, and a wooden implement from graves at Ancon, Peru.— Presented by A. F. BERLIN, Reading, Pa.

11620—11623. Three grooved stone axes and a stone celt from Brookville, Indiana.— Presented by Dr. JOHN DIXWELL, Boston, Mass.

11624—11659. War club, snow shoes, necklace of beads and bear claws, an iron tomahawk, and a pipe of the modern Indians; sash from Mexico; necklace of beetle's wings from Brazil; clubs from Guiana, S. America; clubs, paddles, spears, shark's tooth dagger, stone axe mounted, the handle exquisitely carved, and other articles, also ornamented, from South Sea Islands; boomerang and waddy from Australia; bow and iron pointed arrows from China; Ghoorka "kookery" from Hindostan; Malay Creese; wooden pillow, knob kerrie, necklace of beads, and needle with leather sheath or case probably from Africa; water jar from the Western Islands, bow and wooden pointed arrows probably from the Pacific Islands. — Presented by Mrs. JOHN DIXWELL, Boston, Mass.

11660 — 11691. Earthen burial vases and toys made of same pattern; earthen bowls and vases of different colored clays, ornamented in colors, some with grotesque human faces; fragments of pottery; broken stone implements, and beads of shell, pottery and jade, etc. from Omotepec Island, Lake Nicaragua.— Collected by Dr. Bransford, U. S. Navy, and presented by the SMITHSONIAN INSTITUTION.

11692. Tappa Cloth from Pitcairn's Island.—Collected by Capt. J. S. KNOWLES, of San Francisco, and presented by Mrs. LUCIEN CARR, Cambridge.

11693 — 11700. Eight earthen jars, some in human form and others with animal and human heads only, from the burial places in southeastern Missouri.— By PURCHASE.

11701. Bowl ornamented with red and black bands, made in the interior of Mexico, about ninety leagues from Acapulco.— Presented by Prof. O. C. MARSH, New Haven.

11702 — 11703. Stone arrowheads from Longwood, Fanquier County, Virginia.— Collected by Miss SALLIE HOOE and presented by Mr. HUGH THOMAS DOUGLAS, Catletts Station, Va.

11704 — 11709. Ponchos, scarf and blankets made from the fleece of the vicuna, alpaca and common sheep, by the modern Aymara Indians, near Puno, Peru.— By PURCHASE.

11710 — 11763.— Stone pipe on which is carved the likeness of an animal and human figures, from Rockford, Illinois, collected by Mr. F. W. KIMBALL, of that place; polished slick stone, six stone celts, and five grooved stone axes, one of them very small and one highly polished; hammerstones grooved and plain, round and oval, with and without finger pits; stone mullers, pestles, spearpoints, scrapers, knives, arrowheads,

chips and cores and implements, or worked stones of unknown use, some perforated; an unfinished carved stone, bird shape; rude stone implements from the talus at the foot of the gravel bluff; fragments of pottery and two earthen pots of the same kind of clay and general style of workmanship as those found in the mounds of southeastern Missouri, all from Trenton, N. J.— From researches conducted for the Museum, by Dr. C. C. ABBOTT.

11764—11770. Grooved stone axe; fragment of a pipestem of clay; stone arrowheads, spearpoints and broken and unfinished implements of same material from Trenton, N. J.— Collected and presented by Master RICHARD M. ABBOTT of Trenton, N. J.

11771—11793. Arrowhead and broken implements of stone; stone celt, disk, and worked stones, some polished, some grooved and others perforated; a piece of worked coal, fragments of pottery, columella of shell, bone implements, and a small stone pipe from the banks of the Tennessee River; arrowheads, spearpoints and knives of flint from Cherokee Co., N. C.— By PURCHASE.

11794 — 11795. Discoidal stone from a mound near Carthage, Alabama, found in an earthen pot now preserved in the National Museum at Washington and a plummet-shaped implement also from a mound in Alabama. — Collected and presented by Prof. N. T. LUPTON, of Nashville, Tenn.

11796. A small ball of hematite, from Tennessee.— Presented by the Editors of the Nashville American.

11797 — 11800. Flint knife; perforated shell, and shell beads.—Collected by Mr. E. Curtiss, from a cave on the Cumberland River, and presented by Gen. G. P. THRUSTON, Nashville, Tennessee.

11801 — Ornamented shell disk with scalloped edges from Nashville, Tennessee.— Collected and presented by Col. J. D. MORGAN of that city.

11802 — 11803. Fragment of pottery, and a spearpoint of flint from Falls of the Ohio.— Collected and presented by R. S. ROBERTSON, Esq., Fort Wayne, Indiana.

11804. Small implement of hematite, hemispherical in shape, Nashville, Tennessee, near Love Mound.— Collected and presented by Mr. THOMAS B. BALLOU, Nashville.

11805 — 11807. Scraper, spearpoint and knife of flint from Lebanon, Tennessee.— Collected and presented by Mr. STEPHEN SIMMS, Lebanon.

11808—11813. Earthen pot with two handles, animal bones, shell of Busycon, fragments of pottery and human cranium from a cave near Rome, Tenn.— Collected and presented by Dr. J. L. THOMPSON, Lebanon, Tenn.

11814. Skull of a Comanche Indian.— Presented by Dr. T. O. SUMMERS, Nashville, Tenn.

11815 — 11816. Skull and a stone celt from Mr. Overton's Farm, six miles from Nashville, Tennessee.— Presented by Mrs. JOHN M. OVERTON, of that city.

11817 — 11819. Shell disk, arrowhead of flint, and a discoidal stone of quartz, from a stone grave on Mr. Overton's Farm, six miles from Nashville, Tenn.— Collected and presented by Mr. EDWARD CROSS, Nashville.

11820 — 11823. Skull, fragment of pottery and stone knife, drill, scraper and arrowheads from a field near Love Mound, near Nashville, Tenn.— Collected and presented by Major J. H. COCHRANE, Nashville, Tenn.

11824. Skull from stone graves on the site of Fort Zollicoffer, Nashville, Tenn.— Collected and presented by R. S. ROBERTSON, Esq., Fort Wayne, Indiana.

11825 — 11828. Fragments of crania and an under jaw, shells and pieces of pottery from stone graves on the site of Fort Zollicoffer, Nashville, Tenn.— Collected and presented by Mr. H. N. RUST, Chicago, Ill.

11829—12102. Collection of human remains, pottery, implements and ornaments of stone, bone, shell, etc., etc., from mounds and stone graves in Tennessee.—Explorations of the Curator, for the details of which see special report.

12103—12277. A collection of articles in use among the Pah Ute Indians, including hair brush; rabbit net and sticks used in stretching it; a cradle board; water jar made of basket work and lined with pine gum; baskets of different shapes and patterns, some of them in the form of bowls are water tight and used in cooking, others with fans attached are worn on the back and used in gathering seeds; hats and sandals of the same material; paint, bows, and arrows with wooden, stone and iron points; metates and grinding stones; earthen cooking pots; a bed made of strips of juniper bark; spoon made of horn; and seeds and plants used as food or medicine. An earthen pot filled with strings; cooking stone, corn cobs, pine nuts and roasted agave, fragments of pottery, small earthen jug, small basket and a shovel made from the horn of a mountain sheep and mounted on a long wooden handle from a cave near Johnson, Kane County, Utah; earthen bowls of colored pottery and fragments and disks of the same; bone awl; red, white and yellow paint; shell ornament; arrowheads of chalcedony; obsidian cores and chips; animal and human bones; metate; plain earthen cooking pot, from mound near St. George, Southern Utah; earthen pots and bowls, said to have been found south of Santa Fé, New Mexico, purchased from Mr. J. L. BARFOOT, Salt Lake City; also a collection from mounds at Paragoonah and Payson, Utah. —Explorations of Dr. E. PALMER, conducted for the Museum.[2]

12278. Stone celt from Davidson County, Tennessee.— Presented by Mr. CLARENCE L. GODSHALL, Nashville.

12279. Stone mask from Palenque, Yucatan.— Collected by Hon. J. R. POINSETT and presented by AMERICAN ACADEMY OF ARTS AND SCIENCES, Boston.

[2] In his notes on this collection Dr. Palmer says: "The Pah Ute Indians of to-day no longer make any pottery. Some time since I persuaded an old squaw to reproduce from memory a cooking pot (Museum No. 9448) such as was formerly manufactured and in use among them, and forwarded it to you. By comparing it with No. 12131 (of which it is a feeble imitation in miniature), you will see how very inferior it is in quality and workmanship, thus showing how soon former arts are forgotten when once they have ceased to be of daily practice."

12280. An inscribed stone from near Quishaurani, Peru.—Collected and presented by Mr. EDWARD A. FLINT, Boston.

12281. Rude implement from the gravel on Decou's farm near Trenton, N. J.—Collected and presented by Dr. C. C. ABBOTT.

12282—12283. Clubs made of grooved stones, with handles attached, Modern Sioux Indian.—Collected and presented by Mr. J. A. ALLEN, Cambridge, Mass.

12284. Fan from the Hawaian Islands.—Collected and presented by Mr. J. Q. A. JOHNSON, of Cambridge, Mass.

12285—12286. Scraper and broken implements of flint from Sedalia, Missouri.—Collected by Mr. F. A. SAMPSON and presented by Dr. C. C. ABBOTT, Trenton, N. J.

12287—12294. Stone celts from Swanton, Vt., shell and copper beads from Highgate, Vt., collected by the late Prof. J. B. PERRY; stone implements from Ceara, Brazil.—Presented by the MUSEUM OF COMPARATIVE ZOOLOGY, Cambridge.

12295—12347. Skulls, earthen pot and stone pipe from Bell's Bend, Davidson Co., Tennessee; skulls and human and animal bones; earthen pots, dishes and jars, ornamented and plain, similar to those found in the mounds and burial places of southeastern Missouri; shell spoon; discoidal, sharpening and hammerstones, stone celts, arrowheads and spearpoints; burnt clay and charred bones from grave mounds on Miss Bowling's farm near Nashville, Tenn.—Collected by Mr. E. CURTISS in continuation of the explorations of the Curator for the Museum.

12348. Perforated stone-weight for digging stick from Central America. —Presented by Mr. S. W. GARMAN, of Cambridge.

12349—12354. Two skulls of Indians and other human bones, bone implement and animal bones from shellheap on Great Deer Isle, Maine. —Collected and presented by Mr. MANLY HARDY, Brewer, Maine.

12355—12359. Photographs of arrowheads and bowls of stone from N. America, and of Indian picture writing, or rock inscriptions at Bellows Falls and Brattleboro.—Presented by Prof. E. HITCHCOCK, Amherst, Mass.

12360—12388. Collection of typical pottery from the mounds in southeastern Missouri.—By PURCHASE.

12389. Native copper from the Calumet and Hecla Mine, Lake Superior.—Presented by Mr. ALEXANDER AGASSIZ, of Cambridge.

12390—12796. A collection from the fresh-water shellheaps and mounds of Florida. This collection is of special interest as it is that upon which is based Professor J. WYMAN'S important memoir upon the "Fresh-water Shellheaps of the St. John's River," to which the reader is referred. It was made almost entirely by himself during his visits to Florida in the years 1869-1875; and at the time of his death he was engaged in preparing it for entry in the catalogue of the Museum.

12797—12825. Crania and human bones; shell and stone implements; earthen jars and vases from graves on T. F. Wilkinson's farm near Nashville, Tennessee.—Collected by Mr. E. CURTISS in continuation of the explorations conducted for the Museum by the Curator.

12826. Flint dagger 234 mm. long from a stone grave in a burial mound on Mr. T. F. Wilkinson's farm on Mill Creek, nine miles from Nashville, Tenn.—Collected and presented by Mr. JOHN B. EDMONSON, Nashville.

12827—12861. Rude stone implements from the gravel; stone arrowheads, spearpoints, knives, scrapers, celts, grooved stone axes, and round and oval hammerstones from the surface; perforated stone ornaments, human face carved on stone and fragments of pottery, from the surface near Trenton, New Jersey.—Explorations of Dr. C. C. ABBOTT conducted for the Museum.

12862. Rude stone implements from a cave near Beirut, Syria.—Collected and presented by the Rev. SELAH MERRILL, Andover, Mass.

12863. Human face in pottery from Guayaquil.—Collected and presented by Mr. S. W. GARMAN, Cambridge.

12864. Three photographs of Pelew Islanders.—Presented by Prof. CARL SEMPER, Wurtzburg, Germany.

12865. Three photographs of palæolithic implements.—Presented by Mr. R. P. GREG of Coles, Buntingford, Herts, England.

12866. Ten photographs of the Chinese Department in the Centennial Exhibition at Philadelphia.—Presented by Hon. FRANCIS P. KNIGHT, of the Chinese Commission, Pekin.

12867. Figure of grotesque animal from a temple outside of Pekin.—Collected by Hon. FRANCIS P. KNIGHT, of Pekin, and presented by Mr. THOMAS G. CARY, Cambridge.

12868. Fragment of an Indian belt, ornamented with copper, from a grave at Harpswell, Maine.—Collected and presented by Dr. E. PALMER.

12869. Double stone mortar from Taunton, Mass.—Collected by Dr. A. WOOD of that place, and presented by Prof. J. B. S. JACKSON, Boston.

12870. Earthen cup, from a grave on Mr. T. F. WILKINSON'S farm near Nashville, Tenn.—Collected by Mr. E. CURTISS, in continuation of explorations for the Museum, conducted by the Curator.

12871. Five photographs of skulls found in a mound near Urbana, Ohio.—Collected and presented by THOMAS F. MOSES, Cor. Sec. of the Central Ohio Scientific Association.

12872—12878. Stone arrowheads, knives, spearpoints, and rude implements, also a broken stone celt from Lancaster County, Pennsylvania, collected by Mr. EDWARD HULSE.—Presented by Dr. C. C. ABBOTT, Trenton, N. J.

12879—12888. Fragments of pottery, stone knives, drills, arrowheads and spearpoints from the banks of Tar River, N. C.—Collected and presented by Mr. W. R. CABOT, Brookline, Mass.

12889. Shell beads (*Olivella biplicata*) from California.—Collected by Rev. S. BOWERS, and presented by Mr. E. A. BARBER, West Chester, Pa.

12890—12894. Casts of human heads carved in stone, from Ohio and Greenup County, Kentucky; of a grooved axe from West Virginia; of a biconcave stone, from Indiana and of a perforated and carved cylindrical stone, found near Maysville, Ky.—Presented by Dr. H. H. HILL, of Cincinnati, Ohio.

12895—12944. A collection of earthen jars, vases, cups, bottles, etc., from the mounds and burial places in southeastern Missouri; also three specimens of similar workmanship from northeastern Arkansas.—By PURCHASE.

12945—13003. Tobacco from Japan, collected by Commodore PERRY; fruits, vegetables, seeds, etc., used as food or medicine, or worn as ornaments by the Indians in Southern Utah, California, New Mexico, Alaska and the Plains.—Collected by Major J. W. POWELL, Dr. E. PALMER, Governor ARNY, General EWING, Mr. V. COLYER, Mr. L. STONE, Rev. S. BOWERS, Mr. J. G. SWAN and Mr. J. B. MENTEITH.—Presented by the SMITHSONIAN INSTITUTION.

13004—13012. Stone spearpoints, a sinker, celt, gouge and arrowheads of stone from Lynn and Ipswich, Mass., and a perforated stone implement from the latter place.—By PURCHASE.

13013. Earthen tazza from near Cumæ, Italy.—Presented by Dr. IGNAZIO CERI, Capri, Italy.

13014. Skull and lower jaw, the former showing bullet holes, from Tennessee.—By PURCHASE.

13015—13033. Bones of animals, implements of teeth and horn, and fragments of pottery, plain, cord marked, incised and punched and two specimens colored with cinnabar, from a shellheap in Japan.—Collected by Prof. E. S. MORSE AND PARTY and presented by the IMPERIAL UNIVERSITY OF TOKIO.

13034. Malay dagger.—Collected by Capt. CHARLES S. HUNTINGTON and presented by HENRY W. DANIELL, Esq., Boston.

13035. Cast of a carving in stone representing a combination of an animal and human head and a beetle, from the original found near Canajoharie, New York.—Presented by Mr. A. G. RICHMOND of that place.

13036. Cast of a "Phallus" found in a mound on Clinch River, East Tennessee.—Presented by R. S. ROBERTSON, Esq., Fort Wayne, Ind.

13037—13115. A collection from an ancient cemetery on the Bay of Chacota, one and a half miles south of Arica, Peru, consisting of several "mummies," and the articles found buried with them. This collection was made in 1836 by Mr. JOHN H. BLAKE, of Boston, Mass., and is elsewhere described in a special report by that gentleman.—Presented by JOHN H. BLAKE, Esq., Boston.

13116—13565. A number of human skeletons and a large and valuable collection of implements and ornaments of stone, bone and shell, of native manufacture; also glass beads of different patterns, and implements and ornaments of iron, brass, etc., evidently obtained from Europeans; all from burial places on the Islands of San Clemente and Santa Catalina, off the southern coast of California.—Explorations of Mr. PAUL SCHUMACHER, conducted for the Museum.

13566—13847. A similar collection from the Santa Barbara Islands and the main land, made by Messrs. SCHUMACHER and BOWERS, and also by Lt. WHEELER'S party.—Partly in connection with the joint explorations conducted for the Museum and the Smithsonian Institutions. Received from the SMITHSONIAN INSTITUTION.

13848—13910. Plaster casts of the heads of sixty-three Indian and Mexican captives, made by Mr. CLARK MILLS for the Museum in connection with the Smithsonian Institution.

13911—13930. Arrowheads, mullers, hammerstones, gouges, axes, celts, and plumet-shaped implements of stone, and fragments of pottery from Ohio; a carved stone, and fragments of pottery representing human faces from near Evansville, Indiana (the "Unsicker" collection).—Presented by the late Prof. JEFFRIES WYMAN.

13931—13935. Paper money, copper, silver and tin coins, used by the Russians in Alaska.—By PURCHASE.

Additions to the Library.

From the Hon. Robert C. Winthrop. Popular Science Monthly from May, 1872, to April, 1874. 4 vols., 8vo. North American Stone Implements, and Ancient Aboriginal Trade in North America. 2 pamphlets, 8vo, by Charles Rau. Mémoires de la Société Royale des Antiquaires du Nord. Nouvelle série, 1875–1876. 1 vol., 8vo. Aarboger for Nordisk old kyndighed og Historie, udgivne af det Kongelige Nordiske Oldskrift-selskab. Parts 1, 2, 3, 4, of 1875, and 1, 2, 3, 4, of 1876. Two vols., 8vo.

From the Author. Increase Allen Lapham—a Memorial read before the Wisconsin Natural History Society, by Charles Mann. Pamphlet, 8vo, 21 pp.

From the Academy of Natural Sciences, Davenport, Iowa. Lithographic copies of engraved stones, known as "the Gass Tablets," with an account of the circumstances under which the originals were found in a mound near Davenport, Iowa.

From the Society. Sitzungsberichte der Alterthumsgesellschaft Prussia Zu Königsberg in Pr. for the years 1874-1875 and 1875-1876. 2 pamphlets, 12mo. Preussische Steingeräthe auf fünf Tafeln photographirt von Hermann Prothman, als Beitrag Zur Archäologie Altpreussens herausgegeben und erläutert von Dr. Georg Bujack Z. Z. vorsitzender der Prussia. Pamphlet, 11 pp., 8vo, with 5 plates.

From the Author. Prehistoric Wisconsin, and the Westphalian Medal —1648, by Prof. James D. Butler. Pamphlet, 8vo, 31 pp.

From the Society. Proceedings of the Literary and Philosophical Society of Liverpool, during the sixty-fifth session, 1875-76, No. XXX. 1 vol. 8vo, pp. 302. London and Liverpool, 1876.

From the Museum. Noticia Historico-descriptiva del Museo Arqueologico Nacional publicada siendo director del Mismo El excmo, senor Don Antonio Garcia Gutierrez. Madrid, 1876. 1 vol., 8vo, pp. 210.

From Gen'l A. A. Humphrey, Chief of Engineers, U. S. Army. Annual Report upon the Geographical Surveys west of the one hundredth Meridian, in California, Nevada, Utah, etc., etc., by George M. Wheeler, First Lieutenant of Engineers, U. S. Army. 1 vol., 8vo, pp. 355. Washington, 1876.

From the Department of the Interior. Invertebrate Fossils by F. B. Meek,

and Geometrid Moths by A. S. Packard, being Vols. IX and X of the United States Geological Survey of the Territories, F. V. Hayden, Geologist in charge. 2 vols., 4to, Washington, 1876. Bulletin of the United States Geological and Geographical Survey of the Territories. Vol. III, Nos. 1 and 2. Bulletin No. 1 of the United States Entomological Commission, "Destruction of the Young or unfledged Locusts."

From the Society. Archivio per l'Antropologia e la Etnologia, organo della Societa Italiana di Antropologia e di Etnologia publicato dal Dott. Paolo Mantegazza, Professore ordinario di Antropologia Nel. R. Instituto Superiore in Firenze. Fascicoli 3 and 4, Vol. VI, and Fascicoli 1, 2, 3 and 4, Vol. VII.

From the Author. The Report of the Council of the American Antiquarian Society, made Oct. 21st, 1875, at Worcester; Proceedings of the Centennial Celebration, at Groton, Mass. 2 pamphlets, 8vo, by Samuel A. Green, M. D.

From Dr. Samuel A. Green. Report of a Medical Commission on the Sanitary Condition of Boston. Pamphlet, 8vo, 199 pp., Boston, 1875.

From the Author. Stone Age of New Jersey, by Charles C. Abbott, M.D., Trenton, N. J. 1 vol., 8vo, 144 pp., with plates.

From the Author. Researches in Prehistoric and Protohistoric Comparative Philology, Mythology and Archæology, in connection with the Origin of Culture in America and the Accad or Sumerian Families, by Hyde Clarke. Pamphlet, 8vo, pp. 74. London, 1875.

From the Museum. Seventh Annual Report of the Trustees of the Metropolitan Museum of Art, New York, 1877. Pamphlet, 8vo, 47 pp.

From the Society. Beiträge Zur Anthropologie und Urgeschichte Bayerns, organ der Münchener Gesellschaft für Anthropologie, Ethnologie und Urgeschichte. 1 Band, 1, 2, 3 ur 4 Heft. München, 1876-1877.

From Dr. John Dixwell of Boston. Découverte d'un Squelette humain de L'Époque paléolithique dans les cavernes des Baoussé-Roussé dites Grottes de Menton par Émile Rivière. Paris, 1875. Pamphlet, 4to, pp. 64, photographic plates.

From the Author. The Rockford Tablet, by J. D. Moody, Mendota, Ill. Pamphlet, 8vo, pp. 5.

From the Author. Fugitive Essays, by Col. Charles Whittlesey, of Cleveland, Ohio. 40 pamphlets, 8vo.

From Colonel Charles Whittlesey. History of the 20th Ohio N. V. Infantry, from 1861 to 1865, by D. W. Wood. Mount Vernon, Ohio. Pamphlet, 8vo, 70 pp. Tracts 1 to 36, read before the Western Reserve and Northern Ohio Historical Society, 1870-1877. 1 vol., 8 vo. Proceedings of the Cleveland Academy of Natural Science, 1845 to 1859. 1 vol., 8vo, pp. 295. Published by a gentleman of Cleveland, 1874.

From Count L. F. Pourtales. Catalago N. 1. Raccolta degli Oggetti de cosi detti tempi preistorici compilato da Igino Cocchi. Firenze, 1872. Pamphlet, 8vo, pp. 102, with IX Lithographic Plates.

From the Author. On some Fragments of Pottery from Vermont, by George H. Perkins. Pamphlet, 8vo, pp. 11.

From the Museum. Verzeichniss der im Museum Godeffroy verhandenen Ethnographischen Gegenstände. Pamphlet, 29 pp., 8vo. Hamburg, Sept., 1876.

From Charles H. Hart, Esq. Proceedings of the Numismatic and Antiquarian Society of Philadelphia, from May, 1865, to Dec., 1866. Pamphlet, 8vo, pp. 160.

From the Smithsonian Institution. Annual Report for the year 1876. 1 vol., 8vo, pp. 488. Exploration of the Aboriginal Remains of Tennessee, by Joseph Jones. 1 vol., 4to, pp. 171. Archæological Collection of the United States National Museum in charge of the Smithsonian Institution, by Charles Rau. 1 vol., 4to, pp. 104. List of Publications of the Smithsonian Institution. Pamphlet, 8vo, pp. 64. Washington, 1877. The Moundbuilders and Platycnemism in Michigan, reprinted from the Smithsonian Report for 1873; and certain characteristics pertaining to Ancient Man in Michigan, reprinted from Smithsonian Report for 1875. Two pamphlets, 8vo, by Henry Gillman.

From Samuel L. Boardman, Sec. Board of Agriculture, State of Maine. Reports 1875–1877. 2 vols., 8vo.

From the Author. Notes on Crania of the Botans of Formosa, and the Arrow poison of the Ainos. 2 pamphlets, 8vo, by Stuart Eldridge, M. D.

From the Trustees. Proceedings of the Trustees of the Peabody Education Fund at their annual Meeting in New York, Oct. 3d, 1877. Pamphlet, 8vo, 59 pp.

From the Author. Jesuit Missions among the Cayugas. 1656–1684, by Rev. Charles Hawley. Pamphlet, 8vo, 42 pp.

From Signor Nicolucci. Catalogo della Collezione di Oggetti preistorici dell' eta della Pietra posseduti da Giustiniano Nicolucci in Isola del Liri. Pamphlet, 8vo, 42 pp.

From Dr. C. C. Abbott. Trenton, N. Jersey. Annual Report of the State Geologist of New Jersey, for the year 1877. Pamphlet, 8vo, 55 pp.

From the Society. Archiv des Vereins für Geschichte und Alterthümer der Herzogthümer Bremen und Verden und des Landes Hadeln zu Stade. 1 vol., 8vo, pp. 522.

From the Author. Discovery of Stone Implements in Glacial Drift in North America, by Thomas Belt. London, 1878. Pamphlet, 8vo, pp. 22.

From the Author. The Mayas. Discoveries in Yucatan, by Stephen Salisbury, jr. 1 vol., 8vo, pp. 103. Privately printed.

From the Author. Notice of an interesting relic of Mexican Sculpture, by F. W. Putnam. Pamphlet.

From the Society. Baltische Studien, herausgegeben von der Gesellschaft für Pommersche Geschichte und Alterthumskunde Stettin 1877. 1 vol., 8 vo, pp. 103.

By Purchase. Lectures on Man, by Carl Vogt. 1 vol., 8vo, pp. 469. London, 1864. Memoirs read before the Anthropological Society of London, 1863–1869. 3 vols., 8vo. Parts 1, 2, and 3, Vol. I; No. 1 of Vol. III; No. 1 of Vol. IV; No. 3 of Vol. V, and No. 3 of Vol. VI, of the Journal of the Anthropological Institute of Great Britain and Ireland. Towns-

end's Narrative. 1 vol., 8vo, pp. 352. Philadelphia, 1839. Trumbull's Indian Wars. 1 vol., 8vo, pp. 320. Boston, 1846. Wahtoyah and the Taos Trail, by Lewis H. Garrard. 1 vol., 8vo, pp. 349. Cincinnati, 1850. Belden, the White Chief. Edited by Gen. James S. Brisbin, U. S. A. 1 vol., 8vo, pp. 513. Cincinnati and New York, 1870. Pacific and Dead Sea Expeditions, Wilkes, Lynch, etc., by J. S. Jenkins. 1 vol., 8vo, pp. 517. Rochester, N. Y., 1856. A canoe voyage up the Minnay Sotor, by G. W. Featherstonhaugh. 2 vols., 8vo. London, 1847. Bible for the benefit of the Penobscot, Micmac and other Indians, by Rev. Eugène Vetromile. 1 vol., 12mo, pp. 571. New York, 1860. Report of the Department of Agriculture for 1870. 1 vol., 8vo, pp. 688. Cherokee Almanac for 1856. Pamphlet, 8vo, 36 pp. Temperance address, in Cherokee, by George Lowry, 2d Chief of that nation. Pamphlet, 12mo, 16 pp. 1855. Laws of the Cherokee Nation adopted by the Council at various periods. Pamphlet, 8vo. Tahlequah, 1855. Atala, by M. de Chateaubriand. 1 vol., 12mo, pp. 144. New York, 1818. Ancient Society, by Lewis H. Morgan. 1 vol., 8vo, pp. 560. New York, 1877. Peru, Incidents of Travel and Exploration in the land of the Incas, by E. Geo. Squier. 1 vol., 8vo, pp. 599. New York, 1877. American Antiquities and Discoveries in the West, by Josiah Priest. 1 vol., 8vo, pp. 400. Albany, N. Y., 1838. The Habitations of Man in all Ages, by Viollet Le-Duc; translated by Benjamin Bucknall. Boston, 1876. 1 vol., 8vo, pp. 394. History of the Ceramic Art, by Albert Jacquemart; translated by Mrs. Bury Palliser. 1 vol. 8vo, 627 pp. London, 1873. Ancient Faiths and Modern, by T. Inman, M. D. One volume, 8vo, pp. 478. New York and London, 1876.

MEASUREMENTS OF THE CRANIA RECEIVED DURING THE YEAR.[1]

No. 11,249. Cranium of an Indian. Adult, probably a male. Capacity 1,435.[2] Length 186. Breadth 133. Height 138. Width of Frontal, 92.[3] Index of breadth .715. From a grave near Peters Falls, West Andover, Mass.— By PURCHASE.

No. 11,252. Cranium, imperfect. Adult, probably a male. Length 185. Breadth 136. Height 161. Index of breadth .735. Index of height .870.

Particular attention is called to the height of this skull and the development of the base of the occiput, as it is a case in which the index of height fails to give anything like a correct idea of its form. To appreciate this thoroughly, its height should be compared with its width and not with its length, or should be taken absolutely without any reference to the other dimensions. In this latter respect we find that it exceeds anything received during the year. The nearest approach to it is in No. 11,857 from Tennessee, which is 152$^{mm.}$ high. From a mound near Lynxville, Wis.— Collected by Judge SAMUEL MURDOCK and presented by Prof. B. W. PUTNAM, Jamaica Plains.

No. 11,452. Cranium of a Yankton Sioux Indian. Adult male. Capacity 1,480. Length 176. Breadth 140. Height 139. Width of Frontal 96. Index of breadth .801.— Presented by the ARMY MEDICAL MUSEUM, Washington.

No. 11,814. Cranium of a Comanche Indian. Youth. Capacity 1,510. Length 173. Breadth 143. Height 132. Width of Frontal 96. Index of breadth .826.— Presented by Dr. T. O. SUMMERS, Nashville, Tenn.

No. 12.241. Calvarium, imperfect. Probably a male. Length 174. Breadth 150. Height 124. Width of Frontal 96. Index of breadth .862. Index of height .712. Several small Wormian bones in the lambdoidal suture. Contrast this skull with No. 11.252 and it will be seen that in height and breadth it is at the other extreme. In that the height exceeds the breadth by 25$^{mm.}$, whilst in this, it is 26$^{mm.}$ less. Considered by itself, however, neither of the measurements in this skull is excessive, as we find crania from California that are lower, and others from Tennessee

[1] The measurements of the crania here recorded were taken by Miss JENNIE SMITH and Mr. LUCIEN CARR, jr., assistants in the Museum.

[2] Capacity in cubic centimetres; other measurements in millimetres. Index of breadth or height is in thousandths of the long diameter.

[3] This measurement is taken so as to give the least width of frontal, between the temporal ridges, and not that of its greatest width, which is approximately covered by the width of the skull measured through the parietals.

that approach it closely in breadth. It is of interest to note that both of these skulls are from mounds. From a mound in Utah.—Exploration of Dr. E. PALMER conducted for the Museum.

No. 12,248. Cranium of a modern young Pah Ute woman. Capacity 1,046. Length 166. Breadth 124. Height 123. Width of Frontal 87. Index of breadth .746. Index of height .740. Twenty-four distinctly marked Wormian bones in the lambdoidal suture. From Utah.—Exploration of Dr. E. PALMER conducted for the Museum.

No. 12,349. Cranium of an Indian. Adult male. Capacity 1,375. Length 187. Breadth 140. Height 139. Width of Frontal 94. Index of breadth .748. Index of height .743. From a shellheap on Great Deer Isle, Maine. —Collected and presented by Mr. M. HARDY, Brewer, Maine.

No. 12,350. Cranium of an Indian. Adult female. Capacity 1,182. Length 174. Breadth 132. Height 126. Width of Frontal 95. Index of breadth .758. Index of height .724. From a shellheap on Great Deer Isle, Maine.—Collected and presented by Mr. MANLY HARDY, Brewer.

No. 13,014. Cranium of an Indian, imperfect. Adult male. Length 157. Breadth 142. Width of Frontal 91. Index of breadth .904. Frontal much depressed. Parieto-occipital portion slightly flattened. Right half of the coronal suture closed. Several Wormian bones developed in the lambdoidal suture. Perforated in several places by buck shot. Found under a pile of stones on Moccasin Point near Chattanooga, Tenn. —By PURCHASE.

The tables following, give comparative measurements of the two most important collections of crania received during the year, and are of interest as showing the marked difference between the Indians of the coast of California, and the ancient peoples of the south-western states.

The first table is derived from the collection made for the Museum, at the Santa Barbara Islands, by Mr. Paul Schumacher.

The second table contains the measurements of sixty-seven Crania from the stone-graves of the moundbuilders of Tennessee, and were either collected in person by the Curator, or by Mr. E. Curtiss, who continued the exploration under his direction. This important series of Crania is, further on, discussed, at length, by Mr. Carr.

FIFTY CRANIA FROM THE SANTA BARBARA ISLANDS, CALIFORNIA.

Museum Number.	Capacity.	Length.	Breadth.	Height.	Index of Breadth.	Index of Height.	Width of Frontal.	
	39*	50*	49*	49*	49*	47*	49*	
13 546	1259	176	132	128	.750	.727	88	San Clemente.
13.547	1243	179	137	125	.765	.697	92	"
13.548	1282	184	133	132	.722	.717	89	"
13.549	1388	190	139	132	.731	.694	95	"
13.550	1677	193	145	133	.751	.689	102	"
13.551	1320	182	141	129	.774	.708	94	"
13.552	....	178	...	124	....	.696	88	"
13.553	1212	178	136	122	.758	.685	94	"
13.554	1237	182	138	125	.758	.686	90	"
13.555	....	164	106	...	.646	....	83	"
13.557	1445	194	140	133	.721	.685	94	"
13.558	1469	190	135	134	.710	.705	97	"
13.560	....	190	140	...	.736	....	89	"
13.561	1383	184	131	130	.739	.706	91	"
13.562	....	174	132	127	.758	.729	91	"
13.563	1295	179	138	130	.770	.727	95	"
13.564	1316	186	139	129	.747	.693	92	"
13.231	1015	170	122	119	.717	.700	91	Santa Catalina.
13.232	1386	192	130	133	.677	.692	98	"
13 233	....	194	130	126	.670	.649	94	"
13.234	1347	181	137	134	.756	.740	95	"
13.235	....	191	138	132	.722	.691	95	"
13.236	1258	180	124	133	.688	.738	90	"
13.237	1035	176	124	116	.704	.659	93	"
13.238	1355	192	132	129	.687	.671	97	"
13.239	....	182	136	124	.747	.681	92	"
13.240	1365	189	132	124	.698	.656	96	"
13.241	1448	186	135	129	.725	.693	99	"
13.242	1347	187	135	125	.721	.668	92	"
13.243	....	179	134	118	.748	.659	91	"
13.244	1497	192	137	134	.713	.697	100	"
13.245	1250	185	133	129	.718	.697	95	"
13.246	1320	192	139	123	.723	.640	92	"
13.247	....	187	130	129	.694	.689	96	"
13.248	1320	182	135	132	.741	.725	93	"
13.249	....	194	127	...	.654	....	95	"
13.250	1680	195	137	139	.702	.712	96	"
13.251	....	184	124	123	.673	.668	...	"
13.252	1459	192	138	130	.718	.677	92	"
13.253	1545	189	137	139	.724	.735	95	"
13.254	1311	178	133	124	.747	.696	90	"
13.255	1292	192	139	129	.723	.671	96	"
13.257	1196	173	132	116	.763	.670	91	"
13.258	1467	194	137	134	.706	.690	105	"
13.259	1098	184	127	125	.690	.679	92	"
13.260	1352	191	134	131	.701	.685	95	"
13.286	1210	179	137	129	.764	.720	91	"
13.287	1310	183	135	136	.737	.743	94	"
13.448	1175	181	132	128	.729	.707	94	"
13.449	1157	183	132	129	.721	.704	97	"
Maximum.	1680	195	145	139			105	
Mean.	1326	184	133	128	.723	.680	93	
Minimum.	1015	164	106	116			83	
Range.	665	31	39	23			22	

*These figures refer to the number of Crania measured.

SIXTY-SEVEN CRANIA FROM TENNESSEE.

Museum Number.	Capacity.	Length.	Breadth.	Height.	Index of Breadth.	Index of Height.	Width of Frontal.	Sex.	
	30*	67*	64*	40*			67*		
11.815	....	180	147	...	.816	.....	90	....	Stone grave near Nashville, Tenn.
11.824	....	137	169	...	1.233	.....	90	....	" " " "
12.295	1479	158	155	148	.981	.936	96	M	" " " "
12.298	....	170	130	...	.764	.....	84	....	" " " "
12.299	....	158	137	...	.867	.....	87	....	" " " "
11.918	1275	173	134	137	.774	.791	89	F?	Found in Mound between two stone graves.
11.834	....	168	145	...	.863	.....	92	....	Stone grave near Nashville.
11.854	....	166	132	...	.795	.....	88	....	" in Mound near Nashville.
11.857	1500	187	146	152	.780	.812	97	M	" " "
11.860	....	182	130	139	.714	.763	95	....	" " "
11.860	....	163	142	...	.871	.....	91	....	" " "
11.861	....	160	...	140	.....	.875	86	....	" " "
11.864	1295	161	143	135	.888	.838	89	F	" " "
11.865	1414	190	133	152	.700	.800	93	M	" " "
11.881	....	170	...	141	.....	.829	88	....	" " "
11.882	....	171	...	144	.....	.842	87	....	" " "
11.889	1387	168	138	148	.821	.880	90	F?	" " "
11.891	....	180	141	...	.783	.....	90	....	" " "
11.919	1268	172	128	138	.744	.802	92	F	" " "
11.921	....	168	142	...	.845	.....	87	....	" " "
11.937	....	190	137	...	.721	.....	93	....	" " "
11.941	....	167	130	...	.778	.....	86	....	" " "
11.948	....	167	132	...	.790	.....	101	....	" " "
11.969	....	170	135	140	.794	.823	87	....	" " "
11.970	....	168	134	138	.797	.821	88	....	" " "
11.972	....	167	128	142	.761	.850	90	....	" " "
11.973	....	159	139	144	.874	.905	92	....	" " "
11.974	....	174	133	...	.764	.....	87	....	" " "
12.004	....	184	134	...	.728	.....	97	....	" " near Lebanon, Tenn.
12.015	1275	162	148	138	.913	.851	94	F	" " "
12.022	1487	184	150	146	.815	.793	96	M	" " "
12.027	1237	178	128	136	.719	.764	93	F	" " "
12.303	....	189	143	...	.756	.....	91	....	" " near Nashville.
12.306	....	160	143	150	.893	.937	99	....	" " "
12.308	....	157	138	...	.878	.....	82	....	" " "
12.309	1275	164	144	138	.878	.841	90	M	" " "
12.310	1181	158	133	137	.841	.867	88	F	" " "
12.312	....	160	144	142	.900	.887	91	....	" " "
12.322	1126	162	127	136	.783	.839	86	F	" " "
12.323	1552	177	140	145	.790	.819	96	M	" " "
12.797	1825	167	169	...	1.012	.....	102	M	" " "
12.798	....	153	147	...	.960	.....	84	....	" " "
12.799	....	157	154	151	.980	.961	93	....	" " "
12.800	....	160	151	...	.943	.....	97	....	" " "
12.802	1528	158	157	146	.993	.924	98	M	" " "
12.803	....	173	146	...	.843	.....	96	....	" " "
12.804	....	149	140	...	.939	.....	85	....	" " "
13.981	1178	163	132	144	.809	.883	85	F	" near Nashville.
14.000	....	172	151	145	.877	.843	96	....	" "
14.001	1141	162	137	...	.845	.....	91	F	" "
14.002	1427	169	145	144	.857	.852	92	M	" "
14.003	1368	151	154	...	1.019	.....	90	F	" "
14.004	1452	162	146	146	.901	.901	96	M	" "
14.005	1303	160	145	141	.906	.881	90	F	" "
14.006	1341	172	140	145	.813	.843	92	M	" "
14.089	1084	162	136	139	.839	.858	92	F	" in Mound "
14.090	....	168	138	...	.821	.....	94	....	" " "
14.091	1306	161	142	140	.881	.869	86	F	" " "
14.092	....	156	151	...	.967	.....	95	....	" " "
14.093	....	161	153	148	.950	.919	96	....	" " "
14.094	....	158	136	...	.860	.....	89	....	" " "
14.095	1329	160	141	139	.881	.868	89	F	" " "
14.096	....	171	150	...	.877	.....	95	....	" " "
14.097	1358	178	136	140	.764	.786	90	M	" " "
14.098	1202	156	140	140	.897	.897	86	F	" " "
14.099	1334	169	148	144	.875	.852	92	M	" " "
14.100	1303	161	140	140	.869	.869	92	F	" " "
Max.	1825	190	169	152	.....	.....	102		
Mean.	1341	166	141	142	.852	.854	91		
Min.	1084	137	127	136	.....	.....	82		
Range.	741	53	42	16	.....	.....	20		

*These figures refer to the number of Crania measured.

SECOND REPORT ON THE PALEOLITHIC IMPLEMENTS FROM THE GLACIAL DRIFT, IN THE VALLEY OF THE DELAWARE RIVER, NEAR TRENTON, NEW JERSEY.

By Charles C. Abbott, M.D.

Having, in my previous report, given you the details of such investigations as I was enabled to make, extending over a considerable portion of the present year; this, my second communication will cover the continuance of the series of examinations of the same and other localities, to the close of the year — my later work being but a repetition of that of the past season, but with far more definite results.

While it will be necessary, to avoid all obscurity of statement, to refer frequently, to the previous report, it is not to materially modify, or wholly re-call any statement there made. Every additional fact obtained during the past summer and autumn, only confirm, I believe, the opinion there expressed, that we have, in the rudely fashioned instruments there described, considered with reference to their surroundings, an unquestionable trace of interglacial man along the Atlantic coast of America.

In my earlier report, brief mention only, was made of many interesting features connected with the characteristic implements from the gravel deposits, and of the deposits themselves; which I am now able, after more systematic exploration, and the discovery of a large number of additional specimens, to enter upon in considerable detail; and without unnecessary repetition — so far as my earlier communication covers this subject — shall endeavor to demonstrate conclusively the artificial origin of the specimens of chipped pebbles discovered; to determine the geological age of the deposit of gravel in which they lie embedded; to indicate the co-equal age of the deposit and the paleolithic implements it contains, and finally, endeavor to point out the probable racial belongings of the people that made and used these rudest forms of implements of stone.

Although the more specialized forms of implements since found, clearly bespeak the human origin of all, I have thought it best, to refer again, in some detail, to the many indications that the chipped pebbles, or rude stone implements, that occur in these gravel deposits, have been artificially produced. The more marked features of these specimens have already been pointed out; and although they are but little above the ordinary refuse of a modern quarry, and often quite closely reproduced by the stone breaker, when fracturing rock for road-bed with a hammer, it must be borne in mind that these are artificial forces operating on the stone; and further, this absence of careful workmanship is not wanting in the more recent productions of the Indians; and from graves of the aborigines in Massachusetts, from the stone graves in Tennessee, as well as from surface "finds" in Missouri, are several specimens — now in the Peabody Museum — which are in all respects, except the mineral used, identical with the more specialized examples from the Delaware River gravels.

There is, in all the specimens that I have collected, a considerable amount of weathering of their surfaces, the degree of which, varies but slightly in the whole series, except where other mineral than argillite occurs; when the alteration of the surface is much less; as in a very characteristic pointed pebble of quartzite, which is quite unchanged. It has been suggested that these chipped surfaces might have been produced by frost action, and the specimens of supposed implements therefore, only productions of nature. Given a single fractured surface, which a sudden blow, or the ordinary action of frost, might readily produce, and no reference to any other productive agency is required; but when we consider that instead of one, there are twenty or forty planes of cleavage, all equally weathered, and collectively an implement, as we call their unquestioned neolithic counterparts, has been produced, and we fail to see how nature, by any known or imaginable force, could so fashion either an oval pebble or angular fragment of rock.

In my previous report, it will be noticed that of the three specimens figured, as found in the underlying gravels, one is of flint, and found nearer the surface, than the larger argillite implements, from greater depths. The fact that the former was at a depth that exceptional circumstances might inhume ordinary Indian relics, and being of a different mineral than the characteristic forms

of the gravel, might lead one to believe that this more artistically chipped flint spear-shaped implement, was an "intrusive" relic of Indian origin. The general character of this gravel-bed, even at this shallow depth — six feet from the surface — where this flint specimen occurred, was such as to convince me, at the time, that the specimen had not gotten there subsequently to the deposition of the gravel itself. I fortunately had, at the time, an exceptionally good opportunity of examining the locality, and was satisfied that the gravel here reached the surface, as is quite frequently the case, throughout the whole area of southern New Jersey. Boulders of large size were upon the surface, and the side of the excavation from which I extracted the specimen showed by the close packing of the pebbles of every size, constituting the mass, that it was not a reassorted, but an undisturbed glacial deposit. Immediately above it, *i.e.*, on the same horizon, but not directly over it, and continuously to the surface were numbers of large stones, several of them containing from six to ten cubic feet. In such a mass, and at such a depth, it is scarcely possible a spear-point of the later Indians could have reached. The fact that the specimen is flint, and not argillite, has no bearing on the question of its being other than a paleolithic implement, inasmuch as in all well known localities in Europe, where paleolithic flints occur, there have been found occasional specimens made of other minerals. In the Clement collection, in the Peabody Museum, there is one such specimen that is, in all respects, identical with many from the gravel deposits of central New Jersey. As already mentioned, other examples of rude implements, not of argillite, have been collected, which are less elaborately wrought, but evidently designedly fashioned. Furthermore, many more specialized forms have been found, four of which are here figured.

Before closing the subject of the evidently artificial character of these rude implements of stone, it may be well, also, to call attention to many specimens of "chipped pebbles" which cannot be considered as implements, inasmuch as there is no trace of design in their present shapes. They are, indeed, chipped over the greater portion of their surface, but have no well defined point or cutting edges. These irregularly chipped masses, usually of smaller size than finished implements, bear no evidence of being crushed, although glacial action probably exposes fragments of rock or ice-encased pebbles more to such crushing force, than to

any other, except the rubbing against denser mineral, that results in deeply incised striæ,—the so-called glacial scratches. The lithological character of argillite is such, that a given mass of this mineral, if exposed to a crushing force, will not fracture in such a way, as to resemble in any degree, a chipped pebble, such as are here referred to. When associated with the finished forms, and the same general character of weathering and of chipping is noticed on both, one cannot but consider them as identical, in origin, and I have, myself, no hesitation in classing such designless forms, principally as broken specimens, others as "failures," and in some instances as refuse chips; being in all respects the same forms that we find are so characteristic of the localities where neolithic implements of chert and jasper have been made.

The results of my collecting having been partially anticipated in the preceding pages, I will only remark that the number of highly finished implements is quite large, and that one of the effects of a remarkably violent storm, to which I shall again refer as having a somewhat important bearing upon the question of the age and origin of drift implements, was to expose an entirely new surface on the several bluffs where I have been accustomed to find these rude forms of chipped implements, both in place and in the loose material at the bases of them. From both positions, I have, in all, gathered about sixty specimens.[1]

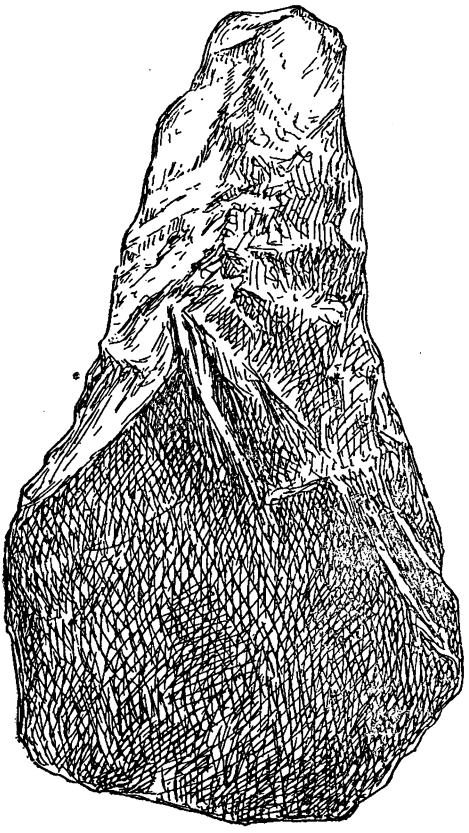
The general character of most of these is much the same as of those described in my previous report; but several have been met with which present certain peculiarities, the more interesting from the fact that they clearly demonstrate, I think, the artificial origin of them all.

Among the specimens of this character, to which I desire to call particular attention, are two, one of which is here figured. The other, not engraved, is a large, originally oval water-worn pebble, that has been carefully chipped at one end, and then discarded,

[1] The relative abundance of these implements is perhaps a matter of some importance, in its bearing on the question of their origin. Were they natural forms, the peculiar force that operated to produce them, so marvellously like ordinary Indian relics as many of them are, would scarcely have been limited to so few pebbles as in this case; unless future exploration shall discover at some distant point a locality where only chipped pebbles occur. I have made an effort to estimate the comparative abundance of these paleolithic implements in the gravel deposit forming the bluffy, eastern bank of the Delaware river, and as near as I can determine, it is about one ten-thousandth of one per cent, or one in every million of pebbles. There certainly, as yet, has not been gathered enough of them, to materially affect this calculation.

in consequence, I judge, of an unsatisfactory fracture occurring which prevented fashioning an implement of the desired size. We have, in this instance, an excellent example of an unfinished paleolithic implement, showing the method, in part, of manufacture ;—in all essential features the same as the unfinished spear-points, that

FIG. 1.



Rude Implement from the gravel. Actual size. Mus. No. 11752.

are found on the former sites of an arrow-maker's labors ; and yet exhibiting in its unfinished state, the peculiarities, that mark the differences between the paleolithic and neolithic forms.

Figure 1 represents a second specimen of a portion of an argillite pebble, with a portion of the water-worn or weathered surface

constituting the greater part of the base, on one side of the implement. The corresponding side is a uniform surface, but is less smooth, and exhibits every indication of being much less weathered, although it is much altered from a freshly fractured surface.

This specimen measures scant four and one-fourth inches in length. The base is, in width, a little less than one-half the length. The chipped portion is a uniform decrease in the width from the base, the flakes having been detached from both sides, and the edges. The specimen terminates in quite a blunt point, and does not appear to have been more acutely finished, than it now is. In general outline, figure 1 quite closely resembles many of the European flint implements from the river valleys, and bears far more resemblance to many neolithic forms than do the majority of the chipped flints from tertiary deposits lately described in detail by M. Robiero.[2]

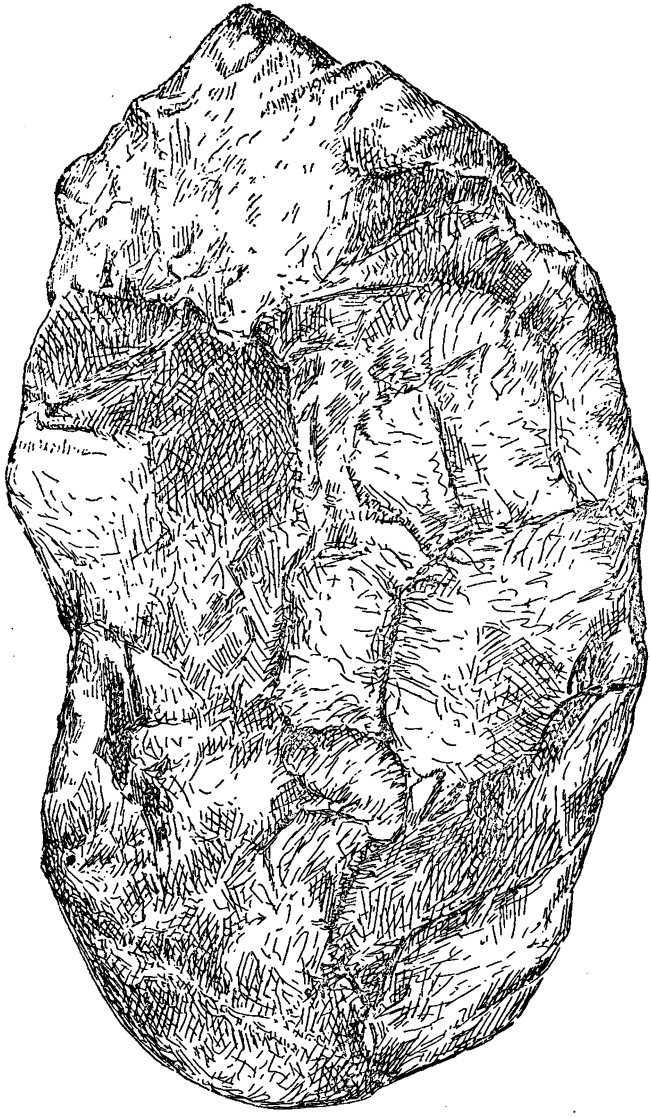
This specimen was taken from the gravel, when in place, at the bluff forming the east bank of the Delaware river at Trenton, at a depth of seven feet from the surface.

Corroborative specimens, as they may be designated because of their more highly finished condition, have sparingly occurred also, and in such positions that they cannot be considered, though probably of the same age and origin as the ruder forms, or typical "turtle backs."

Figure 2 is an example of this more elaborately wrought form, which is of dual interest in being so remarkably similar to the European patterns of paleolithic implements, and as an excellent example of a connecting link between the ruder forms, such as have been figured in my previous report, and the still better designed specimens here figured. This spear-shaped, or pointed implement is carefully shaped from an argillite pebble, and has well defined sharp, if not cutting, edges. The base is rounded, and preserves the natural surface of the pebble. The point is quite acute, and the sides have been produced by chipping, so that a comparatively uniform surface has been produced. The degree of weathering is uniform, and so far as this can be trusted as a guide, the specimen has had each flake removed at practically the same time.

[2] Descrip. de Alguns. Silex E Quart. Lascados en contrados nos camados dos terrenos: Tertiar. e Quaternario. M. Carlos Robiero, Lisboa, 1877.

FIG. 2.



Paleolithic Implement from the gravel. Actual size. Mus. No. 11539.

Figure 2 measures six inches in length; by from three to three and one-fourth inches in width, until near the point where the specimen suddenly narrows.

This interesting specimen, which was found at the bluff at Trenton, was in a narrow gorge, caused by running water which had not displaced the material forming the sides of the little chasm. It was nine feet from the surface, and overtopped by a large boulder. It bears considerable resemblance to certain chipped implements of jasper, porphyry and sandstone, which have been frequently found on the surface associated with ordinary Indian relics; and which the writer has supposed were mainly used as "teeth" for war-clubs. However this may be, such an implement as the one here described, might readily be mounted in a handle, or, having a blunt base, be held in the hand and wielded with terrible effect. Other examples of this form, both of argillite and other minerals, have been collected from the same locality.

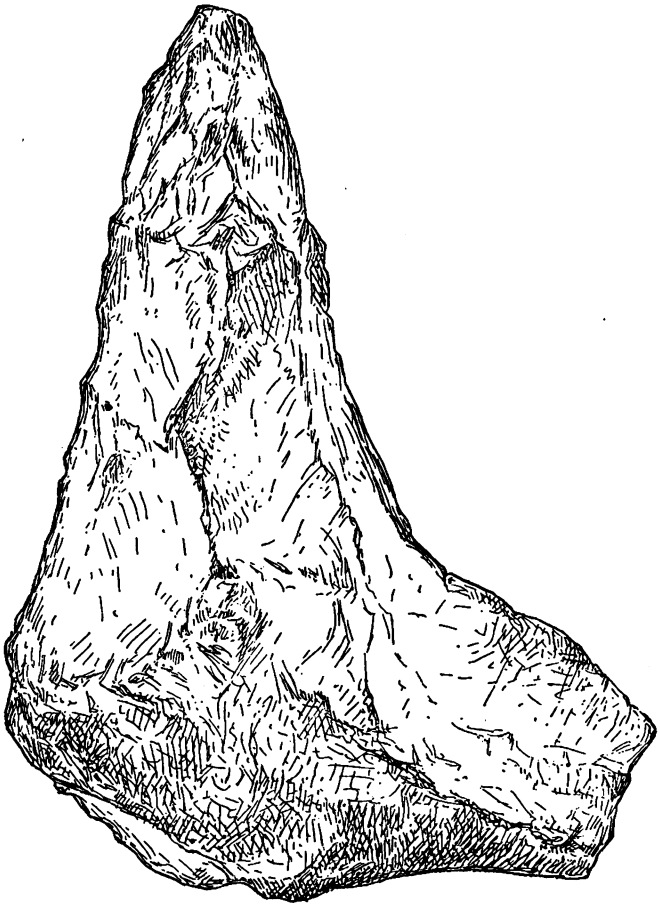
Figure 3 represents a very artificial looking, and yet quite unique form of chipped stone implement. It certainly bears no resemblance to any common form of neolithic weapon or domestic implement. In general, its appearance is that of a rude spear, such as not unfrequently occur upon the surface, made of jasper and quartz; but the handle-like projection, which may or may not have been pointed originally, renders the matter of the probable use of the implement, as it is, a difficult subject to determine; but that the specimen is artificial, and designed for some definite purpose, I have no doubt.

This specimen measures four and five-eighths inches in length, and two inches in maximum width, exclusive of the projecting point or "handle" at one side. This projection is one and one-fourth inches in length. The chipping on this implement is quite well defined along the edges; and this, of itself, gives evidence of artificial force having been operating in the production of the implement; for we do not find traces of secondary chipping, whereby zigzag lines are straightened, occurring among crushed or frost fractured pebbles.

This so far unique form was found on the same gravelly bluff from which the preceding were taken, but at a point two miles distant, down the river. The specimen was exposed after a landslide which occurred on Aug. 24th, immediately after a violent storm of that date. A large mass of gravel was detached bodily,

leaving a fresh surface of the bluff, from which this specimen projected. The depth from the surface was about eight feet, but could not be accurately determined at the time.

FIG. 3.

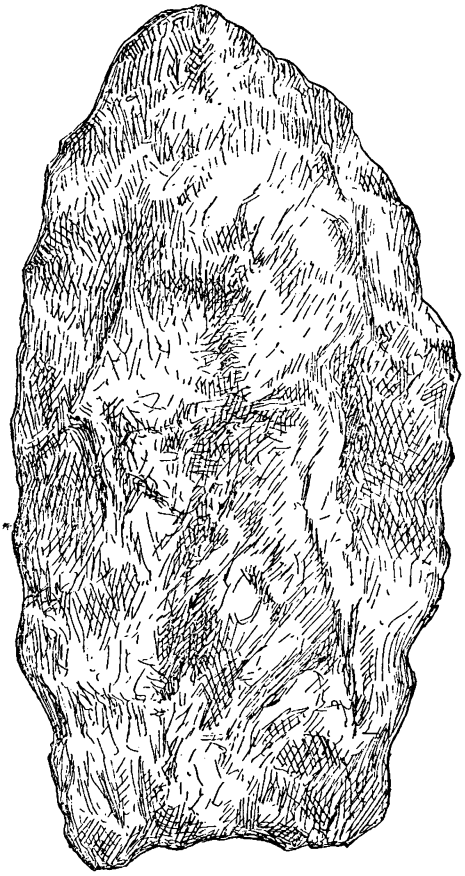


Chipped Implement from the gravel. Actual size. Mus. No. 12281.

Figure 4 represents a very carefully chipped argillite implement that bears a marked resemblance to many of the European specimens of paleolithic implements. The specimen measures four

and one-half inches in length, and a little less than two and one-half inches in its greatest width. In the chipping, this specimen varies somewhat from a typical turtle back, in that the under, or flatter side, is somewhat chipped, especially along the edges, which

FIG. 4.



Spear-shaped Implement from the gravel. Actual size.

throughout their entire length, exhibit traces of secondary chipping, whereby the edges were made more nearly straight. The general outline is that of a spear or lance-head, rather than an indefinitely shaped "chipped implement," as many of them are.

There is in this instance a well defined point, and broad, straight base, giving a general contour quite similar to certain jasper and slate "hoe-blades," as this pattern of neolithic implements is sometimes called.

This specimen, figure 4, was taken from the bluff facing the river, but two miles further south than the exposure near Trenton from which most of the specimens have been gathered. It was discovered in a *perpendicular exposure* of the bluff, immediately after the detachment of a large mass of material, in a surface that had but the day before been exposed and had not begun to crumble. The specimen was twenty-one feet from the surface of the ground, and within a foot of the triassic clays that are here exposed. Directly over it, and in contact, was a boulder of large size, probably weighing one hundred pounds; while at a distance of five feet above, was a second much larger boulder. The character of the mass, which was that of the bluff as exposed on the bank of the river near Trenton, was such as to render it impossible that this specimen of a clearly artificially chipped pebble could have reached this position subsequently to the deposition of the containing bed.

One feature of them all, and of those especially from the deeper gravels, needs to be briefly referred to; this is the worn condition of the edges of the several surfaces produced by the detachment of the flakes. There are, especially in fig. 4, no well defined outlines of a single facet, although each separate flake can be traced on the surface of the implement. This partial wearing away of these lines of separation of the several chips removed, does not occur in any marked degree in such jasper specimens as approach fig. 4 in general character of shape, size and chipping. Whether the result of use previous to being lost or discarded, or of wear by long exposure to the shifting movements of sand and gravel, one cannot determine; but of itself, it seems to closely connect these partly worn, yet clearly artificial forms, with rolled pebbles, which in outline only suggest the possibility of having once been chipped implements.

The four specimens of paleolithic implements, as we believe them to be, that are here figured, are so clearly of designed and not accidental shapes, that it seems unnecessary to give further illustrations, or additional reasons for demonstrating that they were fashioned by man.

A series of visits to several widely separated points, where the configuration of the country was such as to give excellent opportunities for examining deep sections of the gravels and the underlying beds of clay — cretaceous, or earlier — has enabled me to determine that above these clays there may be traced the unmodified drift, or such as is exposed on the east bank of the Delaware river at Trenton, N. J., a stratified drift of small pebbles and sand in alternating layers, covering limited areas, and of variable depth; and overlying the greater portion of these a soil — loess — also of variable depth, but seldom more than from three to four feet in depth. In this unmodified drift, which, like the underlying clay also, crops out occasionally upon the surface; in, but not of, the stratified gravels, and also not uncommon to the loess or surface soil, are numbers of large boulders of different rock, varying in size and weight, but of such dimensions that to the agency of floating ice alone, can the transporting force be attributed.

In my previous report, I have given sufficiently detailed description of the principal exposure of the unstratified mixed deposit, that I have maintained to be the débris accumulated at the foot of the glacier, the variations in its character from boulder clays, being such as are readily explained by the fact of its being a subaquæous deposit, and I will here, therefore, refer only to one feature of the pebbles, determined by my subsequent studies of their character. Before doing so, however, I desire briefly to refer to a publication issued subsequently to my original draft of this report. In the Annual Report for 1877, of Prof. Cook, State Geologist of New Jersey, we find an excellent map, and a detailed account of the glacial drift covering the northern portion of the state, consisting of unstratified boulder clay and ice-scratched, angular pebbles. Where the débris of the ancient glacier ceases to be of this character, Prof. Cook considers the glacier terminated, and all the material lying to the southward is a modified deposit due exclusively to water action. In this, as our preceding report shows, we do not wholly concur; and offer here, in some detail, our reasons for connecting more closely, than Dr. Cook has done, the phenomena of the depositions of the northern and southern gravels.

Of the great glacier itself, Dr. Cook remarks, in the report alluded to, "even in New Jersey, it covered the tops of the highest mountains.

This immense mass of ice had a slow movement from the north

towards the south, in which it scraped or tore off the earth and rocks from the rocky mass under it, grinding, grooving and smoothing down the rocky surface, and pushing forward, tumbling and rounding the fragments of stone and rock, and finally leaving them at the southern edge of the glacier, or wherever breaks in it may have allowed the loose materials to rest.

The terminal or southern edge of the drift is well and very plainly marked by a line of hillocks of mixed clay, sand, gravel, rounded stones and boulders of large size."

Of its extent, geographically considered, he further remarks of it, as "beginning on the eastern side of the State on the north side of the Raritan, at Perth Amboy, the line of Short Hills extending from that place to the First Mountain, and passing just north of Metuchen, Plainfield and Scotch Plains, marks the southern edge of the drift.

From there, it extends to the Delaware below Belvidere. The portion near the Delaware shows the gravel and boulders very plainly, but it appears to have been washed and otherwise modified by floods or great bodies of water descending in that valley. The whole line of this moraine is remarkably plain and well defined.

Across New Jersey the line is not exactly east and west, but appears to deviate towards the north, the deviation being greater somewhat in proportion as the ground is more elevated.

The hillocks of stones, gravel and earth, which together made this long chain, have every appearance of piles of débris which have been thrown down without order, and without the presence of water to sort or arrange the various materials."

Nowhere, as here described, does the terminal moraine of the great glacier approach the bluff at Trenton nearer than forty miles; but this distance is really of little moment, in connection with the subject of man's presence here during the maximum severity of glacial conditions in North America. With the existence of a glacier filling the entire valley of the Delaware, forty miles northward, and extending across the state to the Atlantic coast, there must necessarily have been a widely different physical condition of the entire territory extending southward. Much of this area, now constituting the southern, low-lying portion of the state, was submerged; and Mr. Belt[3] has pointed out, that over such

[3] Quarterly Jour. of Sci., Jan., 1878: London.

low-lying and submerged areas, there would be spread out a vast amount of material, by the agency of sub-glacial torrents, consisting of the true glacial débris, borne still farther southward by the currents caused by the melting of the glacier at and near its base. Such swift-flowing currents might readily, through long periods of time, being charged with sand and small pebbles, wear away much of the ice-scratching that is so characteristic of the pebbles in the more northern drift; but to such sub-glacial rivers we cannot well refer the enormous boulders scattered promiscuously through the gravel bluff, as seen at Trenton; but rather to the more powerful agency of floating masses of ice detached from the glacier as it existed further to the north.

This bluff at Trenton, Dr. Cook considers as "modified" in post-glacial times. He remarks:

"The beds of stratified drift, at various places in the valley of the Delaware, south of the line of glacial drift, bear marks of having originated from the action of water. The boulders and cobble stones are all water worn, and round, and are not scratched or streaked. They have all come from places farther north in the valley and have been moved and deposited by powerful currents. There are to be seen in the railroad cuts near Trenton, where the exposure of this kind of drift is very fine, boulders of gneiss, from the rock near; of red sandstone from the country just north; of trap from Lambertville; of altered shales from the near trap; of conglomerate from New Milford; of magnesian limestone from the valleys of Warren county; of conglomerates from the Blue Mountain, and of cherty and fossiliferous limestones from the Delaware valley north of the Water Gap. The gravel consists largely of quartz, but it contains numerous fragments of red shale, and black slate."

The above description is not wholly applicable to the bluff forming the east bank of the river; but is the locally modified drift to which I have frequently referred in the preceding pages of this report. In the exposure of stratified gravels "in the rail-road cuts," I have as yet found but few specimens that may be considered as *probably* artificial, as already mentioned. On comparing the materials forming these two exposures of the river bank and the rail-road cutting, a marked difference in the degree of angularity, the size and position of the large boulders, is readily seen, and indicates an additional and subsequent agitation and

redeposition of the stratified gravels; and it is well here to mention, that Dr. Cook has, since the issue of his report for 1877, informed me, that he has met with boulders in this same rail-road cutting, clearly showing glacial scratches upon their surfaces.

Assuming that no extension of the ice-sheet covered any inland portion of the state south of the limits described by Prof. Cook, we have in the territory southward much elevated ground that would afford safe harbor for the glacial people that dwelt here; and an area of sufficient extent to sustain a considerable fauna of even large mammals. This is indeed, an important consideration, for it is doubtful if the fauna was solely one of fish and birds, these people could have withstood the rigors of a glacial climate. Furthermore, it was from such an area of elevated ground, free, at least for portions of every year, from snow and ice, that the stone would be gathered, from which they made the rude implements, which continually being lost or discarded, were carried by the floods of the period, and finally lost, in part in the gravels, as we now find them. During the gradual distribution of the gravels in the southern section of the state, which, as we know, were largely altered by water action; be the causes what they may, they were doubtlessly violent in action and of long duration, and it is strange that a single pebble should escape being shorn of every vestige of the ice-scratches, that once doubtlessly covered them all; but any agency capable of producing such effects must have been in connection with some such phenomenon as the melting of the great glacier, with the several characteristic features that would be associated with the gradual cessation of glacial conditions. As we have already pointed out, there is much of this stratified gravel, covering areas of various extent within the territory covered by our researches; but it is of very different character, as compared with the boulder and gravel deposits, to which we now particularly refer.

There is other evidence of a close connection between the boulder clays of the upper Delaware valley, and the coarse, unstratified gravels at Trenton, to which we will refer in another portion of this report.

This connecting link, as it were, was doubtlessly a prolongation of the ice-sheet, extending down, and nearly filling, the present valley until it met the open sea, where the present bluff at Trenton now forms the eastern bank of the river.

In commenting on the physical character of this deposit mention was made of the absence of ice-scratches on the pebbles and boulders forming the mass of glacial débris, from which the majority of the rude implements were taken; and Prof. Shaler[4] also remarked on this circumstance, in his report on the age of the gravel beds from which the specimens here described have been obtained. In my previous report I endeavored to explain their absence by the probable circumstances of their accumulation where now found, and Prof. Shaler agrees with me, as to the deposition of this gravel "in the sea near the foot of the retreating ice-sheet."

Subsequent examinations of thousands of pebbles in this same deposit and at other localities where it outcrops, has resulted in finding a few pebbles, and I believe one stone implement that clearly exhibit ice-scratches; and besides many angular pebbles, there are others that are smooth but not polished and have a limited portion of their surface beautifully planed off and as polished as glass, which latter feature appears to be the work of moving ice passing over these interesting specimens when in some retaining matrix.

It may be well here to consider how far the material caught up by the last glacier that occupied the present valley of the Delaware, transported pebbles of an earlier day; for it must be borne in mind, that the masses of pebbles of any glacial deposit are not the exclusive production of the glacier; not fragments of rocks in place, that were broken away and rolled and crushed until every angle was obliterated. For ante-dating glacial conditions, there were smooth water-worn pebbles in abundance. Prof. Shaler[5] mentions the implements described in this and my earlier report, as "made in a region where water-worn pebbles greatly abounded as they now do all along our shores." The upper valley of the Delaware doubtlessly abounded in such pebbles in pre-glacial times, and such loose material scattered over the level surfaces of the rocks we can easily conceive as being transported by a glacier one or more hundred miles, and yet escape any scratching

[4] Tenth Annual Rep. Peabody Museum; p. 44. In commenting upon the character of the material forming the bluff, Prof. Shaler remarks, "all the pebbles and boulders so far as observed, are smooth and water-worn; a careful search having failed to show evidence of distinct glacial scratching or polishing on their surfaces." This, it will be seen, will not hold good concerning all the material forming this deposit.

[5] l. c., p. 47.

whatever. To this subject we will refer again, with reference to the associated implements.

This additional determination of characteristic features of the mass constituting the bluff forming the eastern bank of the Delaware river at Trenton, N. J., is of much importance in its bearing on the question of the age of the deposit, as it seems to be confirmatory of the opinion previously expressed, that the deposit is intimately associated with the glacial epoch; is, indeed, one of its phenomena; and the contained implements, undeniably of the same age, demonstrate the presence of inter-glacial man upon the Atlantic coast of our continent; a point in geological time so distant that we are scarcely able to realize it. Like indications of such vast antiquity are not wanting elsewhere; and Mr. Pengelly[6] has lately remarked of the traces of human occupancy of Kent's Cavern, England, that "in the present state of the evidence" he is "compelled to believe that the earliest men of Kent's Hole were *inter-glacial*, if not *pre-glacial*."

I have already briefly referred to stratified gravels as a characteristic feature of the geology of the surface of this low lying portion of the state. Their structure is such, it seems probable that subsequent to the retirement of the last glacier there has been a protracted period characterized by extensive floods, with powerful currents and at various localities, dependent wholly upon the contour of the country at the time, which was by no means regular or level, the glacial drift proper has been carried away and redeposited in its present condition.

In such stratified gravels I have not been successful in finding the characteristic forms of paleolithic implements such as occur in the drift as exposed on the river bank. A few doubtful specimens have been met with, and a few that may probably be accepted as of artificial origin; but I am led to believe that the violence of these post-glacial floods, in reassorting the drift, has well nigh destroyed every vestige of artificially chipped surfaces and edges. Where the original deposits were comparatively undisturbed the implements scattered through the mass were preserved as we now find them.

I have endeavored to show that the only objection to the gravel deposit forming the river bank being unaltered glacial drift, the

[6] Nature, No. 407, Aug. 16th, 1877, p. 323.

comparative absence of ice-scratches, may be explained away by its being a subaqueous deposit; and in considering the limited areas of undoubtedly stratified and reassorted gravel, the probable character of the force operating to produce this re-arrangement must be carefully considered in connection with the condition of the supposed stone implements found within its mass. In the unmodified drift we have seen that the contained implements are unworn to any significant degree, but those that have as yet occurred in this stratified gravel, are so rolled and worn that it becomes, perhaps, a question whether they are implements or natural forms. If they are artificial, the hypothesis formed for these implements of the unmodified drift[7] is strengthened by the condition of such specimens as have unquestionably undergone the destructive action of long exposure to abrasive contact with sand and pebbles in connection with strong currents of water.

So far as I have been able to trace the course and extent of these stratified gravels, they do not appear to have been formed by any, *geologically considered*, protracted flow of water, but rather by comparatively local floods, which, having spent their force upon the drift for a definite time flowing in a given direction, have had their currents diverted, and then, if less powerful from any cause, only the less resisting material has been moved from such of the original deposits as were washed by the newly made stream. So very limited are the areas covered by many of these tracts of clearly stratified materials, that it is possible many of them are explicable by reference to peculiar local conditions of the once existent glacier, and are not, in reality, a post-glacial phenomenon; and finally, it must be borne in mind, that the material of these stratified gravels is sand and small pebbles, with rarely a small boulder of a cubic foot in dimension; but in no instance, do the massive boulders, weighing several tons, occur as a constituent of these stratified deposits, although the latter may occasionally surround such an one, as where the stratum is of little depth, but even such an occurrence is unusual. Where the large boulders occur, even upon the surface, there is the drift as we find it on the river bank; unless they clearly are, as we will see quite frequently happens, a feature of the surface soil itself.

Again, local disturbance of the surface as by unusually violent

[7] Tenth Annual Report, Peabody Museum, p. 47.

action of water, such as sudden overflows caused by storms, may have the effect of transporting material from various strata of widely different character, and in this way may we account for the occurrence of paleolithic implements in positions to which they are really foreign; and it is only to be wondered at that there is really so little commingling of the two forms. As an instance of this, I may mention, in detail, the following occurrence:

On the afternoon of Friday, August 24th, 1877, there occurred a remarkable rainstorm, over a limited area in this state, of but three hours' duration; but during which time it is estimated that over eight inches of rain fell. The surface of the country in many places was quite altered, and the small spring brooks were suddenly converted into streams of great bulk. When such brooks flowed ordinarily between high banks, the confined waters carried away vast quantities of surface soil and gravel, depositing them on lower levels or transporting them to the river.

The details of this unusually severe storm direct our attention to the effects produced upon the surface, whereby unquestionable specimens of paleolithic implements are brought to positions that we may call abnormal. In one extensive deposit of débris of every description that was violently torn from the uplands and spread over an expanse of meadow, after passing through a narrow gorge on the writer's farm where there occurs an outcropping of the gravel of the river bluff, I found too very characteristic specimens of these implements, associated with fragments of pottery and a small grooved axe. Now these several specimens doubtlessly were widely separated previous to their last localizing in the meadow. Inasmuch as an occurrence of this character had the effect of thus commingling the two forms of paleolithic and neolithic implements, it can scarcely be urged that the fact of finding isolated specimens on the surface of the country can effect the question of the geological age of the specimens, seeing that they are, as a class, characteristic of the gravel and not of the surface, where their presence is exceptional; nor can it be held explanatory of their presence in the older gravels, even if admitted to be of vastly greater antiquity than ordinary Indian relics. No such occurrence as that we have related could inhume these implements to such great depths as have been recorded of many specimens in the Museum, and associated them so intimately with boulders of such large dimensions as those with which they are found. A

violent flood, even of long duration, would have the effect of spreading over a large area a comparatively shallow deposit of gravel, and at or near the surface, as newly made, on the abatement of the water, transported implements might occur, as we have seen in this case, but they would not be inhumed to a depth of thirty and forty feet in a boulder-bearing bed of gravel, miles in width. On the other hand, in a stratum of fine sand and pebbles washed from unmodified drift, we can readily see how an implement from the latter might become incorporated with the former rearranged deposit.

In this connection, I have endeavored to determine the transporting power of water, unaided by ice, in connection with the movement of boulders even of small dimensions; and so far as I could determine, where there was no precipitous descent in the river bed, the ordinary freshets in the river seldom, and the currents never carry other material than sand any important distance. The pebbles and small boulders are gently moved by the water, when they roll down from the banks into the stream, until they are fitted into some hollow, and there afterwards they appear to remain. It would seem to require a combination of circumstances, such as the undermining of gravel beds, and a violence or rapidity of flow, in connection with sudden descent, to move stones of one or two pounds in weight, for any important distance. I am inclined to believe the unaided transporting power of water, so far as moving the pebbles upon a river bed is concerned, is really quite limited.

We are now brought to consider, in its connection with the contained paleolithic implements, the surface soils, that at varying depths overlie both the unmodified drift, as I have claimed it to be, and the clearly stratified gravel. This surface soil, as to its origin, constitution and great variation in character, opens up an extensive field of inquiry, which in great measure is beyond the scope of my report; but the fact existing that paleolithic implements occur in it, renders it necessary to determine their true relationship to those of the underlying gravels.

In studying the surface soils covering the drift, to which attention has been more particularly drawn, I will, at first, briefly quote from Prof. Cook's Geology of New Jersey,[8] as to the general character of these deposits. He states, "there is a remarkable

[8] Geol. of N. J., p. 249, 1868.

degree of uniformity in the surface of the country. The inequalities of the surface are almost entirely caused by denudation. The streams, unlike those of the northern part of the state, have no apparent connection with the geological structure of the country. They are simply channels worn in the surface of the ground, following the lines of most rapid descent to tide water. "Of the soils," he remarks, "it is a loam varying from light sandy to sandy, gravelly and clayey, susceptible of high degree of improvement."

Whatever the particular character, and whatever its origin, it is evident that this soil is a sedimentary deposit, originally a fine sand, latterly increased in bulk, by aerial denudation of the broken drift rocks that outcrop through it, and the constantly added decomposed vegetable matter. The main agency in originally distributing this, the major portion of the soil, appears to have been the comparatively quiet waters that immediately followed the abatement of extreme glacial conditions.

This product of rock destruction, from the grinding action of the ice, throughout the whole extent of the northern hilly portions of the state was brought down in large quantities, and its depth, as originally deposited, was probably quite uniform. We see now that this uniformity of depth is wanting, as explained by the remarks of Prof. Cook; and the inequality of the land, which is a comparatively modern feature, becomes more pronounced every century.

To the contained paleolithic implements I need scarcely more than allude, as I have, in my previous report, expressed my belief as to their origin in connection with their surroundings. Just as there is abundant evidence of the presence of man dwelling at the foot of the great glacier that occupied the valley of the Delaware, when boulders, gravel and coarse sand were being deposited in vast quantities in the open sea, in which the southern terminus of the ice ended; so, as the glacier gradually left the valley of the present river, melting rapidly, the flood of waters, flowing southward, were surcharged with sand and mud, which, as the waters spread, and flowed more quietly, settled on the bottom of the then shallow sea; and here also, have we traces of this same race, who, as before, continued to lose in the depths of the once deeper, and now shallow waters, those implements of stone which tell the story of their sojourn here.

Still another important feature remains to be considered in con-

nection with the surface soils. I refer to the numbers of immense boulders, which are not only embedded in them, but are, geologically, *of them*, i. e., synchronously deposited. There are, I think, many facts confirmatory of this view, and their importance as bearing upon the question of the age of the implements found upon the surface, is great.

One question will certainly be asked of these surface boulders —may not the material originally surrounding them have been removed by means inadequate to alter their positions, and were they not deposited prior to the accumulation of soil which partly or wholly covered them? I am convinced that in many instances, such is not the case, for several reasons.

Take the boulders of a given area, and it will be found that there is no regularity whatever in their positions, wherever met with. The long axes of their diameters point in all directions. In one instance an irregularly cylindrical boulder, measuring seven feet in length and about nine in circumference at the larger end, rested nearly perpendicularly in the soil, which was three feet in depth below the buried end; while two others in the same area of about one hundred acres, of nearly the same shape but smaller, were in somewhat similar positions. Had the soil been removed subsequently to their deposition these upright stones must have fallen over and assumed horizontal positions. Examinations of flattened boulders, also, has shown that there was in many cases a considerable depth of soil beneath them, and thus separating them from the underlying gravels. In other instances, they have been noted as embedded in soil that overlaid the plastic clays, from which the earlier drift had been removed, or on which it had not, from some cause, accumulated.

The surface soils we have seen contain nothing but sand in so minute condition that it could well be carried by gently moving waters. In such a deposit these boulders occur, and it is evident, that while apparently belonging to it they could not have reached their present positions by the same agency that deposited the soil itself; but it is a marked feature of the earth immediately surrounding every boulder that there is a small quantity of little pebbles, and that as the distances increase between the positions of any two the proportion of gravel also decreases, and considerable areas, often several acres in extent, do not have a pebble of any size upon them.

I have therefore concluded, as in part already stated, that the soil itself was very slowly deposited from comparatively quiet waters, on which occasionally drifted an ice-raft from some distant glacier, and here and there an embedded boulder, loosened from its mass, sank to the bottom of the shallow sea, carrying with it more or less of such finer material as had originally been gathered up by the ice at the time. This would explain the presence of the pebbles mingled with the soil, as well as the larger boulders; and, if we admit the existence of inter-glacial man, would fully meet the difficulties of assigning an earlier origin to the surface-found rude implements than that of post-glacial times.

While to base the assertion of a paleolithic man having dwelt on our shores during so remote a period upon the presence of implements of a paleolithic character in our surface soils, would certainly be hazardous in the extreme, it does appear probable that they do really confirm the alleged antiquity of similar implements occurring in the earlier accumulations known as "drift."

Arguing thus, it might reasonably be claimed that these rudely fashioned implements should be met with in the northern hilly portions of the state, where boulder clay and striated pebbles occur in abundance as glacial drift. Careful search in favorable localities, however, has failed as yet to bring to light unquestionable specimens, although several chipped pebbles had they been met with elsewhere would probably have been so classed. This fact, at first glance, seems to render doubtful the claims of glacial age asserted of the specimens found at Trenton; but this possible absence of implements in the boulder clays, I think, may be explained by the fact already referred to, that the implements at Trenton were made during the prevalence of the ice-sheet, which at the time rendered the upper Delaware valley uninhabitable by a people dwelling at the foot of this glacier, where there was doubtless some uncovered land; and there are abundant indications to show that this gravelly bluff and all the country south and east of it, was then the bottom of a shallow sea.

Prof. Dana[9] has referred to this very point at Trenton as sea-coast during the cretaceous period, remarking of the Delaware river, that it "emptied into the Atlantic at Trenton; and the regions of the Delaware and Chesapeake bays, were out at sea."

[9] Manual of Geol., 2nd Ed., p. 478.

Nor did the coast line materially change in much later times. Of the Miocene period, the same authority states,[10] "there was no Delaware or Chesapeake bay," and again, upon the same page remarks, "the Atlantic Tertiary region must have remained submerged until after the miocene era." When finally it did emerge, which was undoubtedly in Pliocene times, when, as Prof. Dana states[11] "the continent * * * * had at least its present breadth along the larger part of the Atlantic coast, if not a still greater eastward extension," it is safe to infer man first appeared on our eastern shores. Prof. Marsh[12] has remarked that "the evidence, as it stands to-day, although not conclusive, seems to place the first appearance of man in this country in the Pliocene, and the best proof of this has been found on the Pacific coast." Granting this, the evidence of his presence on the Atlantic coast is fairly inferential, when, if in the chipped pebbles described in the present report, we have traces of an inter-glacial man; for we can scarcely conceive of a race originating *de novo*, or migrating voluntarily to the foot of a glacier; but that this early race should withstand the maximum rigor of a change to glacial conditions we know is wholly practicable; but whatever the changes that may have occurred in climate, in distribution of land and water and of elevation or depression of the former, at the close of the tertiary and dawn of the quaternary periods, it is evident that the present low lying southern section of the state was beneath and not above the sea when the great glacier occupied the valleys and overtopped the mountains that flank the Delaware.

Having, as clearly as it lies in my power to do, described in their several aspects the containing beds from which the relics here described have been taken, and having endeavored to fix the date of deposition of these, as well as demonstrate the artificial character of the implements, it is desirable to show what relationship the latter bear to the deposits containing them. Are they really of co-equal age, or are they intrusive objects?

In considering the relationship of these rudely fashioned stone implements to the beds containing them, and the place of the latter in the geological history of the globe, it must first be borne in mind, that the many changes which have been shown as having

[10] Ibid, p. 522. [11] Ib., p. 522.

[12] Proceedings American Assoc. for Advance. Science: Address at Nashville, Aug., 1877.

occurred in the past, were all periods of long duration, and the changes of climate and of depression and elevation of the dry land, were all gradual occurrences, and none of such violence as to render the globe, the while, uninhabitable by man. The severity of the glacial climate itself, it is known, but partially destroyed, though it largely displaced animal and vegetable life; and if the displacement of mammals is a clearly ascertained fact, it is quite safe to include man, if he then also existed here, as we have endeavored to show was probably the case.

Although there is no reason, geologically, why man should not have occupied our Atlantic coast during the Pliocene period, it is not to be assumed that he did, but it remains for the archæologist to demonstrate his former presence clearly, if any indications have been discovered that seem to be indicative of such early occupancy by man of America. In the implements from the gravel we certainly have nothing indicative of this, for, as has been clearly shown, I think, the facts, as yet gathered are indicative of an interglacial, and not a pre-glacial age. Even this may be questioned, and the suggestion made that the contained implements are of a later origin than the original deposition of the containing bed; and that during some material change which the deposit, originally glacial, has undergone, these implements have become embedded. To prove that such was not the case, I desire to call attention to certain features of the gravel beds as we now find them. I have frequently referred to the abundance of massive boulders that are everywhere scattered *promiscuously* through the deposit, and are also very characteristic of the subsequently deposited surface soils. If it is maintained that this gravel deposit was originally a mass of striated boulders, pebbles, sand and clay, which water has subsequently wholly changed in character and rearranged, then such water action must necessarily have so loosened up the mass, in the general overturning of every pebble until the ice-scratches were obliterated, that the boulders, many weighing twenty tons or more, would have settled to the very bottom of the disturbed moraine; and if, during this supposed process of re-arrangement, which however gradual and gentle in its movement must have had the above effect, then the lost chipped implements which became embedded in the mass, would here more surely have undergone a grinding and crushing action that would have obliterated every trace of artificiality, than in the small percentage of chance of

escaping destruction if caught up and carried for miles by the moving glacier. Again, if the gravel, where it now lies, has been deposited by simple water action, which, considering the contained boulders, is inconceivable, subsequently to the retirement of the glacier, and during this later transportation, the pebbles have become smooth and oval, and synchronously with such assumed post-glacial action, the paleolithic implements have been lost, then they should also have undergone a like alteration of their surfaces, ending in the complete obliteration of the characteristic features of artificial chipping; but I have already pointed out, that where such post-glacial redeposition and stratification have been effected, there I have not been able to discover any implements that were free from all doubt as to age and origin; and the fact of their occurrence on the surface, especially in fields, where there is an outcrop of the gravel, has this bearing upon the question of the co-equal age of the deeper lying specimens and their containing bed; that if a given deposit of unmodified drift—a terminal moraine—or such a formation as is exposed on the banks of the river, yields, at various depths at that point, a number of chipped pebbles, it is at such a position as an extensive level outcrop of the same deposit, that we should expect to find the same forms; and as the outcropping is of longer duration than the occupancy of the later races formerly dwelling in the country, traces of these also will unavoidably be mingled with the older forms. Had the paleolithic implements been found only upon the surface, although much weathered and otherwise evincing indications of greater age, there would be no positive proof of an earlier origin than the ordinary Indian relics, except that, even in such a position as a gravelly field, they are usually met with at greater depths, *i. e.*, a foot or more below the surface, than are the neolithic forms.

When under the impression that the Indians were a paleolithic people when they first occupied the Atlantic coast of North America, and that these rude implements were to be ascribed to them, I remarked of these rude forms,[13] that "just in proportion as these relics—stone implements generally—are rude in manufacture and primitive in type, *they are more deeply embedded in the soil*," and I have since had no reason to modify this statement, otherwise than to remark that those of the gravel are of uniform

[13] Nature, Vol. XI, p. 215. Jan. 14, 1875, London.

character, and do not vary according to their depths; but instead of their being traces of the Indian, I am convinced that they had a pre-Indian origin. In our references to the boulders found upon the surface, I have shown how many of these paleolithic implements may have become incorporated with the surface soil, and long antedated its deposition, in their conditions as chipped implements. My remarks on the age of the surface boulders indirectly referred to the age of accompanying relics, and have an obvious bearing upon the question of the co-equal age of the gravel and its accompanying implements.

Finally, if the same age is ascribed to these paleolithic implements and the ordinary Indian relics, then, as already asked, how could the one series become embedded, often to great depths, and not representatives of any class of weapons, domestic utensils and ornaments?

What seems to me a most conclusive argument in favor of the views herein expressed, is that while the paleolithic implements are characteristic of the gravel, and neolithic implements of the surface, it is quite natural to find the former, as we find its containing bed, frequently cropping out upon the surface; while we never find this same soil a feature of great depths, nor do the relics of the Indian, that now dot its surface, ever occur in such inexplicable positions. We can easily imagine an earthquake creating a deep chasm or crack in the surface, and inhuming a comparatively modern implement; but there are no traces of such cataclysmic action here, and if such an event had occurred, there would be other evidences than the commingling of objects from the surface with the underlying deposits, but such are wanting and the same objection still holds of such violent occurrences only inhuming paleolithic forms; unless, indeed, these are held to be the original forms of the later varied patterns of stone implements. This, however, is scarcely compatible with the universally accepted conclusion of the Asiatic origin of the so-called American Indian. If not advanced beyond the production of such primitive implements, they would scarcely have reached our Atlantic coast, having entered the country on the Pacific side.

Perhaps it is a wise caution that is exercised in but provisionally admitting the great antiquity of American man, but were these rude implements not attributed to an inter-glacial people their co-equal age with the containing beds would never have been ques-

tioned; and yet we are not in possession of facts that even seem to dispute the asserted antiquity of the American races.

Having determined that the rude forms of stone implements such as we have here described indicate the former occupancy of our shores by a race long disappeared, and that the date of that occupancy extends as far back, at least, as the closing of the glacial period, I desire to conclude my report on this subject with a few remarks on what I am led to believe are the racial belongings of this early race.

A careful study of the relationship of the implements characteristic of the gravel, to the better known traces of the Red-man — the ordinary Indian arrowheads, spears and axes — has shown that it is highly improbable that the Indians of our country were the primal occupants; but rather that they were preceded by a still ruder race. This conclusion is based not only upon the character of the relics themselves, but upon the fact, as I consider it safe to assert it, that the character of the country was greatly different at the time these implements were made and used than now.

As to the ordinary stone implements, it may be mentioned that those found upon the surface are all in accordance with what we know of the Indians, who, while occupants of the Atlantic coast of North America were dwellers in a densely wooded country, with the distribution of land and water as it now is; but are not these paleolithic implements wholly out of place in like positions? One cannot conceive of any use for a "turtle back celt," or for some of its modifications such as are seen in the limited range of patterns of the older forms. These rude implements of themselves, when recognized as artificially shaped, suggest uses, to which only a people living in a country of vastly different character, and with a different fauna, could put them. A marked variation in the physical condition of this country, both as to distribution of land and water, and climate, with concomitant differences of fauna and flora, we have seen, obtained during the glacial epoch, and to this period, and not to the — geologically speaking — recent times, must we ascribe these rudely fashioned implements, which by their presence in the drift gravels give us a faint glimpse of the primal race that occupied our shores.

When also, we consider that the several conditions of glacial times were largely those of Greenland and Arctic America, and that there is unbroken land communication between the desolate

regions of the latter, and our own more favored land, and, more important than all, that there now dwells in this ice-clad country a race which, not only in the distant past, but until recently (if they do not now) used stone implements of the rudest patterns; it is natural to infer that the traces of a people found here, under circumstances that demonstrate a like condition of the country during their occupancy, are really traces of the same people.

Having carefully studied the characteristic arts and habits of the modern Eskimo, and compared them with the existent traces of the people of Aquitaine, Prof. Dawkins[14] finds so great a similarity, that he concludes that "these facts can hardly be mere coincidence, caused by both peoples leading a savage life under similar circumstances: they afford reasons for the belief that the Eskimos of North America are connected by blood with the paleolithic cave-dwellers of Europe," and again, "the conclusion * * * * seems inevitable that so far as we have any evidence of the race to which the dwellers in the Dordogne belong, that evidence points only in the direction of the Eskimo."

This conclusion of Prof. Dawkins is of peculiar interest in that it is evidence that the Eskimo, now strictly a boreal race, once spread over a vastly more extended range of territory, and as a race is of such antiquity, as shown by the investigations of archæologists in Europe, that it is easy to realize, that, at one time, they dwelt as far south in America as New Jersey.

In his excellent article on the Tribes of the Extreme Northwest, Mr. Dall[15] remarks, "my own impression agrees with that of Dr. Rink, that the Innuit were once inhabitants of the interior of America; that they were forced to the west and north by the pressure of tribes of Indians from the south," and again, "there are many facts in American ethnology which tend to show that originally, the Innuit of the east coast had much the same distribution as the walrus, namely, as far south as New Jersey." The conclusion reached by Dr. Rink, to which Mr. Dall refers, is, that the "Eskimo appear to have been the last wave of an aboriginal American race, which has spread over the continent from more genial regions, following principally the rivers and water-courses,

[14] Cave Hunting, by W. Boyd Dawkins, p. 358, London, 1874.

[15] Contributions to N. A. Ethnology (U. S. Survey of Rocky Mt. Region), Vol. I, p. 102.

and continually yielding to the pressure of the tribes behind them, until they have, at last, peopled the sea-coast."[16]

These several quotations refer wholly to post-glacial forced migrations of a pre-Indian people that were dispossessed of their territory by the incursive race; and the result of my own investigations may be held, I think, a preface to this their later history, wherein I venture to date their occupancy of the country as far back as during, if not prior to, the last great geological change — the great ice age.

Considering the purport of the remarks quoted above, from several competent workers in widely different fields, and who, yet, come to the same conclusions; if it still be objected that the characteristic implements of the gravel are also found upon the surface, I will but add that this is precisely in accordance with what must necessarily be the case, if the above conclusions of Mr. Dall and Dr. Rink be correct; that the Eskimos were displaced by "the pressure of tribes of Indians from the south." Such displacement must have occurred after the glacial epoch, and therefore the Eskimos, being the occupants of the country at the time of their contact with another race, may have been the fashioners and users of these surface-found paleolithic relics, in part; which, like those from the deeper gravels, are all well worn and decayed upon their surfaces by long exposure, and thereby give evidence of their antiquity.

When we come to examine a full series of ordinary surface-found arrowpoints, as we gather them by the scores from our fields, and occasionally find associated with them, a rude implement of the type of those found in the gravel beds, we are naturally led to draw some comparisons between the two widely different forms. The arrowheads, and others which from their size may be considered as spear or lance-heads, are of two quite different types; being those made of jasper, chert, quartz, and rarely of argillite, of a dozen different patterns; and those of argillite of a nearly uniform pattern and of larger sizes, as a rule; all greatly weather-worn, and varying notably from the arrowpoints of other minerals, in being of much coarser workmanship, and in this respect, seeming to be a natural outgrowth of the skill once exercised only in producing the primitive forms of the glacial drift. If it be claimed that these rude arrowpoints of argillite, now so weathered and

[16] Tales of the Eskimo, London, 1875.

worn cannot be distinguished from ordinary Indian arrowheads, I reply that there is abundant evidence that the Eskimo had the bow in use, in times as far back as the close of the glacial epoch in North America; and furthermore, there is evidence that while occupancy of the Atlantic coast by the Eskimo was greatly prolonged, the advent of the Indian was not so very far distant, comparatively speaking. In such a case, there must as necessarily be a commingling of traces of the Eskimo, or post-glacial relics of the earlier race, and the more recent Indian relics; just as I have shown there was a continuance from inter-glacial to post-glacial times, of the presence, along the Atlantic coast, of paleolithic man.

Finally, as bearing upon the subject of the post-glacial occupancy of the country, by a pre-Indian people, I desire to give in some detail, the conclusions reached after a visit to the rock-shelter at Chickies, Lancaster Co., Penn., discovered by Prof. S. S. Haldeman, who kindly accompanied me and at the same time laid open for my study, at leisure, the extensive collection of stone implements he has gathered, not only from the rock-shelter, but the neighborhood generally. A careful examination of the specimens from this rock-retreat, shows a marked mingling of the two forms of implements, which I think is to be accounted for by there having been a forcible displacement of the earlier race; or by re-occupancy by the Indians, at a comparatively short interval after the voluntary retirement of the first occupants. The result also of careful study of the stone implements from the neighborhood, and more particularly of the islands in the Susquehanna river, is the discovery of several specimens of such rude forms as characterize the gravel beds at and near Trenton, New Jersey.

Since the above was written, I have received the following letter from Prof. Haldeman, accompanied by a number of very interesting specimens.

MY DEAR SIR:—

There is a group of small islands in the Susquehanna about a mile below Bainbridge, Lancaster Co., Penn. One of these islands is named Moore's; another, Forge Is. Yesterday, in company with Hon. H. H. Wiley, I visited Moore's Is., of several acres in extent, formerly cultivated; but a flood, a few years ago, swept off the cultivable surface, leaving a mixture of sand, gravel and clay upon this denuded surface and around the edging banks (five to six feet high). I found the objects sent herewith, including a few found previously by Mr. Wiley, at the same

locality. I shall not attempt to decide whether the gravel is drift, or ordinary river accumulation; but a flood like that which removed the arable land, would not transport gravel above the river bottom, and the probabilities are against an ice freshet being the transporter.

Hoping that you will find the specimens interesting, I remain

Yours truly,

S. S. HALDEMAN.

Chickies, Pa., 27th Sept., 1877.

Two of the specimens referred to, in the above letter, are quite rudely chipped "hoe-shaped" implements, similar to others in his collection from neighboring localities; but not common to the Delaware River gravel bluff, from which I have taken but one specimen. These from the Susquehanna, and one from near Trenton, just referred to, somewhat resemble the "rudely chipped flint axes" of Scandinavia, as they are designated by Prof. Nilsson; but are not exclusively chipped upon one end, the edge extending down one or both sides. Those forwarded by Prof. Haldeman, bear upon their surfaces every mark of the weathering so characteristic not only of the one similar specimen but of all the implements, found in the bluff facing the Delaware River; and it should be remarked that this weathering occurs in this instance in specimens of a different rock, and one of denser texture. The accompanying arrowpoints are of the same material, and all of equally rude workmanship; but their size is such as to render the use of the bow a certainty; and as we cannot safely dissociate the two forms, it is probable that we have in the series traces of a pre-Indian people, which I believe to be the Eskimo. But it is evident, from Prof. Haldeman's letter, that the basis of the island may be glacial drift, and the surface soil, which lately concealed this deposit, may be a deposit of same character as the soils that I have described as overlying the Delaware valley gravels. In such a case, the ruder inter-glacial and better finished post-glacial forms may here be associated by the freshet referred to, which, while washing away the soil, left a portion of the gravel and ordinary arrowheads upon the now denuded surface. If such be the case we have in the Susquehanna valley, also, traces of inter-glacial man; if not, we have, at least, indications of the presence of a post-glacial people, which, as I believe, occupied the valley of the Delaware for untold centuries prior to the advent of the Indian.

In conclusion, I re-affirm my conviction, that in the specimens of artificially chipped pebbles, from the essentially unmodified débris of the terminal moraine in Central New Jersey, and in others found upon the surface (which, however, are in part only of more recent origin), it is shown that the occupancy of this portion of our continent by man extends back into the history of our globe, in all probability to even an earlier date than the great ice age; and that the maximum severity of the climate during that epoch displaced but did not destroy him; and that subsequently he tenanted our sea-coast and river valleys, until a stronger and more warlike race drove him from our shores.

Note.—It may be desirable here to add that as the final proof of the above report was passing through the author's hands, he received a letter from Mr. Thomas Belt, dated Grant, Colorado, June 29, 1878, in which he states that he has "made a discovery that may throw some light not only on the question of man's existence in the Glacial Period, but on that of his physical structure. I have found a small human skull in undisturbed loess, in a railway cutting, about two miles from Denver, near the water-shed between the South Platte and Clear Creek. All the plains are covered with a drift deposit of granitic and quartzose pebbles, overlaid by a sandy and calcareous loam closely resembling the Diluvial clay and the loess of Europe. It was in this upper part of the drift series that I found the skull. Just the tip of it was visible in the cutting about three and one-half feet from the surface."

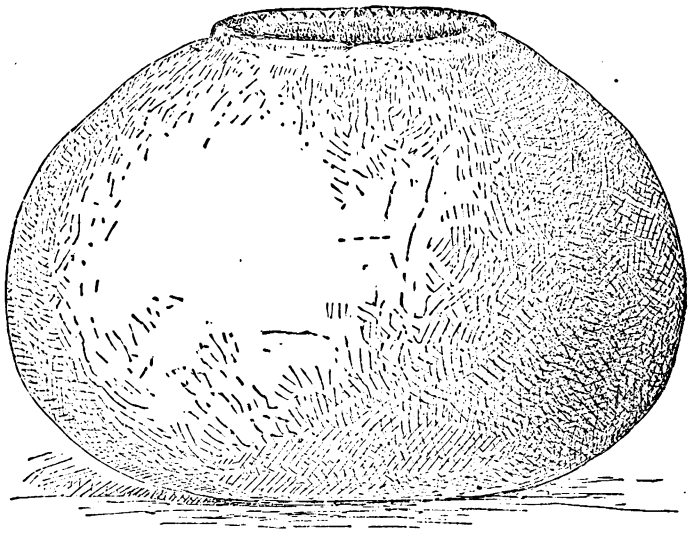
THE METHOD OF MANUFACTURE OF SEVERAL ARTICLES BY THE FORMER INDIANS OF SOUTHERN CALIFORNIA.

By Paul Schumacher.

I. The Stone Pot, or *Olla*.

In my investigations among the remains of the aborigines of the Pacific coast, south of San Francisco, I was always rewarded by finding the *olla*,[1] one of the most beautiful utensils of genuine aboriginal workmanship. The pot is usually of globular form with a narrow opening on the top, sometimes pear-shaped, and others of the Mexican form with a wide opening. Illustrations of the main

Fig. 1.



Cooking Pot of Steatite, Dos Pueblos, Cal. P. M. No. 9202. ¼ diameter.

types are found in Bancroft's "Native Races of the Pacific States,' Vol. IV, page 693, from my own drawings; and in Rau's "Archæ-

[1] *Olla*, Mexican pronunciation *óya*, from the Latin *olla*, pot.

ological Collection of the National Museum," page 36, from collections made by me two years ago. [Figures 1 and 2 represent two common forms of these pots, drawn from specimens in the Peabody Museum, collected by Mr. Schumacher.—F. W. P.]

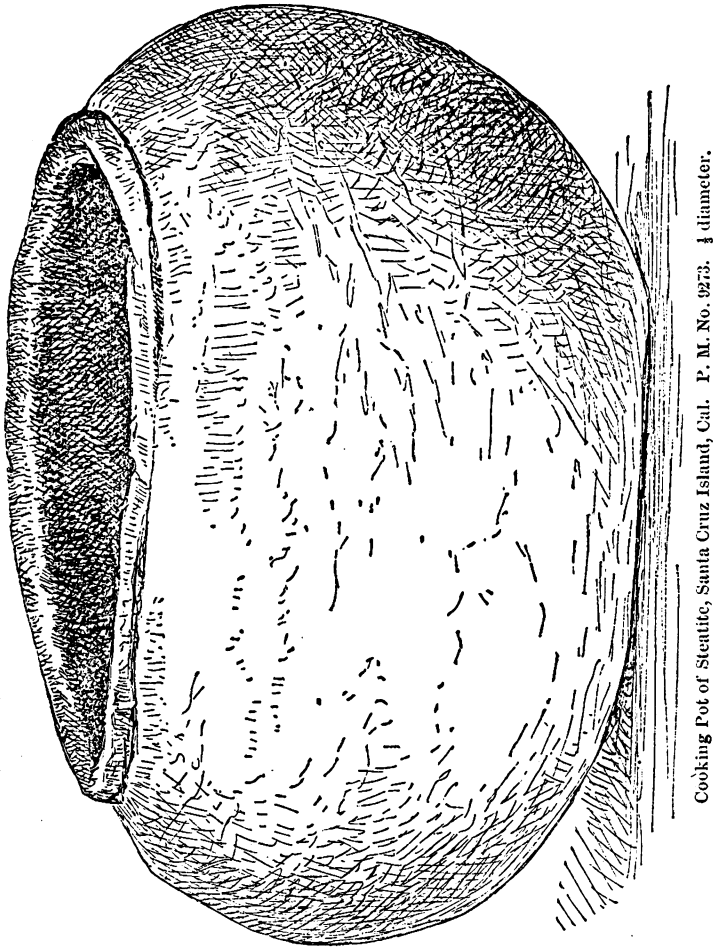


Fig. 2. Cooking Pot of Steatite, Santa Cruz Island, Cal. P. M. No. 9273. ¼ diameter.

The stone of which this utensil for culinary purposes, and some other articles of our Indians, were worked out, has been well known and in use for like purposes since the classic times of Theophrastus and Pliny. The Magnesian stone (*μαγνῆτις λίθος*),

and the kind quarried at Siphnus and Comum—the *lapis ollaris* of a later period—of which, in ancient times, vessels were hollowed out in the turning lathe, and carved, coincide in nature and composition with the potstone of our Indians. The stone is steatite, and is usually of a greenish gray color, sometimes showing hexagonal prisms in stellated groups, with pearly lustre and greasy touch, especially when reduced to powder. It changes in some portions of the same ledge into a more flaky and micaceous character; while in neighboring deposits on Santa Catalina Island, it exists crystallized in stellated groups of well-developed hexagonal needles of glistening apple color, which are easily detached from the weathered surface. The living rock is not as bright or shining as are the fragments of pots that have been exposed to heat; it loses its greasy character the more a utensil has thus been in use, and the color is changed to a bright metallic lead color. Some years ago I showed a potsherd, the color of which had thus been changed by fire, to a mineralogist, who pronounced it Magnesian mica.

The first information I gained of the locality of quarries of potstone, or where pots were made, was from a venerable Spanish lady while exhuming in Nipomo rancho, San Luis Obispo county, in the spring of 1874. She recollected a narrative of her mother, according to which the Indians had brought *ollas* in canoe-loads from the islands in Santa Barbara channel to the mainland, which they exchanged for such necessities as the islanders were in want of. Two years later, in Santa Barbara county, I received similar information from an old Mexican, then my guide. While making researches among the islands, at the joint expense of the Smithsonian Institution and the Peabody Museum,[2] I gained the assurance, during my short stay on Santa Catalina, that the stone exists in certain places on that island, but did not then succeed in finding the quarries. But during my last expedition to that locality, in behalf of the Peabody Museum, and of which an outline is given in my prefixed letter, I made the discovery, found pits and quarries, the tools used and unfinished articles. I noticed that the softer stone, usually obtained in pits, which is of a more micaceous character, was used for pots, while the close-grained rock of darker

[2] "Researches in the Kjökkenmöddings of the coast of Oregon, and of the Santa Barbara Islands and the adjacent mainland." Hayden's Geog. and Geol. Survey, Bulletin, Vol. III, No. 1.

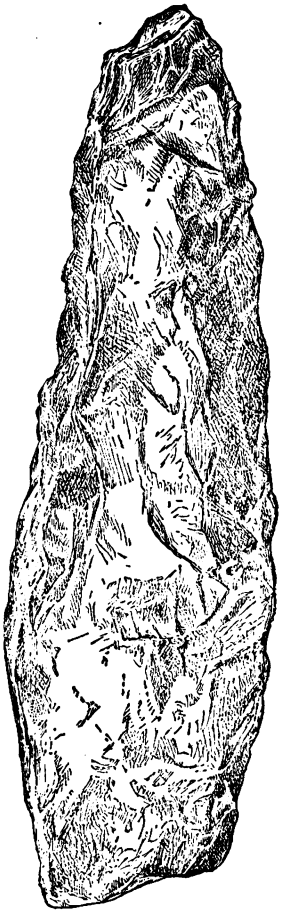
color, serpentine, was mainly used for the weights of digging sticks, cups, pipes, ornaments, etc.

While in camp at Little Springs, my attention was first arrested by a small mound of silvery hue, which same hue also extended over the adjoining ground. The mound is in front of a large outcropping rock of potstone, which I found to be an impressive witness of the tedious labors of the aborigines, it being entirely covered with marks where pot-forms had been worked out or left in various stages; some even were only begun and abandoned, while others were nearly worked out in rough outlines but still united with the living rock. At the foot of the bluff is a burrow in which, and among the débris forming the mound, many potsherds, a broken pot of which the outside had already been well worked, and even the hollow started, and a pot-form as broken from the mother rock, were brought to light, with many tools of hard slate in shape of chisels, and scrapers of quartz.

From the Little Springs we followed the cañon to the northward, and crossed the pass, easy of access from this side, into Pots Valley. It is a wide hollow cañon in which potstone, silicious slate and "float"-quartz are found abundantly. The potstone is found especially below the small spring, which makes out near the base of a very conspicuous, isolated, large rock, which stands nearly in the centre of the valley; while the slate, of which the chisels are made, crops out boldly, higher up, near the pass. Several hundred yards below the spring at the ravine to the right, going down, is found a pit; and the ledge of potstone close by forms a face in the ravine, which shows the same marks of the chisel as at Little Springs. About eight distinct marks cover the lower face, while others are obliterated by subsequent mining. One, having only been commenced, shows the outlines of a pot-form in a circle worked to a depth of only an inch, and measures sixteen inches in diameter. Between this place and the second ravine about fifty yards to the northwestward, is another pit of larger dimension—about fifteen feet in diameter and still five feet deep—where, too, among the débris, potsherds and quantities of slate fragments and quartz are found, some of which had evidently been used in working the mine, and making the pots. Besides these places there are many more pits in the valley, and a quarry especially prominent about four hundred yards to the eastward from Pots Valley boat landing, close to the steep ocean shore. In

fact, on entering the cañon by the pass, as we did, when the grand rock near the spring, the lesser cliffs and the scattered boulders can be overseen, I was struck, on examining the locality through a field-glass, by the discovery of so many silver hued mounds, the débris of pits, the rock quarries and open air workshops, so that I believed I had found the main factory of the *ollas* of the California aborigines. Even those not interested in aboriginal remains cannot fail to notice the manufacturing propensities of the people that formerly roamed here, and the locality was appropriately named.

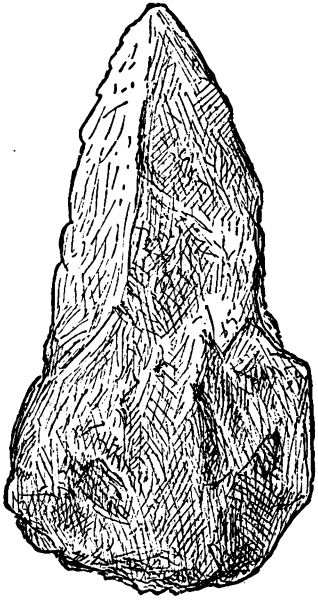
Fig. 3.



Rude Chisel of Slate used in making the steatite pots. P. M. No. 13411. ½ diameter.

In examining the slate quarry I found the rock had been first broken into accidental shape and size, and such pieces best adapted for chisels were then selected and trimmed.

Fig. 4.



Rude Scraper of Quartz, used in making steatite pots. P. M. No. 13412. Actual size.

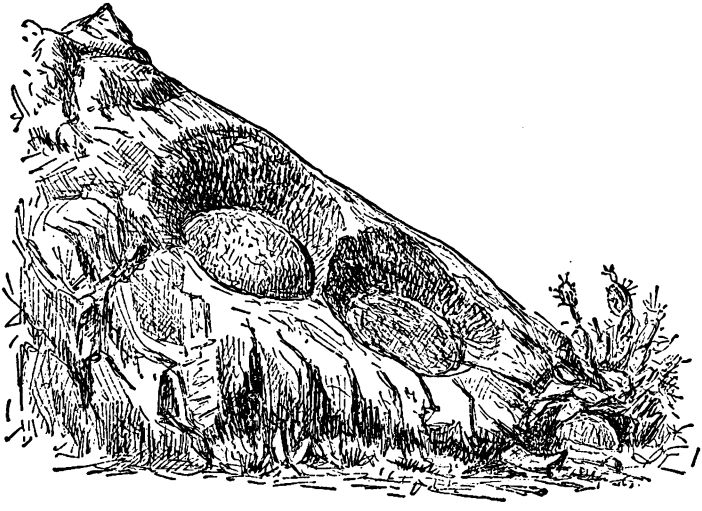
The scrapers, usually made of milky quartz, found in abundance all over the island, are sometimes quite well chipped, but oftener simple flakes.

I will mention here that we detected among the chisel-marks on the living rock, as also on several potsherds, distinct signs of metallic tools having been used. These were probably of iron and like those which we frequently found in the burying-ground on the Isthmus.

Figure 3 illustrates a chisel of slate, half its natural size, and figure 4 a scraper made of quartz, of natural size.

Figure 5 represents a part of the bluff near the boat landing,

Fig. 5.



Ledge of Steatite, Santa Catalina Island, showing the method of detaching and shaping the pots.

and will give a better idea of how the rough work of detaching the rock was carried on.

After the pot-form had been worked out, it was broken from the living rock by working under it and by the gradual pressure of the chisel around the base. The detached pot-boulder was next rounded into proper form; it was then hollowed out until a certain thickness of the pot was reached; and finally, carefully finished with the scraper. As the thickness of the *olla* increases towards the bottom—it usually thickens from about half an inch at the rim

to one and a half at the bottom—it requires skill to attain this evenly. No mechanical apparatus was used for this purpose (as shown by certain irregularities in the form of the pot) but simply the touch of both hands in antiposition, one gliding outside the already finished surface while the other worked inside towards the guiding hand. In this wise, with some practical experience, a greater accuracy is attainable than at first might be supposed, especially if the work proceeds from a known thickness to which reference can be taken, which is here the case as it progressed from the rim.

A new pot is without polish, and has only the smooth surface imparted by the scraper; while those which had been in use attained frequently a polished surface by wear, which the soft and greasy nature of the potstone is inclined to adopt.

II. The Mortar.

On the southwestern shore, near the southeast end of San Clemente island, where a fair landing exists, we found a station prominently located on a shallow dune, about a mile below what is known as Chinese Point. To this place large numbers of beach-worn boulders of basalt of different sizes were brought, mostly such as were suitable for the manufacture of mortars which were here largely made. Some of the rocks were broken in the rough state, in the attempt to split off a section of the globular mass, to make a flat surface on which to begin the excavation; others, of a more convenient semi-circular form, bore marks of the chisel as, in one instance, a circle outlining the intended size of the basin; some broke in the hands of the worker while working out the basin, and one, we found, was abandoned on account of a flaw in the rock. The work of shaping the stone was first done with the hammer, consisting of a piece of hard rock, generally of quartz, of about a pound in weight, with sharp edges and points. Persistent and well directed blows with such a hammer, applied either directly with the hand or attached to a handle, will detach even large pieces with sufficient accuracy to give a rough form, if the tendency of cleavage is properly taken into consideration; while the more exact form, and a smoother surface, is worked in the way the serrated hammer of the modern stone cutter is directed, vertically against the face. The basalt rock, al-

though very hard, is of a crumbling nature and will granulate easily under a pointed hammer. We found, therefore, but few chisels in the workshops of Clemente island, and these were evidently applied more for working out the basin, when the hammer could not conveniently be used. When the mortar is made of sandstone, which, instead of being brittle like the basalt, is soft and more adhesive or tough, I believe the chisel was used to a greater extent, and this is indicated by the sharper peck-marks.

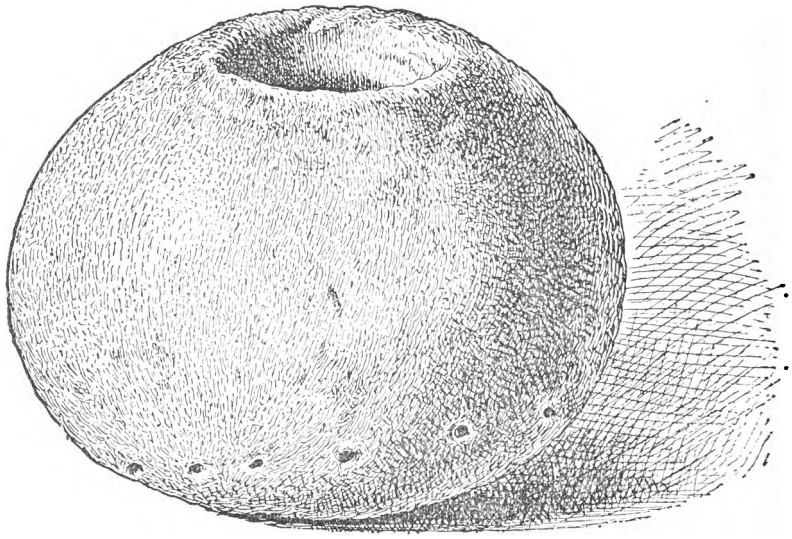
Judging the progress of work by the advance of a single stroke of the hammer or chisel, I am of the opinion, a neat mortar of common dimensions — twelve inches in diameter — should not have required more than a week's work; and for a pot even less time should have been consumed by a skilled worker, not allowing for the detachment of the pot-form from the living rock which must have nearly doubled the time.

III. Weights for Digging-sticks.

These implements, — as are so many others that have a hole, a notch, or other means of fastening a line, — are often considered as sinkers. One of the less frequent types of net sinkers, indeed, resembles the weight for a digging-stick, but yet there is as much difference between the two as between a mortar and an *olla*. The sinker is of a different material; is coarsely finished; the hole is much smaller, and narrower in the middle; and is hardly ever drilled, or finished by drilling, but simply pecked. My first impression, on finding these perforated stones, was that they were the heads of war-clubs, to which those of a pear-shape especially seem to answer. By examining a large number of fragments, however, I found most of the stone-rings had been broken in two, parallel with the hole, which could not be caused by the side pressure of the club, but by a wedge-like action against the inner sides. The suggestion that these stones were weights for digging-sticks, such as are still in use among the Hottentots, I received from an aged half-breed, while working on Santa Cruz island, two years ago, and I have since become convinced that such was their use. If we examine a stone-ring which has done some service, we find the hole shows a polish and fine striæ running lengthwise, and wear on one end of the ring imparted by the hand while in use and

in carrying the digging-stick where it naturally would rest, with its projecting stone weight, against the hand. I found some of the weights thus deeply worn, and by mounting one on a proper stick it fitted nicely to the grasped hand. I also noticed a specimen, among the many sent to the Peabody Museum, in which the hole had been enlarged in full width but in one direction only — making an elliptic hole — worn by the digging-stick while worked, when its own weight could only act against the sides of the stick corresponding to the flattened ends of the wooden spade. There were two methods by which the hole in the stone was made, both of

Fig. 6.

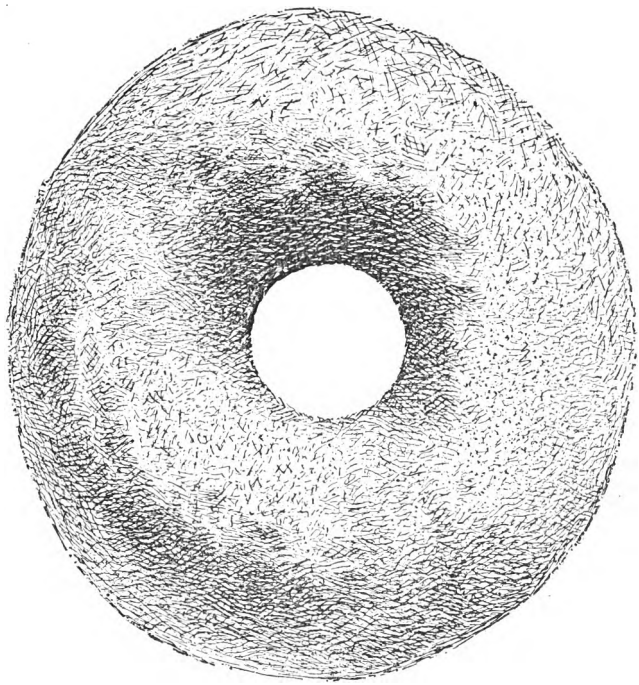


Weight for Digging-stick from Santa Cruz Island. P. M. No. 9296. Nat. size.

which are illustrated by numerous specimens in the collection. In one instance the weight, — almost exclusively of steatite, but occasionally of a harder stone, — was first roughly worked into the desired ball or a more flattened disk; the hole was then chiselled from both sides until it met; it was then drilled out to an equal width throughout; and the weight was finally finished by working the outside in a symmetrical form. The more elaborate weights, however, were finished in outline before the hole was bored. The hole

was made, no doubt, with a flint point, the *striæ* are deep and the width of an unfinished hole decreases towards the centre. A drilling apparatus might have been used, for the streaks of the drill are well defined and in full circle, which could hardly be attained

Fig. 7.



Weight for Digging-stick from San Nicholas Island. P. M. No. 9353. Nat. size.

by turning the borer simply between the hands. Figures 6 and 7 represent two common forms of these weights.

Among the weights for digging-sticks we find many of small sizes and inferior make, which could not have been of any practical use for this purpose and often deviating so much in form as to make it doubtful if they were designed as weights. The same deviation from the practical size we find sometimes among mortars — not meaning the paint-cups — the pestles, and frequently among the *comales* (the flat stone plates for baking *tortillas*) which were formerly extensively in use, judging by the many specimens col-

lected. Such articles we may safely bring under the head of children's playthings, in whose graves they are usually found.

IV. Pipes.

Very little need be said of the manufacture of this article which has been, in the form common on this coast, a mysterious thing to many, and was usually classed among the nondescripts of the medicine-man, wherewith, it was thought, he practised deception to sick believers. The pipe is a funnel-shaped tube like a thick, enlarged, modern cigar-holder, with an opening usually over an inch in diameter at the large end, and narrowing to one-third of an inch towards the other, which has a corresponding decreased thickness.

The hole was drilled from both ends, but only to a short distance from the smaller, and the mouth of the pipe was then enlarged by scraping parallel with the longer axis. For a mouth-piece, which protrudes about an inch, a piece of a wing, or leg-bone, of some bird, was inserted and tightly secured with asphaltum. The pipe was usually made of steatite and is sometimes neatly finished.

The Klamaths of the present day use a pipe of similar form to those found in the graves, and still smoke the native tobacco, *Nicotiana quadrivalvis*, which I found to be a sickening narcotic. It amused me to see an Indian bending back his head to bring the pipe in a vertical position, so as not to lose any tobacco, while taking a long draught which he inhales, the longer to enjoy the short opportunity, as the pipe must be passed on.

CAVE DWELLINGS IN UTAH.

By Dr. Edward Palmer.[1]

About eighty-four miles east from St. George, at Johnson, Kane Co., Utah, there is an exposure of soft sandstone in which are many natural caverns.

Owing to the rapid decay of the rock, the openings of many of these caves have been closed by the fall of the roof, and much labor would be required for their proper exploration. Many of those that are still of easy access are now used by the Pah Utes as storehouses for their seeds, corn, and other articles. Such as were so used could not be explored without the risk of bringing trouble to the settlers on the return of the Indians. Another difficulty in exploration was owing to the sheep and goats which resort to the caves for shelter, the cave from which the articles were obtained having the floor covered to the depth of two or three feet by the droppings of these animals.

The cave explored was located about two and a half miles from Johnson. It was ten feet high, thirty feet wide at its mouth, and extended about the same distance into the cliff.

Water is convenient to these caves, and they were evidently used as habitations in ancient times, and even by the present Indians when planting or gathering crops from the adjacent land.

The cave explored had already been partially examined by Mr. H. A. Martin, who stated that he had found "two balls of yellow yarn, and a piece of cloth about the thickness of flannel; also two pieces of wood, each about twelve inches long, flat on one side and rounded on the other, with rounded and smooth edges."

[1] On page 199 I have given a general statement of the explorations of Dr. Palmer in Southern Utah. Among the notes accompanying the specimens are many of interest and value, but as they would require Dr. Palmer's revision to prepare them all for publication, and as he has already published similar observations in connection with his papers in the *U. S. Agricultural Report*, and in the *American Naturalist*, I have thought it advisable at this time simply to abstract from the notes such as relate to the articles found in a cave, as they are of special Ethnological interest.—F. W. P.

The articles obtained from the débris on the floor of the cave, which was removed to the depth of two or three feet, after clearing away the droppings of the animals, were as follows:—

A fine specimen of an earthen cooking pot (Mus. No. 12,132) covered with a baking stone (12,134), and filled with one hundred and nineteen small coils of strong and well preserved string (12,133), probably made of the fibre of *Apocynum cannabinum*, and such as are used by the present Indians for various purposes. Each piece of string is between seven and eight feet in length.

This pot is not of Pah Ute make but probably of Moqui origin, and like those found in the mounds in Utah and in the ruins of the cliff houses.[2] The small slab of stone protecting the contents of the pot shows signs of contact with fire, and was probably used to bake the thin wafer-like bread, in the same manner as the Moqui Indians do at this time.

Another vessel of pottery (12,140) was also found at a depth of about three feet. This is shaped like a small jug, with a handle on one side extending downwards from the lip of the jug. It is of smooth and reddish clay, well made and symmetrical, four inches high, and about the same diameter through the centre; bottom rounded; mouth one and a half inches in diameter. Over this vessel, and protecting it, was about half of a bowl (12,141) of the characteristic shape and style of ornamentation of the Ancient Pueblo pottery.

Fragments of other vessels (12,139) of the same colored pottery as the bowl were also found.

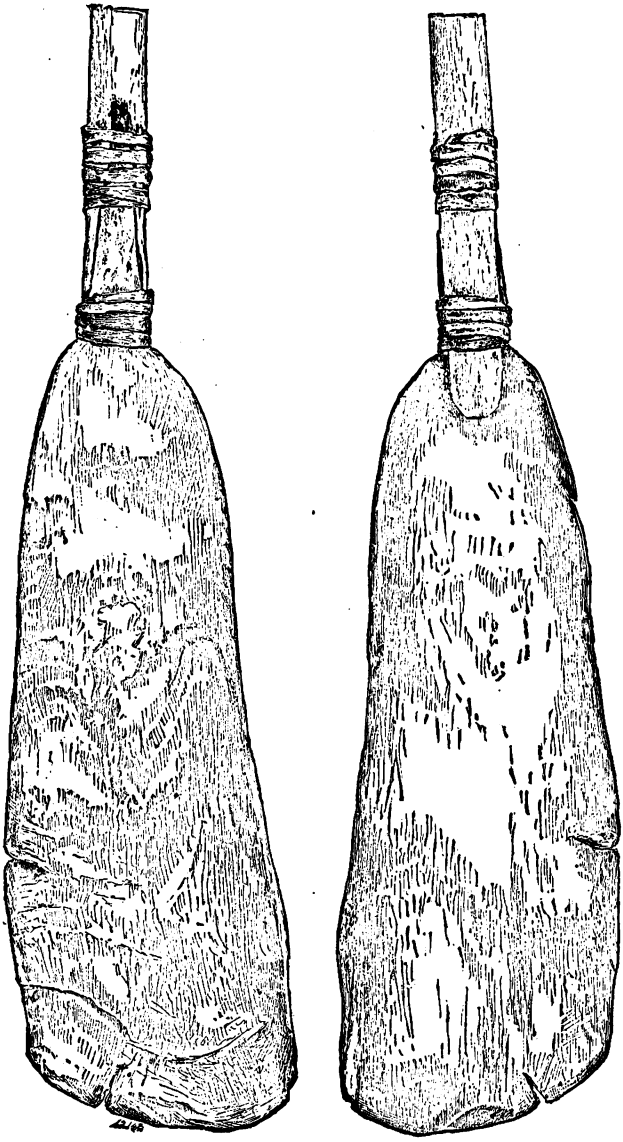
Wooden Tongs (12,135), fastened by a band, from the leaf of some *Yucca*. Similar tongs to these are used by the Apache Indians in gathering the fruit of the cactus. The Indians hold the fruit in the tongs in one hand, and with the other brush off the slender spines with a bunch of grass.

Tongs like these are also used to take any hot article from the fire, and are particularly serviceable in transferring heated stones from the fire to the baskets in which food is cooked by their heat.

Hair brush (12,277). This brush is made of the stems of grass

[2] This vessel, which is seven and one-half inches in diameter and seven and three-fourths inches high, is of the peculiar form made by coiling the strip of clay from the bottom to the top, and leaving the edge of the coil projecting on the outside, like the clapboards on a house, while carefully uniting and smoothing them on the inside. A large vessel of this character has been figured by Mr. HOLMES, plate 13. fig. 1, from the Mancos Cliff houses. Bull. U. S. Geol. Geogr. Sur., Vol. II, No. 1, 1876.—F. W. P.

Fig. 1.



Shovel with blade of Horn, from a Cave in Utah (12142). Blade 14 inches long, 5 inches wide. Handle 5 feet long.

tied with fibres of a species of *Agave*, and is like those used by the Moqui, Pah Utes, Navajos and Apaches.

Fragment of roasted leaf of a species of *Agave* (12,136). The leaves of the Agave are used by the present Indians as an article of food.

Pine cone (12,137). The seeds of cones of this species are used by the Indians for food, and this was probably carried to the cave for that purpose.

Several Corn cobs (12,138).

A small Basket (12,113) similar to those made by the Moqui Indians, and unlike those made by the Pah Utes.

All the articles above mentioned were found in the débris of the floor of the cave as stated, and are well preserved, owing to the dryness of the cave.

Perhaps the most interesting thing obtained was a shovel (12,142) which was found under large rocks, covered by débris, and evidently had been long buried in the cave. Figure 1 represents a front and back view of the blade, showing the method of its attachment to the long wooden handle. The blade is made of the horn of a mountain sheep, the horn evidently having been steamed and flattened, the pointed end being the portion fastened to the handle by sinews. The blade is five inches wide, fourteen long, and not quite one-fourth of an inch thick. The wooden handle is five feet long and of a nearly equal diameter of one and one-fourth inches throughout.

Altogether the implement is a very handy one for use in a light soil, and would prove of great service in planting, cutting up weeds, ditching, etc. Several old Indians of different tribes have told me of such implements having been used for agricultural purposes before they obtained iron tools. They stated that the blades were made of horn, bone, or stone, and, by the outlines they would draw on the ground, they showed that the general shape of the shovels they described was like this interesting and probably unique specimen.[3] On showing this implement to some old Pah Utes, they said at once that it was of Moqui make, and was used to make ditches and plant corn.

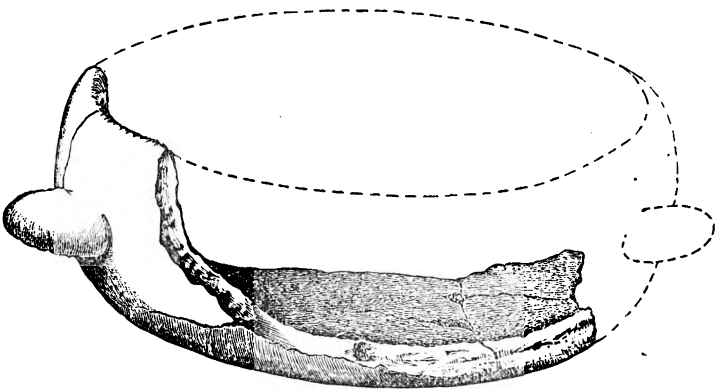
[3] The general shape of the blade of this shovel is very much like that of the large stone implements which have generally been called "hoes," and it is probable that while some of these implements may have been mounted for use as hoes, others were affixed to handles, similar to this blade of horn, and used as shovels.—F. W. P.

THE MANUFACTURE OF SOAPSTONE POTS BY THE INDIANS OF NEW ENGLAND.

By F. W. Putnam.

Throughout the Eastern States, vessels made of soapstone have been found and are represented in most collections. They are, generally, more or less oblong in shape, rather shallow, and provided with two knobs, or handles. In fact, the term *dish* would probably convey a better idea of their shape than the term *pot*, though the latter is applicable, as they often bear evidence of having been in contact with fire and were undoubtedly used for the preparation and cooking of food.

The accompanying figure, representing a portion of one of these



PORTIONS OF A SOAPSTONE POT FROM AN INDIAN GRAVE IN SALEM. ¼.

vessels from Massachusetts, illustrates the common form of these pots, though there are numerous variations in size and shape.

That these utensils were made in large number is evident, and while it is very probable that many of the surface exposures of steatite were worked by the Indians, the actual existence of such

working places on the Atlantic coast is only known to me at two localities.[1] One of these I mentioned in the Report of the Museum for 1875, page 16, wherein is recorded a collection of "Rude stone implements and fragments of soapstone pots, from near Christiana, Lancaster Co., Penn.—Presented by Mr. S. P. Sharples." In connection with this entry it is stated that these rude implements were probably used in shaping the soapstone pots; and, from information given by Mr. Sharples, it appears that a quarry of this stone exists at the place where the implements were found, which is said to have been resorted to by the Indians of recent times for the purpose of making utensils of the stone.

In connection with the preceding description, by Mr. Schumacher, of the method of manufacturing the soapstone pots on the Santa Barbara Islands, the discovery of a similar ancient quarry, showing an identical method of getting out the stone by the Indians of both sides of the continent, is of interest.

For the opportunity of making an examination of this second eastern locality, I am indebted to the interest taken by Prof. J. W. P. Jenks of Brown University, who, as soon as he heard of the discovery, informed me of the fact and arranged with the proprietor of the place, Mr. H. N. Angell, of Providence, for my visit. Mr. Angell very kindly accompanied Prof. Jenks and myself to the quarry, and allowed me to take such specimens as I desired for the Museum.

This ancient quarry consists of a seam of steatite about twenty-five feet wide, which, at the time of my visit, soon after its discovery, in February, 1878, had been exposed for about ninety feet. The seam of steatite is bordered on each side by a hard slaty rock, and, at certain places, the steatite runs into the associated minerals. Its location is on Mr. Angell's land, known as the "Big Elm Tree Farm," about a hundred yards north of the Killingly Pike, in the town of Johnson, near Providence, R. I. About a hundred yards to the west of the ledge is a fine mineral spring, and the locality must have been one of constant resort by the Indians.

The seam of soapstone was completely covered by the soil that had accumulated over the ancient chippings, and was discovered by the workmen after removing many cart-loads of the pulverized rock. In clearing out the ancient quarry, over three hundred cart-

[1] Since this article was put in type, I have seen a notice, in the *Boston Advertiser* of July 15, of a third ancient quarry recently discovered in Virginia, about thirty miles southwest of Richmond, on the Richmond and Danville Railroad.

loads of débris of the manufactory were taken away, and this débris consisted almost entirely of the fine particles of soapstone which had been chipped off in the process of taking out the pot-forms from the mother rock. When this material had been cleared away the peculiar character of the surface of the rock at once attracted attention, and then notice was taken of the fragments of pots and the large number of roughly pointed stones that were lying about and bearing evidence of having been used.

At the time of my visit, many of these rude chisels had been carted a few hundred yards distant to fill up a low piece of land, and others had been thrown in a pile on the ledge. A careful estimate of the number convinced me that at least two thousand of these rude stone chisels had been found on the ledge, or in the immediate vicinity. They were all of nearly the same size, rudely chipped to a blunt point at one end, and roughly rounded to fit the hand at the other. Those brought to the Museum vary in length from five to eight and one-half inches, and in weight from one to four pounds; the majority being of about seven inches in length and from two to three pounds in weight. These chisels were made from the hard stone of adjoining ledges, and their manufacture must have required considerable labor. A short trial of the chisels upon the soapstone showed the facility with which the steatite could be pecked by these rough implements, and what patience combined with muscle would accomplish.

Associated with the stone picks, or chisels, were between seventy-five and a hundred large rounded stones, weighing from twenty-five to a hundred or more pounds each, which might have been used as hammers for the purpose of breaking off large masses of the soapstone.

The bed of steatite had been excavated its full width, and nearly all its length and depth as far as at present exposed. The remains of the circular and oval masses, that had been broken off from the sides of the ledge, showed that the seam of steatite was formerly from six to twelve feet deep; the whole of this mass of rock having been worked out and probably made into utensils.

Several fragments of pots were found in the débris of the ledge, evidently broken during manufacture, and also several unfinished pot-forms just as detached from the matrix; while on the ledge itself the pot-forms could be followed out through their various stages of development.

The method of procedure in getting out the mass from which the utensil was to be made was identical with that described by Mr. Schumacher, as followed by the California Indians. The outside of the vessel being roughly shaped and the stone cut away to the required depth, the mass was broken off, the detached surface hollowed out and the outside more carefully finished. In the eastern specimens, however, we do not usually find such a smooth and perfect finish as noticed in the Californian pots.

In one part of the ledge, where an impure seam of harder material has divided the workable steatite, a limited area is formed, which enables an estimate to be made of the number of pot-forms taken out. These forms, as shown by the remaining portions, were from six to twenty-one inches in diameter. On the walls and floor of this limited space, fifteen feet long, eight wide, and six deep, were evidences of the removal of sixty pot-forms. As many as three or four hundred pots had probably been made from the material taken from this part of the ledge alone, and several thousand must have been taken from the whole ledge, which suggests that these vessels were in considerable demand, or that the place had been long used.

The fact that soapstone vessels, of the peculiar shape and character of those made at this ancient New England manufactory, are widely distributed east of the Mississippi River, though more common in the New England States than elsewhere, may be one of the many indications of aboriginal trade.

I am indebted to Prof. Jenks for a beautiful series of photographs of this interesting Indian quarry, and regret that I am unable to reproduce the one showing that portion of the ledge which I have particularly mentioned, as containing the evidence of sixty masses of stone having been removed.

Among the specimens, now in the Museum, is one consisting of a mass of the ledge showing the remains of one of the pot-forms, which well illustrates the method of work, and with this are placed the rude chisels, and a few fragments of pots which were probably broken in the course of manufacture, for all of which the Museum is indebted to Mr. Angell.

NOTES ON A COLLECTION FROM THE ANCIENT CEMETERY AT THE BAY OF CHACOTA, PERU.

By John H. Blake.

In 1836 the writer visited and made a careful examination of the ancient cemetery in Southern Peru, situated near the shore of the Bay of Chacota, about a mile and a half in a southerly direction from the town of Arica, in Lat. 18° 30′ S., Long. 70° 13′ W.

This Cemetery is on a plain, the soil of which is composed of fine silicious sand, marl and gypsum, impregnated with common salt and nitrate and sulphate of soda. The graves and tombs occupy a large extent of ground, in two distinct places, about an eighth of a mile apart. They are marked in some instances by small circular mounds made up of pebbles and shells, or by circles of rounded stones laid loosely on the surface; but, for the most part, only by slight depressions in the soil over them. They all bear marks of fires having been kindled over them, as shown by the fragments of wood, coal and ashes on the surface and within the interstices of the piles. In form they are all circular, but vary in size from three to five feet in diameter, and from four to five feet in depth. Some of them are walled with water-worn stones, laid up loosely, and all have linings of coarse flag mats.

At the time referred to, it was found that a great number of the graves had been opened and despoiled of their contents, probably in search of the precious metals occasionally found in them. Numerous skulls and other human bones, associated with fragments of pottery, were scattered over the surface of the ground. Many graves, however, remained intact, and a number of these were carefully opened and their contents examined. These in some respects were very similar, but in details there was found a wide difference. All the bodies, excepting those of infants, were in a sitting posture, with the knees elevated and the arms crossed over the breast, and generally seated upon flat stones, under which were placed many of the articles interred with them. They were closely wrapped in woollen garments, and the outward

edges of the folds were sewed together with yarn, and in every instance the thorn needles, used for this purpose, were found thrust through the enveloping garments, often with pieces of yarn remaining in the eyes.

Fig. 1.

MUMMY OF A CHILD FROM PERU, IN ITS WRAPPINGS. (13037.)

Of the larger part of these bodies little more than the skeletons remain. Some appear to have been subjected to careful desiccation, while others, the flesh of which is permeated with resinous substances, are well preserved.[1]

[1] It is interesting to note that the bodies from Ancon, in the Museum, are not permeated by the resinous substance, like those here mentioned by Mr. Blake and those from Pisagua collected by Mr. Agassiz.—F. W. P.

There are no traditions connected with this particular cemetery, or similar ones in this neighborhood, and the present inhabitants of the country, of Indian origin, evince no respect for them, although not wanting in those sentiments which lead them to view with horror the desecration of the last resting places of those whom they consider their kindred.

Fig. 2.

MUMMY OF A MAN FROM PERU. (13038.)

Figures 1, 2, and 8 represent three mummies from one of the tombs, or walled graves, referred to, selected from among those which were evidently intact, and in the best state of preservation.

Figure 1 represents a body (13037) from which none of the coverings have been removed, and presents the appearance of all

of those which are in a good state of preservation. It is closely wrapped in woollen garments, outside of which, around the head, is wound a thread, having attached to it small feathers of various colors. The inclined position, toward one side, of the head and legs, is doubtless due to the pressure of the superincumbent sandy soil upon the body while it was soft and flexible, there being no arch, or other covering, to bear the weight or prevent the soil from filling the tomb, except the reeds and mats laid over the bodies within it. It is evidently the body of a young person, probably not more than twelve or fourteen years of age.

Figure 2 represents the body of a man (13038) from which a part of the garments belonging to it have been removed, exposing to view the head, part of the breast, and one hand. With the

Fig. 3.

CAP FROM MUMMY, ½. (13039.)

exception of a part of the integuments of the lower jaw, the body is in a good state of preservation. The flesh is soft, of a dark brown color, and has a strong and peculiar odor which pervades the clothing, and is plainly perceptible throughout the whole cemetery. The head is of the rounded form (brachycephalic) with a somewhat retreating forehead; the cheek bones are high, and the nose prominent. The hair is long, of a brown color and of

the ordinary fineness of that of Europeans. It is neatly arranged and braided; that on the front part of the head having been carried backward and formed into two rolls, one on each side, and that on the back part into a triangular plait made up of six braids.

Fig. 5.

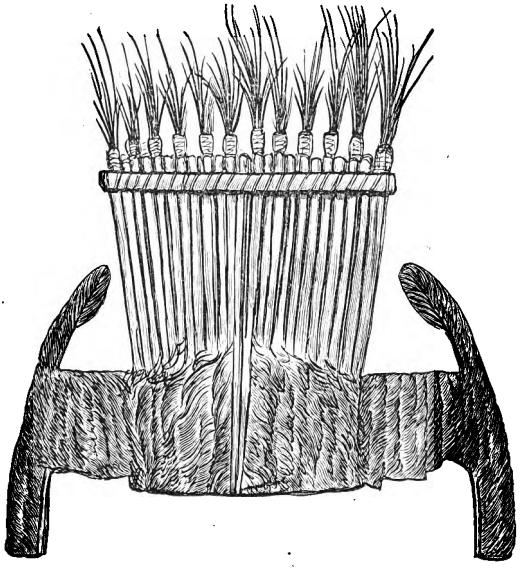
ARROW FOUND WITH MUMMY. ½.

The following are measurements of parts of the body which were accessible:

Length of the ulna, 10 inches; of tibia, 16.5 inches; of hand, 7.5 inches; of middle finger, 4.5 inches. The breadth of the part of the hand formed by the metacarpal bones is only 2.5 inches.

The outer covering of this body is a woollen garment of a brown color and comparatively fine texture, and a hood of similar material, with black, brown and yellow stripes, was drawn over the head, the edges in front stitched together, and, at the bottom, to the other garment. Over this was a cap (13039), Fig. 3, also of woollen threads, of various colors, closely and ingeniously woven, surmounted with a tuft, Fig. 4, made up

Fig. 4.



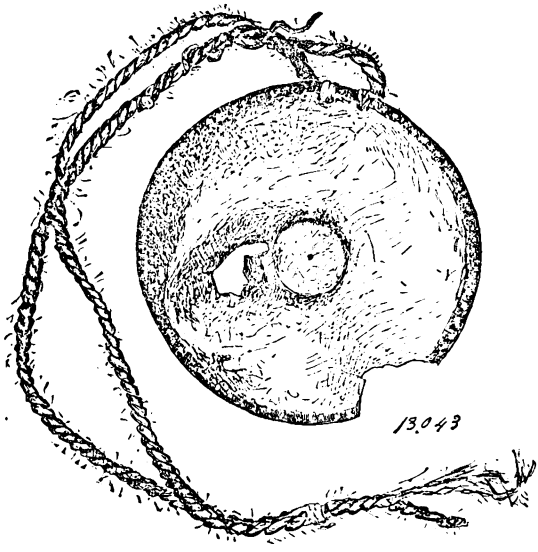
FEATHER ORNAMENT FROM CAP. ½.

of twelve small bunches of feathers, and in front an ornament

formed of quills of the condor. [Not now in the collection]. Around the cap was a woollen cord about eight feet long (13111), the outer part of black and yellow threads neatly woven around a central core. A smaller cord made of hair, attached to its lower edge, served to keep it in place when tied under the chin, as shown by the bow-knot connecting the ends. There was also around the cap a thread with small feathers of different colors, and a single flint arrow-head attached to it (13040), as shown in Fig. 3.

Secured to the back by a hair cord, and also by stitches to the outer covering, was a quiver [not now in the collection], containing five arrows [four are now in the collection] (13041), the heads are of stone and the shafts, which are in two parts, are about two feet long; one of these arrows is represented in Fig. 5.

Fig. 6.



SILVER ORNAMENT FOUND WITH MUMMY. ½.

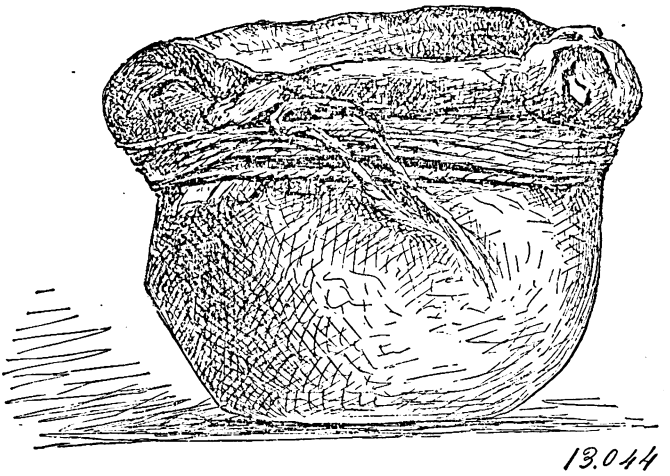
Suspended by a flat belt, passed over the shoulder, on one side, was a bag (13042) containing leaves of Coca (*Erythroxylon Coca*) and a thin silver medal. The belt, or band, by which the bag was secured, is woven and of fine yarn in handsome black, white and brown figures, with a border of red on one side and brown on the other; it is two and a half feet long and over an inch wide. The bag, measuring seven by eight inches, is very handsomely and evenly woven of fine yarn, in black, white and brown stripes, and the edges are very curiously and tastefully sewed together with red, yellow, blue and white thread.

The silver medal, or ornament (13043), Fig. 6, found in the bag, is three and a half inches in diameter. A space in the centre,

three-fourths of an inch in diameter, is countersunk on one side, and in the centre of this there is a small round hole; there are also indentations on one side, all around, near the edge. A triangular piece about three-eighths of an inch long is wanting to render the circle complete, but this may have been broken off accidentally. The medal is very thin and brittle from oxidation. A hair cord, about two feet long, is attached to it, by which it may have been suspended from the neck.

Upon removing the cap and hood there was found, beneath the chin, a small earthen vessel (13044), Fig. 7, about two inches in diameter, the top of which had been closed by a membrane, part of which, with the string which fastened it around the neck, still remains attached. It is not improbable that this cup contained

Fig. 7.



CLAY VESSEL FOUND WITH MUMMY. Natural size.

originally a liquid, and this may account for the condition in which part of the lower jaw, before mentioned, was found, and it may, perhaps, also account for the oxidation of the silver medal. Such a liquid would most likely be *Chicha*, an acid drink, prepared by fermenting roasted maize, which has been known from time immemorial in Peru.

Figure 8 represents the body of a female (13045), from which all the wrappings have been removed. The fleshy parts of a dark

brown color are soft, and the joints slightly flexible. For its preservation the same means evidently were used as for the preservation of the body which has just been described. The following are measurements of parts of the skeleton:

Fig. 8.

MUMMY OF A WOMAN FROM PERU. (13045.)

Length of humerus, 9 inches; of ulna, 8 inches; of hand, 5.5 inches; of middle finger, 3.5 inches; of femur, 13 inches; of tibia, 12 inches; of foot, 7.7 inches.

The breadth of the hand in the widest part is only two inches, and that of the foot only two and a half inches.

From the ankles to the knees the legs are coated with red paint, and there are marks of the same pigment on the hair of the head. The head resembles in form that of the body last mentioned. The hair upon it is fine, of a light brown color, and when first exposed was smooth and neatly arranged in braids passed across the upper part of the forehead, then carried backward and secured on each side of the head above the ears. It is somewhat coarser and much shorter than the hair on the head of the man.[2] This body, like the one represented in Fig. 1, when first found, was closely wrapped in woollen garments. On the outside a cord was passed several times around it, and one also between the outer covering and that nearest within it.

Upon removing the outer covering there were found beneath it the following articles:

A wooden comb (13046), much worn, with hair adhering to the teeth.

A pair of sandals (13047), about five and a half inches long and two inches broad, painted red.

Three needles of thorn (13048), about three inches long, tied together.

Two balls of yarn (13049), one of them colored green and very tender, the other white and strong.

A small package of shells, *Littorina Peruviana* (13050).

A bladder containing red pigment (13051).

A small package of *Rutile* (13052).

A bladder containing a gum resin (13053), similar to that obtained by treating a part of the flesh of the body first described, with water and afterwards with alcohol.

A pod from an *Algaroba* tree [not now in the collection].

Two mussel shells, *Mytilus* (13054).

Several locks of human hair (13055), some of them rolled with leaves of coca.

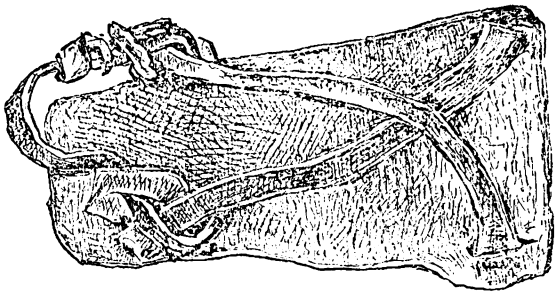
On removal of the inner garment, the body appeared as shown in Fig. 8, with impressions of the cloth upon the flesh particularly about the face.

In the same tomb there were the remains of an infant (13056), carefully wrapped in a black woollen cloth (13057), and enclosed in the skin of a penguin [not now in collection], with the feather

[2] Among many Indian tribes it is a custom when a relation dies for the women to cut short their hair. The men sever only a lock or two.

side inward. Attached to the inner wrapper was a pair of sandals, Fig. 9, about two and a half inches in length (13059). Between the wrappers were several small rolls of cotton (13060), also rolls of hair of the *Vicuna* (13061), with leaves of coca, two mussel shells (13062), and several small shells (13063) of the kind before mentioned. The infant was dressed in a garment of brown cloth (13058). The head was partly covered by a loose cap (13064), lined with a wadding of cotton and hair covered with red paint. Within it was a large lock of soft human hair (13065) on which the head rested; also, folded in a small piece of cloth (13066), and tied with care, was a brown thread (13067) with seven knots [only one knot now left] in it,[3] and on one end what appears like,

Fig. 9.



SANDAL FROM MUMMY OF AN INFANT. Natural size. (13059.)

and probably is, a part of the umbilical cord (13068). Around the neck was a green cord [not now in the collection] with a small shell attached to it. Of this body, little more than the skeleton and the scalp, which is thickly covered with very fine dark brown hair, remain. The appearance of this and many similar bodies of infants, found in this and other Peruvian cemeteries, shows that no efforts were made for their preservation, at least no other than, perhaps, by desiccation.

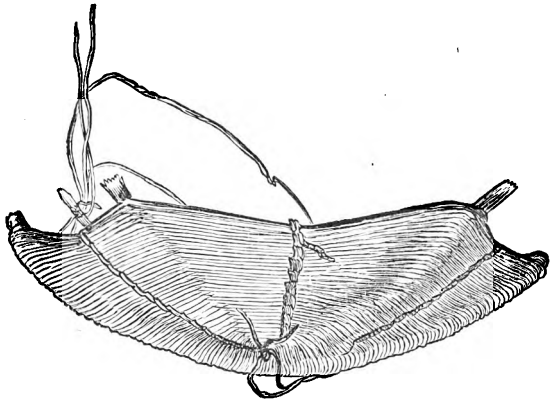
A fœtal body (13069), in its wrapper (13070), was also found

[3] Probably a quipu, quippus or quippo, used for arithmetical purposes, and, also, as aid to the memory by way of association, by the Peruvians. The custom of preserving a part of the umbilical cord is common, if not universal, among the we-tern tribes of Indians of North America.

in this tomb, and it is particularly deserving of notice that, in many others, fœtuses were found preserved as carefully as the body of the infant just described.

Besides the articles before enumerated, there were found in the tomb, a package of coca done up in a brown cloth (13073), and a number of woollen bags, of various patterns and sizes, some of them containing maize (13071) both ground and unground, and others leaves of coca (13072). Several of these bags are of fine and even texture with ingeniously woven figures of various patterns and colors. Many of them are much worn and have been neatly repaired. Each bag is made of a single piece of cloth, woven of the exact size required for the purpose for which it was intended, and this remark is applicable to every article made of cloth

Fig. 10.



WOOLLEN THREADS ON A FRAME, ½. (13076.)

which was found in the cemetery. The fabric is generally evenly woven, often fine and soft, of threads dyed with durable colors consisting of two or more strands. The sewing is generally strong, uniform and often ornamental. One of these bags contained a long cotton cord [not now in the collection] formed of nine strands evenly twisted together and as uniform throughout as if made by means of modern machinery. It is noticeable as being almost the only article made from this material which was found.

Another bag (13074) of fine texture, differing in pattern from the rest, contained five locks of human hair (13074), and a

single bead formed of *Chrysocolla* (13075). This hair is fine and does not appear to have undergone any material change of color; it is of several shades of brown in all the locks excepting one, which is black.

Fig. 11.

13081

SPINDLE WITH WHORL OF STONE, ½

If, as some have supposed, the hair on the mummies, now brown, was originally black and had changed by age, why should not this lock of black hair have changed also?

Other articles found in the tomb were:

A piece of unfinished work (13076) of woollen threads of various colors, upon a rude frame made of twigs; this is shown in Fig. 10; with it there were a thorn needle with a piece of thread still in the eye (13077), and three balls of yarn (13078). From its having been found in connection with the body of the woman, it is not improbable that it is a piece of work upon which she was engaged a short time before her death.

Similar pieces of unfinished work (13079) were found in other tombs; for what they were designed is unknown, possibly for caps like the one which has been described.

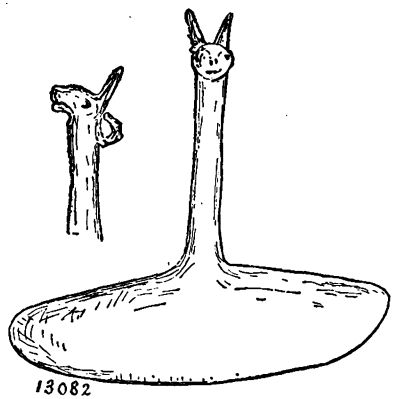
Several spindles and distaffs (13080) of wood, and one of wood and stone (13081) were found; one with a stone whorl is represented by Fig. 11. These simple instruments for spinning by hand are in common use at the present day, and weaving is still done, to some extent, by Indian women who have no knowledge of the loom; the warp being held by stakes driven into the ground and the woof inserted under and over the threads by means of a long wooden needle.

The only articles of metal found in this tomb, beside the silver disc before mentioned, were two knives of copper alloyed with a small percentage of tin, each formed of a single piece of metal, with the handles in the middle of, and at a right angle to, the blade; in one of them (13082), Fig. 12, the end of the handle represents the head of a *Llama*. The blade of the largest (13083), Fig. 13, is two and a half inches long and five-eighths of an inch wide; the

handle measures two and a half inches from its end to the edge of the blade.

There were three combs (13084) similar to the one before mentioned, one of these is represented in Fig. 14. The teeth, each of which is formed of a separate piece of hard wood, are bound together between two semicylindrical pieces of wood, by thread.

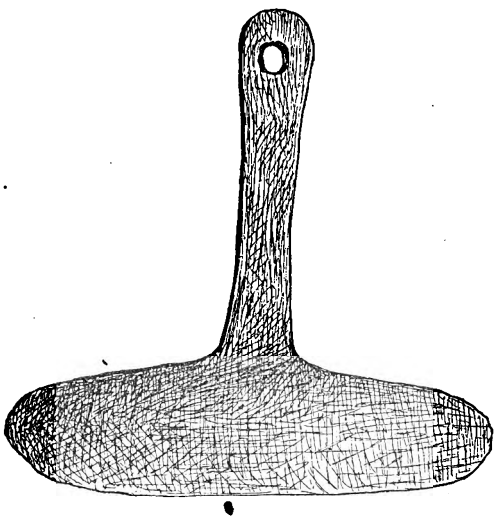
Fig. 12.



BRONZE KNIFE FROM ANCIENT GRAVE, PERU. Natural size.

Several ears of corn or maize (13085), of a peculiar kind. The receptacle is remarkably small, the grain long and cylindrical, and the farinaceous portion nearly free from oil. All efforts to make it vegetate have proved unsuccessful.

Fig. 13.



BRONZE KNIFE FROM ANCIENT GRAVE, PERU. Nat. size.

A thorn needle with an eye (13086), and a thorn (13087) such as the needles were made of.

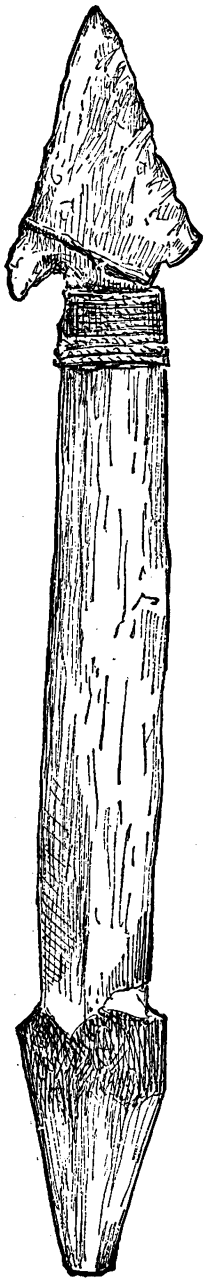
A small pointed stick (13088) showing marks of fire.

Six pointed sticks of various sizes and shapes (13090), and five larger pointed sticks of different shape (13091).

Three knives, or possibly arrows, Fig. 15, actual size, made of stone and fixed in short wooden handles, or shafts, pointed at the end as if for insertion in a reed (13092).

Two peculiar articles made of small sticks bound together by

Fig. 15.



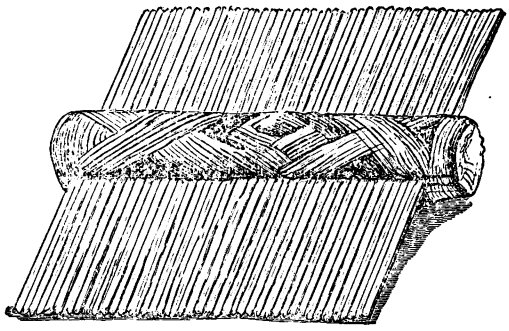
cross cords in a peculiar manner (13093), Fig. 16.

Two small open-work baskets made of split reeds (13094), Fig. 17. Small and beautifully made basket of reeds (13096), Fig. 18.

A piece of unfinished work (13095), like that described on a preceding page and represented by figure 10. Foot of a bird prepared in a peculiar manner (13097), somewhat like a bottle with a wooden stopper (13089).

A small twig bound with fine thread and having the appearance of a miniature bow (13098), perhaps a child's plaything.

Fig. 14.



COMB FROM ANCIENT GRAVE, PERU, ⅔. (13084.)

Two lots of wool of the *Vicuna* (13099).

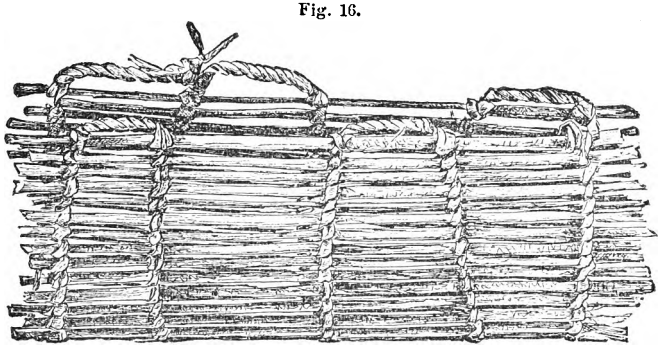
A small gourd bottle (13100) ornamented about the mouth.

Beside the articles enumerated, there are a number of earthen vessels, of which several are represented in the following figures, both glazed and unglazed; some are plain and others are ornamented. They were moulded by hand without the aid of a potter's wheel.

One of them (13101), Fig. 19, rudely represents a bird; similar vessels have been

found unbroken, which, when filled with water and rocked forward and backward, emit a sound not unlike the note of a bird.

Fig. 16.



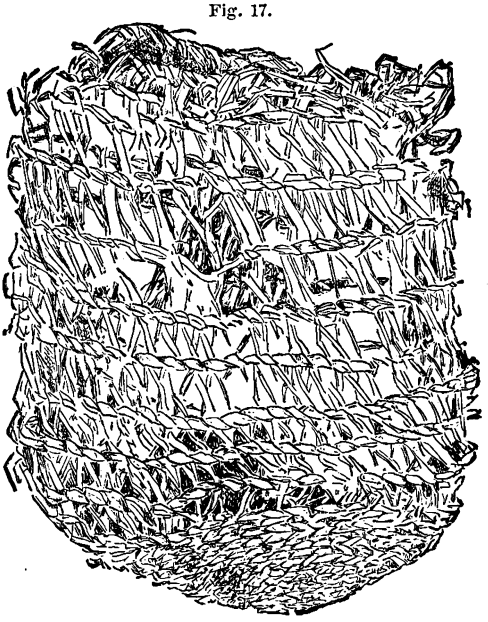
STICKS BOUND WITH CORDS, FROM ANCIENT GRAVE, PERU, ¼. (13093.)

Figure 20 represents a beautiful jar (13102), in which the bowl part is supported by the head and horns of a deer.

Another symmetrical and beautiful vessel (13103) of clay, is that represented by Fig. 21. Still another vessel (13104) of the same general character of pottery, but not so symmetrical, is shown, of natural size, in Figure 22.

These several examples of ancient Peruvian ceramic art, are made of fine clay and well finished. The ornamentation is in black and white paint on a red ground, or as in the case of Figure 22, black and red on a brownish ground.

Fig. 17.

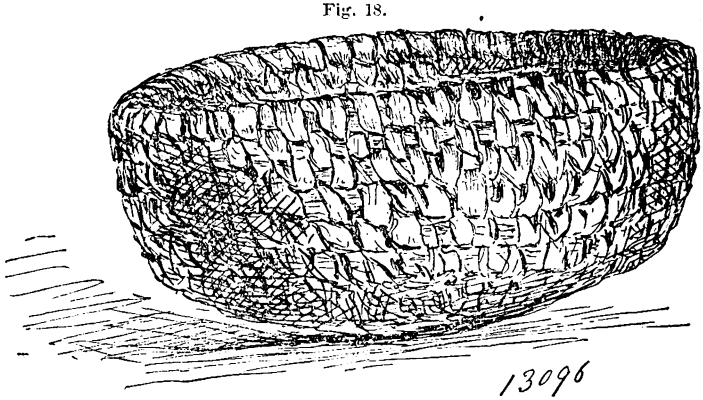


BASKET FROM ANCIENT GRAVE, PERU. Nat. size. (13094.)

An interesting clay bowl is shown in Fig. 23. This bowl

(13107) is well made and carefully finished, and as shown in the

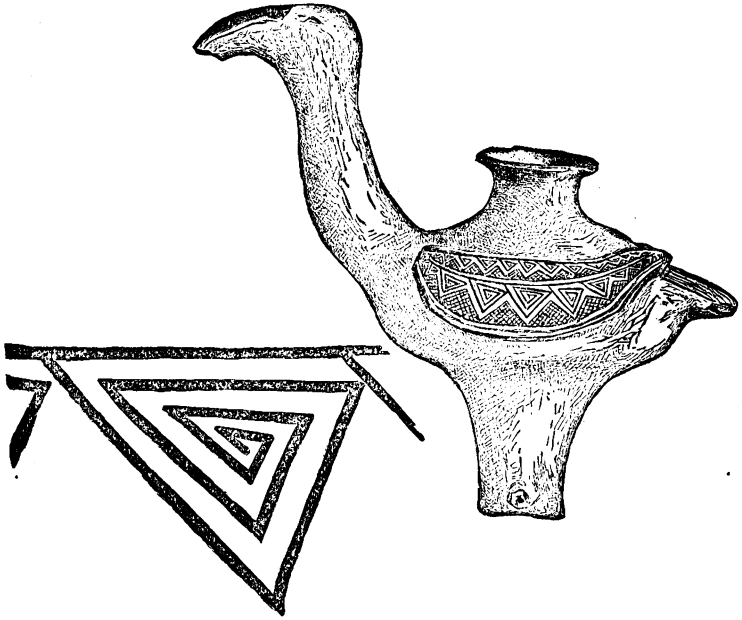
Fig. 18.



BASKET FROM ANCIENT GRAVES, PERU. Natural size.

figure is ornamented on the inside by two black lines of border, under which are represented three birds.

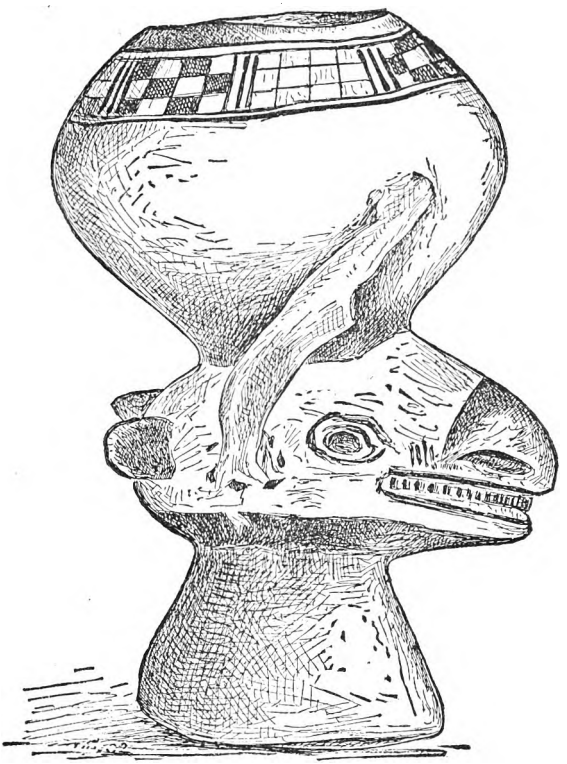
Fig. 19.



CLAY VESSEL FROM ANCIENT GRAVE, PERU, ¼. (13101.) *a*, The pattern on the wing, enlarged twice.

Figure 24 represents, of natural size, a peculiar pointed little vessel (13106) of black clay; and Figure 25, also of natural size, a small rudely made pitcher-shaped vessel (13105).

Fig. 20.



CLAY VESSEL FROM ANCIENT GRAVE, PERU, ½. (13102.)

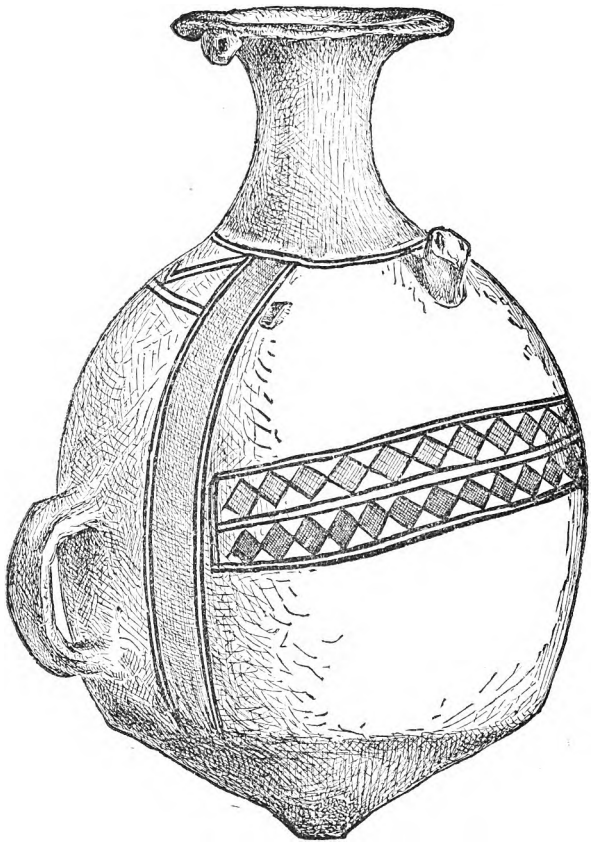
Several other vessels of clay were collected and are with the collection (Nos. 13108, 13109, 13110).

Spherical vessels, such as are represented in the drawings, are used in Peru at the present time for preparing a kind of tea from leaves of coca, which is used for medicinal purposes, and sipped by means of a small tube passed through the hole in the top.[4]

[4] In the arid parts of Peru, such is the nature of the soil and climate that articles which would soon perish in a humid atmosphere are here, after the lapse of centuries, found perfectly preserved. The burial grounds afford the largest number of interesting relics, which evince strong feelings of attachment and regard for the dead on the part

The crania found in the cemetery, and the remark applies equally to those found in other similar cemeteries, present two distinct forms, the one rounded and the other elongated. Those

Fig. 21.



CLAY VESSEL FROM ANCIENT GRAVE, PERU, ½. (13103.)

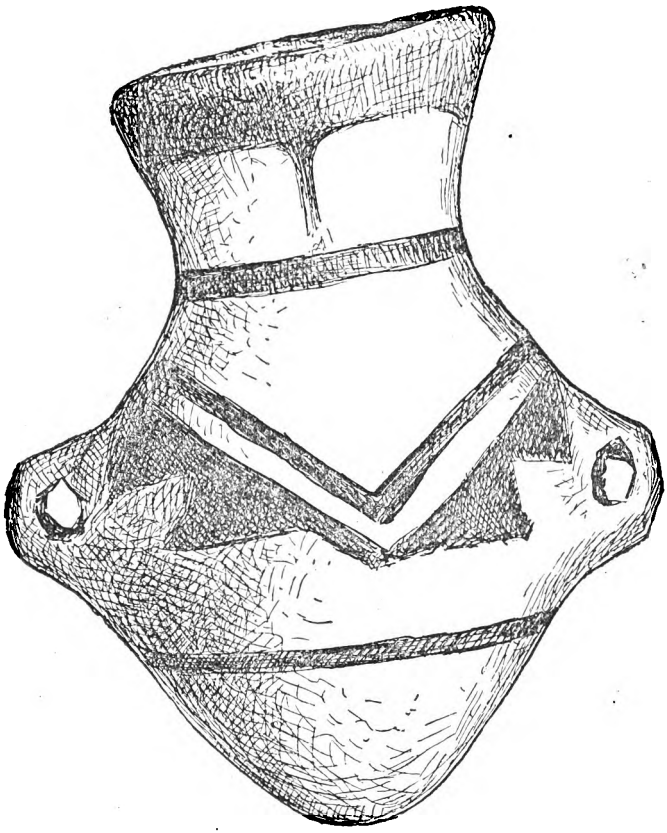
of the bodies described are of the former shape. A large number were collected and brought together, and from them a selection of

of their relatives and friends. It is a common opinion that the custom of burial with the dead of the various articles found in sepulchres, grew out of a belief that they would be useful to the deceased in another state of existence; but it is more probable that it was the result of a feeling, rather than any process of reasoning, by which the living were prompted to invest their relatives and friends with interesting associations in their last resting places.

a few of each kind was made, in order to obtain fair average specimens of each type.

The rounded, *brachycephalic*, crania are small. The occipital

Fig. 22.

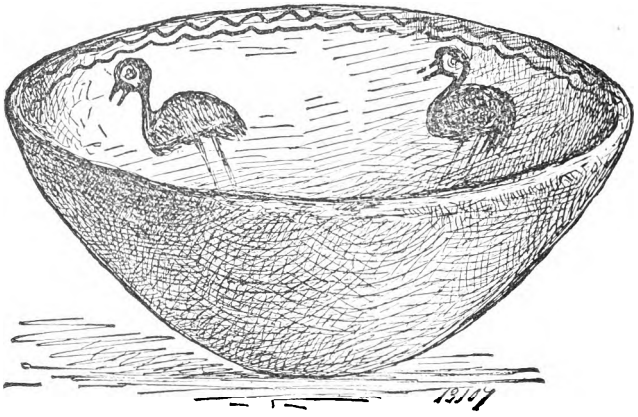


CLAY VESSEL FROM ANCIENT GRAVE, PERU. Natural size.
(13104.)

bone is flat; the forehead retreating, but elevated and broad in comparison with that of the elongated, *dolichocephalic*, crania. The temporal fossa is not remarkably large. When the eye is

directed downward upon these skulls, the occiput being towards the observer, the zygomatic arch is nearly, in most, and entirely, in

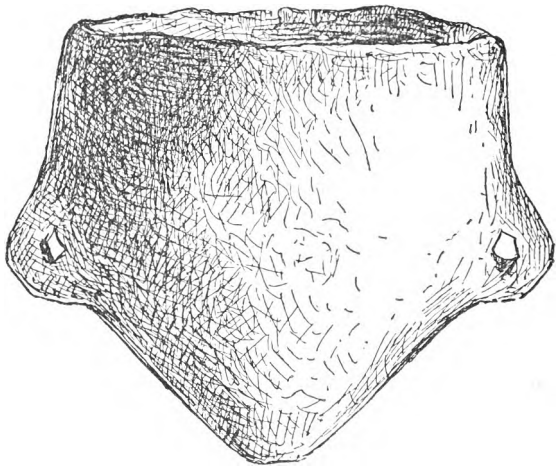
Fig. 23.



CLAY BOWL FROM ANCIENT GRAVE, PERU, ¼.

some of them, hidden from the sight. Viewed in the same position, the face is completely hidden by the upper and front part of

Fig. 24.



CLAY VESSEL FROM ANCIENT GRAVE, PERU. Natural size.
(13105.)

the cranium. The orbital cavities are deep, and their margins quadrangular. The bones of the nose are prominent and the orifices large. The alveolar edges of the jaws are obtusely arched in front, and the chin projects on a line with the teeth. The cheek bones descend in nearly a straight, vertical line from the external angular process of the frontal bone. Compared with the elongated

Fig. 25.

CLAY VESSEL FROM ANCIENT GRAVE, PÉRU. Natural size.

crania the face is small, and its outlines more rounded. The following are measurements in inches, from four which were selected as fair average specimens of this type.[5]

Longitudinal diameter.....	6.	6.3	6.6	6.7
Parietal diameter.....	5.2	5.	5.3	5.3
Frontal diameter.....	3.5	3.5	3.4	3.6
Vertical diameter.....	5.2	5.3	5.3	5.4

Of the other type of crania, the elongated, *dolichocephalic*, full two-thirds of the cavity occupied by the brain, lies back of a

[5] The flatness of the occiput, in this type of Peruvian crania, is common with those of the Mexican and many of the tribes of North America, and it is probably due, in all of them, to a custom which still prevails of securing infants to a board or bark cradle by means of a broad flat belt passed tightly around the body from the feet upwards, and over the forehead. The practice of swathing infants among the Peruvians, is universal at the present time. They are first wrapped in a square cloth, a folded corner of which is brought over the forehead and the whole secured in the manner described.

vertical line drawn from the middle of the occipital foramen, and, when laid upon a table, resting on the condyles, the skull falls backward. The forehead is low, and very retreating. The temporal ridges approach near to each other and a large space is afforded for the temporal muscles, between which the skull seems compressed. Compared with those before described, the whole bony apparatus of the face is more developed. The zygoma is stronger and more capacious; the superior maxillary bone is more prolonged in front, and its incisor teeth are in an oblique position. The entrances to the nose are more ample, and the cribriform lamella more extensive. The substance of the skull is thicker, and the weight greater. In these, also, the orbital cavities are deep and the margins quadrangular. In both, the foramen magnum and the other openings for the passage of the nerves are large. The following measurements in inches were taken from three fair average specimens.

Longitudinal diameter.....	7.2	7.3	7.
Parietal diameter.....	5.2	4.9	4.7
Frontal diameter.....	3.6	3.3	3.2
Vertical diameter.....	5.1	4.9	5.1

These measurements average for each type

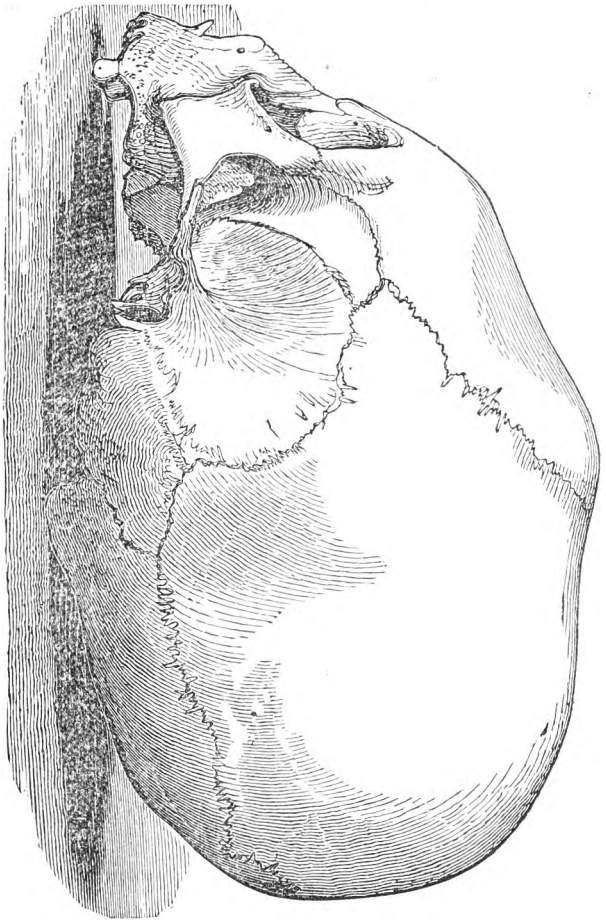
	BRACHYCEPHALIC.	DOLICHOCEPHALIC.
Longitudinal diameter.....	6.4	7.1
Parietal diameter.....	5.2	4.9
Frontal diameter.....	3.5	3.3
Vertical diameter.....	5.3	5.

Figures 26–29 represent, of about two-thirds their natural size, the skulls of two children, of from five to six years of age, both of the dolichocephalic, or elongated type. One of these (13112), Figures 26, 27, shows evident marks of artificial distortion, and the other (13113), Figs. 28, 29, evident indications of its normal shape.[6]

[6] It is of interest, and of importance, to call attention to the fact that the two crania here described and figured, are the very specimens about which considerable controversy has been held by Drs. Wilson, Davis and Wyman, and are those from which the figures in Wilson's "Prehistoric Man," were taken. The seven other crania mentioned in this article were not received with the collection, but, since this report has been put in type, they have been found at the Warren Museum and the proper order received for their delivery to the Peabody Museum, where they will be placed with the rest of this valuable collection. — F. W. P.

In the former an unnatural ridge is seen near the coronal suture, and the parietal bones bulge out on either side. No similar peculiarities are to be seen in the latter.

The differences which have been shown in the crania are by no



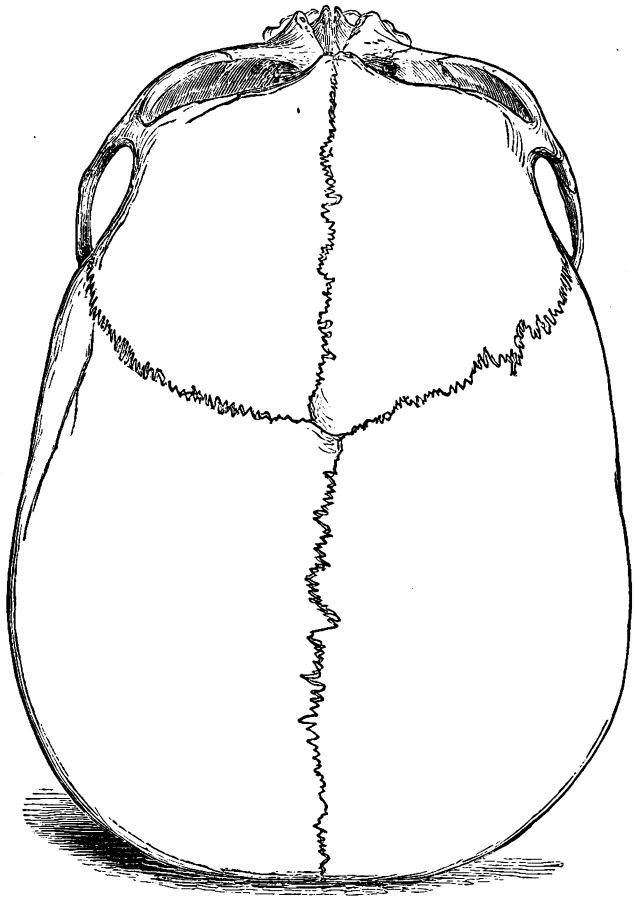
CRANIUM OF A CHILD FROM ANCIENT GRAVE, PERU, ABNORMAL, ⅓. (13113.)

Fig. 26.

means the only differences between the two classes. Other parts of the skeletons when compared show a striking dissimilarity. All the bones belonging to the elongated, or dolichocephalic type of crania, are larger, heavier and less rounded than those belonging to the other, or brachycephalic type, and their processes are more

protuberant;[7] the hands and feet are larger, and there is every evidence of their general greater muscularity, showing that they were

Fig. 27.



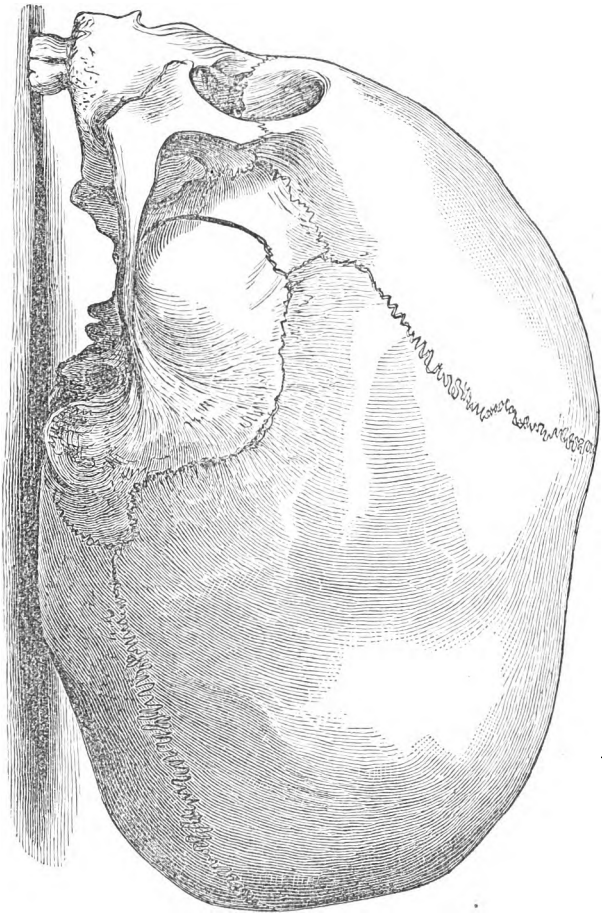
CRANIUM OF A CHILD FROM ANCIENT GRAVE, PERU, ABNORMAL, $\frac{2}{3}$. (13113.)

fitted for, and accustomed to, manual labor, the reverse of which is indicated by the narrowness and delicacy of the hands and the long

[7] Many distinguished naturalists are of opinion that the two forms of skulls described are representative of one type, the elongation of the one being due entirely to artificial compression. In the two skulls of children referred to, the normal shape of the one appears as evident as does the abnormal shape of the other; and this may be said of a very large number of adult crania which were examined.

and regularly formed finger nails of those to whom belonged the rounded, or brachycephalic crania.

In one of the tombs in the same cemetery, in which were several



CRANIUM OF A CHILD FROM ANCIENT GRAVE, PERU, NORMAL, ⅔. (13112.)

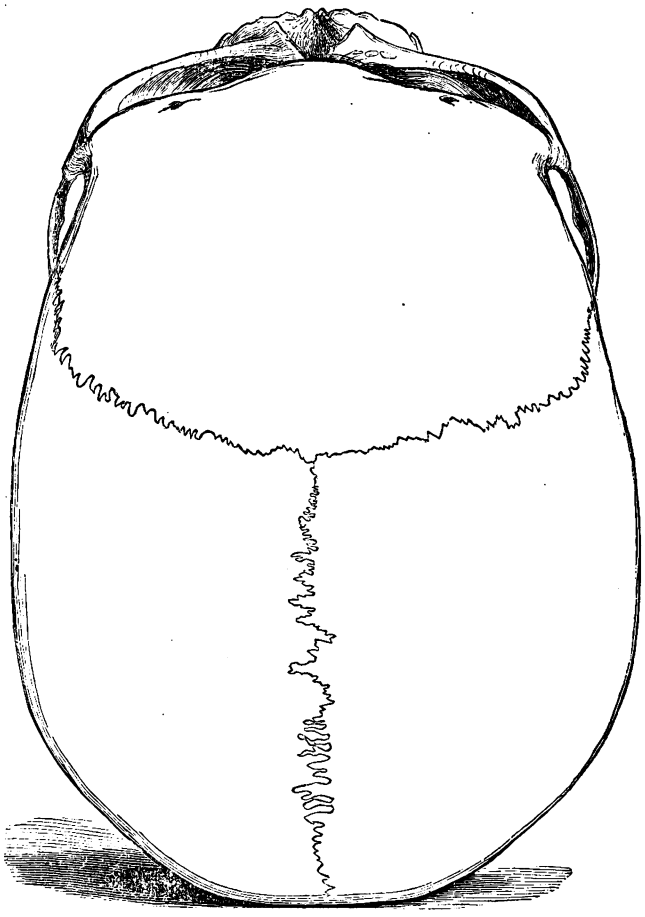
Fig. 28.

bodies, there was found, deposited separately, a well preserved head(13114), Fig. 30, wrapped in a thick cotton hood.[8] It is in a

[8] No similarly formed head was observed among the many which fell within the writer's observation, and it is the only instance found by him of a head preserved separately. This is the head of which Dr. Morton gives an illustration in his *Crania Americana*, plate 1.

good state of preservation, and this appears due to careful desiccation without the use of resin, or other antiseptic. From the manner in which the skin of the neck is drawn inward over the *atlas* and *dentatus*, it is evident that the preservative process was

Fig. 29.

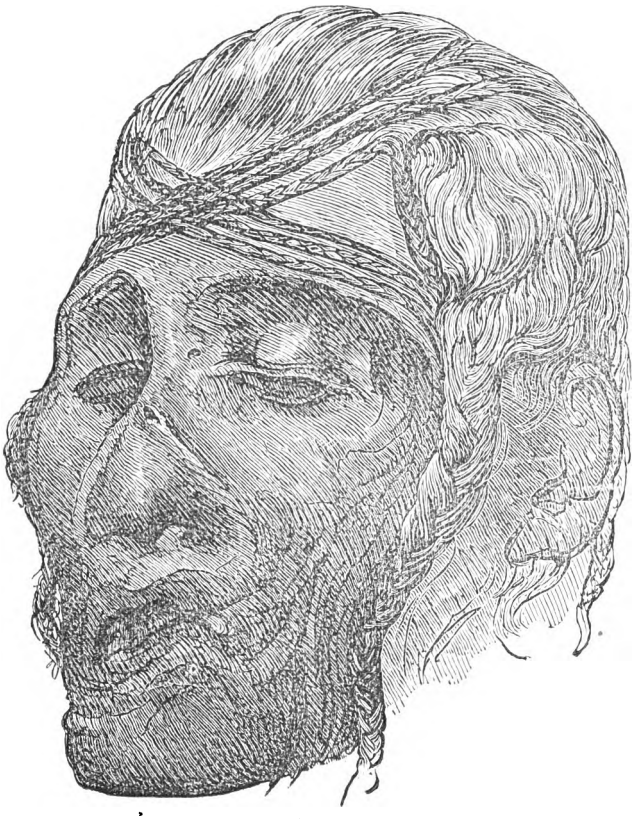


CRANIUM OF A CHILD FROM ANCIENT GRAVE, PERU, NORMAL, §. (13112.)

applied to the detached head soon after death. No other separate or similarly formed head was found. In some respects it presents striking points of dissimilarity to any of the crania already described. It is remarkable for its great height compared with

its diameter. Measured from the most prominent part of the frontal bone to the extreme projection of the occiput, it is 6.4 inches; from the most prominent protuberances of the parietal bones, the diameter is 5.8 inches, and vertically, from a horizontal line drawn

Fig. 30.



MUMMIED HEAD FROM ANCIENT GRAVE, PERU. (13114.)

across the centre of the orifice of the ear to the highest part of the head, is 5.2 inches. The forehead is broad and high, the nose prominent, the cheek bones high, the alveola edges of the jaws obtusely arched in front, and the incisor teeth stand in a vertical position. The hair, which is brown, and slightly gray, is remarkably fine with a tendency to curl. It has been neatly braided, and

several of the braids are passed across the forehead, for which purpose they have been lengthened by the addition of false hair, so ingeniously joined as nearly to escape detection. The orifices of the ears are filled with tufts of cotton, and the same are passed through slits in the lobuli. The teeth in this head, and in all the adult skulls examined, including those under middle age, are much worn. The incisors are ground down from their cutting edge to a broad flat surface, and the cuspidati present a similar appearance. Though this condition is very common in the crania of primitive races, it is accounted for among the Peruvians by a habit, still prevalent, of chewing the leaf of the coca mixed with a gritty substance called *llute*, made of the wild potato, calcined shells, and ashes of cacti, or other plants rich in alkali.

ARCHÆOLOGICAL EXPLORATIONS IN TENNESSEE.

By F. W. Putnam.

During the month of September, 1877, as stated in my general report (p. 203), friends in Nashville tendered to me such facilities for archæological research in central Tennessee as enabled me to make extensive explorations in several localities, the results of which are briefly recorded in the following pages.[1]

My first examination of the ancient stone graves, which are so numerous in the state of Tennessee as to form a marked feature of its archæology, was in the prehistoric cemetery on Zollicoffer Hill. It was soon found, however, that the graves at this place had been so much disturbed as to make any work done here rather unsatisfactory as to results. The building of Fort Zollicoffer on this hill was probably the first cause of disturbance of the cemetery, while its easy access from Nashville has recently led many curiosity hunters to the spot.

One of the graves at this place had been opened by a friend a few days before my visit, and in it he had found the remains of what he believed to be a mother and child. The few bones he collected and kindly gave me, however, showed conclusively that

[1] Prof. Joseph Jones in his elaborate and interesting work, "Explorations of the Aboriginal Remains of Tennessee," Smithsonian Contributions, No. 259, 1876, gives much valuable information about the archæology of the state, and describes and figures many articles found in the graves. In this report I do not intend to enter into a discussion of the facts, but simply to give the results of my own explorations in Tennessee. This limitation is also advisable for the reason that large collections, made under my direction, have been received from the state since the close of the year covered by this report, which will be referred to in the next Annual Report. I must, however, state that it was most gratifying to me on reading Prof. Jones' work, which, though dated 1876, was not received at Cambridge until October, 1877, after my return from Tennessee, to notice how our similar explorations had led to the collection of nearly identical material, and the corroboration I had obtained of many of the facts which Prof. Jones has so well presented; although, as would be expected from two persons having nearly identical material in hand, but looking upon the evidence furnished from different stand points, I am forced to differ from him in some of his conclusions, particularly so in regard to the evidence of syphilis prevailing in this old nation of Tennessee. Undoubtedly very many of the human bones show the results of disease, but it may be that the disease was not syphilis, and that other diseases affect the bones in a similar manner.

while those belonging to the adult had been long buried, and were probably those of the body for which the grave had been made, those of the infant were on the contrary of a much later date, and were evidently of a child that, not many years ago, had been placed in this old grave, which was near the surface and formed a handy place for burial. This fact is mentioned simply to show the caution with which such examinations must be made in order to secure trustworthy results.

One grave which I opened at Zollicoffer Hill, though only a few inches under the surface, had escaped former disturbance. This grave was formed of six slabs of stone on one side and five on the other, with one slab at the head and one at the foot; forming a grave five feet eight inches in length, inside measure, and six feet outside. The average width being eighteen and the depth sixteen inches. The side stones were unevenly broken to dimensions of eight to fifteen inches in width, by about twenty inches in depth and two, or three inches in thickness. The two stones forming the head and foot of the grave were larger than those on the sides. All these stones extended a few inches below the floor of the grave, which was made by placing thinner and smaller pieces of stone in such a manner as to form a level bottom to this cist. Five slabs of stone, larger than those used on the sides, rested on the nearly even edges of the upright stones, and, slightly overlapping, formed the cover or top of the grave.

Further examinations in other localities showed that all the stone graves were made after this plan, the only variation being in the size of the stone slabs and in the dimensions of the graves. Any rock was used that could be easily detached in slabs of convenient size. That most common to the localities I visited was limestone and sandstone.

In the grave I have described the body had been laid on the back and extended at full length, occupying nearly the whole length of the grave, showing that the person when living was about five feet, five inches in height.

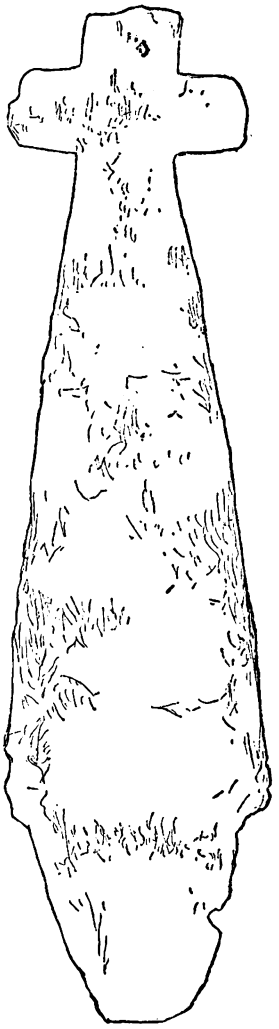
From many measurements of the graves taken during my explorations, I am convinced that the people buried in these stone graves in Tennessee were of ordinary stature. Occasionally a grave seven feet, and even of eight feet in length was found, but in such cases there was always a space of several inches between the bones of the feet and the foot-stone, and between the skull and the head-stone.

In the grave specially mentioned above, the only articles found were fragments of two vessels of clay, which had been placed in the centre of the grave, and a pointed implement made of deer's horn (11830).

In another grave of the same character and about the same size, located by the side of the first, and also with the covering stones in place, the remains of the skeleton of an adult were found, and with it, in about the centre, on one side of the skeleton, were the fragments of an earthen dish. On the breast of this skeleton was the ornament of copper here figured of its actual size (Fig. 1). The cross-like form of this ornament may give rise to the question of its derivation; and had any article of European make, such as glass beads, brass buttons, etc., so common in Indian graves subsequent to contact with the whites, been found in any one of the hundreds of graves I opened in Tennessee, I should consider the form of this ornament the result of contact with the early missionaries; but, from the total absence of articles denoting such contact, I think it must be placed in the same category with the "tablet of the cross" at Palenque, and be regarded as an ornament made in its present form simply because it was an easy design to execute and one of natural conception.[2]

The ornament is evidently made from a piece of native copper hammered and cut into shape. The small perforation at the upper border still contains a fragment of the string by which the article

Fig. 1.

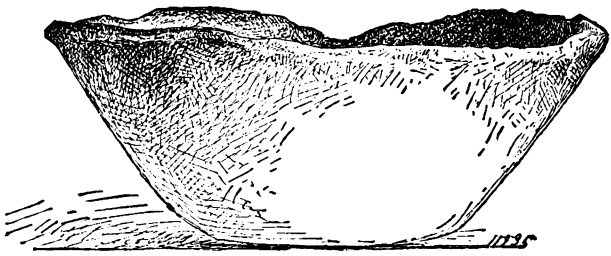


Ornament of Copper, from grave on Zollicoffer Hill. Natural size.

[2] Prof. Jones mentions finding the cross represented in several instances upon articles of shell and of copper found in the graves he examined, and has discussed the question of its origin. l. c., p. 77.

was suspended, preserved by the action of the copper; and on one surface of the copper are slight evidences of its having been in contact with a finely woven fabric, thus showing that this ancient

Fig. 2.

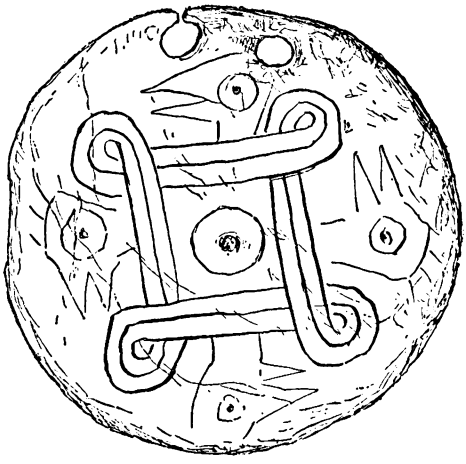


Dish from grave on J. M. Overton's place. ¼.

people, who were well advanced in the ceramic art, also possessed the knowledge of weaving.

On the large estate of John M. Overton, Esq., eight or nine miles south from Nashville, there was formerly an extensive cemetery, and many graves are still to be found about the hill on which stands Mr. Overton's hospitable residence, known as the "Traveller's Rest." At this place Prof. Joseph Jones obtained many of the articles which he has described and figured in his valuable work.

Fig. 3.



Ornament of Shell from grave on J. M. Overton's place. Natural size. (11817.)

It was my good fortune to receive the kind attentions of Mr. Overton during a short visit to this interesting locality, and thanks to Mrs. Overton, and her gardener, Mr. Edward Cross, I was made the recipient of several very valuable specimens which had

been taken from graves on the place, and also had an opportunity to open two graves myself, from each of which I secured pottery, and from one a cranium.

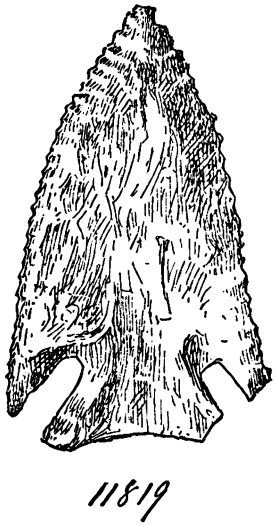
One of the articles of pottery (11835) is here represented, of one-half of its diameter (Fig. 2). This is a well-made, rather thick dish, without ornamentation, and was found by the side of the skull.

A short time before my visit, a stone grave was removed by Mr. Cross, and in it were found two interesting articles which he gave to me. One of these is a highly polished discoidal stone, two and a half inches in diameter and one and one quarter thick, made of white quartz (11818); the other is the shell ornament here represented, of actual size (Fig. 3).

This ornament is made from a large marine shell, probably a *Busycon*, and is symmetrically carved on the slightly concave surface as shown in the figure.

The four heads of birds, resting on the rectangular central figure, are represented by simple incised lines. Two holes near the edge of the disk indicate that the ornament was suspended.[3]

Fig. 4.



Flint-point from Mr. Overton's place. Natural size.

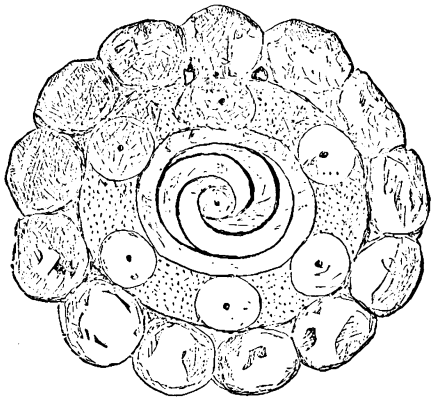
Mr. Cross also gave me a spear, or arrow-point of jasper with serrated edges (11819), which is represented, of actual size (Fig. 4). This flint-point was found while cultivating the land in the vicinity of the graves, and with two polished celts (11816), presented by Mrs. Overton, were probably once enclosed in graves which had been destroyed in former years.

In connection with the shell ornament found in the stone grave

[3]Since this was sent to press there has been received at the Museum from Mr. E. Curtiss, half of a shell disk found on the surface in Humphreys Co., Tenn. This shell disk has carved upon it figures identical with those on the one described above from Overton's farm. The two localities are between 70 and 80 miles apart and at both places the number of stone graves indicate large settlements. Can these carved shells be regarded as totems? Several distinct patterns are now known, of each of which two or more examples have been found.

on Mr. Overton's place, I give the following illustration (Fig. 5) of a similar ornament (11801) which was given me by the venerable Col. J. D. Morgan, of Nashville, in whose possession it had been for some time. Col. Morgan was not certain that this ornament was taken from a stone grave, though the probability is that it was so found in the immediate vicinity of Nashville. This disk is made from the shell of *Busycon*, and is larger than the one given me by Mr. Cross. Figure 5 represents this ornament, of one-half its diameter, and will give a better idea than words of the design carved upon it. Like the other, it has two holes for suspension.

Fig. 5.



Ornament of Shell from Nashville. ½.

Prof. Jones has described and figured (p. 43, figs. 7 and 8) a shell disk, found in a stone grave on the banks of the Cumberland, opposite Nashville, the carving on which is identical in its design with that on the one here figured, the only difference being in the number of circles in the two groups. In Prof. Jones' specimen the outer ring contains fourteen circles, and the inner nine, while in our specimen there are thirteen and six respectively. The central spiral figure is the same in both.[4]

Many of these carved disks of shell have been found in the graves and mounds of Tennessee and Missouri, and, with the identity of the associated pottery from the two localities, go far to prove the unity of the people, notwithstanding some slight differences in burial customs.

On the farm now owned by Miss Gertrude Bowling, about four and a half miles southwest from Nashville, were five burial

[4] In relation to this central figure Prof. Jones has ventured, on p. 137 of his work, a comparison between what he calls the "Symbolic divisions of the circle by the ancient stone grave race and mound builders of Tennessee," and the "Chinese figure Taeheih."

mounds, which, thanks to the kind permission of Miss Bowling, were thoroughly explored. Of these, I personally conducted the work on one of the largest, which was about fifty feet in diameter and between five and six in height. A second and part of a third were examined by Mr. Curtiss under my direction.[5]

These five mounds, containing the graves of from six to eight hundred persons, were probably the burial places of a former settlement in the immediate vicinity, all other traces of which had long since been destroyed by the cultivation of the land. Not far from this locality, as I was informed, are the remains of a cemetery where the graves were located on the side of a hill; a well known mineral spring is situated within half a mile of the mounds and a small winding creek is near by. The locality must have been a desirable one for a permanent village and, like all other such sites met with in the state, was well chosen for the natural advantages offered.

In the mound which I explored, over two hundred bodies had been placed, with one exception, in stone graves of various sizes. The single exception of a body buried without the care which was used in all other burials in the mound is of interest, especially as there was no indication that any article had been placed with the body, and while engaged in carefully getting out the skull of this skeleton, I could but feel that it was that of some poor outcast, who had not been considered worthy of a stone grave. The skull of this individual is noted in the table of measurements on p. 224, under No. 11918, and belongs to the ordinary type of skulls from the graves.

The mound itself was formed by several irregular layers or tiers of stone graves, the lowest of which had probably been placed irregularly round the grave first made. These lower graves were formed by making an excavation sufficiently deep to support the side-stones of the grave, but not so as to cover the overlying top-stones, at all events not more than an inch or two. On the graves, offerings of food, etc., probably had been left, which would account for the many fragments of pottery, the several stone implements and other articles found upon the covering stones, and by the sides of the graves.

Below several of the graves, near the centre of the mound, and

[5] Major Powell and his party explored the other mounds.

as nearly as could be determined on the original surface of the ground, was a bed of ashes several inches deep, in which fragments of pottery and a few bones of animals were found. In at least two of the mounds near this, corresponding beds of ashes were noticed. Over this bed of ashes were several graves, the stones of which they were formed extending but a few inches into the ashes, thus showing that these stone graves were often formed above ground. After these early graves were covered by a few inches of soil, a second tier was placed above them, and eventually this was followed by a third and fourth.

At the highest point on the mound, a few graves were found, which, though nearly destroyed by the growth and falling of trees, probably belong to the latest, or fifth tier of graves.

Over the mound was a recent growth of trees, the largest of which was a black walnut, standing on the very centre with its roots reaching down the sides of the mound and penetrating some of the upper graves. This tree was eight feet four inches in circumference at its base, and seven and one-half feet, at a height of four feet; but, as a section of the trunk only showed between sixty-five and seventy rings of growth, the tree is not of value in estimating the age of the mound, for it is historically known that this region was without Indian inhabitants one hundred and fifty years ago, and, uncertain as we are as to the period when they were constructed, it is certainly safe to state that the mounds were not made after that date.

The mound, formed in the method stated, by the gradual accumulation of the stone graves, was conical in shape, as each irregular tier of graves had a smaller number than that below it. The lower graves were thus, of course, the oldest, though there was little difference in regard to the condition of the bones, and the contents of graves side by side in any of the layers were in entirely different degrees of decay.

It was noticed that no method was followed in placing the head of the body in any particular direction, though in the lowest tier the majority were placed with the head towards the centre of the mound, but even among these oldest graves one was occasionally found at right angles to that adjoining. In the upper layers, the graves were placed in all directions, sometimes one would be found lying lengthwise directly over a grave below it, and others were resting crosswise upon two, three or even four graves in the

tier below. It was particularly noticed that without regard to the proximity of other graves, each was constructed perfectly independent of those adjoining, notwithstanding the fact that the side or head stones of adjoining graves were often in contact. Generally, however, there was a space of about six inches between the graves, and often the space was one or two feet.

The following transcript of my field notes, for two days of the six that I spent with my diggers in examining this mound, will give sufficient details to show the character and contents of the graves in this and the adjoining mounds. In designating the several tiers, the lowest is counted as the first, and so on to the fifth, or most recent. The graves here recorded were principally on the eastern side of the mound.

Grave 1. 1*st tier.* Inside measure, 6 feet 9 inches in length, 1 foot wide, 9 inches deep. An adult, body extended, lying on back, head to west. Bones of the skeleton very dry. Skull taken out perfect, but fell to pieces in cleaning, pieces saved with all the teeth. Took out long bones, part of pelvis, vertebræ, etc. Fragments of a pot, a broken arrowpoint, and three flint chips in grave. Top of grave covered by four large slabs which projected over the sides.

Grave 2. 1*st tier.* A child of four or five years, body extended, head to west. Skeleton all gone except portions of left parietal and occipital, several teeth and piece of femur. No article in the grave. Length 3 feet 9 inches, width 11 inches, depth 9 inches. Side rocks extending several inches below the bottom of inside of grave. Two rocks on top.

Grave 3. 1*st tier.* Grave of an old person, body extended, head to west, 6 feet 9 inches long, 1 foot 8 inches wide. Skull, pelvis and long bones taken out in good condition. Nothing but skeleton in the grave.

Grave 4. 1*st tier.* Adult, body extended, head to west, 6 feet 6 inches long, 2 feet 2 inches wide. Took out skull in pieces, long bones, fragments of pottery and shell of Unio.

Grave 5. 1*st tier.* This grave, though 6 feet 6 inches long and 2 feet 1 inch wide, was that of a youth or a woman of delicate frame. With the exception of portions of the long bones, the skeleton had nearly decayed. No article in the grave.

Grave 6. 1*st tier.* 3 feet long, 2 feet 5 inches wide. A young

child, all the bones decayed except the shafts of the long bones of arms and legs. No articles in grave.

The grave of an adult, designated as No. 1, was between the two graves of children, Nos. 2 and 6.

Graves 7 *and* 8. 3*rd tier.* These graves were close together, of same size, the indications being that they were made at the same time. Each grave was 2 feet by 1 foot 4 inches, and each covered by a single slab. No. 7 contained bones of an infant in such position as to show that the body had been extended when placed in the grave. Several of the bones in a good state of preservation, and were saved. In this grave found fragments of pottery and a mussel shell.

In No. 8, the bones of the head and body were in a compact mass of 12 by 6 inches, and had the appearance of having been buried in a bundle. In this grave were also fragments of pottery.

Grave 9. 1*st tier.* 7 feet long. Adult. Long bones, pelvis and under jaw saved. A ring of pottery $1\frac{1}{2}$ inches in diameter resting on under jaw.

Grave 10. 1*st tier.* That of a child, 3 feet long, 1 foot wide. Part of skull and the long bones saved. No articles in grave.

Grave 11. 1*st tier.* Adult, 7 feet long. Skull and long bones saved. No sign of pottery or articles of any kind.

Grave 12. 2*nd tier.* Long grave. Skeleton too far decayed to save any portion. No articles in grave.

Grave 13. 2*nd tier.* 3 feet 8 inches long, 14 inches wide, 9 deep. A child about five years old. Long bones and under jaw saved. No articles in grave.

Grave 14. 3*rd tier.* 3 feet long, 9 inches wide, 7 deep. That of a child. Portions of skull and the long bones saved. No articles in grave.

Grave 15. 2*nd tier.* 7 feet long, 11 inches wide, 6 inches deep. Adult, body extended on back, head to north. Skull, long bones and pelvis saved. The following articles were found in space between the skull and head stone: —

Large spear point and knife of flint; several flint chips; two awls made of deer's horn, and two others made of bone; a shell bead; tooth of a beaver, tooth of a carnivorous animal; wing bone of a bird.

Grave 16. 2*nd tier.* Next west of 15 and of about the same size, head to north. Long bones and jaw saved. Fragments of pottery.

Grave 17. 2*nd tier*. Old person, head to west. Skull, long bones, pelvis and other bones saved. Two flint chips in grave. No signs of pottery.

Grave 18. 3*rd tier*. Small grave containing portions of much decayed skeleton of a youth. Shell of Unio, and a flint chip in grave.

Grave 19. 4*th tier*. On the western side of the mound and the upper tier at this place. The covering stones of this grave had been disturbed. Head to west, feet towards centre of mound. Nothing saved.

Grave 20. 1*st tier*. In part under Nos. 15 and 16. Youth of about eighteen years. Jaw and arm bones saved. A slender flint drill, fragments of pottery and a few flint chips in grave.

Grave 21. 1*st tier*. About in centre of mound and running north and south. 6 feet long. Body extended, head to north. Skull saved. No articles in grave.

Grave 22. 1*st tier*. 6 feet 3 inches long. In same line with 21, and the head stones of the two graves in contact. Head to south. The skull and some of the long bones saved. Flint chips in grave.

Grave 23. 1*st tier*. Grave of a child, 3 feet 2 inches long, 12 inches wide, 5 inches deep. Head to west. Bones much decayed. None saved. No articles in the grave.

Grave 24. 1*st tier*. On same line with grave 23. Foot stone of 24 in contact with head stone of 23. Two tiers of graves over 23 and 24, the graves resting on 23 and 24 lying east and west, while those in the upper tier were lying north and south. The position of this grave and the condition of its contents, mark it as one of the oldest in the mound, though on the eastern side of the centre. The grave was very dry and the bones had nearly all been reduced to dust. What remained consisted of a few teeth, a fragment of the femur, small fragments of the tibiæ, and portions of the spongy part of a few of the bones. A pipe made of pottery and a few flint chips, were found near the teeth and had evidently been placed near the head.

From these notes it will be seen that from comparatively few of these old graves can either crania or other bones be obtained, and those that are removed require long and patient work. It will also be noticed that very few graves contained pottery or other articles, though this would not indicate any neglect on the part of

friends, as it is probable that many perishable articles were placed with the dead in the graves, while the numerous fragments of pottery, the stone implements, etc., found among the graves, as already noticed, suggest that offerings were placed over the graves as well as within them.

On the southern side of this mound, owing probably to its being always comparatively dry, the pottery was in a better state of preservation, and numerons perfect specimens were obtained from the graves. In two instances, one on the southern, and the other on the western side of the mound, there were double graves. That is, two bodies had been placed in a grave of the usual length but wider than ordinary. In one of these, the skeletons were extended at full length and crossed each other, the skulls being at opposite ends of the grave. In the other the skeletons were side by side, but one of them was without the bones of the feet.

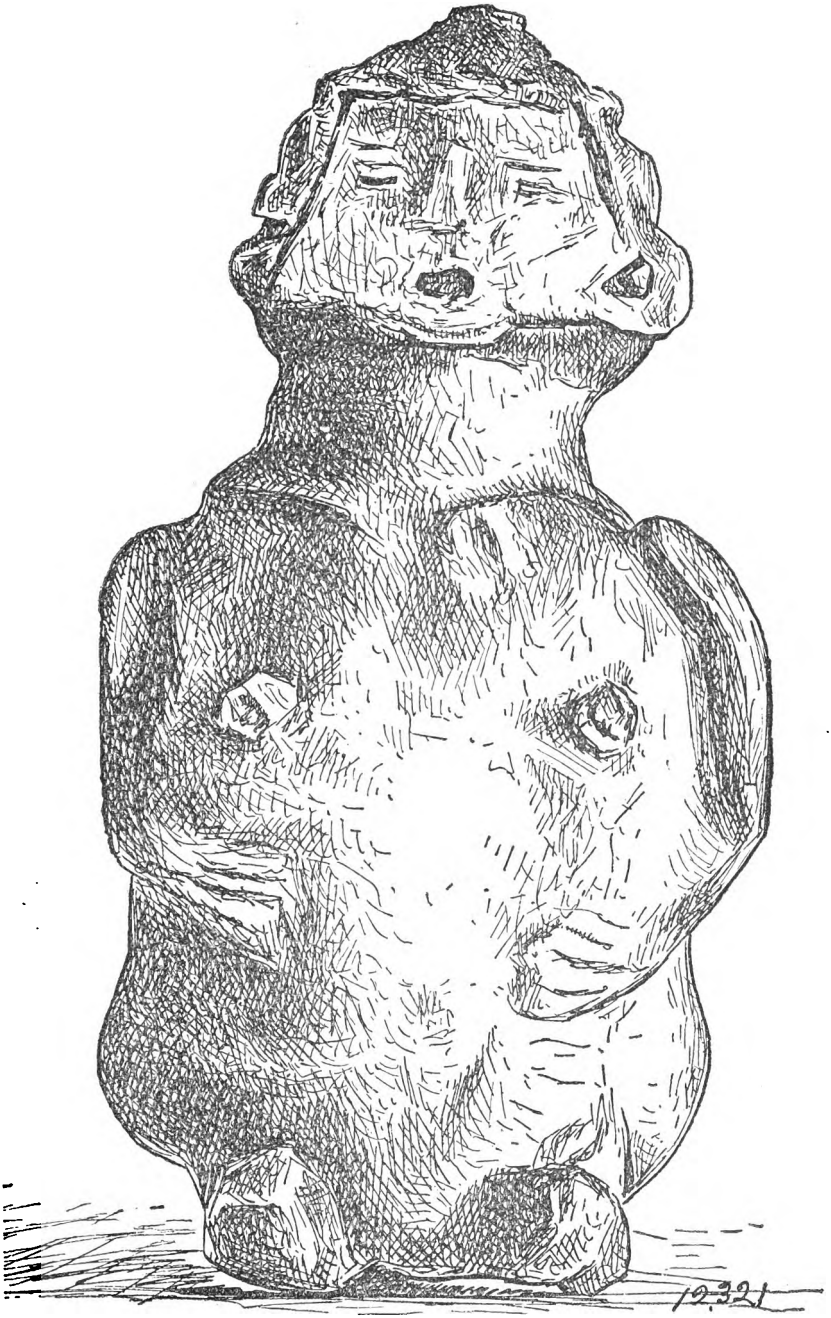
In several instances the skeletons in graves which were about two feet square, were those of adults, and showed by the compact arrangement and confusion of the bones, which were out of all natural connection, that the bones must have been buried after the flesh had decayed. Such instances were probably the burial of bones brought from some other place.

The finding of two distinctly marked forms of crania in this mound is interesting, and of course suggests the very probable reception into the tribe of persons of another nation. The collection of crania from this mound, and other stone graves, seems, to me, to show that while the ordinary form of the crania of this stone grave people was such as would bring them among the short headed nations, they were, by intermixture with a long headed people, often of the orthocephalic type, though individual variation would also cause many heads of a purely brachycephalic nation to pass into the orthocephalic. The presence of several dolichocephalic crania among the others that were collected from the stone graves, furnishes data suggesting the intrusion of that form.

Several bones collected in this mound show the effect of disease of some kind, and are such as would be generally called syphilitic; but several pathologists who have examined them unite in stating that they do not prove the existence of syphilis, as other diseases than syphilis might leave such effects.

The following summary of the collection obtained from this mound, in which about two hundred and fifty persons had been

Fig. 6.



Jar from Stone-grave Mound, Miss Bowling's farm. Natural size.

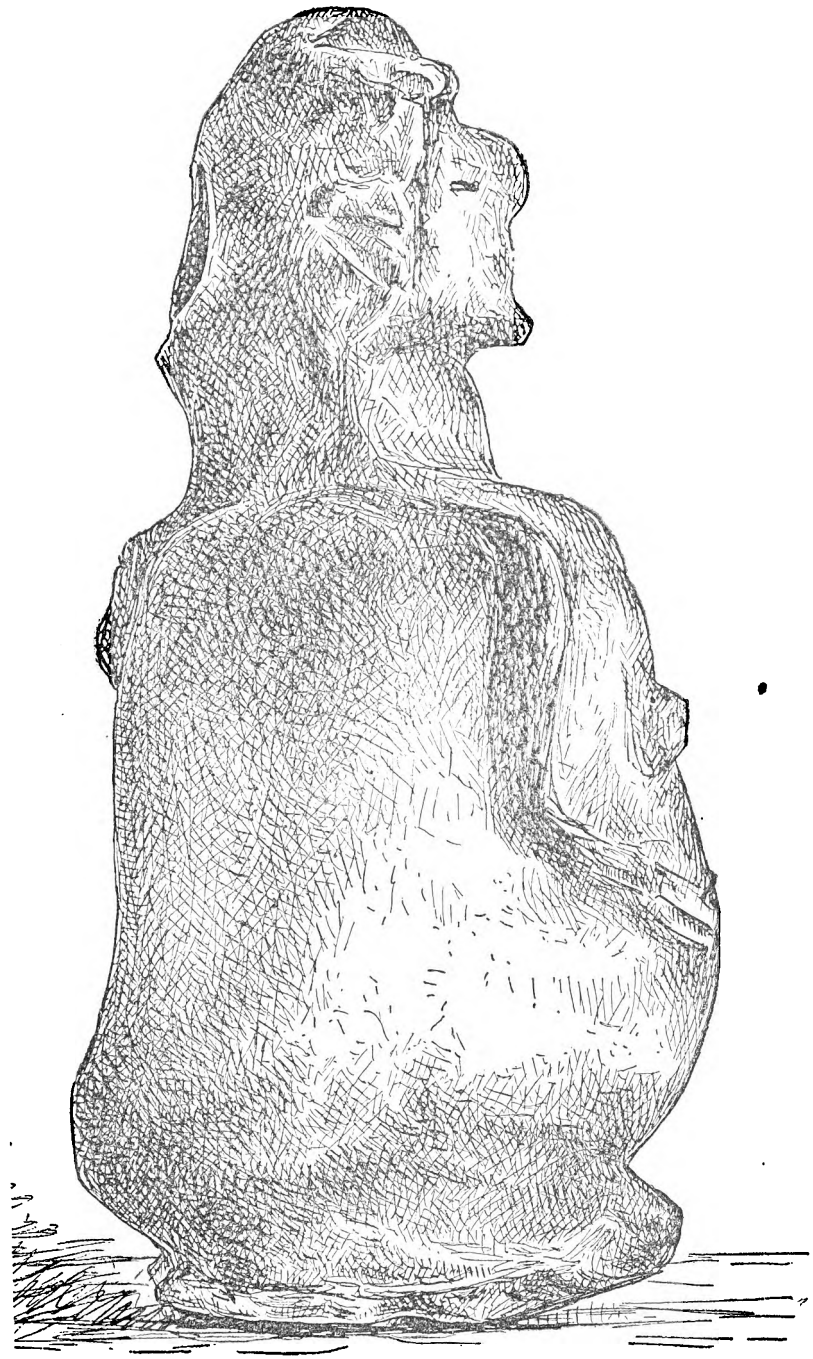
buried, will convey an idea of the contents of the graves, and I may add that the other mounds on Miss Bowling's farm, yielded a corresponding amount of material of the same character:

Portions of fifty-four different skeletons, including many long bones of arms and legs, six sets of pelvic bones, and twenty-five skulls; twenty-four whole or nearly perfect vessels of pottery, nine lots of fragments of pottery from the graves, fifty-nine pieces of considerable size picked out of the dirt outside of the graves; nine stone implements from the graves and seventeen outside of them; eight lots of flint chips from as many different graves; two awls made of deer's horn, four made of bone; four teeth of animals, two of which were perforated for suspension; two shells of turtles; one wing bone of a bird; one animal bone; all from graves; six spoons made out of shells of fresh water mussels (*Unionidæ*), thirty shells of Unionidæ and five lots of *Melania;* two lots of small shells, *Olivella*, perforated; four small lots of shell beads, all from graves; one pipe made of pottery, from a grave; two rings made of stone, found in one grave, and one made of pottery, found in another.

The pottery is generally well made, though some vessels are much ruder than others. It is usually of a dark gray color, and composed of clay mixed with finely pounded mussel shells. As a rule very little attempt at ornament was made on the vessels from this mound and others adjoining, and only one of the peculiar human shaped vessels, so characteristic of the pottery of this class, was found in the mound. This water vessel, or "idol" as these vessels representing the human form have been designated, is of special interest from its very rudeness of construction and the manner in which the hair, or head-dress is represented. The two views of this vessel (Figs. 6 and 7), representing the front and profile, of natural size, give a far better and more accurate idea than could any description. As will be noticed in figure 7, the opening of the vessel is at the back of the head, and the woman is represented as resting on her knees. This rude attempt in plastic art must not be considered as a fair example of the artistic capabilities of this people, for there are several other vessels modelled after the human form, in the collection from Tennessee now in the Museum, and among them is not one so rude and uncouth as this.

In direct contrast to this grotesque figure are the two beautiful and symmetrical vessels here represented (Figs. 8 and 9), of one-

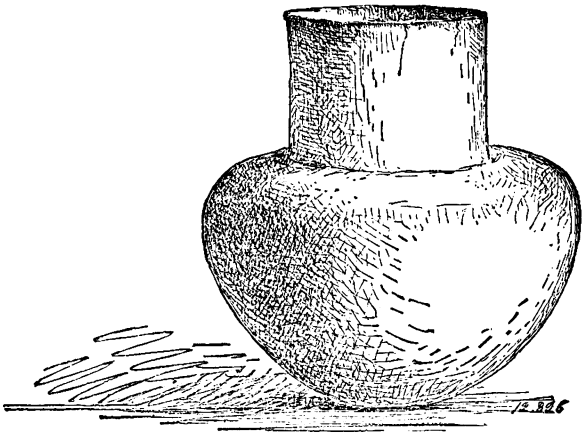
Fig. 7.



Side view of figure 6.

half their diameter. These jars are made with care and skill;

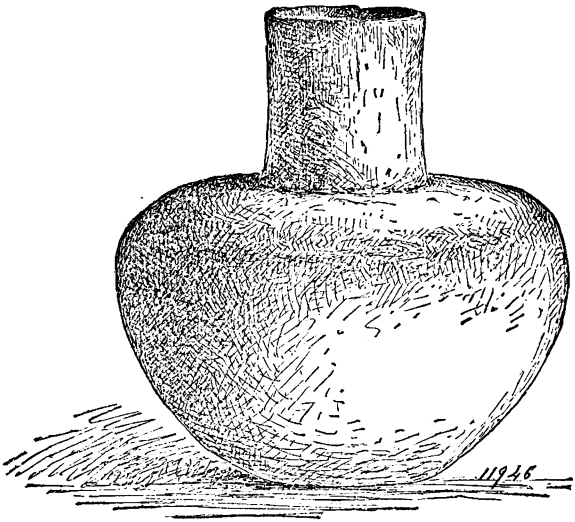
Fig. 8.



Jar from Stone-grave Mound, Miss Bowling's farm. ¼.

their good proportions and well made curves equalling, and closely resembling in outline, some of the best of the early forms

Fig. 9.



Jar from Stone-grave Mound, Miss Bowling's farm. ¼.

of the Old World which were produced by the aid of the wheel, while their very simplicity is perfection of the art. Smooth and

well finished, and standing firm and steady, they are in every way superior to the usual vessels of this character which have been taken from the graves and mounds of the southwestern states, as shown by the two following examples of the ordinary type (Figs. 10 and 11). The vessels represented by figures 8, 14 and 15 were taken from graves in mound 2, on Miss Bowling's place; all the other figures, here given, represent those found in graves in the mound of which special mention has been made in the preceding pages.

Another, and very common form of vessel from the stone graves, is represented by figures 12 and 13. These are comparatively

Fig. 10.

Vessel from Stone-grave Mound, Miss Bowling's farm. ½.

well made cooking pots, furnished with holes, through which strings were probably passed, by which the vessels could be suspended.

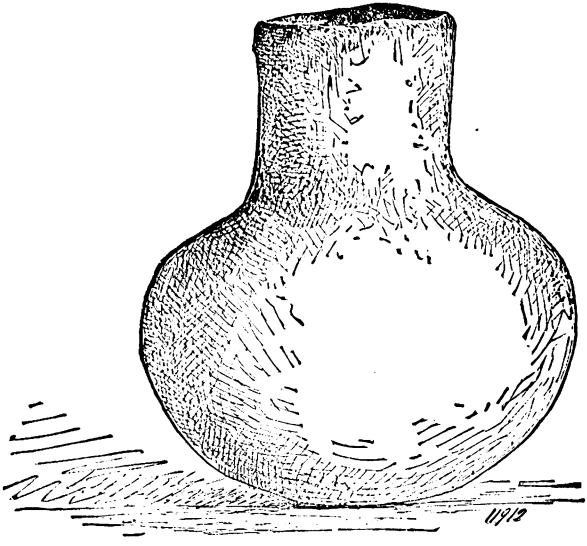
By far the most common of the vessels found in the graves, are cooking pots, of various sizes, furnished with two handles. Many of these are rudely made and resemble the two toy vessels which are shown, of actual size, in figures 14 and 15. Others are nearly symmetrical and of more graceful shape, as shown by figures 16 and 17. Still better, and exhibiting a higher degree of workmanship, is the one represented in figure 18.

Figure 19 expresses an early style of ornamentation, consisting of a line of punctures, which give relief to the waved outline of the body of the vessel where it joins the neck.

Figure 20 illustrates a form of vessel of which we have numerous examples, showing the peculiar method of ornamentation by pinching up the clay, in a regular manner, so as to form a series of little knobs, in this case arranged around the body of the vessel just below the neck.

Other forms of vessels were, also, found in this mound, some of which were dish and bowl-shaped, like those figured farther on

Fig. 11.



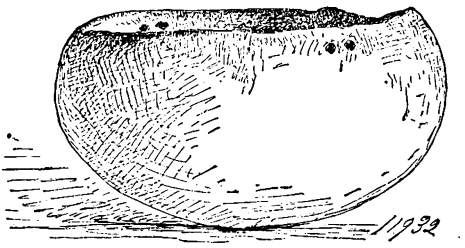
Vessel from Stone-grave Mound, Miss Bowling's farm. ¼.

from the Lebanon mound, and the one from Mr. Overton's, represented by figure 2, which is a common shape. Among the fragments from outside the graves, and particularly in the ash bed, were several of a thick and rude character, evidently of large cooking pots.

With these articles of pottery should be mentioned the ring made of the same material, which was found in contact with an under jaw, in one of the graves; also the pipe, of which figure 21

is a representation of full size. This was the only pipe found in the mound, and only two or three others, all of this material and shape, were obtained from the other mounds on Miss Bowling's farm.

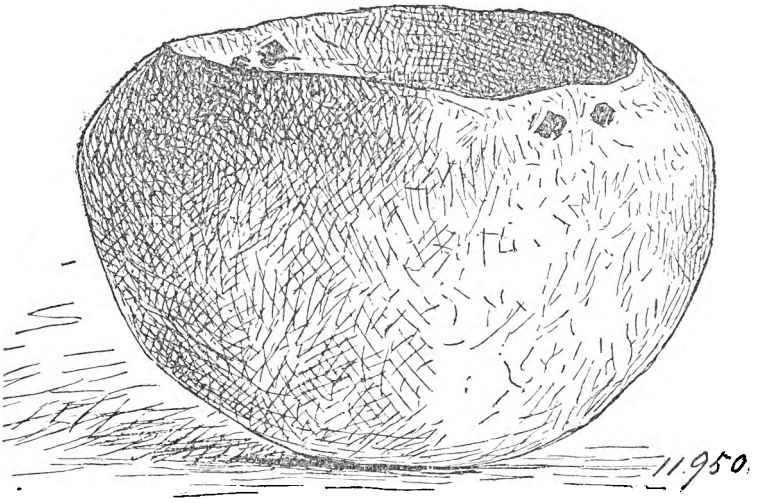
Fig. 12.



Vessel from Stone-grave Mound, Miss Bowling's farm. ½.

Among the articles of special interest found in the graves, were three rings of nearly uniform size, though made of different materials. One of these (Fig. 22) is made of a hard, green steatite and is represented of actual size. It is perfectly symmetrical and highly polished, one and three-quarters inches in diameter

Fig. 13.

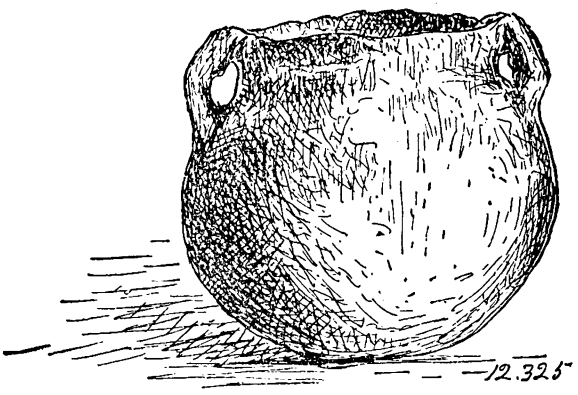


Vessel from Stone-grave Mound, Miss Bowling's farm. ¼.

and three-quarters of an inch wide. As shown by the figure, the central portion of the outer surface is cut out so as to leave a ridge around each edge. The inner surface is slightly convex, the

edges being rounded outwards. A similar ring of steatite of about the same size, from Pennsylvania, has been figured by Mr. Rau,

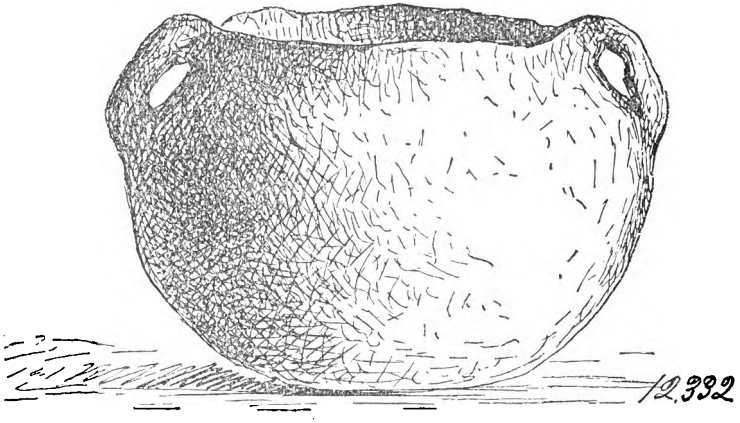
Fig. 14.



Vessel from Stone-grave Mound, Miss Bowling's farm. Natural size.

and a few others, made of various materials, have been found in mounds and on the surface. The specimen here figured was in

Fig. 15.

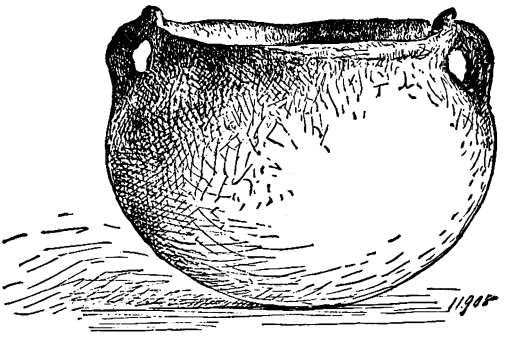


Vessel from Stone-grave Mound, Miss Bowling's farm. Natural size.

close contact with the under jaw of the elderly person buried in the grave, and in the same grave, near its centre, was another ring

made of slate. This second specimen is one-eighth of an inch less in diameter and in width, than the one made of steatite, and differed from that simply in not having the projecting rims, it being perfectly flat and smooth on its outer surface.

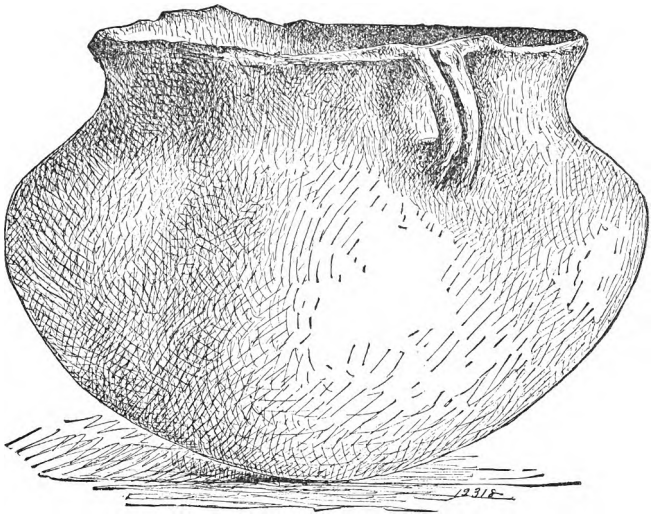
Fig. 16.



Vessel from Stone-grave Mound, Miss Bowling's farm. ½.

The third example of these rings is made of well burnt pottery, and while it is of the same external diameter as the one made of steatite, the thickness is slightly less. The width is the same as the one figured, and its outer surface is flat like the specimen made of slate.

Fig. 17.

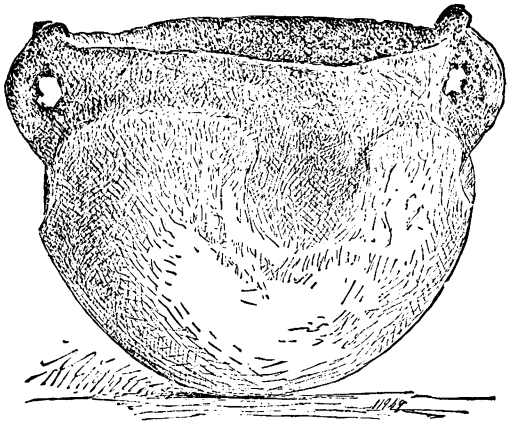


Vessel from Stone-grave Mound, Miss Bowling's farm. ½.

This pottery ring, like the one made of steatite, was found in a grave and close to an under jaw.

From the fact that two of the three rings were found in the position stated, it may be surmised that they were labrets, and were in the lips of the individuals when buried. Their size is not as large as some labrets that have been described as used by Indians of the northwestern coast, therefore there is no objection to the theory on account of the size of the rings, although, as they were found in only two of the many graves, their scarcity indicates they were not in common use. Of course, these rings may have been for an entirely different purpose than I have suggested, and the contact of two of them with the under jaws may be accidental.

Fig. 18.



Vessel from Stone-grave Mound, Miss Bowling's farm. ½.

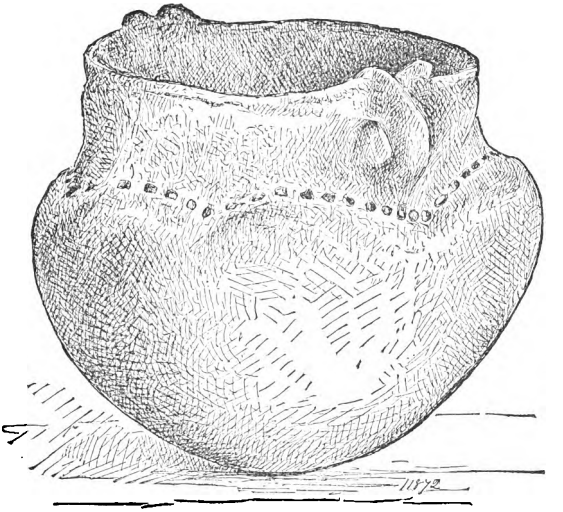
Implements made of stone, though often found on the surface in the vicinity of the old cemeteries of the Cumberland Valley, were not very abundant in these mounds, and were seldom found in the graves.

Out of thirty-one chipped implements obtained from the mounds on Miss Bowling's farm, explored for the Museum, only five were found in the graves. The position of the others among the graves, however, shows that, like many of the articles of pottery, these stone implements had been left upon, or by the sides of the graves and hence are contemporaneous with them.

The chipped implements are of the several varieties of hornstone and jasper, of which the majority of such articles found in the southern and western states are made. They are of various sizes, patterns and perfection of finish, such as are usually found together. One of the largest of these, which can be regarded as a knife, scraper, dagger, or spearpoint, as fancy may incline, is represented of natural size (Fig. 23). This was found in grave 15, with several other articles, as already mentioned. Two other

large implements (12339) would be classed as scrapers. They are five inches long and from two, to two and a half wide.

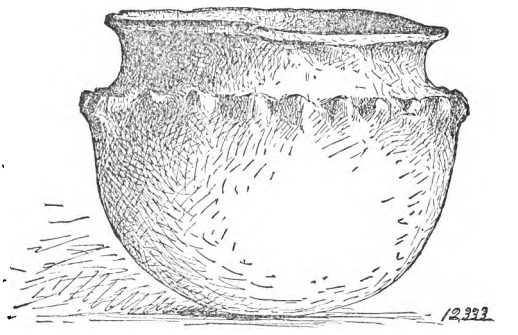
Fig, 19.



Vessel from Stone-grave Mound, Miss Bowling's farm. ½.

One of them is made from a piece of black hornstone which has an impure nodule on one side, that must have proved far less tractable to the worker than the rest of the stone, and may indicate that the scraper was used without a handle of wood, for the nodular part fits well to the palm of the hand and allows the opposite side to be freely used when so held.

Fig. 20.



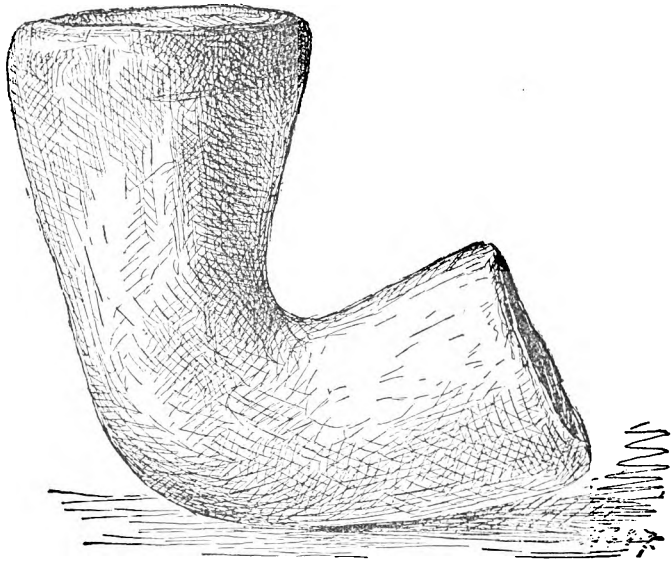
Vessel from Stone-grave Mound, Miss Bowling's farm. ½.

The other scraper is made of a gray hornstone, and its highly polished edges and surfaces show that it had long been used, probably, simply as a hand-stone.

A still ruder form of scraper (11959), of the same material as the last, was found between the graves. This specimen is three and three-quarters inches in length, by two and a quarter in width, and nearly an inch in its greatest thickness. It is as rudely made as many of the implements from the gravel bed at Trenton, described by Dr. Abbott, although of a material which is easily worked into delicate forms.

Another specimen (12338), of a light mottled gray hornstone, is a well made scraper with a bevelled edge, and its size is such as to suggest that it had been attached to a handle. It is two and three-quarters inches long, by one and a half across the

Fig. 21.



Pipe of Pottery, Stone-grave Mound, Miss Bowling's farm. Natural size.

bevelled portion, the scraping edge of which is slightly convex. The opposite end of the implement is somewhat pointed and thinner at the edges.

From the scraper last described, the transition is easy to a small leaf-shaped implement of similar material, carefully chipped to a point and thin edges. This implement (12340) is an inch and three-quarters long, not exceeding in its greatest width three-

quarters of an inch, flat on one surface and having a ridge along the opposite centre. While it might be classed as a leaf-shaped arrowpoint, it is more likely to have been mounted on a short handle for use as a knife, for which it is well adapted by its shape, point and edges.

An implement of a gray hornstone, three and three-fourths inches long, one inch in width and one-half an inch in thickness in the centre, is interesting from

Fig. 22.

Ring of Steatite, Stone-grave Mound, Miss Bowling's farm. Nat. size. 11877.

its rather unusual shape, being pointed at both ends and decreasing in thickness in all directions from the centre to the cutting edges. This was found in the dirt between the graves, and is No. 12339 in the Museum catalogue. It is, in shape, like the implement figured by Prof. Jones (p. 138, fig. 75), but only about one-quarter of the size.

Passing to the spearpoints, knives and arrowpoints, there are several of interest, a few of which were taken from the graves.

Fig. 23.

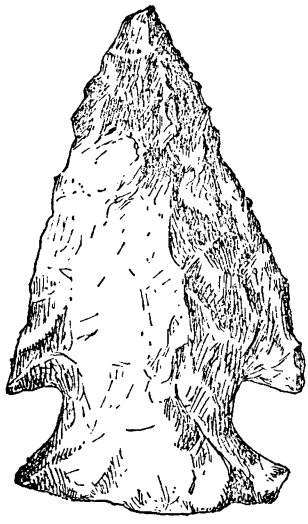
Chipped Implement, Stone-grave Mound, Miss Bowling's farm. Nat. size.

The largest of these is a well-made, symmetrical spearpoint (11958), four inches long, one and three-fourths in greatest width, and one-fourth of an inch thick at its expanded base, which is perfectly straight and flat. The stem is slightly notched.

Another specimen (12337), as long as the one just described, is somewhat thicker, but only one and one-fourth inches wide. This has a narrow stem without side notches.

Ranging between these spearpoints and the small arrowheads, are ten perfect and several broken implements that may be classed either as spearpoints, knives, or arrowpoints. The largest of these (11957), and the only one having an approach to barbs, is shown in figure 24, of actual size. As will be seen by the figure this is not a symmetrical implement, and its shape is such as to suggest its use as a knife, or daggerpoint.

Fig. 24.



Chipped Implement from Stonegrave Mound, Miss Bowling's farm. Natural size.

Two specimens (12336–7) are about half the size of the last; one of these has a perfect and delicate point, and is slightly notched on the sides of the stem. Seven others are of various sizes and widths, between two and one-half and three inches in length, and all have short, straight, or slightly notched stems. One of these (12336, *a*) is much thinner and broader, in proportion to its length, than any of the others, and mounted on a handle would form a cutting instrument of no mean character.

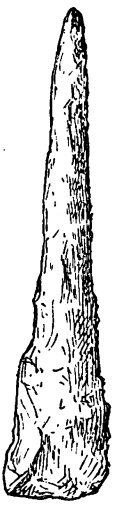
Of three specimens from an inch and a quarter to an inch and a half in length, that were probably arrowpoints, one (12341) has a fine point, an expanded and slightly convex base, and a notched stem. Another (12341, *a*) has a straight stem and a proportionally longer and more slender point. The third (11890) is short and broad, with a convex base and that peculiarly shaped and abruptly made point which gives the impression that it was a broken specimen repointed.

Among the chipped implements of flint, was one that would

probably be classed with the drills, or perforators. This was found in a grave and is represented, of natural size, in figure 25.

Stone axes and celts have not often been found in the stone graves, though common among surface collections; and but two specimens were found in the three burial mounds explored under my direction, on Miss Bowling's farm. These are made of the same hard greenstone as the specimens obtained at Mr. Overton's place, previously described, and resemble them in size, shape and finish. The smallest is one inch thick, two inches wide and three and one-half long. The other is of the same thickness but is one-half of an inch wider and longer. The lower half of these small axes has been ground and polished on both sides, forming a central cutting edge like the modern steel axe. The opposite end is left rough, and was probably inserted into a socket of wood or horn, like those from the Swiss Lakes, some of which correspond very closely to the specimens from Tennessee, in material, shape and finish. Both of these specimens were found in one grave in the third mound.

Fig. 25.



11.870

Chipped Implement from Stone-grave Mound, Miss Bowling's farm. Nat. size.

In connection with these polished implements of stone, it is of interest to note a fragment of fine grained sandstone (12344), seven inches long, four wide and two thick, which I found between the graves, in the burial mound here particularly referred to. This fragment is evidently a portion of a sharpening and polishing stone that had been long in use. Its opposite surfaces were concave and were worn so deep by long use that they had nearly come together and to this fact the breakage of the stone at this particular point was due. On the sides and in the large concavity of one surface, are small grooves and several deeply cut lines, formed by rubbing implements of different kinds on the stone. As will be inferred, this is a very interesting specimen, illustrating the method of polishing stone implements, and with the three rings, probably as important as any obtained from this mound.

A water-worn stone (12345), six inches long, of oval form, was found in the second mound, and is of interest as furnishing conclusive evidence of the use of natural forms for the various purposes to which they may have been adapted. The stone in question is highly polished on one portion of its surface, and by holding it in the hand in the easiest manner, its adaptation for various rubbing purposes, which would cause the polishing of the particular portion showing use, is readily perceived.

Among the articles found between the graves in the mound was the half of one of the thin, flat stones with two holes, which are generally classed as personal ornaments.

In mound 2, three discoidal, or "chungke" stones were found. One of these is made of white quartz, highly polished, and is three inches in diameter. Another, about half an inch greater in diameter, is made of a compact gray sandstone, and shows signs of rough usage on its fractured edge. The third is three inches in diameter, one and one half thick, and is biconcave. The material is rather coarse, hard sandstone.

Near the ash bed, which I have already mentioned as having been found under the lower tier of graves, north of the centre of the mound, was found a fragment of talcose slate (11961), that probably once formed a portion of a cooking utensil of some kind, perhaps a large vessel, or possibly a baking stone like those found in the shellheaps of California. It is a well-worked piece of stone of nearly an equal thickness of about an inch, and slightly smoother on one surface, which is a little convex, than on the other. Near one edge there is a hole three-eighths of an inch in diameter. A careful search was made for other portions of this utensil, but only this was found and its weathered edges show it to have been a fragment when left near the ancient fireplace.

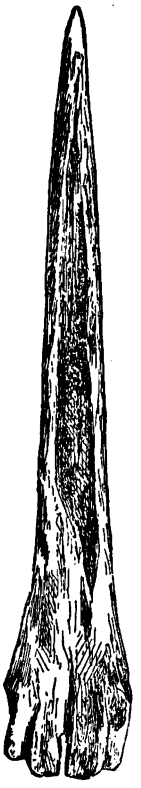
A small mass of burnt clay (12346) containing the impression of several reeds which had been placed parallel to each other, was also found in the bed of ashes.

Implements made of bones of animals have been found among the remains of prehistoric races in various parts of the world, and the graves, mounds and shellheaps of America have furnished many examples of the typical forms. Pointed implements made from the leg bones of animals, particularly of the metatarsal bones of various species of deer, are the most common forms, and specimens from the mounds and stone graves of Tennessee

are identical in shape and finish with those from the Swiss Lake dwellings.

One of these large implements (11904), here shown (Fig. 26), of one-half its diameter, was found in one of the graves in the first mound explored on Miss Bowling's farm.

Fig. 26.



Implement of Bone. Stone-grave Mound, Miss Bowling's farm. ½.

Other implements for like use were made from the antlers of deer, and two such (11895) were found in grave 15, which, as already mentioned, contained numerous articles. Another similar and pointed tool (11901), made from the leg bone of a large bird, was found in another of the graves in the same mound.

Splinters of bone were also utilized as awls and needles. Two such (11024), six and seven inches in length, and looking like knitting needles, were found in grave 25. These were probably made from pieces cut from the metatarsus of a deer and then polished and pointed. The smaller of these has a slight groove cut around the large end, as if for fastening a thread. The other, which is shown in figure 27, of one-half its length, is smooth and highly polished over its whole surface.

Fig. 27.

Implement of Bone, Stone-grave Mound, Miss Bowling's farm. ½.

Among the articles found in grave 15 were six small splinters of bone, which have been carefully pointed at one end, and, in those that are perfect, the opposite end is notched as shown in figure 28, representing a perfect specimen of its actual size. These small bones were found close to the skull, and I believe them to have formed part of a hair comb, from this fact and from their close resemblance to the teeth of combs found in the graves in Peru, and their still greater resemblance to the wooden teeth in the hair comb once belonging to the famous Modoc, Capt. Jack,

and now in the Museum. This view was further substantiated by the discovery, afterwards, in a grave at Lebanon, of several similar pieces of bone, also by the side of a skull.

Several other bones were found in the graves of mound 1, but with the exception of two wing bones of a large bird (11897), which may have been whistles, there was nothing to indicate that they were intended for special purposes.

Several teeth were also found, among them one of a large rodent, and two canines, probably of a young bear (11917), which were perforated, and as they were found with a number of beads made of shell, near the neck of the skeleton, it is very likely that they formed part of a necklace. One of these teeth is figured (Fig. 29). Several shells of turtles (*Cistudo*) were found in the graves, and though they do not show any signs of particular use, they may have been rattles, similar to those known to have been used by some of the Southern tribes and still common among the Indians.

Fig. 28.

11896

Pointed Bone, Stone-grave Mound, Miss Bowling's farm. Natural size.

Fig. 29.

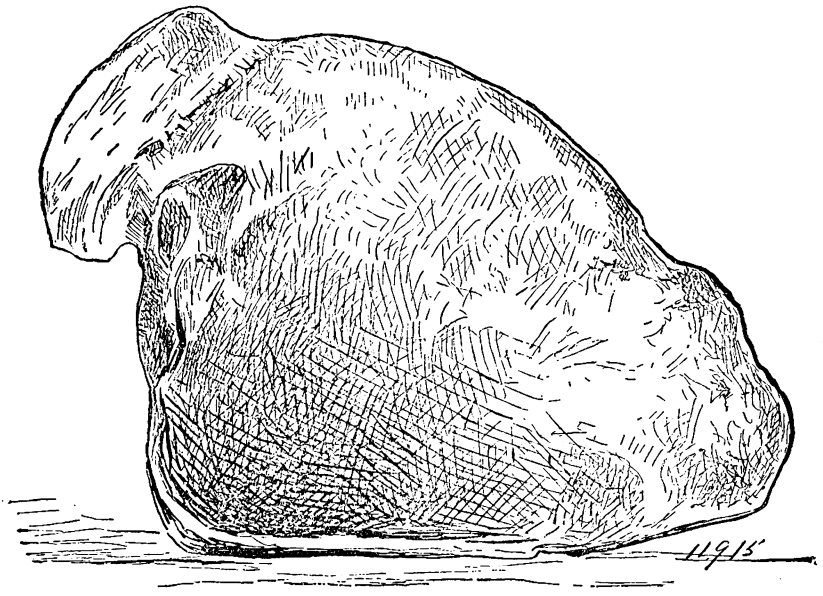
Tooth of a Bear, Stone-grave Mound, Miss Bowling's farm. Natural size.

Of articles made of shells several forms occurred in the graves in this mound, the most common being the spoons made of the valves of *Unio*. These spoons, as will be seen by the illustration (Fig. 30), were very convenient and useful domestic articles. Many of them were found in the graves and generally in such vessels as food would naturally be placed in, but owing to the decay of the thin shell, few could be handled without crumbling into chalky particles. Six were, however, saved from the graves in mound 1, and several others were collected afterwards in different localities. All of those from the graves in the mound were made from the right valves of the mussels, and indicate righthandedness, as the rule, with this people.[5] They were made by cutting away the thick portion of the

[5] I have since examined over thirty of these shell spoons now in the Museum, and all are made from the right valves of *Unionidæ*, and so shaped as to be most conveniently used with the right hand.

shell along the hinge, and also the thin portion of the lip. The shell was then further cut away on its upper part, leaving the projecting handle as shown in the figure, which, from the position in which the spoon was placed by the artist, does not convey as good an idea of the thing itself as would be the case if the drawing had been reversed, and the handle part of the spoon placed in the right lower corner. This would bring the valve of the shell in its natural position and also show the spoon in its most convenient position for use in the right hand. In

Fig. 30.



Spoon made from Shell of Unio, Stone-grave Mound. Natural size.

some specimens the handle is not rounded and smoothly cut, as in the one figured, but is deeply notched on its outer edge as if for ornament.

Many natural valves of several species of *Unionidæ* were found in the graves, sometimes in the same grave with one or more spoons. Several other shells in natural condition were, also, found in the graves. The most numerous of these were two species of *Melania*, and one or two other species of fluviatile shells

common in the State, and, of course, they must have been purposely deposited within the graves, while several specimens of *Helix* were undoubtedly living intruders.

In one grave, near the head, were several hundred specimens (11934) of the little *Olivella*, identified by Prof. Hamlin of the Zoölogical Museum as *O. mutica* Say, of the Southern Atlantic coast. Every one of these little shells, which are not much over a quarter of an inch in length, has the apex ground off, thus making a hole through the shell by which it could be strung, the whole lot in question probably having once formed a necklace, or head ornament of great value to its owner. The occurrence of this and other marine shells is another indication of intertribal intercourse, or of extensive wanderings on the part of this ancient people.

In three other graves in this mound, beads made from marine shells were found. These beads were the same as those obtained from the mounds throughout the country, and have been cut principally from large marine shells, such as *Strombus*, *Busycon*, etc. Similar beads are figured in the last Report, p. 85, fig. 1. Many of the beads in this mound were very much decayed. Those that were collected are of three forms.

In the grave in which the perforated bear's teeth were found was one large, oval, and symmetrical bead, three-quarters of an inch long by one-half an inch in diameter. About one hundred other smaller, well finished beads, with a diameter of about a quarter of an inch and a length of about two-thirds the diameter, formed the rest of what I believe was a necklace, which we could probably reconstruct by placing the large bead and the two bear's teeth in the centre with the small rounded beads on each side.

In another grave in which were several common fresh-water shells, were also a number of beads very much decayed, but about twenty were saved. These are of two kinds, a small rounded form about a third of an inch long, and a flat bead having a thickness of not over an eighth of an inch, and a diameter of about one-half an inch. In another grave was found a single bead like the last described.

In closing this account of the contents of the mound, I must reiterate that not a single article was found indicating contact with any other people than different tribes belonging to their own race, and the same applies to all the other mounds of this important group on Miss Bowling's farm.

Having a desire to make an examination of one of the large mounds, of which there are many still remaining in the Cumberland valley, I accepted the invitation of the Rev. M. A. Matthews to explore one on land belonging to the family of Mrs. Matthews and known, from the name of the family, as the Love Mound.

This large mound is 23 feet high, and, as near as the measurements could be made, owing to the washing of the banks, 155 feet in diameter in a north-south line, and 147 feet in an east-west direction. It is located near the East Fork of White Creek, which flows in a southwestern direction to the Cumberland, entering that river about six miles distant in an air line.

In the immediate vicinity of the mound, on the north, west and south, are large artificial depressions, showing where the earth forming the mound was obtained. The excavations on the north and south have left a slight ridge, about a hundred feet in width and several hundred feet in length, to the eastward of the mound. About two hundred feet to the north of the end of this ridge is a small mound nearly obliterated by cultivation, and about three times the distance to the southeast is an outcrop of limestone. Along this ridge, and towards the limestone ledge, are traces of many stone graves of the same character as those already described. These graves had nearly all been destroyed by continued cultivation of the land, and I found but one that had not been disturbed. This grave was 6 feet long, 22 inches wide and 18 inches deep. The body had been placed in the grave with the head to the west. The skeleton was so far decayed that only a few of the bones could be saved, and the only article found in the grave was a portion of an ear ornament in contact with the side of the skull. This ear-drop was made of a piece of wood covered with a thin layer of copper.

An excavation was made in the centre of the small mound, but nothing was discovered except the indications of a fire a few feet from what is now the surface of the mound.

The large mound was a land mark at the settlement of the place, in 1795, by Joseph Love, the grandfather of Mrs. Matthews, and its summit has been used as a family cemetery, which somewhat interfered with the work of exploration.

In 1795 Mr. Love, as reliable family tradition states, "found a heavy growth of timber on the mound, and decayed stumps of red oak trees that were over two feet in diameter." Twenty-five years

ago the mound was cleared of timber with the view of cultivating the sides, but as they were found to be too steep, it was again left to nature. The trees which cover the mound at present are, therefore, less than twenty-five years of age.

Four days, with six to eight men each day, were given to the exploration of this mound, in the following manner. A trench, 4 feet wide and 44 feet in length, was cut on the southern side of the mound in its central portion, and running east and west. This trench was dug to the depth of 10 feet. Two other trenches, 15 feet apart, of the same width as the first, were then started from the first trench. The westernmost of these was carried 11 feet directly north, so as to reach as near the centre of the mound as possible, without disturbing the several graves on the summit. The other trench was carried 16 feet in a northwesterly direction, the two trenches terminating between 10 and 11 feet apart. These two trenches were dug to a depth of 23 feet, when the original black soil was reached, upon which the mound was erected. At the bottom and ends of these trenches, tunnels were started so as to reach the centre of the mound. Eight feet in length was thus added to the trenches, and from these tunnels auger borings, three feet in length, were made in all directions without meeting with the slightest indication of a central chamber or relic of any kind. As it seemed useless to continue the exploration, the trenches were filled and the mound restored to its former shape.

The earth of which this mound was composed had been brought in small quantities, probably in baskets, and the outline of each little load could be distinctly seen on the sides of the trenches. This earth had, through the long period of time that must have elapsed since the mound was erected, become dry and compact and nearly as hard as sandstone. It was, therefore, necessary to loosen it by the pick and much was thrown from the trenches in lumps by the workmen. The fineness of the material, and its freedom from stones and pebbles, were noticed by all at work, and it appeared as if the earth had been carefully sifted before it was placed on the mound. In the nearly five hundred cubic yards of earth removed from the trenches, only the following extraneous things were found. In the long trench, at the depth of 3 and 5 feet, two small fragments of cannel coal, and at the depth of 5 and 6 feet, two small pieces of greatly decomposed limestone. In the two trenches diverging from the one first made, and at depths of 3,

EARTHWORK

on the

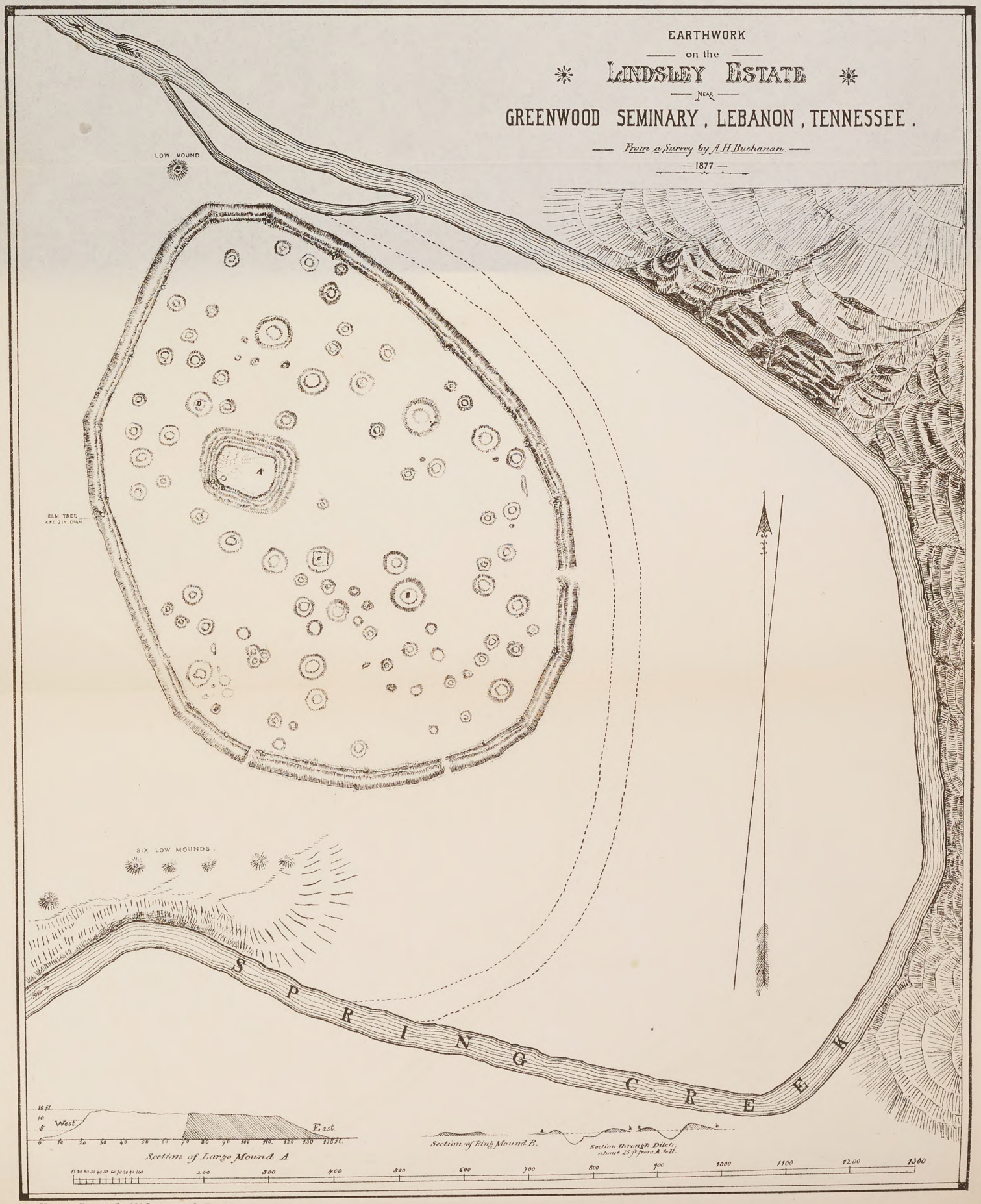
LINDSLEY ESTATE

NEAR

GREENWOOD SEMINARY, LEBANON, TENNESSEE.

From a Survey by A.H. Buchanan

1877.



THE HELIOTYPE PRINTING CO. 250 DEVONSHIRE ST. BOSTON.

5 and 8 feet, four small pieces of limestone and a fragment of flint were found. At 14 feet a piece of the shell of a *Unio* was discovered, while three or four flint chips and as many minute pieces of sand and limestone were thrown out at various depths. In the trenches near the centre, at a depth of 13 feet, were found three slabs of decomposed limestone each of about 12 × 18 inches, and 1 inch in thickness. The position in which these stones were found was such as to indicate that they were part of a circle of stones around the centre of the mound when it had reached the height of 10 feet. The decayed condition of these slabs of limestone and the formation, on the under side of each, of a thick scale of red oxide of iron, are indications of the great age of the mound itself.

The results of the exploration of this mound lead to the supposition that it was erected for some other purpose than as a monument over the remains of the dead, and, as the remains of numerous graves near it indicate a settlement at this place, it is very likely that it was devoted to some other important purpose of the people of the town.

The most important of my explorations were those within the Earthwork near Lebanon, in Wilson Co., and about sixty miles east from Nashville. At this place on the farm of Dr. Samuel Crockett, included in the estate of the Lindsley family, who were early settlers in the county, are the remains of an extensive settlement of the Moundbuilders of Tennessee. Accepting the kind invitation of Mrs. N. Lawrence Lindsley, Principal of the Greenwood Seminary, I was enabled by her coöperation and the assistance of Mrs. Henry Lindsley, Dr. Crockett, and twenty-five workmen, to make, in a week's time, a comparatively thorough exploration of these remains, for an accurate survey of which, reproduced on the accompanying map, I am indebted to Prof. J. H. Buchanan of Lebanon.

As will be seen by an examination of the map, Spring Creek, a tributary of the Cumberland, makes at this place a bend to the eastward, where there is a limestone bluff. In this bend, near its narrowest part, is located an earthwork enclosing an area of between ten and eleven acres, and having its greatest length, of about 900 feet, in a north-south direction, and a width from east to west of about 650 feet. At nearly regular distances along this embankment, on the inside, are slight elevations at the angles of the earthwork. These are now 18 inches higher than the embank-

ment between the angles, and slope uniformly to the bottom of the ditch, which was originally, probably, between 3 and 4 feet in depth. Between the angles, the top of the inner wall is now not much over a foot above the general level, and the slope to the bottom of the ditch is divided into two parts by a level bench nearly 3 feet in width. The outside slope of the ditch, throughout, is uniform from top to bottom, and along its outer edge is a crest about 6 inches high. The sections at the bottom of the map illustrate this structure; *a*, the outer, and *b*, the inner side of the ditch. At the eastern and southern portions of the enclosure are three causeways or openings through the embankment. Near the northwestern end, between the embankment and the creek, is a low mound, the existence of which I was not aware of until the survey was made by Prof. Buchanan, after the rank vegetation, which covered everything at the time of my visit, had been destroyed by the frosts. At this portion of the enclosure and to the southeast, the land is very low and in the time of spring floods must be washed by the overflow from the creek. To the westward the land rises, and at the southwestern corner of the enclosure there is a rocky portion 20 to 25 feet higher than along the eastern embankment. Still further to the southwest, near the creek, the land is 30 feet higher than at the point near the creek on the northern side. On this southern bluff are six mounds, only a few feet in height, situated as shown on the map. Two of these mounds I caused to be trenched, and found that they were constructed of earth and stones which had subsequently been heated and burned by long continued fires, and there was no indication of their having been used for any other purpose. In the ditch, on the western side, is a large elm tree 4 feet 2 inches in diameter. On the summit of the large mound within the enclosure were several large trees, among them a poplar 2½ feet in diameter and a Hackberry 2 feet in diameter.

Many other trees of considerable size were growing within the enclosure and several large trees had fallen and gone to decay. While this tree growth does not, in all probability, give any approximation to the period when this ancient town was deserted, it at least points to a time before the intrusion of our own race, and everything found within the enclosure was confirmatory of the antiquity of the place. To the east of the embankment there is a depression following the curve of the wall on that side, indicated

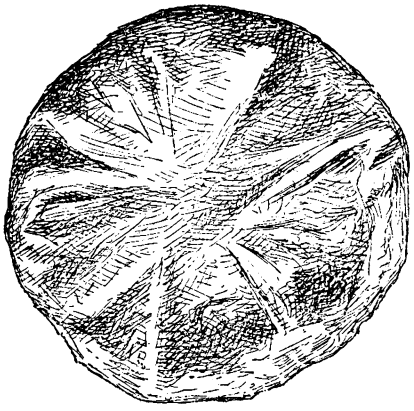
on the map by parallel dotted lines, which looks like a former channel of the creek; and it is very likely that when the earthwork was made, the creek flowed near the eastern wall, and has since cut its way four or five hundred feet farther to the eastward. The geological structure, contour of the land and direction of the natural flow of the creek, are all favorable to such a change in the course of centuries.

The first object of attention within the enclosure is the large mound marked *A* on the map, and also shown in section at the bottom. This mound, as shown by the section (the shaded part in which represents the portion excavated), has steep sides and a flat top. Its dimensions are 138 feet by 120 at its base, and 95 by 75 feet on its summit, with a height of 15 feet. A trench was cut from the base of the eastern side and carried to the centre; beginning with a width of 4 feet and gradually widening to 14. After the centre was reached that portion was deepened to 18 feet from the summit, thus digging down 3 feet in the original soil, consisting of yellow gravel and clay, which was found to have been previously undisturbed. The earth of which the mound was composed was very hard, dry and compact, and necessitated the use of the pick. The construction was the same as that of the Love Mound. At a depth of between 3 and 4 feet from the surface, near the centre, were found three slabs of stone, each about 12 × 16 inches, a stone chip, piece of mica, fragment of pottery, and a discoidal piece of sandstone (Fig. 31), with several grooves upon its surface, indicating that it had been used as a sharpening stone. At a depth of between 7 and 8 feet was an ash bed that had evidently extended over the surface of the mound when at the height of 7 feet. In this bed of ashes were fragments of burnt bones, stones, and pottery; a discoidal stone, an arrowhead, flint chip, portion of a shell of a *Unio*, several burnt corn cobs, a piece of charred matting, charcoal, etc. Under the ashes the earth was burnt to a depth of a few inches, showing that the ashes were the remains of a fire on the spot and not material brought to the mound. At the depth of 13 feet, a piece of cedar, a few inches in diameter and much decayed, was found standing upright, with its base below the surface of the earth upon which the mound had been erected. Between 14 and 15 feet, and thus on, or close to the original soil, was another extensive bed of ashes, in which a few burnt bones of deer and pieces of charcoal were found.

The examination, therefore, showed that this was not a burial mound and the two fires that had been made, with the relics found in the ashes, lead to the supposition that it was erected in connection with some peculiar rites celebrated at two periods during its construction. The place may have been the site of an important building. It is very likely that one stood upon the summit of the mound and that all traces of it have been washed away after the decay of the structure, as would be expected upon such an exposed position.

To the southeast of the large mound, was one, marked *C* on the map, which was nearly 3 feet in height and 47 in extreme diameter, having a slight central depression 26 feet in diameter. On removing the earth, this mound was found to contain sixty stone graves, arranged in the form of a hollow square about the outer portion of the mound, in two or three irregular rows and in three tiers. The graves were carefully made with large flat stones, in the same manner as those I have already described, and were all of large size. The examination showed that, with the exception of one child buried in the same grave with an adult, all the bodies were adults and had been placed at full length in the graves. The grave containing the bones of the child with those of an adult person, was in the lowest tier and among the first made. In this grave was found a large dish made of pottery like the one represented in figure 34, and in this dish was the bowl (Fig. 32), reproduced of one-half its diameter. A small discoidal stone (Fig. 33) was also found in this grave and is shown of natural size. Near this grave, on the inner side, were found the remains of a body that had not been enclosed in stone, and this was the only instance of the kind in the mound. The skull belonging to this skeleton was

Fig. 31.

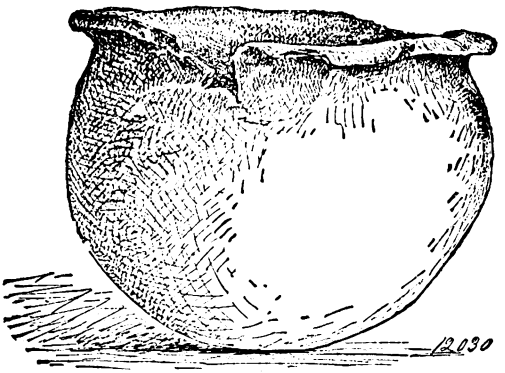


Sharpening Stone from Large Mound within Earthwork. Natural size.

saved (12003). In the lowest tier of graves was one that contained the remains of two skeletons, the skulls of which were saved (12014, 15). The only article found in this grave was a dish similar to No. 12009, which is figured.

In another of the graves of this lowest tier, in which the skeleton was much decayed, the following articles were found. A jar (12008) at the feet of the skeleton; near it the dish (12009) of which figure 34 is a representation, reduced to one-half its diameter. With the bones of the hand was a pipe (12011) made of sandstone, which is shown of full size by figure 35. In the dish was a large bone of a deer's leg (12010), which had been cut and

Fig. 32.



Bowl from grave, Burial Mound within Earthwork. ½.

broken, and near the dish was a small mass of graphite (12012), a pebble and a flint chip (12013).

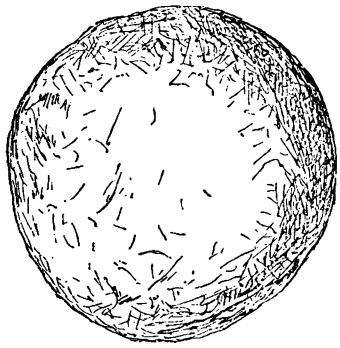
In another of the graves of this lowest tier, were found the following articles. An ornament of very thin copper (12021) which was originally circular and with a corrugated surface. Only fragments of this could be preserved, and its full size could not be determined, though it was probably 4 or 5 inches in diameter. An earthen pot (12025), a dish (12024), and the skull (12022) were also secured. The remainder of these oldest graves in the mound yielded only fragments of pottery. As the earth of the mound was very damp, the pottery was soft and the bones were much decayed, so that great difficulty was experienced in taking the

articles out, and it was necessary to have the pottery carefully dried before it could be handled.

Several of the skeletons showed the effects of inflammatory diseases, and a number of specimens of pathological interest were obtained.

In the middle and upper tiers several graves were found containing relics. In one were portions of an ornament, circular in shape and about 5 inches in diameter, made of two sheets of copper closely united (12023), similar to that found in one of the oldest graves, and like that, also resting on the breast bone, which, with the ribs, had been discolored and preserved by its contact. In this grave were also three delicate and well-made arrowheads (12020) and an earthen pot (12019, Fig. 36).

Fig. 33.



Discoidal Stone from grave. Burial Mound within Earthwork. Nat. size.

In another grave were found three articles of pottery, viz.: a vessel with handles (12034), a large dish (12035), and the water jar (12033) of a pattern similar to others found, and represented by figure 37.

A similar jar of slightly different shape (Fig. 38), having the surface divided into portions as if designed after a gourd, was found at the feet of a skeleton.

Figure 39 represents a potsherd (12005) taken from one of the graves. This is probably a portion of a small bowl, and is an attempt, it seems to me, at a reproduction of the head of a bat, the features of which are more apparent in the fragment than in the figure.

Pieces of mica (12038) were also found in one of the graves, and in another was a pipe (12040) carved from a dark slate (Fig. 40), which is of interest from its resemblance in form to pipes of recent manufacture.

In the earth between the graves, numerous fragments of pottery and a few perfect vessels were found. In one of the pots were two of the shell spoons of which mention has been made on a preceding page. A discoidal stone was also obtained. Between two of

the graves, nearest the surface, was found the interesting pipe (11993), carved from green steatite, and representing a man holding a cooking vessel which forms the bowl of the pipe, the hole

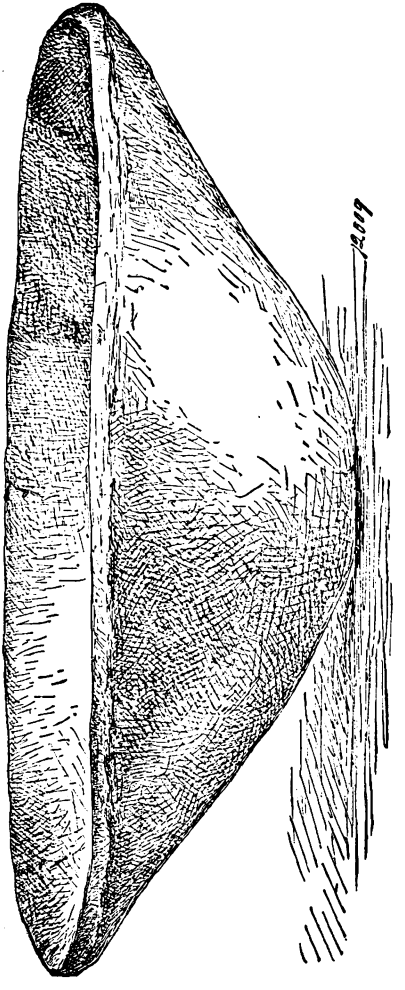
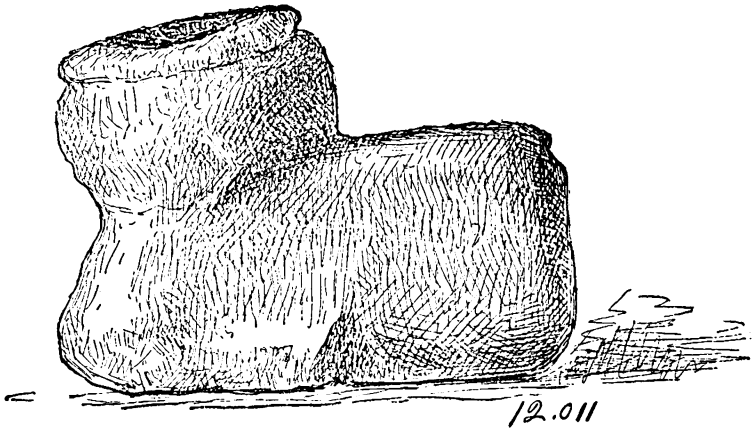


Fig. 34. Dish from grave, Burial Mound within Earthwork. ½.

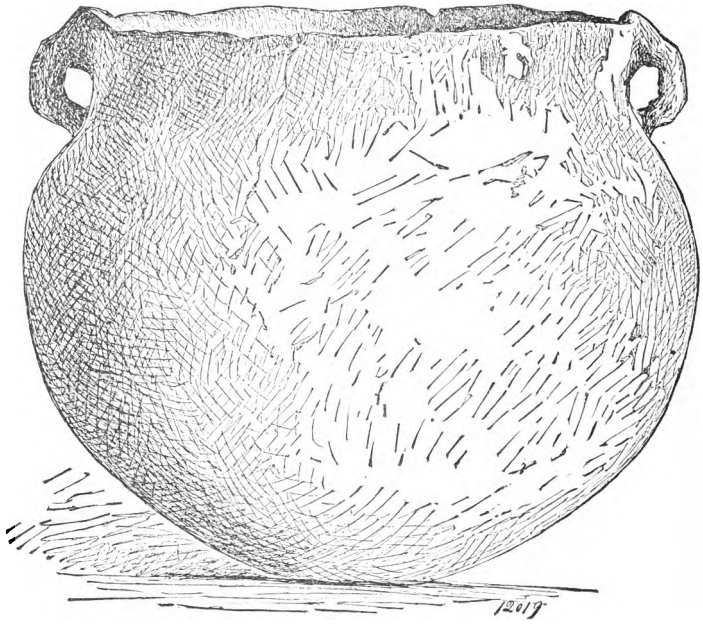
for the insertion of the stem being in his back. The three views given in figures 41, 42 and 43, will convey a better idea, than words, of this interesting relic. The lower portion of the figure is

Fig. 35.



Pipe made of Sandstone, from grave, Burial Mound within Earthwork. **Nat. size.**

Fig. 36.

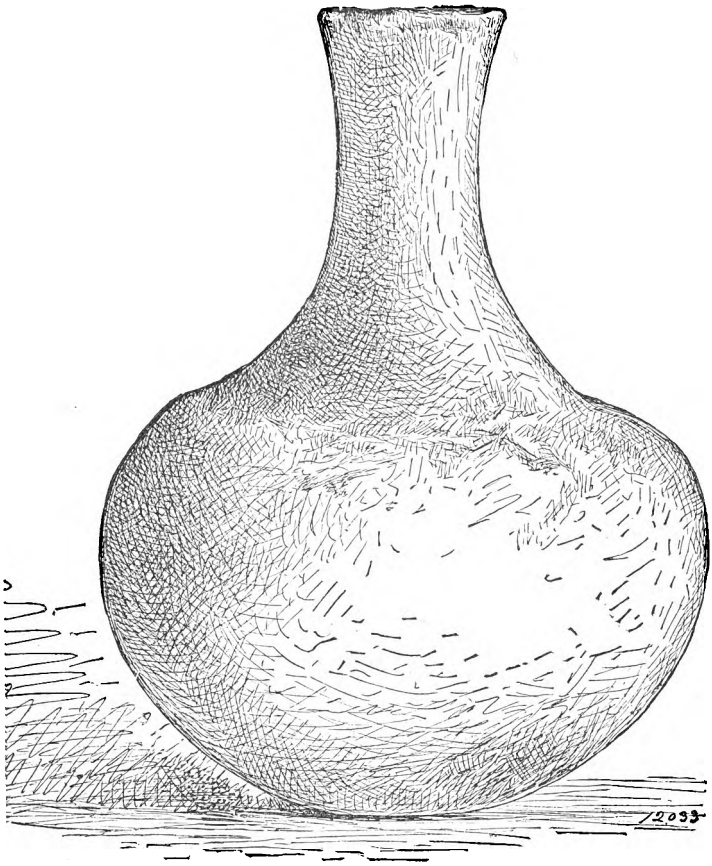


Pot from grave, Burial Mound within Earthwork. ½.

left unfinished as if that part had been inserted in a base of some other material, which is also indicated by the hole in the stump of the right leg.

Scattered irregularly within the enclosure are nearly one hun-

Fig. 37.

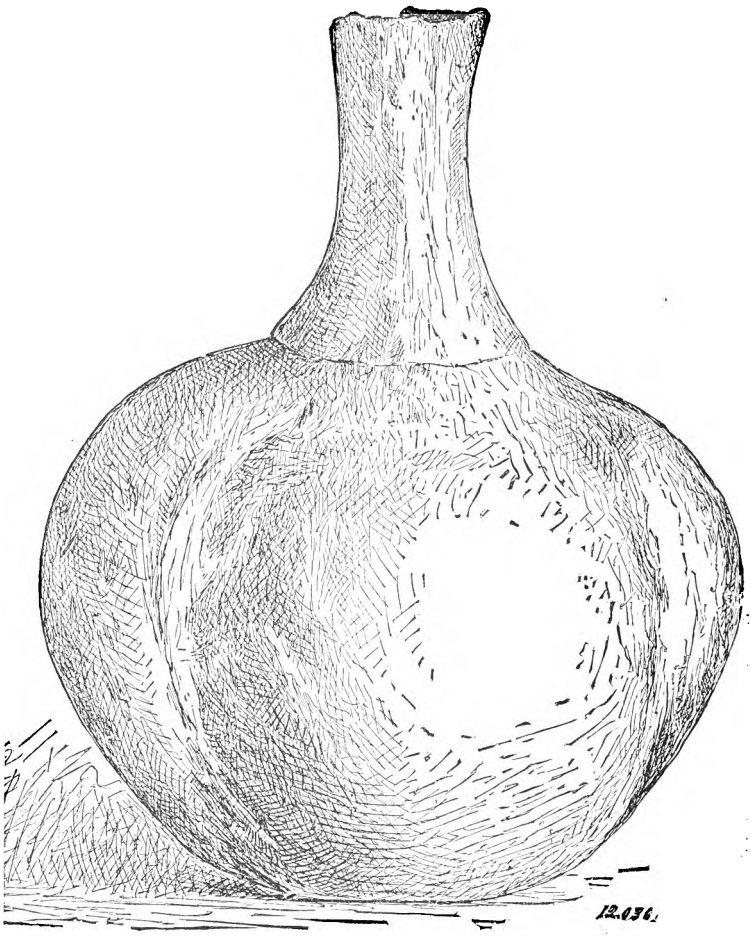


Jar from grave, Burial Mound within Earthwork. ½.

dred more or less defined circular ridges of earth, which are from a few inches to a little over 3 feet in height, and of diameters varying from 10 to 50 feet. The best defined of these little mounds was that marked *B* on the map. An examination of these

numerous low mounds, or rather earth rings as there could generally be traced a central depression, soon convinced me that I had before me the remains of the dwellings of the people who had

Fig. 38.

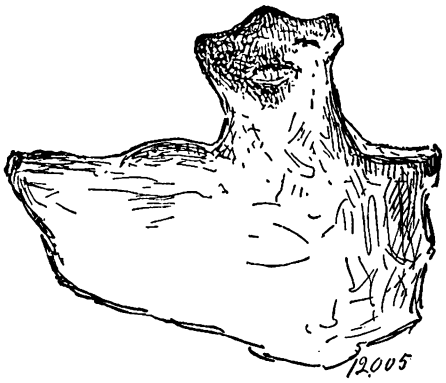


Jar from grave, Burial Mound within Earthwork. ½.

erected the large mound, made the earthen embankment, buried their dead in the stone graves, and lived in this fortified town as I now feel I have a right to designate it.

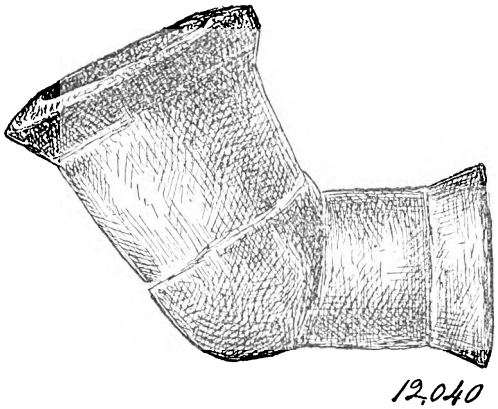
Nineteen of the best defined of these earth circles were carefully explored with very gratifying results, and proved to my satisfaction that the ridges were formed by the decay of the walls of a circular dwelling, about which had accumulated, during its occupancy, such materials as would naturally form the sweepings and refuse of a dwelling of a people no further advanced towards civilization than were these mound-builders of the Cumberland valley. These houses had probably consisted of a frail circular structure, the decay of which would only leave a slight elevation, the formation of the ridge being assisted by the refuse from the house.

Fig. 39.



Fragment of Pottery from grave, Burial Mound within Earthwork. Natural size.

Fig. 40.



Pipe made of Slate, from grave, Burial Mound within Earthwork. Natural size.

After the recent soil within the ridges had been removed, hard floors were discovered upon which fires had been made; while in the dirt forming the ridges, were found fragments of pottery; broken and perfect implements of stone, several discoidal stones, most of which were made of limestone; bones and teeth of animals; charcoal, etc. On removing the hardened and burnt earth forming the floors of

the houses, and at a depth of from one and a half to three feet, small stone graves were found in eleven of the nineteen circles that were carefully examined. These graves were in every case those of children, and were from one foot to four feet in length. In some the bones were entirely decayed, in others a few of the more solid parts of the skeleton such as the shafts of the long bones, the central parts of the vertebræ, and fragments of the crania were preserved.

The tibiæ of one young child in particular are worthy of remark

Fig. 41.

Pipe carved from Steatite, from Burial Mound within Earthwork.

from their extreme thickness and great curvature. These tibiæ of children are not in the least flattened, though some of the tibiæ of adults from the burial mound are.

These children's graves were found at one side of the centre of the house, and generally, it was noticed, that a fire had been built

over the spot, as shown by the burnt earth and charcoal. From them were obtained the best specimens of pottery found within the earthwork, with shell beads, pearls, and polished stones of natural forms, etc., which were probably playthings. In several of the smaller graves were the metacarpal bones of birds, which may have been given to the children to aid the teeth in perforating the gums, as is stated to be the custom among some of the present Indians.

Three small discoidal stones were picked up in the ridges of as

Fig. 42.

Side view of figure 41.

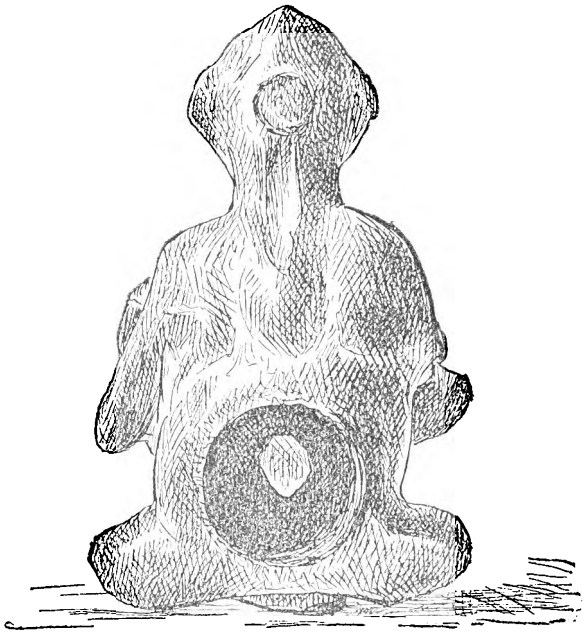
many different houses, and one other was found on the hard floor, while still another was discovered in the burnt earth over a child's grave.

In the dirt forming the ridge of the house designated as No. 3 in my notes, and under the floor of which graves were not found, was a fragment of thick pottery (Fig. 44) with the impression

of a closely woven fabric of coarse threads. Near this was taken out a bowl (12046) with rudely scalloped edges, of which figure 45 is a representation. From the same place was also taken a rude celt (Fig. 46), made of sandstone (12047).

Under the floor of one of the houses was a small grave containing the remains of the bones of two children, and with them the dish (12072), of which figure 47 is a drawing. No other article was found in this grave, over which a fire had been made, and in the

Fig. 43.



Back view of figure 41.

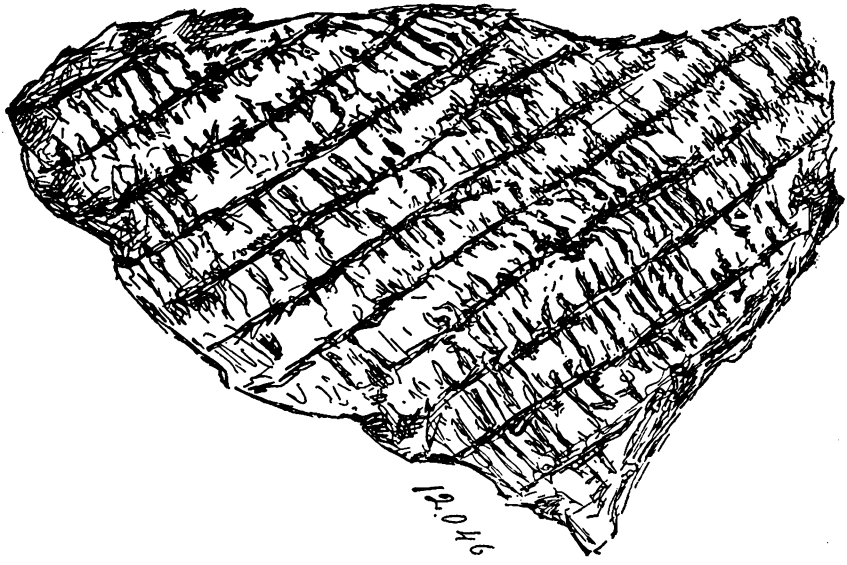
ashes were burnt animal bones, a discoidal stone and several fragments of pottery.

Within the area covered by another house, three burials had taken place, and from these graves were obtained two earthen vessels, a discoidal stone, a dish, and a few shell beads.

Three other houses contained graves of children in which were found several articles worthy of note, and evidently of considerable

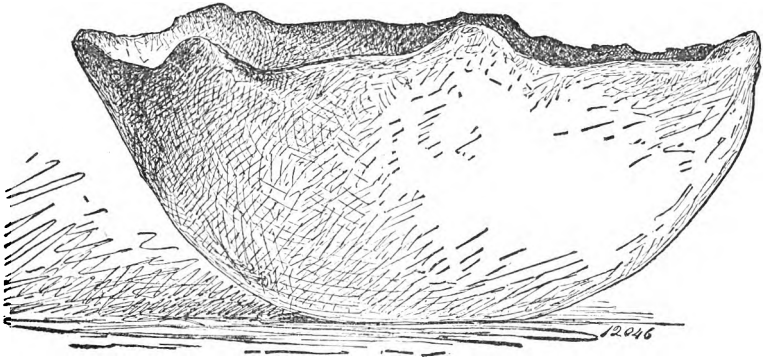
value. Under the floor of one of these houses, two graves were discovered, one of which was made simply by placing two stones

Fig. 44.



Fragment of Pottery from refuse of a House within Earthwork. Natural size.

Fig. 45.



Bowl from refuse of a House within Earthwork. ½.

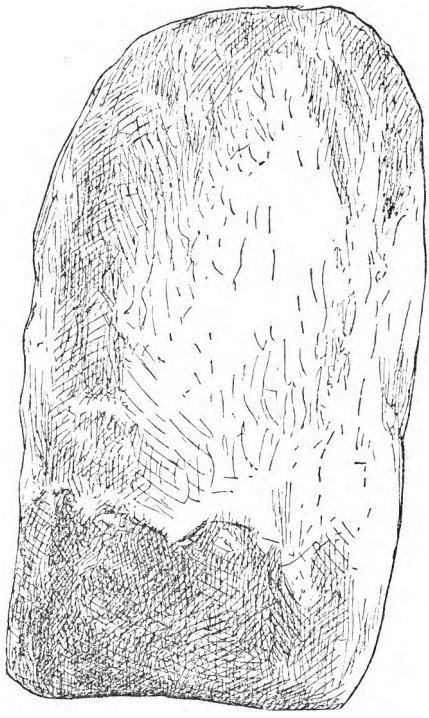
about eight inches apart, and was without the usual pavement at the bottom, or the covering and end stones. This contained the

remains of an infant buried in ashes, though the bones were not burnt, and two broken vessels of ordinary form.

In the other grave was a similar vessel (12062, Fig. 48), an awl, or pointed implement of bone (Fig. 49), and another made of deer's horn, the leg bone and a vertebra of a bird, and five shells of *Unio*.

Another house, located near the large mound, contained two

Fig. 46.



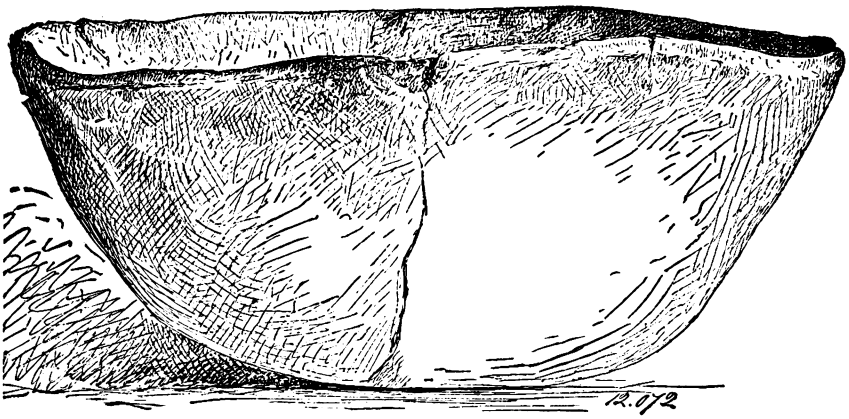
Celt of Sandstone from ridge of House within Earthwork. Natural size.

graves, in one of which was found a water jar mounted on three hollow legs, the cavities of which connect with the body of the jar, while the cross bars between them are solid. This jar (12093) is shown, of one-half its diameter, in figure 50.

The other grave in this house was remarkably rich in relics, and contained an earthen pot (12086), a bone of an animal (12087),

the shell of a *Unio* (12088), two large shells of *Busycon* (12089) from the Southern Atlantic coast, from which the columella had

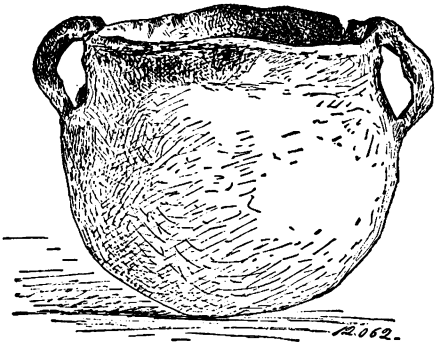
Fig. 47.



Dish from grave of a child in a House within Earthwork. ¼.

been removed, and a large lot of small shell beads (12091), of which six hundred and fifty were collected and many more were in fragments. These beads would have formed a chain several feet in length, as one hundred of them measure eighteen inches. With these shell beads were seven perforated pearls (12092) of large size, among them one which is nearly one-half an inch in diameter; also several handsome pebbles (12090) of quartz, chalcedony, etc., and a piece of the stem of a fossil crinoid.

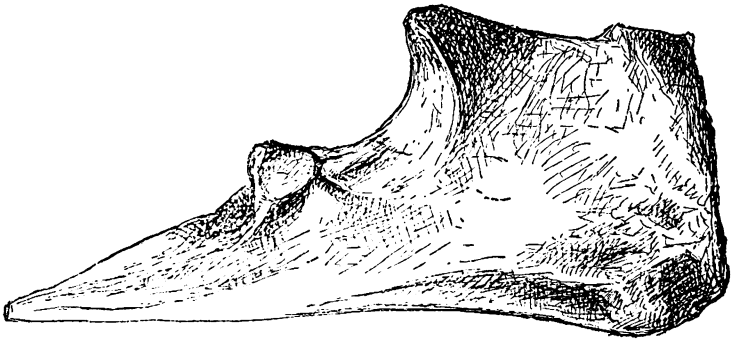
Fig. 48.



Pot from grave of child in a House within the Earthwork. ¼.

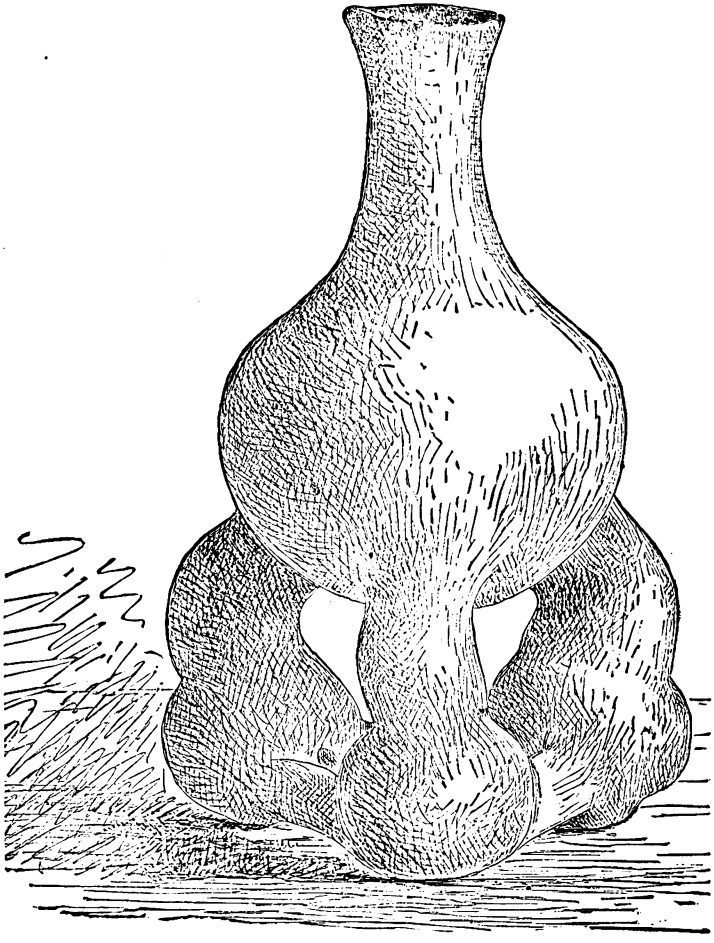
The last of the houses examined, which was also located near the large mound, contained the graves of an infant and of two other children. In the grave of the infant, the only

Fig. 49.



Implement of Bone, from grave of a child in a House within Earthwork. Nat. size.

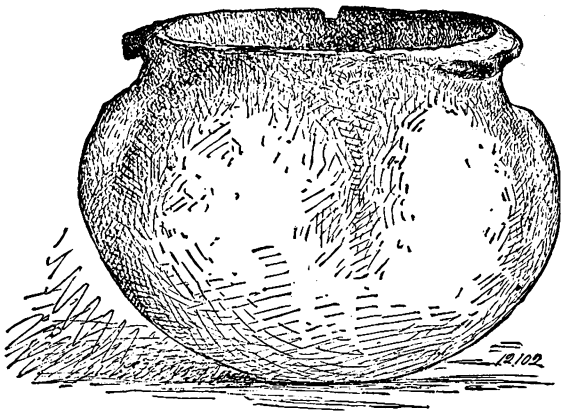
Fig. 50.



Jar from grave of a child in a House within Earthwork. $\frac{1}{3}$.

article found was an earthen pot (12101), represented by figure 51. The second grave contained a dish (12096), and the small pot

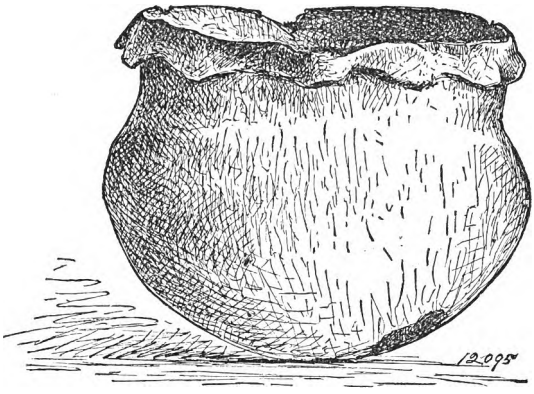
Fig. 51.



Pot from grave of a child in a House within Earthwork. ½.

(12095) with ornamented edges, shown in figure 52. The third grave was remarkable for the three well-made articles of pottery

Fig. 52.

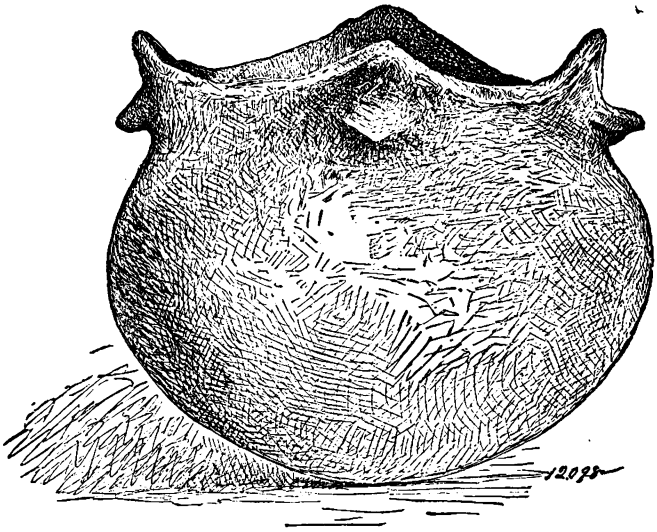


Pot from grave of a child in a House within Earthwork. ½.

which it contained. These are represented, of one-half their diameter, by figures 53, 54 and 55. The pot shown by figure 53, is

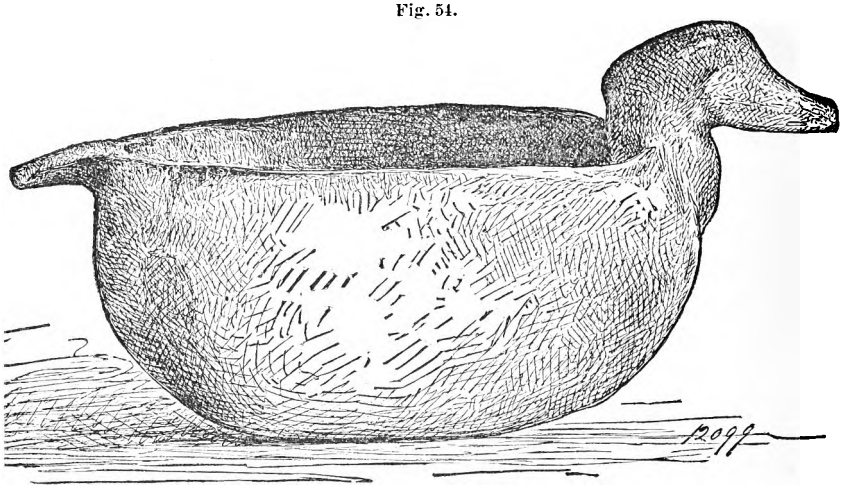
a symmetrical vessel, with deeply scalloped edge and with a pro-

Fig. 53.



Pot from grave of a child in a House within Earthwork. ½.

Fig. 54.



Duck-shaped Dish from grave of a child in a House within Earthwork. ½.

jecting portion under each point of the scallop. Figure 54 is a

well executed design of a duck-shaped bowl, while figure 55 represents a water jar in the form of a bear. This last is the only article of pottery obtained within the enclosure at Greenwood that was not of the ordinary blue gray color, like the majority of the pottery from Tennessee, Missouri, etc. The surface of this jar is

Fig. 55.

Painted Jar, from grave of a child in a House, within Earthwork. ½.

of a yellowish color, and on this had been painted a number of concentric figures, which were perfectly apparent when the jar was first removed from the grave, but, as they had not been burnt in, they scaled off in drying and are now only faintly indicated. This interesting jar, with others that are here figured, is evidence of the

high attainments of this ancient people in the ceramic art, and shows the development reached in native art by people who worked in copper, carved in stone and shell, moulded in clay, wove fabrics of several kinds, cultivated maize, lived in walled, or fortified towns, buried their dead in an extended posture, generally in stone graves, and erected the large mounds of the Cumberland valley, from which they are now known as the Mound-builders.

OBSERVATIONS ON THE CRANIA FROM THE STONE GRAVES IN TENNESSEE.

By Lucien Carr.

On page 224 of this Report will be found the measurements of sixty-seven crania collected, during the past year, by Messrs. F. W. Putnam and Edwin Curtiss, in the course of a series of explorations undertaken for the benefit of the Peabody Museum. These crania are all from the valley of the Cumberland, and, with but few exceptions, are from the immediate neighborhood of the city of Nashville, Tennessee. Except in one instance (Museum No. 11,918), they were all taken from stone graves, and a large majority of these graves were found in mounds. In fact, the mounds, themselves, were composed almost entirely of these graves arranged in layers, from three to five deep; and the one skull,—an orthocephalic—mentioned above, which seems to have been an exception to the general style of burial, was taken from one of these mounds, where it was found lying between two such graves. Of these mounds, the one at Greenwood near Lebanon, Tennessee, formed one of a group that stood within an earthen enclosure; whilst the others, marked on the table as being "near Nashville," were situated on the open plain without any such surrounding embankment at present existing. The graves are elsewhere described at length, by Mr. Putnam, and without repeating what he has so well said, we may be pardoned for insisting upon the fact that there was nothing in the manner of their construction, in the condition of the remains, or in the character of the very peculiar pottery and of the ornaments and implements of stone, bone, and shell found with them to indicate that the people who died and were buried here had belonged to different races, or even to different tribes of the same race, unless, perchance, the difference in the form of the skulls should be taken as evidence of such diversity. Similar graves are not unfrequent in the eastern section of the State and the adjoining portions of Virginia, and they are found, usually on the level and singly or in groups of

three or four, in regions as far apart as Kentucky[1] and Georgia, and Missouri[2] and New Jersey;[3] whilst in point of time, they are said to have been in use in southern Illinois, among the Kickapoo Indians,[4] within the memory of men now living, or but recently dead. They have also been found, elsewhere, in mounds,[5] but never it is believed in layers, piled one on top of the other and constituting as in this case almost the entire bulk of the mound.[6] Mr. Lyon did, it is true, in the course of his explorations in Union County, Kentucky, open mounds that contained rows of dead bodies, arranged in tiers, but they were not buried in separate stone graves. In only one or two instances did he unearth bodies that "appeared to have been covered by slabs of the stone forming the pavement set up slanting toward the body with the ends of opposite stones resting against each other, thus roofing the body in."[7] This would give a sort of triangular, or tent-like shape to the stone coffin, instead of the usual rectangular, or box-like form common in other localities; but aside from this difference in construction, there is nothing to suggest the idea of a different race of people,

[1] During the course of several summers' service in the field as archæologist to the Kentucky Geological Survey, I have repeatedly found such graves, either singly or in groups of three or four, in East Tennessee, southwestern Virginia and in the Green river district of Kentucky. Sometimes they are marked by small cairns, but usually there is nothing but an enclosure of small stones, set on edge and projecting but slightly above the surface, to indicate their presence. In the choice of these burial places there does not seem to have been any method, other than the proximity to stone, suitable for use in building them. I have found them at all levels, from the bottom lands of the river valleys to the tops of the hills; but never far from some outcropping ledge of rock that could be used in their construction. In Powell's Valley, Virginia, extending almost its entire length, there is such a ledge of outcropping limestone, on and near which these graves are quite common, though they were not found elsewhere in the valley. There are, however, in that region numerous caverns, many of which contain human remains. The skulls found in them and in the caves of Kentucky, as is elsewhere noted, do not differ materially from those taken from the stone graves.

See also Smithsonian Report for 1870, p. 377.

[2] Jones' Antiquities of the Southern Indians, pp. 213, *et seq.* New York, 1873.

[3] Dr. C. C. Abbott, of Trenton, writes me that "there is a stone grave in the neighborhood of the Delaware water-gap, which is described in a guide book to that locality by L. W. Brodhead." See, also, Mr. E. A. Barber, quoted in Popular Science Monthly for Sept., 1877, p. 638.

[4] Professor Charles Rau, quoted in Antiquities of the Southern Indians, p. 220. New York, 1873.

[5] Smithsonian Report for 1870, pp. 378 and 402.

[6] The mounds opened by Dr. Joseph Jones, with results precisely similar to those obtained in the course of these explorations, were in this immediate locality and thus confirm the statement. For a most interesting account of the valuable work done by Dr. Jones, see "Explorations of the Aboriginal Remains of Tennessee," published by the Smithsonian Institution, Washington City, 1876.

[7] Smithsonian Report for 1870, pp. 402–4.

whilst the many points of resemblance notably in the shape and size of the prevailing form of cranium, in the manner in which the dead were buried in layers, though not always, or even generally in stone graves, and, last but not least, in the character of the articles found in them, leave but little doubt as to the identity of the people who built these mounds and buried in these graves. As to whom they were, or to what race they belonged, history and tradition are alike silent; but it is a singular coincidence, to say the least, that the city of Nashville, the centre as it were of this class of remains, stands on the very site of a former Shawnee village[8] and that this same tribe of Indians, or their congeners[9] can be shown, on undoubted historic authority, to have occupied each one of the above-mentioned localities in the course of their erratic and checkered career. I am not, however, prepared to assert that they were in the habit of burying their dead in stone graves, or even in mounds, though such customs were common enough among their neighbors.[10]

This much seems necessary by way of thoroughly understanding the circumstances under which this exceedingly valuable collection was made. Turning now to the crania and grouping them according to their most obvious characteristics, it will be found that

1st, All are more or less prognathic, and

2d, That there are twenty-nine that show marks of "posterior flattening" to a greater or less extent, and thirty-eight that are either normal, or else the amount of distortion in them is so very slight that it is not believed it will materially affect the general accuracy of the measurements.

Flattened posteriorly, the term generally used in describing this particular class of skulls, is not altogether satisfactory, for the reason that it seems to indicate a certain sameness in the distortion,

[8] Ramsey. History of Tennessee. p. 79. Charleston, 1853.

[9] The Kickapoos, who occupied the section of southern Illinois in which these graves are found, are included among the Western Lenape, under which head the Shawnees are also placed. Archæologia Amer: Vol. II, p. 60.

[10] Since this article was in type, I have had an opportunity of examining a skull found on Big Shawnee Island, in the Delaware River, a few miles above the Water Gap, and forwarded to the Peabody Museum by Dr. Abbott of Trenton. In shape and size, and even in the manner and amount of the posterior flattening to which it had been subjected, there is absolutely no appreciable difference between it and many of the specimens in the collection, now under consideration. As the Shawnee Indians occupied each of these localities, at different times, in the course of their wanderings, and, so far as we know, no other one nation ever did, why may not this be regarded as an important link in the chain of evidence that points to this unfortunate people as the Moundbuilders of the Cumberland Valley?

or flattening, as well in kind as in degree, and to imply that the pressure necessary to produce it had been designedly applied, when, in point of fact, it is probable that nothing was farther from the truth. Still it is accepted for the want of a better term, though it might, perhaps, be more accurate to say of this form of cranium, that the distortion was the result of pressure undesignedly applied. This may seem to be rather a sweeping assertion, but it is believed to be justified by a study of this collection and a comparison of the different specimens with those from Peru that show marks of posterior flattening. So similar are the effects of this process found to be, that but for the difference in capacity, amounting to 111[c.c.][11] in favor of the Tennessee crania, and the accidents of discoloration, etc., resulting from the circumstances of burial, a selection might be made from the posteriorly flattened crania of these widely separated localities, that would be absolutely indistinguishable. With but slight alterations, the language applied to one might be safely used in describing the other. Undoubtedly, if only the more aggravated cases of distortion be considered—those for instance in which the occipital and parietal bones have been flattened into one plane and that plane pushed far forward of a vertical line, as in Museum, No. 12,799,—no craniologist would feel justified in describing it as the result of accident, or the effect of force undesignedly applied. But if, on the contrary, we begin at the other extreme—at those cases in which the distortion, at best but very slight, is only revealed by the development more or less unequal of one or the other of the parietals, or perhaps by a slight flattening of the occiput just above the protuberance—and carefully note the intermediate steps by which one form insensibly merges into the other, it will be found impossible to draw other than an arbitrary line of demarcation between them. The same causes that produced one must have produced the other; and if, as is generally admitted, the less distorted forms may have been caused by the manner in which the child was strapped to the cradle board,[12] or even by the habit of "laying the child to sleep from earliest infancy on its side with a persistent adherence to one

[11] The average capacity of fifty-six crania from Peru, is 1230[c.c.] = 75 c. inches. Fourth Annual Report Peabody Museum, p. 18.

[12] Morton. Crania Americana, p. 115. London and Philadelphia, 1839. Dr. Thurnam in Memoirs read before the Anthropological Society of London. Vol. I, p. 157, etc., etc.

side,"[13] there does not seem to be any good and sufficient reason why in those cases in which the distortion is greater, the same causes, operating for a longer period, may not have produced the same results. It is, after all, but a question of time and the amount of force exerted, and any attempt to fix a point beyond which it can be affirmed that this pressure was applied for the deliberate purpose of producing a certain form of distortion, must be arbitrary.

Bearing upon this point, though the evidence is negative and not entitled to much weight, is the fact that in all this class of skulls the different forms of distortion seem to have been produced at random. There is no effort to attain any particular form, as it is fair to assume there would have been, if any such had been recognized as a type of beauty, or mark of honor. Nowhere is there any apparent unity of design, any evident application of force for a specific purpose; but on the contrary, we find just such a confusion of forms as might be expected to result from the hap hazard practice of strapping babies to a cradle-board. In some of the skulls, all the bones of the posterior portion of the head are more or less flattened; in others, it may be one or both of the parietals with, perhaps, the upper portion of the occiput; whilst again in others, the right, or left half of the occipital with the adjoining part of the parietal seems to have been forced forward, thus giving to the skull, when seen from above, a decidedly lop-sided appearance. Amid such confusion, it is impossible to effect any classification save upon the very indefinite, general basis of "posterior flattening." This may mean very much, or it may be found to signify very little; but in either event it is to be regarded as accidental and cannot be accepted as a race or tribal characteristic. Certainly it was not so considered by the early chroniclers, since nowhere, so far as the writer knows, is there any evidence that it was ever, intentionally, practised by any of our American Indians. If it had ever obtained to any extent among them, it is hardly possible that it would have escaped all mention on the part of writers who have left us any quantity of evidence as to the intentional depression of the frontal and the means taken to bring

[13] Wilson, Prehistoric Man, Vol. II, p. 226. London, 1876. "Sometimes the flattening inclines to the right, sometimes to the left side; — a difference, perhaps, due to the custom of the mother as to suckling the child at the left or right breast." Dr. Thurnam, Memoirs of the Anthropological Society of London, Vol. I, p. 157. "I have observed the effects of pressure in flattening the occiput, in white infants, who, during protracted illness, have lain long in one position." Jones, Aboriginal Remains of Tennessee, p. 127.

it about. We have accounts, it is true, any number of them, of the application of pressure to both the frontal *and* occipital, at one and the same time, and it is possible that a moderate amount of pressure applied anteriorly, as was the case among the Choctaws, might aggravate the parieto-occipital distortion; but nowhere do we find any account of the application of force to the back of the head alone, for the purpose of moulding that particular portion of the head into some desired form.

For these reasons it is believed that this custom of flattening the head posteriorly, whether found in Peru, Europe, or the Mississippi valley, is simply accidental,—the result of pressure undesignedly applied,—and can only be regarded as evidence of the extensive use of the cradle-board, but as furnishing no proof, beyond this, of the antiquity or identity of the people among whom it is found to have existed.

Whilst upon this point, it may, perhaps, be as well to state that there is not in this entire collection a single skull showing indisputable evidence of an attempt to depress the frontal, or to flatten the head *anteriorly*. Two, and only two of them, exhibit the least trace of this process, and in them it is so exceedingly faint as to require some aid from the imagination in order thorougly to believe that the attempt was ever made. In all the others, the foreheads though somewhat retreating and in many instances far from symmetrical, are more or less rounded or arched, and apparently never felt the pressure of a sand bag,[14] or any other method of depression.[15] This fact would seem to exclude from the list of possible builders of these stone graves, the Natchez,[16] Chickasaws,[17] Choctaws[18] and any and all other tribes in which the custom of intentionally depressing the frontal can be shown to have prevailed. Granting that either of these tribes buried here, and it does not seem within the bounds of probability that a collection of this size could have been gathered together without containing a percentage of skulls showing the particular form of distortion which they are known to have practised. That there might be no chance of mistake, careful comparison has been made with crania from Peru,

[14] Adair, History of the American Indians, p. 284. London, 1775.
[15] Du Pratz, History of Louisiana, Vol. II, p. 162. London, 1763.
[16] History of Louisiana, l. c.
[17] Memoir of the Sieur de Tonty, French's Historical Collections of Louisiana, Part I, p. 60.
[18] Adair, Hist. Amer. Indians, p. 284. Bartram's Travels, p. 517. Philadelphia, 1791.

the Northwest Coast and the Ohio valley, in which this depression of the frontal is marked, and it is not believed that the two forms can ever be confounded. It is, indeed, true that the method by which this particular form of distortion is brought about, and which we find described in Adair[19] Du Pratz,[20] and others of the early writers, does also, sometimes, cause a flattening of the posterior portion of the head similar to that found in the skulls taken from the stone graves, but it also causes a flat retreating forehead, and a levelling or depression of the parietals along the line of the sagittal suture, that differs as widely as possible from the rounded forehead and the high, arched crest of the other. In a word, the two forms are separated by the whole extent of the impassable gulf that exists between the accidental *com*pression or forcing *forward* of some portion of the posterior part of the head and that intentional *de*pression, or forcing *backward* of the frontal, which results from the application of force exerted deliberately and for the attainment of a specific purpose. But it is unnecessary to pursue this branch of the subject farther, especially as there is no intention of entering into a discussion of the question, who constructed these graves? The theme is tempting, and at some future time it may occupy our attention, but for the present it must suffice to protest, however feebly, against the fallacious style of investigation that is wont to assume the identity of race from the accidents of a custom.

Returning from this long digression and dividing the crania according to the features that distinguish the sexes, we find among the thirty that are sufficiently perfect for us to take their capacity, that there are seventeen which are probably those of females and thirteen, of males. All are adults with perhaps one exception, and that one, to judge from the dentition, may be anywhere from fifteen to twenty years of age. The mean capacity of the seventeen females is 1250$^{c.c.}$, of the thirteen males, 1459, leaving a balance of 209$^{c.c.}$ in favor of the latter. The mean capacity of the whole is 1341, which is less than that of the American Indian, 1376$^{c.c.}$, but greater than the Peruvian, which is only 1250$^{c.c.}$, and agrees closely with the average of the collection, made by Dr. Jones, in this same neighborhood. These differences and resemblances, however, can be best seen when the measurements

[19] l. c. p. 284.
[20] l. c. Vol. II, p. 162.

are arranged in tabular form, and for this reason we have brought them together in Table I, adding other measurements that are of interest, and including crania from other localities.

TABLE I.—MEAN MEASUREMENTS OF CRANIA.[21]

		Capacity.	Length.	Breadth.	Height.	Index of Breadth.	Index of Height.	Width of Frontal.	
1	[22] Mean of 67 Crania from stone graves in Tennessee.	30 1341	67 166	64 141	40 142	.852	.854	91	Flattened posteriorly
2	Mean of 21 Crania from stone graves in Tennessee.	15 1335	21 165	21 143	21 141	.872	.854	....	"
3	Mean of 38 Crania from a mound in Kentucky.	24 1313.33	5 165.4	38 142.28	36 132	.857	.769	92.7	"
4	Mean of 10 Crania from Caves in Kentucky and Tennessee.	2 1382	10 168	8 140	4 143	.831	.823	90	"
5	[23] Mean of Crania from Mounds in United States.	39 1374	118 168	115 145	78 139	.867	.821	....	"
6	Mean of 18 Crania from Florida.	7 1375.7	10 173.5	18 145	11 135.6	.830	.777	98.47	.....
7	Mean of 103 Crania from Santa Barbara, California.	1248	175	136	129	.779	.741	98	.....
8	Mean of 50 Crania from Islands off Santa Barbara, Cal.	1326	184	133	128	.723	.680	93	.....
9	New England.	.....	179	136	136	.759	.759	....	.....
10	Iroquois.	.....	185	137	137	.740	.740	....	.....
11	Algonquin.	.....	184	141	136	.766	.739	....	.....
12	Algonquin — Lenape.	.....	180	140	137	.777	.761	....	.....
13	Esquimaux.	.....	184	132	138	.717	.750	....	.....
14	Tschuktchi.	.....	176	135	137	.767	.778	....	.....

[21] The measurements given in this table are taken as follows:—No. 2 from Jones' Aboriginal Remains of Tennessee, p. 109; No. 5. from the Check List of the Army Medical Museum; Nos. 9, 10, 11, 12, 13. 14. from Wilson's Prehistoric Man, Vol. II, p. 197, and the rest from crania in the collection of the Peabody Museum.

[22] The small figures over the line in this and the succeeding columns, running from left to right, refer to the number of Crania measured. These measurements are given:—Capacity in cubic centimetres; length, breadth, etc., in millimetres.

[23] The check list from which this average was prepared, was issued by the Army Medical Museum for use during the International Exhibition of 1876, at Philadelphia.

In the above table and thus far in our study of the collection, we have dealt altogether with mean measurements, or with those divisions that could be easily noted by the eye. This method of proceeding is sufficiently accurate for the purpose of comparing

Since then there have been numerous additions to the collection, though they are not included in the above table of Mean Measurements. I am indebted to Dr. G. A. Otis for the following interesting memorandum, showing the distribution and distortion of the Mound Crania now in that collection:—"There are 174 Crania from Mounds in the collection of the Army Medical Museum, 57 of which are normal, 104 flattened, and 13 fragments, the normal and abnormal character of which cannot be ascertained. They were collected in the following localities:

LOCALITY.	Normal.	Flattened.	Fragments.	Total.
Dakota	18	.....	.....	18
Wisconsin . . .	2	.....	.....	2
Iowa	.....	5	1	6
Illinois	3	.....	.....	3
Indiana	5	.....	.....	5
California . . .	4	.....	2	6
Utah	1	4	.....	5
Missouri	1	.....	.....	1
Kentucky . . .	6	21	3	30
Virginia	.....	1	.....	1
Tennessee . . .	1	6	.....	7
Mississippi . . .	3	44	1	48
Louisiana . . .	1	6	.....	7
Alabama . . .	.....	.....	1	1
Florida	12	17	5	34
	57	104	13	174

the capacity, etc., but it fails to give us anything like a correct idea of those measurements that vary with the amount of distortion, or of the differences between the groups of skulls that go to form each one of the above averages. For instance, in group No. 1 of the above table, we have the mean breadth of the Tennessee crania given as 141^{mm}., and the index of breadth as .852, or .852 of the length, assuming that to be a thousand. This brings the entire collection within the class of brachycephalic,[24] or short heads, and is unquestionably accurate so far as it goes. It belongs, however, to that class of half truths that are sometimes as pernicious as error itself, insomuch as it omits all mention of the fact that there is a large percentage of these skulls, which must be ranked as among the long or the oval heads, or in scientific nomenclature, among the dolichocephali or the orthocephali. These groups are separate and distinct, and should be kept so in any comparison that aims at accuracy, otherwise the cephalic index becomes a variable quantity, and the classification of the same skulls will vibrate from short to long, accordingly as one or the other form may be made to preponderate. To obviate this difficulty as far as possible, it is proposed to divide these crania into the three groups according to their relative proportions of breadth and length. Apparently this is a very simple process, and if all the skulls were perfectly normal and symmetrical it would give us results that are absolutely accurate. But the reverse of this is the case with the collection now before us, and consequently we are met, at the very outset of our classification, with the startling fact that in a collection that contains a percentage of distorted skulls, absolute accuracy is unattainable, for the reason that there is no method by which the extent of such distortion can be measured. It will not do to trust to the eye alone, because due allowance cannot always be made for what may be termed the personal equation of the person making the measurements. In taking the cubic contents of a skull, this can be equalized by giving the average of a series of measurements; but should it become necessary, at any time, to pronounce upon the amount of distortion in any particular skull,

[24] The classification, omitting the subdivisions, is that adopted by Dr. Thurnam Professors Huxley, Dawkins and other English authorities, and may be found in "Cave Hunting," by W. Boyd Dawkins, p. 190. London, 1874.

I. "Dolichocephali, or long skulls with cephalic index at or below .73.

II. Orthocephali, or oval skulls with cephalic index from .74 to .79.

III. Brachycephali, or broad skulls with cephalic index at or above .80."

in order to effect a classification according to that standard, the eye cannot always be trusted as a sure and safe guide. The want of symmetry in crania is so very general, and in many of those that have been flattened posteriorly the extent of the distortion, even when it is admitted to be present, is so exceedingly small, that probably no two craniologists would agree in their judgment as to a number of skulls. Even the same person might, not unlikely, find it difficult to reconcile the decisions of one day with those of another. The callipers, it is true, can be trusted to give us the precise present status of any skull, i. e., whether dolichocephalic, brachycephalic, or belonging to some one of the intermediate subdivisions; but it is powerless to estimate the extent of the compression, often very slight, by which the relative proportions of any given skull may have been so changed as to transfer it to a class to which it did not originally, rightfully belong. That this is an incident of frequent occurrence will not be denied by any one who has ever had occasion to note the imperceptible stages by which these different forms of skull grade into each other. But small as the amount of this distortion in each case may be, and however slight its effect on the general average, yet, as it always acts in one direction and its force is cumulative, a moment's reflection will show that it may become a prolific source of error. Thus, whilst a very slight amount of posterior flattening may sometimes suffice to transform a dolichocephalic skull into an orthocephalic, or an orthocephalic one into a brachycephalic, yet by no possibility *can it ever reverse the process* and transform a brachycephalic skull into a dolichocephalic, or even into an orthocephalic of high grade. The tendency is always in one and the same direction, and its effect is ever to increase the number of short, or of oval heads at the expense of those that are longer.

Recognizing these difficulties in the way of attaining accuracy in classification, and at the same time feeling the necessity of eliminating certain exaggerated cases of distortion from the calculations, it has been thought desirable, as a temporary expedient, to establish a purely arbitrary fourth class or flattened skulls, to which is relegated all those having an index of .900 and over. There may be and probably are, perfectly normal skulls with an index equalling this, but in all such cases, it has been the aim to keep them apart, and to confine this class of flattened skulls to those in which the judgment of the eye and the verdict of the calipers are

found to be in accord. It must not, however, be inferred, that this group includes all the most aggravated cases of distortion, or that all the crania in the other classes are entirely free from such malformation. Take for instance a brachycephalic skull with a high index,say .880, and having fixed the point of distortion at .900, it will evidently require a much less amount of posterior flattening to bridge over this interval than to carry an orthocephalic skull with low index up to the limit of brachycephalism, or say from .750 to .800. This is evident in theory, and though in practice it is perhaps difficult or impossible to verify it, as there are no known methods of measuring the extent of the flattening, still, as a fact, there are crania in the orthocephalic and brachycephalic groups, in which the deformity, measured by the eye, seems as great, though not always displayed in the same direction, as is to be found in the average of the flattened skulls. Neither must it be supposed that all the crania in the other classes are free from marks of posterior flattening. Probably not a third of the whole collection can be said to be perfectly normal, and certainly not the half, even of that number, would be pronounced symmetrical. Still, in the case of those classed as dolichocephali and orthocephali, the extent of the flattening is exceedingly small and as it is usually above, or on one side of the occipital protuberance, through which and the glabella our measurement of length is taken, it is not believed that it will materially affect the accuracy of the result. Among the brachycephali, such immunity is not claimed. Some of them are undoubtedly normal or but very little flattened, whilst others exhibit marks of distortion to a greater or less extent. It is even probable that some skulls naturally orthocephalic may have been transferred to this class by this process. Be this as it may, it is believed that the subdivision of this group by limiting the range of distortion, has narrowed the chances of error, and that the measurements are a close approximation to the truth. Still, as a matter of fact, it must be admitted that the process of flattening the skull posteriorly does shorten and broaden the head, and, consequently, it may have raised the cephalic index of this group though not, it is believed, to any very great extent. As to the fourth class or flattened skulls, distortion, among them, "goes without the saying." It must not be forgotten, however, that this subdivision is purely arbitrary and is introduced merely for the purpose of elucidating

some points that will arise hereafter. If it be considered objectionable, the last group, No. 4, of flattened skulls may be left out of our calculations altogether. The effect of this will be, simply, to tone down the contrasts of the brachycephali (No. 3) with the other classes of skulls (Nos. 1 and 2), and thus strengthen any conclusions that may be based on such contrasts.

TABLE II.—MEAN MEASUREMENTS OF 67 CRANIA FROM STONE GRAVES IN TENNESSEE.

		No. of Crania.	Capacity.	Length.	Breadth.	Height.	Index of Breadth.	Index of Height.	Width of Frontal.	Index of Breadth.
			2	5	5	3			5	
1	Dolichocephali.	5	1325	184	132	142	.716	.775	94	.730 and under.
			6	18	16	11			18	
2	Orthocephali.	18	1346	172	134	141	.775	.819	89	.740 @ .800
			15	9	28	18			29	
3	Brachycephali.	29	1284	165	141	142	.856	.865	90	.800 @ .900
			7	15	15	8			15	
4	Much Flattened.	15	1461	156	152	145	.973	.907	93	.900 and over.

An examination of the above table will show that there are in this collection five (5) dolichocephalic, eighteen (18) orthocephalic, twenty-nine (29) brachycephalic and fifteen (15) that we have classed as flattened skulls. They range from a cephalic index of .716 among the dolichocephali to .856 among the brachycephali, or accepting the classification of the English authorities, from the subdolichocephalic to a high grade of brachycephalism. Names, however, are of but little import; the one, central fact is to be found in the presence, in these graves, of skulls which, after excluding those tabulated as distorted or much flattened, are shown by their measurements to belong to the two extremes of classification, and which cannot be brought into the same group without doing violence to all ideas of craniology. If the terms dolichocephalism and brachycephalism mean anything, then those two forms of skulls are found here, and there is no method of measurement sufficiently elastic to include them both under one head. This fact is by no means new or novel, though it has not been many years since Dr. Morton and anthropologists of his school stoutly maintained the uniform brachycephalic type of crania among all the

American aborigines except the Esquimaux. Of late years, however, the contrary opinion, so ably advocated by Dr. D. Wilson, has been steadily gaining ground, and to day there is but little hazard in saying that it is generally received. But the evidence, furnished by a study of this collection, seems to lead still farther, and we are required not only to admit the existence of different forms of skulls, as there well might be in different tribes, but also to conclude that they are to be found among the same people, or people living under the same tribal organization, much after the fashion in which they are, to day, known to exist among the composite peoples of our great commercial cities. This is hardly in accord with the opinions generally held as to the purity of race, in prehistoric times,[25] but it seems impossible to avoid the conclusion, if it be admitted that the fact that these skulls were found buried together indiscriminately, in the same style or set of graves, in the same mound, and so far as we can judge, at or near the same time, is any proof that they belonged to people of the same tribe and race. In the case of Museum No. 11,860, the evidence is even stronger, as in this instance a normal dolichocephalic skull and a brachycephalic one, slightly flattened posteriorly, were found buried in the same stone grave, in a mound, and under circumstances that make it impossible that the interments could have been made at different times. This mode of burial could hardly have taken place except among members of the same family or *gens*, or at least members of the same tribal organization, and the argument as to the probable identity of race is certainly of equal weight.

It is, of course, possible that the skulls which are found to differ so widely from the prevailing type, may have belonged to members of different tribes. The custom, almost universal among the American Indians, of absorbing the remnants of conquered tribes,[26] would account for much of this diversity, and as they lived in a constant state of warfare,[27] their opportunities in this

[25] "This" (variation of skull form) "is due to our very abnormal conditions of life, and to the mixture of different races brought about by the needs of commerce, as in Manchester and Vienna, as is pointed out by Mr. Bradley.

In prehistoric times neither of these causes of variation made themselves seriously felt. There was little if any peaceful movement of races, but war was the normal condition, and society was not sufficiently advanced to remove man from the influence of his natural environment." W. Boyd Dawkins, Cave Hunting, p. 190. London, 1874.

[26] Du Pratz, History of Louisiana. Vol. II. p. 157. Arch. Amer., Vol. II, p. 95.

[27] "We cannot live without war. Should we make peace with the Tuscaroras, we must immediately look out for some other, with whom we can be engaged in our beloved

line must have been magnificent. If to this be added the frequency of adoption[28] and intermarriage,[29] a strong case is made out in favor of this explanation. But admitting all that can be said in its favor, and it may still be doubted whether these factors are of sufficient importance to produce the immense results here seen. Out of a total of sixty-seven crania which, taken as a whole, belong distinctly to the brachycephalic type, there are twenty-three, or over thirty-three per cent. that cannot be considered as coming within that group. This is a large percentage, and it may well be questioned whether it is not too great to have been produced save by causes that must have been at work through a long series of years, or upon an exceptionally large scale. Upon this point, however, speculation is idle. Craniologists may well differ as to how this state of affairs was brought about, but as to the main fact,—the existence of different forms of skulls, even among people living under the same tribal organization—there cannot be two opinions, in view of the rapid accumulation of evidence within the past few years.

But whilst this classification of crania according to the cephalic index gives us the relative measurement of breadth and length, and of course varies as either member of the proportion is increased or diminished, it does not furnish the actual breadth or height of any skull, or even the mean of the whole. To ascertain these we must again go to the tables, and referring to the measurements as given above, we find that the breadth ranges from a mean of 132^{mm}. among the dolichocephali, to 152 among those that are distorted, or in class 4. As has been said before, the crania in Nos. 1, 2 and 3, show but little if any marks of distortion, and consequently the measurements there given may be accepted as a close approximation to accuracy. In No. 4, however, or among the flattened crania, this state of affairs no longer exists, and whilst the figures there do not give us any idea of the original form of these skulls, yet they do accurately indicate the present measurements, and, by comparison, may help us to form some conception of the effects of this method of distortion. That it increases

occupation." Reply of the Cherokees to an offer to bring about a pacification between them and the Tuscaroras. Ramsey, History of Tennessee, p. 83. Charleston, 1853. Archæologia Amer., Vol. IV, p. 90. Schoolcraft, Vol. II, p. 84, etc., etc.

[28] "Captives taken in war were either put to death, or adopted into some gens. Women and children taken prisoners usually experienced clemency in this form." Morgan, Ancient Society, p. 80. New York, 1877.

[29] Tecumseh was the son of a Shawnee father, and Creek mother. Schoolcraft, Indian Tribes of the United States. Vol. V, p. 45.

the width of the skull can be seen at a glance. Compared with the brachycephali, the class that is nearest to them in shape and size, the mean breadth of the crania in this group is (11) eleven^{mm}. greater, and these figures may be considered as representing roughly the measure of the distortion of these skulls in this particular direction. Among themselves, the variation is great, though diminished by the limitations arbitrarily fixed on the class as a whole. It extends from 140^{mm}. to 169, and the cephalic index ranges from .900 to 1.019, though the broadest skull is not always the one having the highest index.

In this collection there are two that are broader than they are long, or with an index of over a thousand. A third, with an index even greater than either of these, amounting to 1233. has been omitted from our calculation, as, after a careful examination, it was thought that possibly the length might have been shortened by *post mortem* compression. On this point, it is proper to state that the utmost care has been observed, though in those cases in which the point of posthumous deformation coincides with that of cradle-board distortion, it is, sometimes, difficult to say exactly how much is due to one cause and how much to the other, admitting that both have been instrumental in modifying the original form of the skull. In the present collection there are three such coincidences, but for reasons given above, when treating of posterior flattening, it is not believed that the distortion has been such as to impair the correctness of the measurements. As a rule, the conditions of burial in stone graves or coffins, are such as to protect these skulls from any very great amount of superincumbent weight, whilst, as a matter of fact, in those instances in which the malformation seems to have been brought about by a comparatively slight pressure acting upon a body rendered soft and pliant by incipient decay, the process is found to have been altogether too effectual; as that portion of the cranium, which is supposed to have been subjected to the pressure, is usually, entirely missing. But this whole question of posthumous distortion is as yet but imperfectly understood. Perhaps the most that can be said is, that given certain conditions and it is almost sure to follow. Dr. George A. Otis, Curator of the Army Medical Museum, speaking of some crania that had been exhumed from the Vicksburg mounds by Surgeon Ebenezer Swift, U. S. Army, says in a private note to the writer, "the skulls were so soft that they would assume almost any shape given them on exhumation. Many of them were sent

to Washington in the wet clay in which they were found and I had scalar demonstration of the facility with which *post mortem* deformation was possible." There is no higher authority on matters craniological than the accomplished Curator of the Army Medical Museum, and whilst fully admitting the force of this statement, I feel great hesitancy in venturing to intimate a doubt as to whether there may not be some danger of overrating the frequency with which the conditions necessary to bring about post mortem distortion are supposed to occur. Within a few weeks, the writer has had occasion to examine the very valuable collection of crania now in the Peabody Museum, and out of one hundred and fifty skulls dug from graves in California and the islands off its Southern Coast, there is not one that shows any marks of posthumous distortion, though the evidence of posterior flattening is more or less common. In the same collection, there are one hundred and two skulls from Italy, some of them antedating the Christian Era. Among these are a few with the peculiar lop-sided appearance found in crania from Peru and the valley of the Ohio, which is supposed to be one of the forms of distortion resulting from the use of the cradle-board, but no marks of *post mortem* deformation. This is of course negative evidence again, but in view of the fact that these skulls, selected at random, were buried under circumstances as likely to produce a posthumous change of shape as any that we can expect to find, may it not be considered as one of those rare instances in which it is permitted to argue the general scarcity of a form from its absence within certain, comparatively narrow limits? But there is no intention of entering upon this matter, and even the little that has been said has been with a view of showing that we were fully aware of the possibility of error resulting from this cause, rather than from any desire or expectation of influencing opinion either way. Thanks to the friendly word of caution from Dr. Otis, and to the circumstance of the interments in stone graves, it is believed that danger of error in this direction has been reduced to a minimum; and this opinion is confirmed by the fact that the few specimens in this collection, in which the distortion can by any possibility be supposed to have resulted from causes acting after death, can be duplicated by others from Peru and elsewhere, which, so far as we are able to judge, are absolutely free from any and all such indications of *post mortem* pressure.

Referring to the measurements of height, we find that among

the flattened crania (class 4) it is 3mm. greater than among either the dolichocephali or the brachycephali, both of which are higher than the orthocephali. At first, it was thought that this slight increase of height might be due to the process of flattening the head posteriorly, as suggested by Dr. Morton[30] and Prof. Busk.[31] But on a careful study of the collection, it was found that this group was largely composed of male skulls, and it is believed that this superiority may, possibly, be due to that fact. This conclusion is borne out by a comparison of this collection with that obtained by Dr. Jones,[32] from the same neighborhood, in which the height of the much flattened crania, or those having an index of over .900, is found to be 4mm. *less* than the brachycephali, the group nearest to it, whilst that is smaller than the orthocephali, thus precisely reversing the results obtained above. It is possible, that in this latter instance, the inferiority may be due to the predominance of female skulls, just as, in the former case, a preponderance of male skulls turned the balance the other way. On this point we are in the dark, as there is no division of these crania, by Dr. Jones, on the basis of sex, though the importance of this element as a factor in swelling or diminishing the aggregates within certain limits, cannot be over estimated. Dividing his collection according to the formula given above and reducing his figures to the metric system, we find the following results, which are of much interest for purposes of comparison.

TABLE III.—MEAN MEASUREMENTS OF DR. JONES' COLLECTION OF 21 CRANIA FROM STONE GRAVES IN TENNESSEE.

		No. of Crania.	Capacity.	Length.	Breadth.	Height.	Index of Breadth.	Index of Height.	
1	Dolichocephali.	W	A	N	T	I	N	G.	.....
2	Orthocephali.	5	1261	173	134	145	.772	.836	.....
3	Brachycephali.	8	1387	168	143	142	.852	.844	.....
4	Much Flattened	8	1323	154	147	138	.945	.885	With an index at or over .900.

[30] Crania Americana, page 116. Philadelphia and London, 1839.
[31] Journal of the Anthropological Institute for April, 1873, p. 92.
[32] Aboriginal Remains of Tennessee, p. 110.

In the above table it will be seen that the dolichocephali are altogether wanting, and that the percentage of orthocephali is something less than in table II. The mean measurements, however, as given above and in Table II correspond very closely, as was to have been expected, when it is remembered that the two collections were made in the same neighborhood, and consist so far as we can judge, of the remains of the same people. There are, however, some minor differences, as will be seen by comparing the two tables, but it is believed that they can be accounted for by the accidental grouping of the crania on the basis of sex. Thus for instance, the capacity of the orthocephali in table III is found to correspond most closely, not with the same group in table II, but with the brachycephali, and as this latter class is largely composed of females, it is fair to presume that there exists a similar state of affairs among the former. Other resemblances and contrasts will doubtlessly be found, growing out of a comparison of these measurements, but it is believed that they admit of ready solution, and therefore do not call for any special mention on our part.

There are, however, other features connected with these crania which are worthy of attention, though not, perhaps of any ethnical significance. Some are anatomical, others the result of morbid conditions, and others, again, may be partly due to the custom of flattening the head posteriorly. Thus, of the 67 crania in this collection, we find that

Wormian Bones are developed in twenty-one, or nearly thirty-three per cent., distributed as follows: two among the dolichocephali, seven among the orthocephali, six among the brachycephali, and six among those we have classed as much flattened. If to this number be added the five each, among the orthocephali (2) and the much flattened (4), and the six found among the brachycephali (3) in which this suture was so very irregular and complicated as to show a decided tendency to the development of these extra bones, the percentage will be largely increased. In nine of these twenty-one, the number of extra or intercalated bones is limited to one,—the Inca bone as it is called,—situated at the apex of the occiput. In this shape it is found in three instances among the orthocephali, four among the brachycephali and one each among the flattened skulls and the dolichocephali. In the latter specimen besides the Inca bone at the apex of the occi-

put and wormian bones in the lambdoidal suture, there is also an extra suture connecting the lower posterior angles of the two parietals, thus dividing the occiput into two parts of which the upper is the larger. In two others, making twenty-three in all so affected, numbered respectively No. 11,889 and 11,921, these extra bones are found in the coronal suture, near the crossing of the temporal ridge. In the latter specimen there were two such irregularities, one on each side; in the former, only one and that on the left side. It is rare that they are found in this suture, though there are specimens in the Peabody Museum from Peru and the Northwest Coast, the latter much flattened anteriorly, that have such intercalated bones, similarly placed. Whilst there can be no doubt that the ratio of these bones in the crania of this collection, is very large, yet they are distributed throughout the different groups so evenly and in such manner that the process of flattening the head posteriorly cannot be said, in this instance, to have had any effect in increasing their development.

Sutures.—In eighteen the coronal *suture* (usually on both sides) does not extend below the temporal ridge, and the spheno-frontal and spheno-parietal is obliterated, so that at or near the point of union, complete ossification has taken place, and the parietal, frontal and sphenoid form but a single bone. This peculiarity is not confined to any age, or sex, or form of skull, but is distributed throughout the different groups, with the percentage largely in favor of the dolichocephali, as all five of those skulls are so affected. A similar condition of affairs is found in seven of the one hundred and fifty Californian, and in fourteen of the one hundred and two Italian crania examined. In sixteen, we find one or more of the sutures closed, as follows: in eight, the coronal and sagittal are both obliterated, either wholly or in part; in six, the sagittal alone; in one, the coronal; and in one, all three are closed. Among the dolichocephali, two have the coronal and sagittal so affected, and in one, the sagittal alone is closed. So far as we can tell, the crania in this latter group belonged to people much beyond the prime of life, and to this fact, no doubt, may be ascribed the closing of the sutures. In one skull, No. 12,303, the squamosal suture is closed; a thin scale of bone seems to have grown over it, and on this, in high relief, is impressed much of its irregular outline. In the three skulls Nos. 11,824, 12,797 and 14,003, that show marks of the greatest compression,

each having a cephalic index of over one thousand, and being respectively one, the skull of a youth, and the other two, of persons in the full vigor of manhood, all three of the sutures are open.

Small bony tumors are found in the outer opening of the ear, in seven of the brachycephali, and in two among the flattened skulls of class four; but they are not present in either of the other groups. This percentage, a little more than one in seven, is greater than Prof. Wyman found among the Peruvian crania, in which it existed in one in 41·25, or among Europeans, among whom it is said by Dr. C. J. Blake to be found in about five out of a thousand.[33] There is also more or less difference in the shape of the outer opening of the ear, a fact to which my attention was called by my friend, Dr. H. P. Walcott, of Cambridge, to whom I am indebted for many valuable suggestions. In some, it is almost circular, whilst in others it is more or less elliptical in form. This may be due to natural causes,[34] though in some instances it is difficult to believe that the opening has not been somewhat narrowed by posterior pressure. Still this conclusion would not be warranted by the facts, as there are crania in this collection, very much flattened posteriorly, in which it does not exist, just as there are others, that are normal, in which it is found.

Three of these crania show evidences of a diseased condition. In one, a youth, No. 11,970, there are marks of severe inflammation, by which the apex of the occipital and the adjacent parts of both parietals, were much affected. A bony excrescence, or rather a series of them running into one another, and forming a united whole, covers all that portion of the head and completely effaces the lambdoidal and inter-parietal sutures, so far as the inflammation extends.

In No .12,308, there is found in the upper part of the occiput and extending almost entirely across it, about $20^{mm.}$ below the apex, a line, or belt, $16^{mm.}$ broad, of small holes, something like those in the top of a pepper box. These holes or indentations extend through the outer table and spongy portion of the bone of the skull, but do not penetrate through the inner table. The adjoin-

[33] Seventh Annual Report of the Peabody Museum, p. 15.

[34] The meatus auditorus externus, which is circular in young subjects, and somewhat oval in adults." Sharpey & Quain. Anatomy. Edited by Leidy. Vol. I, p. 157. Philadelphia, 1849.

ing part of the left parietal for a space measuring 42mm. long by 24mm. broad, is affected in the same manner.

In No. 14,001, complete anchylosis has taken place between the occipital condyles and the superior articular surfaces of the atlas bone.

Some of these crania possess anatomical features of special interest.

No. 12,297 was much broken at the time it was taken out of the grave and was not mended until within the past few days, too late to tabulate its measurements with those of the other crania from this region. It is the calvarium of an adult, probably a male, and measures 152mm. in length, 152 in breadth, 144 in height. Width of frontal 92. Index of breadth 1,000. Wormian bones are found in the lambdoidal suture. The frontal suture is persistent and this is the only skull in the entire collection, in which it is. Along the line of this suture, from the glabella to the point of intersection with the coronal, there is an angular or roof-shaped arrangement of the two parts into which the frontal is divided, very similar to the formation that is frequently found at the junction of the parietals in the New England and some other groups of Indians. This skull is flattened posteriorly.

In No. 12797 there is an additional suture beginning at a point on the lambdoidal suture 46mm. above the posterior inferior angle of the left parietal, and extending along the temporal ridge for 52mm., throughout which distance it continues open. At this point it trends downwards, and though faint can still be traced for a farther distance forward of 50mm., or to a point within 24mm. of where the coronal bends forward to join the sphenoid, when it is obliterated. Just back of this point a short suture, 12mm. long, unites it with the squamosal. The sphenoid suture is almost perfectly horizontal, extending forward from the upper anterior angle of the temporal bone, to where the transverse suture crosses the malar bone. By this arrangement of the sutures we have two extra bones intercalated between the parietal and temporal bones of the left side, extending along their entire length. At the junction of this extra suture with the lambdoidal, there is a well developed wormian bone, as there is also on the right side where a section of that parietal, in the shape of a trapezoid, is cut off by an extra suture, squamosal in character, which unites the upper posterior angle of the right temporal, with a point on the lamb-

doidal suture 20mm. above its junction with the *additamentum suturæ squamosæ*. Attention is also called to the extraordinary capacity of this skull, which, after careful measurement, is found to amount to 1825c.c. This is 273 more than No. 13,323, which is nearest to it, and 741 larger than the smallest on the list. In other words the capacity of the smallest is less than 60 per cent. of this one. Some idea may be formed of its unusual size, when it is remembered that it is 275c.c.[35] larger than the average European, and that the largest healthy European skull on record, only exceeds it by 43c.c.[36] Large as this skull undoubtedly is, it does not stand alone. In the collection of Dr. Jones to which we have so often had occasion to refer,[37] there is one that measures 103 c. inches or 1688c.c.; the Army Medical Museum[38] has one from a mound in Illinois with a capacity of 1785, and Schoolcraft[39] speaks of "an untamed Shawnee brain that rises to 104 c. inches" or 1704c.c. It must not be forgotten, however, that this is an anatomical characteristic, and that unless "the quality of the brain can be represented at the same time as the quantity, brain measurement cannot be assumed as any indication of the intellectual position of races, any more than of individuals."[40] It may, indeed, be true, as recent researches seem to show,[41] "that a superior race contains more of voluminous crania than an inferior," and that "the difference between the largest and smallest brains among modern Parisians is three times that observed in the negro;" but to infer the superiority of a race (whatever that may mean), from the presence of one or all of these characteristics in their crania, would involve certain other admissions that cannot be sustained by the facts. Judged by this standard, the moundbuilder of the Cumberland valley would rank very high in the scale of develop-

[35] Seventh Annual Report of the Peabody Museum, p. 10. "The largest crania measured, 1550 c. c. . . . is a little larger than that of the average European."

[36] Lyell. Antiquity of Man, p. 89. London, 1873.

[37] Exploration of the Aboriginal Remains of Tennessee, p. 110. Published by the Smithsonian Institution. Washington, 1876.

[38] Check list of Preparations and Objects in the section of Human Anatomy of the United States Army Medical Museum. Washington, 1876.

[39] Schoolcraft. Indian Tribes of the United States. Vol. II, p. 330.

[40] Fourth Annual Report of the Peabody Museum, p. 11.

[41] Experimental researches on the variations of volume of the cranium, etc., by M. Le Bon, quoted in Nature, for July 18, 1878. "Among 100 modern Parisian heads, there are about eleven with a cranium of 1700 to 1900 cubic centimetres; in the same number of negro heads not one will be found of such size. The weight of 100 masculine Parisian brains of the present, varies between 1000 and 1700 grammes, the volume, between 1300 and 1900 cubic centimetres, etc., etc."

ment — far ahead of the ancient Peruvian, who was, confessedly, among the most civilized of the American aborigines, but whose skull in point of capacity, did not exceed that of the Australian or the Hottentot.[42] This conclusion, however, legitimate though it be, is not borne out in the story of those nations, as revealed by the spade and pick-axe; but it will serve to show the uncertain nature of the ground that must be occupied by any one who engages in the vain effort to conjure up the vision of an extinct civilization, by a study of the crania of the people among whom it was developed.

[42] Fourth Annual Report of the Peabody Museum, p. 11.

ON THE DISTRIBUTION AND TENURE OF LANDS, AND THE CUSTOMS WITH RESPECT TO INHERITANCE, AMONG THE ANCIENT MEXICANS.

By Ad. F. Bandelier.

In a previous paper we have endeavored to describe the warlike customs and organization of the Mexican tribe.[1] Our conclusions in regard to them are somewhat at variance with those generally adopted, since, instead of the military despotism which heretofore has been admitted as existing in ancient Mexico, we found but the military democracy peculiar to a warlike tribe.[2] It is our purpose now to investigate how far the Mexicans may have progressed in their notions about the tenure and distribution of the soil.

The picture which nearly all the authors, ancient as well as modern, trace of the condition of aboriginal Mexico is that of a feudal monarchy.[3] This alone should fix permanently the mode of landed tenure. It implies also the notion of abstract ownership, and thus indicates a high state of culture. But we have already

[1] "On the Art of War and Mode of Warfare of the Ancient Mexicans," in 10th Annual Report of the Peabody Museum of American Archæology and Ethnology.

[2] "Art of War, etc., etc., of the Ancient Mexicans," pp. 113, 114, 115, to 127 inclusive, especially the notes. See also "Ancient Society," by Lewis H. Morgan. (N. York, 1877.) Part II, chapter VII, "The Aztec Confederacy," pp. 188–214 inclusive.

[3] The first information tending to represent the condition of Mexico as a feudal state was probably furnished by Cortés; or through his expedition at least. The reports of the preceding voyage of Grijalva (1518) contain no positive statements. On the other hand the certificate issued by Cortés (probably about the 20 May, 1519, or 29 days after his landing at Ulua), to the chiefs of Axapusco and Tepeyahualco, already speaks of "the great Montezuma, which resides in this great city of Tenochtitlán and all its provinces." We have not Cortés' first letter to the emperor, but in his second report, 30 Oct., 1520, he mentions "a great Lord called Mutezuma." (Vedia, "Historiadores primitivos de Indias," Vol. I. Carta Segunda, pp. 12 and 13.) The same dispatch contains a number of details on Montezuma's power, from which a feudal empire was necessarily construed as for inst. (p. 33): "There are in this great city many very large and fine houses, the cause of it being that all the *Lords of the land, vassals of the said Mutezuma*, have their houses in that city . . ." "What has been ascertained is: that his sovereignty was almost as large as Spain . . ." (p. 34.) Gomara, who published his "Conquista de Méjico" in 1552, already mentions "thirty lords of one-hundred-thousand vassals each, and three-thousand lords of places." (Vedia I, p. 345. "Corte y guarda de Moteczuma.") Oviedo ("Historia general y natural de Indias," Vol. III, Lib.

seen that the institutions of the Mexicans were democratic and not monarchical, that their chiefs and leaders filled elective, and in no case hereditary positions.[4] This latter fact whose final discussion we reserve for another occasion, speaks strongly against the existence of privileged classes, based upon territory and landed property; therefore it also militates against feudality itself.

Still we cannot permit ourselves to become prejudiced by such indications, against the views generally accepted. They merely warn us of the *difficulties of our task.* These difficulties are greater yet than those against which we contended in our first essay. The military life of the Mexicans has furnished the bulk of their history, and through it a number of facts, by which the former could be almost restored. The question of distribution of the soil, however, apparently relates to *customs* only; broken up and to a great extent obliterated centuries ago. Nevertheless, accessory facts, and especially a merely cursory review of the history of the Mexican tribe, may enable us yet to form an idea of these customs. The Mexican rules of inheritance are in direct connection with them also, and lastly, the *acts of the Spaniards* during the first times after the conquest, when they more or less suddenly overturned the ancient order of things, should bring to light many forgotten features of aboriginal tenure and distribution of the soil.

Having thus sketched the programme — so to say — of our work, we have yet to offer two explanations ere we proceed to enter upon the discussion proper, itself.

In the first place: by "accessory facts," we refer to the *social organization* of the Mexicans in particular. It is inseparable from

XXXIII, cap. XLVI, p. 503) again speaks of "more than three-thousand lords his subjects, each one of many vassals, and each held his principal dwelling in Temistitan, residing there certain months each year." The author, a friend of Columbus, and personally acquainted with all the eminent men of the conquest, resided at the West Indies and Nicaragua until 1556 (his stay though interrupted by at least six voyages to Spain and back), was one of the most cautious and best situated of the old chroniclers. But the chief originator of the feudal view is Fernando de Alva Ixtlilxochitl, a half breed of Tezcuco, and belonging to the kin of that tribe's chieftains. He wrote about the year 1600, and both of his works, the "Relaciones historicas," and the "Historia de los Chichimecos ó reyes antiguos de Tezcuco," present, it should not be denied, a picture of logical development of feudal institutions on Mexican soil. Torquemada of course concurs. We hope to be able to investigate, elsewhere, the claims of Ixtlilxochitl to the rank of a reliable source. Fairness, however, compels us here to mention the above authors, as the mainstays of current opinion.

[4] "Art of War," etc., pp. 96, 128 and 161.

landed tenure, and we therefore must recur to it frequently in the course of our allusions to the history of the tribe.

Secondly: we do not pretend to review the history of ancient Mexico as fully as it *should* be done, but only as far as it touches the subject of this paper. Many points therefore, which ought to be closely scrutinized, will be passed over lightly, or without any discussion.

One of the most learned authors of the 16th century, on American topics,—the Jesuit father Joseph de Acosta, says: "Learned men affirm and write that the relations and the memories of these Indians do not go further back than four-hundred years. . . . . "[5]

Indeed, although much has been written about the aboriginal history of Mexico, it appears as if the 12th century was the *limit* of *definite tradition*.[6] What lies beyond it is vague and uncertain, remnants of traditions being intermingled with legends and mythological fancies. Nothing positive can be gathered except that, even during the earliest times, Mexico was settled or overrun by sedentary, as well as by nomadic tribes,—that both acknowledged

[5] "Historia natural y moral de las Indias," Lib. I, cap. XXV, p. 83. The passage relates directly to Peru, but is just as applicable to Mexico.

[6] "We venture to assume this period as the one during which traditional history of Mexico really begins. Of course, those writers who have made the fabrication of a Mexican chronology a special object, go much further back. The late Abbé Brasseur de Bourbourg, for instance, quotes the "Codex Chimalpopoca," purported to bear date 22 May, 1558, and which begins as follows (History of the three suns). "This is the beginning of the histories of all kinds which happened a long time ago, how the earth was divided, and distributed to each one, its origin and foundation, how the sun began to give to each one his share, assigning the limits; there are now six times four-hundred years, and one-hundred more, and thirteen more . . . ." The distinguished historian concludes therefrom, that 955 B. C. there occurred already, in Middle America, a division of lands according to a systematic register ("Popol-Vuh." Introduction, page CXI). Clavigero's Chronology begins 596 A. D. ("Storia del Messico," Lib. II, cap. I). Don Mariano Veytia ("Historia Antigua de Méjico," published by Sr. Ortega, 1836), after fixing the date of the establishment of "Huehuetlapallan," to the year 2237 of the earth's creation (Vol. I, cap. II, p. 23), or 1796 B. C. (p. 219) begins for the settlement of the Toltecs at Tolantzinco in 697 A. D. (Cap. XXII, p. 121, of 1st volume). Ixtlilxochitl ("Histoire des Chichimèques ou des anciens rois de Tezcuco," translation by Mr. Ternaux Compans) says: (Cap. II p. 13) that the Toltecs founded Tollan 503 A. D. No reliance can be placed on these statements and dates. They are not any longer traditional, but mythical, and although we are far from disregarding the importance of legends or myths for historical investigations, we still cannot accept them as chronological bases. The oldest date in the history of Mexico which appears to be approximately certain is that of the settlement of the Mexicans in the marsh where they subsequently built the pueblo of Tenuchtitlan. It would about agree with A. D. 1325. Allowing two centuries more for the period during which the Mexicans and their kindred tribes reached the valley, we are carried to the twelfth century as the time from which distinct tradition has yet reached us. What lies beyond can occasionally be rendered of value for ethnological purposes, but it admits of no definite historical use.

a common origin, while the sedentary tribes were still further connected together by the bond of language,—and that the original home of these people lay to the north of Mexican territory. We further can infer, that even the sedentary tribes, among which the TOLTECS are most conspicuous, had nowhere advanced to the condition of a *nation* or *state; political society*, based upon territory and landed property, being unknown to them. Their institutions appear to have been *democratic*, their manner of living *communal*, thus excluding the idea of feudality altogether; even at those remote periods of Mexican history.[7] The usual inter-tribal wars,

[7] Our information in regard to the Toltecs is limited and obscure. The name itself appears to be a surname: "Toltecatl"—"oficial, de arte mecanica, o maestro" (Molina, Vocabulario, Parte II. p. 149). Torquemada (Lib. I, cap. XIV, p. 37) "I merely say, that Tulteca signifies a skilled worker . . . ." Veytia (Vol. I, cap. XXI, pp. 205 and 206). Sahagun ("Historia general de las cosas de Nueva-España," edited by Don Carlos Maria de Bustamante, Vol. III, Lib. X. cap. XXIX, p. 106). "First the Tultecas, signifying excellent workmen . . . ." (p. 107) "y no tenian otro nombre particular sino este que tomaron de la curiosidad, y primor de las obras que hacian, que se llamaron obras tultecas, ó sea como si digesemos, oficiales pulidos y curiosos . . . ." Their proper name, as we shall hereafter see, was "Chichimecas,"—in common with all the aborigines of Mexico. Even such tribes as are reported to have preceded them, like the Xicalancas and Olmecas, are connected with reports indicating the same origin. Thus Motolinia ("Historia de los Indios de Nueva-España" in Sr. Icazbalceta's "Coleccion de Documentos," Vol. I), says: ("Epistola proemial," p. 7), that the Xicalancas and Mexicans descended from sons of the same father. Gomara ("Conquista de Méjico," Vedia I, p. 432), says the same, and also that "Ulmecatlh" was one of their brothers, and that from him the Olmecas descended. Sahagun, however (Lib. X. p. 147), contradicts, excluding the "Olmecas, Vistoti, and Nonoualca" from the general appellation of Chichimecas, but includes nearly all the other tribes of Mexico under a common origin. But Veytia seems to consider the Ulmecas and Xicalancas as descending from the same stock as the Toltecs (Vol. I, cap. XIII, p. 150); though his statements might be more positive yet. The Toltec language was the "Nahuatl," a fact too frequently mentioned to need any further quotations. Through it their connection with the tribes of the valley of Mexico, with the Tlaxcallans, Huexotzincas, Cholullans,—and also the Niquirans of Nicaragua is established beyond a doubt. Their division of time and numeral system (as far as the language allows a judgment), was the same as that of the natives of Michhuacan, Oajaca, Chiapas, Yucatan, and Guatemala. If we add to these indications those derived from local myths and legends, we become inclined to believe the reports, that the aborigines of Yucatan and Guatemala for instance, are direct descendants of the Toltecs, or at least from their original stock. This fact acquires a certain importance, since it enables us, from the condition of these tribes at the time of their first contact with the Spaniards, and from their local traditions, to judge partly of the status of the Toltecs, and perhaps to reconstruct their condition and organization of society.

In order to attempt an investigation of the true condition of Toltec society, we have to consider three different points which are the following: Reports about the Toltecs, contained in Mexican sources; since only in Mexico they were called by that name. Reports about the condition of the Toltecs in Mexico *after* their reported dispersion. The condition and organization of such tribes, outside of direct Mexican influence, which still acknowledged an original connection with what has been called the Toltecs in Mexico.

If we follow the traditions current in the Mexican valley, as reported *first* by father

as well between sedentary Indians and roving tribes, as among the

Sahagun (hardly any of his predecessors mentioning the Toltecs,—a fact not devoid of importance!) it simply appears that the Toltecs were sedentary people, therefore agricultural and proportionately skilled in the use of metals and stones (Lib. X, cap. XXIX, Vol. 3). The same author, in his tale about the fortunes of Quetzalcohuatl, whom he acknowledged as distinctly connected with the fate of the Toltecs, says that (Lib. III, cap. V, p. 248, of Vol. I): the pueblo of Tollan had *two* chiefs,—that it was engaged in war with another tribe not far distant (Coatepec, cap. VI, p. 249),—thus showing at the same time: that the Toltecs were not subject to a ruler residing in Tula, as is commonly reported, but that Tula (or Tollan), was the settlement of a tribe, without authority over any others. There are other indications, in this very legend of Quetzalcohuatl, to show that the Toltecs of Tula were very independent from their chiefs (See cap. VI to XI). Further on, if we follow the peregrinations of Quetzalcohuatl after the same authority, it strikes us that this mythical personage travels through a singularly disjointed country. Everywhere he meets strange places (Cap. XII to XIV), not subject to the tribe from which he originally went out.

Torquemada ("Monarchia Indiana," Lib. I, cap. XIV, p. 37), is more detailed. He asserts that the Toltecs were originally led by seven chiefs, but that after their settlement at Tulantzinco they elected a "king," establishing as a rule that no one of these so-called monarchs should "rule" any longer than fifty-two years, and that if he died previously "the republic governed until the expiration of the time." In his relation of the history of Quetzalcohuatl (Lib. III, cap. VII, pp. 254, 255, and 256), whom he distinctly connects with Tula, the same fact is mentioned as in Sahagun, namely; that the inhabitants of the country were divided into independent tribes, such as Tula, Cholula, Quauhquechollan and others.

It is, however, Fernando de Alva Ixtlilxochitl, whose writings have furnished the chief material for the Toltec history. He gathered his facts from his kinsmen, and, he says, from ancient picture-writings which they explained to him ("Hist. des Chichimĕques" Dedication to the vice-roy of Mexico p. XIII, and XIV). Also from songs. It is a slender basis for his otherwise very positive statements, since it may well be accepted that Toltec picture-writings did scarcely exist any more at his time, unless we except such as are analogous to the Dresden-Codex (Humboldt "Vues des Cordilléres et monuments des peuples indigènes, etc." Plate XLV of the atlas in folio), regarding them as of Toltec origin. These, however, no Mexican native could have interpreted at that time.

Ixtlilxochitl also speaks of seven chiefs of the Toltecs ("Ils avaient sept chefs, et choisissaient alternativement un d'entr'eux pour les gouverner." Hist. des Chichimĕques," Cap. II, p. 13; also "Segunda Relacion" in Vol. IX, p. 323, of Lord Kingsborough's "Antiquities of Mexico.") He equally mentions the 52 year period of the head-chief (Cap. II, p. 13), and in his "Tercera Relacion" (p. 325), but adds in the "Cuarta Relacion" (p. 326): "Este Mitl gobernó 59 años y quebró en la orden antigua de los Tultecas de gobernar 52 años."

But he also tells us in his Second "Relation" that at Tollantzinco "they constructed of planks a house large enough to accommodate the entire nation," and hints at a number of scattered settlements springing up, though he insists that these were all dependencies of a great Toltec "empire." Nevertheless, his description of the wars among the Toltecs ("quinta Relacion") is not in favor of the latter assumption.

It is mostly on such statements that Don Mariano Veytia has based the Toltec history which forms the beginning of the "Historia antigua de Méjico."—But the eminent Mexican scholar (he wrote about the middle of the 18th century) has added some other details, which we dare not neglect here.

In common with all the others, Veytia places the origin of the Toltecs to the North, where he locates the great city of Huehuetlapallan. Of this great city he says: "The houses in which they dwelt, as well in the city as in the other settlements were then (and for many centuries afterwards, although they had Kings and governments already) but natural caverns, which they also imitated. These were all their dwellings, they sub-

village-Indians themselves, were waged during these early periods.

sisted on fruits, herbs and the chase, and dressed in the skins of wild beasts . . . . ." (Vol. I, cap. III, p. 25.)—From this place there went out bands or families (Cap. II, p. 24), "taking each one a different name, after that of the chief or father of the family leading them," and one of these bands were the Toltecs.

These were again composed of seven lineages (Cap. XXI, p. 207), and the government "resided in the seven principal chiefs" (Cap. XXII, p. 214). Describing the peregrinations of this tribe until they reached central Mexico, he again mentions the large house made at Tollantzinco "in which when completed, all the people found room" (Cap. XXII, p. 221), and finally (Cap. XXIV, p. 227), the formal change made by free common consent of all the Toltecs, of their heretofore democratic government into a despotic monarchy, with descent in the male line, but the term of office of each of these despots limited to fifty-two years (Cap. XXV). We also read of a number of pueblos co-existing with Tollan, but reputed subject to it, in direct opposition to Sahagun and Torquemada, and even sometimes to himself. Of course, there are abundant details about the arts and sciences attributed to the Toltecs, the magnificence of their buildings, etc., etc. To all these we shall refer on another occasion. In regard to weapons and military costume Veytia confirms what we have already said (Art of War, p. 126, and note No. 124), about the great analogy between the Mexicans proper and other tribes of older date (See cap. XXXIII, p. 289).

Veytia was the precursor and cotemporary of the Abbé Clavigero, but the latter's work, "Storia antica del Messico" was printed fifty-six years previous to the writings of the former. Clavigero's statements are, in a condensed form, but a repetition of those of Veytia, with whom he corresponded.

If we now attentively consider the above we shall readily see:

(1). That the Toltecs were descended from at least semi-nomades.

(2). They were organized in consanguine groups, governmentally sovereign, whose chiefs formed the council of the tribe.

(3). They possessed a head war-chief, elected for life, since the limitation of the office for fifty-two years is in itself a concession, that the incumbent held it for lifetime.

(4). They practised communism in living.

(5). Consequently, their organization and institution was democratic, not monarchical, and the picture of a feudal empire among them is erroneous.

It is generally admitted that in the 10th or 11th century of our era, the Toltecs of Mexico were dispersed; only a few settlements remaining. Of these the principal were removed to Tezcuco "where they founded four quarters, since the Culhuas, as the Toltecs were then called, formed four families" (Ixtlilxochitl, "Hist. des Chichiméques," cap. XIII, p. 87. Mr. Ternaux has translated "tribes" but the Spanish original has "families.") This is a further evidence of what we have advanced, the four quarters being consanguine groups localized, or "gentes," as Mr. Morgan has established the term in "Ancient Society." Feudalism, however, is incompatible with gentile society.

Those of the Toltecs who emigrated are reported to have fled to the South where perhaps others of their language had preceded them. Among such as have been reported of the same origin, the Maya of Yucatan, and the QQuiché of Guatemala are most prominent. Sr. Orozco y Berra, in his excellent work "Geografía de las Lenguas y Carta Etnográfica de México," regards the Maya and QQuiché as sister-languages (Part I, cap. IV, p. 18). If the assumption is correct that they are of Toltec descent, the reports about the condition of these tribes at the time of the conquest, or in their undisturbed aboriginal condition, are of weight for this discussion.

Yucatan, at the time of its first discovery (1517), was inhabited by numerous sedentary tribes, not connected with each other (Bernal Diez del Castillo, "Historia verdadera de la Conquista de Nueva España," cap. XXIX, p. 24, in Vedia, Vol. II. Villagutierre y Sotomayor "Historia de la Conquista y Reduccion de los Itzaex y Lacandones,"

Sometimes the latter, then again the savages prevailed, until

Lib. I, cap. V, p. 28 and 29. Antonia de Herrera "Historia general de los hechos de los Castellanos en las Islas y la Tierra Firme del Mar Oceano," Dec. IV, Lib. X, cap. II, p. 203, and cap. III, p. 208), except through their common language. These tribes consisted of Lineages or consanguine groups. Herrera says (Dec. IV, Lib. X, Cap. IV, p. 211): "They are very proud of their ancestry, by which they all regarded themselves as relatives, assisting each other greatly. Their style of living was communal. Lorenzo de Bienvenida, in his letter to the Emperor, dated 10th February, 1548, Yucatan ("Recueil de pièces relatives à la Conquête du Méxique") states: "Your highness must know that it is very rare to find a house with but one inhabitant, all have two, three, four, six, and even more, among which the father of a family is chief (p. 331). When, in 1698, the last pueblo inhabited by Maya Indians,—Tayasál on Lake Peten, was captured by Don Martin Ursúa, it was found that the houses "were dirty within and unswept. All the inhabitants lived brutally together, an entire relationship together in one single house." (Hist. de la Conquista de los Itzaex, Lib. VIII, cap. XII, p. 494). We have already alluded to the fact the Itzaex had two chiefs. ("Art of War," p. 126, note No. 121. The information is taken from the work just mentioned, Lib. VIII). See further, on the Maya, L. H. Morgan's "Ancient Society" (Part II, chapter VI, p. 181). These indications do not, certainly, speak in favor of feudality among the natives of Yucatan.

The territory of Guatemala, when first visited by Pedro de Alvarado, in 1524, was also divided into a number of sedentary tribes, living in bitter enmity together. Of these tribes the QQuiché of Utlatlan or rather Gumarcaah, near where Santa Cruz del Quiché now stands, are best known. Their history has been written by Juarros ("Compendio de la Historia de Guatemala," 1808–1818), who especially bases upon the MSS. of the Captain Francisco Antonio Fuentes y Guzman, who wrote about 1690, a "Recordacion florida" now acknowledged to be full of exaggerations and misstatements. Juarros makes the QQuiché direct descendants of the Toltecs, and after their settlement in Guatemala under a certain King named "Nimaquiché," he gradually builds up there a mighty feudal Empire, which was in its splendor when the Spaniards overthrew it. The empire is already disproved by the first two letters of Alvarado (See Vol. I of Vedia's collection), by Herrera (Dec. III, Lib. V, Cap. X, p. 166), who also states (Dec. III, Lib. IV, cap. XVIII, p. 141), that the QQuiché had three chiefs "and that the election was made by the principals in the same way, as it has been told of Mexico," Torquemada (Lib. XII, Cap. VIII, p. 386), goes still further by asserting that the heads of families ("los que eran Cabeças de Familias ó Casas Solariegos") had the right to kill the "king" for misdemeanor. He also considers the Toltecs the first settlers.

But the document which conveys the most detailed information of the QQuiché is the "Popol-Vuh." This singular production, which we consult in its publication and translation by Mr. Brasseur de Bourbourg, appears to be, for the first chapters, an evident fabrication, or at least accommodation of Indian mythology to christian notions;—a pious fraud. But the bulk is an equally evident collection of original traditions of the Indians of Guatemala, and as such the most valuable work for the aboriginal history and ethnology of Central America. We cannot here enter into a bibliographical discussion. A few quotations from the third part of the Popol-Vuh will, however, be indispensable (Cap. III, p. 207). After having given the names of the four *mothers* of the QQuiché: "Balam Quitzé is the grandfather and father of the nine great houses of Cavek; Balam Agab is the ancestor and father of the nine great houses of Nimhaib; Mahucutah the ancestor and father of the four great houses of Ahau Quiché. They existed in three divisions of families without forgetting the name of their grandfather and of their father, which extended and grew in the East." This is the beginning of a true genealogy, and it is carried through with great precision.

Then follows a long description of how each of these "families" received an idol for itself, whereas "one was the name of their God, and they were divided afterwards" (Cap. IV, p. 217). Then they moved to "Tulan-Zuiva, at the seven caves, seven ravines." At that time they had yet but skins of animals to cover themselves with, but "at Zuiva

finally the Toltecs, who represented the sedentary class, were either exterminated or expelled; only a few scattered settlements remaining on Mexican territory.[8] Their successors on the soil were tribes of utter savages hailing from the north also, and to whom the vague and indefinite appellation of Chichimecas is given. (If the word is Mexican, it might derive from "Chichiltic" red,

Tulan they forthwith acquired wisdom." This is a striking analogy indeed with the Mexican traditions above reported about the first times of the Toltecs. Settling at Izmachi, they occupied four quarters "they already covered four hills who together bore the names of their tribe" (Mr. Brasseur translates "tinamit" sometimes by tribe and again by town, I prefer the former). At Izmachi they built houses of lime and stone (Cap. VII, p. 301). "But only three palaces were erected at Izmachi, the twenty-four palaces were not yet erected, but only three, one of those of Cavek, one single palace at the face of those of Nihäib, as likewise a single one, possession of those of Ahau Quiché." Recapitulating the festivals it is mentioned "For this reason the three branches assembled in the palaces named after them, where they drank their beverages, and ate their meals, price of their sisters and daughters, and with their hearts full of joy, they but ate and drank out of their painted cups within their palaces" (p. 305). This is a plain indication of communal meals, and of communal living. Finally it is related that at these places "they came to put names, there they took their titles, divided into families, organized into seven "chinamit" (kins not tribes), and classed themselves by quarters." Moving to Gumarcaah or Utlatlan, there they subdivided into twenty-four "great houses"—"the title of all their honors being distributed to each of the princes, *there* formed nine families with the nine princes of Cavek, nine with the princes of Nihaïb, four with the princes of Abau-Quiché, and two with the Lords of Zakik" (p. 309, cap. VIII).

It is easy to detect the following points:

(1). The QQuiché were originally organized in three consanguine groups, to which latterly a fourth was added.

(2). These kinships localized as four quarters, their mode of life was communal.

(3). They subsequently divided into twenty-four kindred groups, constituting so many gentes.

(4). The government of the tribe lay in the hands of the chiefs of these gentes.

This government, as the last chapter of the Popol-Vuh plainly states, was composed of twenty-four chiefs. Of these, three, one from each of three of the "quarters," had the title "Nim-Chocoh" or "great elected one." "There were consequently three Nim-Chocoh (great elected), acting as the fathers of all the chiefs of Quiché, they met together, commanded together, as the fathers and mothers of speech, and their condition is of the most exalted one." They commanded the forces of the tribe.

We have here consequently the organization of the QQuiché as a military democracy, based upon consanguine groups, with three *elective* war-chiefs at its head. The analogy of this organization with that of the Iroquois is really striking. It utterly discards all notions of feudality.

If now, as most of the older sources admit, the QQuiché really belonged to Toltec stock, we believe that the foregoing certainly sustains our views of the condition of these tribes, and justifies our statement that the Toltecs had "nowhere advanced to the condition of a nation or state" and that their institutions were democratic, their manner of living communal; monarchy and feudality being unknown to them.

[8] Compare the legend of Quetzalcohuatl, as related by Sahagun (Lib. III, cap. III to XIV, Vol. I); by Torquemada (Lib. III, cap. VII), and contained also in the Popol-Vuh, where he is, of course, called Gukumatz (Part III, cap. VIII). See further Veytia (Cap. XXII, to the close of Vol. I).

and "mecayotl"—consanguine relationship, thus: "the kin of red men.")[9] Enough is told us of the condition of these people to establish; that they were roving nomades for whom the soil had no other importance than for temporary occupancy as hunters,—that even the maize plant was unknown to them, and that they re-

[9] The etymology of the word "Chichimecatl" which we have ventured to propose, is not sustained, to our knowledge, by any author. We give it for what it may be worth. Much has been said about its probable derivation. Durán ("Historia de las Yndias de Nueva-España é Islas de Tierra-firme," cap. II, p. 13), says: "Chichimeca, que quiere decir caçadores ú gente que viven de aquel oficio agreste y campesina . . . . "thus showing that the word is Nahuatl, and its explanation to be sought for in Nahuatl terms. Ixtlilxochitl ("Relaciones historicas," 2nd part, "Historia de los Señores Chichimecas" —"Relacion primera,") says: "the Toltecs, Aculhuas, Mexicans, and all the other nations of this land pretend to be derived from the Chichimecan race, thus called after its king Chichimecatl who brought it to the New World" (p. 335 and 336). Torquemada (Lib. I, cap. XV, p. 39), affirms: "These people took the name of Chichimecas, because Chichimecatl signifies one who sucks; for Chichiliztti is the act of sucking . . . .; and since these people in the origin ate the raw flesh of beasts and drank their blood, sucking it, they called themselves Chichimecas or suckers." Acosta (Lib. VII, cap. II, p. 453), "they were a very barbarous people, living solely from the chase, and therefore they called them Chichimecas." Betancourt even derives the word from "chichini"—bones of a dog. It is again Veytia who, with his clear and positive judgment has gone further than any of his predecessors. He has been the first (we think) to discover the term "mecatl" which signifies a cord (Cap. XII, p. 143), in the last two syllables of the word. It naturally led him to the allied term "mecayotl" which designated a consanguine relationship, and finally to the etymology of "kinship of Chichen" assuming Chichen to have been the name of their first chieftain. There is hardly any proof of the latter however, and still less that "Chichimecatl" was his personal name. On the other hand, all the authors agree in stating, that the locality inhabited originally by the Chichimecas was called "Huehuetlapallan"—the old red place—that one of the stations said to have been occupied by tribes on their migrations towards Mexico bears the name "Chichilticalli" or red house. Our suggestion is, therefore, not altogether improbable: that Chichimecatl may have derived from "chichiltic" a red object, and "mecayotl"—kin—therefore signifying "the kin of red men."

Señor Manuel Orozco y Berra, the distinguished author of the "Geografia de las Lenguas," makes it very likely that the Chichimecas which invaded Mexico after the dispersion of the Toltecs, or inhabited it jointly with them, spoke a different language (Part I, cap. I, p. 8), which has since disappeared. His opinion is sustained by that of another eminent Mexican scholar, Don Francisco Pimentel ("Cuadro descriptivo y comparativo de la lenguas indigenas de Mexico," Vol. I, p. 155). Nevertheless, the unity of origin of the Chichimecas, Toltecs and other tribes of "Nahuatl" stock, Mexicans of course included, is admitted, not only by Ixtlilxochitl, but already by Sahagun (Lib. X, cap. XXIX, p. 147), who resumes as follows: "All these families call themselves Chichimecas, and even pride and glorify themselves of such a name, and it is because like Chichimecas they went wandering over those lands aforesaid, and thence turned towards these parts, although really such lands were not called lands of Chichimecas, but Tlaotlalpan, Tlacohcalco, Mictlanpan, which means, wide and spacious plains, lying towards the north." Veytia, who almost incorporates the statements of all his predecessors, confirms it as follows: (Cap. II, p. 24). "Of this empire (of the Chichimecas) Huehuetlapallan was the famous court, and from it sallied at various periods bands and squads to people remote countries, each one taking its own name, after the chief or father of family which governed it, and becoming in course of time distinct nations with different languages or dialects, so that according to the belief of these nations and from their history, all the inhabitants of this new world have sprung

sorted to caves and thickets for shelter and residence. Landed tenure of any kind we cannot expect to find among them, and still less the system of feudality.[10]

Ethnographically, central Mexico must have presented an appearance, at those times, similar to that of the State of New Mexico and the territory of Arizona at present, in respect to their aboriginal population. Savage tribes swayed and roamed over the greater part of the country, while in the valley of Mexico proper, and east of it, some few "pueblos" of village Indians remained, barely protecting their crops and themselves from the inroads of marauding tribes.[11]

from these seven families, and this city of Huehuetlapallan has the glory of having been the first settlement made in it since the flood, and of being the cradle of all its people, whose memory those of New Spain have preserved, calling it their ancient home."

(Compare, with this view of the peopling of Mexico, the beautiful exposé of Morgan, of the peopling of America from centres of subsistence as initial points of migration, in "Ancient Society" (Part II, cap. IV, p. 108). Mr. Morgan recognizes three such centres in N. America, the most prominent of which is the Valley of the Columbia.)

The title of "Chichimecatl," often extended to "Chichimecatl-tecuhtli," is found very frequently, not only among the Mexicans, but also the Tezcucans and Tlaxcallans. It was an appellation given in reward of personal merit in war.

[10] Ixtlilxochitl has depicted to us a feudal Chichimecan Empire, more complete and typical than the feudal institutions of England. But at the same time he describes the Chichimecas as mere *savages* ("Histoire des Chichimèques," Cap. IV, p. 30). "He arrived in a place called Tenayucan Oztopolco, where there were many grottoes and caves, which formed the principal dwellings of that nation." Id. cap. IX, p. 65 and 66), Torquemada (Lib. I, cap. XV, p. 38 and 39), describes them a "people naked, without robes of cotton, of wool, or any other covering but the skins of beasts. Their appearance was wild, they were great warriors, whose weapons are bows and arrows." . . . . "This nation of Chichimecas was governed and ruled by valiant and valorous captains . . . . ." Ixtlilxochitl further states ("Hist. Chichimeca," cap. IX, p. 66): "Every family lived together, and such as had no caves which were their chief dwellings, built huts of straw. The game was divided among the family of the hunter but the hide belonged exclusively to him who had killed it." The soil, therefore, had no other value for them than as "hunting grounds." Nevertheless, both of the authors just quoted report a distribution of the land by their chiefs, in the shape of individual donations, and feodes at an early date. But Ixtlilxochitl (Cap. IX, p. 63 and 64) asserts that the culture of the soil, even the maize plant, was unknown to them until the twelfth century of our era. Torquemada is still more explicit (Lib. I, cap. XLII, p. 67): "Neither did the Chichimecas pay any attention to it (agriculture or horticulture) for the reason that the Lords and Kings had parks ("Bosques") of rabbits and deer, which supplied them with meat, and the common people and Maceuales went after it through the fields, thus sustaining themselves without any other kind of work, and without the toil of sowing or planting, to which they had not been accustomed." More than a century elapsed, according to the above sources, ere horticulture, and therefore sedentary living, began to appear among them. How could feudal tenure of the ground exist meanwhile? We need not refer here to other authors, neither to the descriptions furnished of the condition of the Chichimecas north of the Mexican valley, at the time of the conquest (Motolinia, Trat. III, cap. VII, p. 185). "Tuvićon Senōres en esta tierra, como ahora son y estan los Espanōles, porque se enseñorearon de la tierra, no de la manera que los Españoles."

[11] See "Zwoelf Sprachen aus dem Südwesten Nordamerikas," by Albert S. Gatschet

While thus the high Mexican tableland especially was in a condition but little different from that of a fertile waste, migrations were in progress from that same undefined "north," which gradually carried thither tribes, or at least *kindred groups detached* from tribes, of horticultural sedentary Indians.[12] These bodies moved slowly, and independently from each other, and they settled down at last in the beautiful valley, near the watersheets in its centre. There they occupied *independent territories which they held as their own;*[13] and while they, in all probability, did not always maintain friendly relations towards each other, it is still not improbable that, owing to the bond of common stock-language, they

Weimar, 1877 (a valuable contribution to Linguistics and Ethnography). Also "Lieut. G. M. Wheeler's Zweite Expedition nach Neu Mexiko und Colorado, 1876," by Oscar Loew (in Vol. 22 of Dr. Petermann's "Geographische Mittheilungen," p. 209). "The Spanish Conquest of New Mexico," by W. W. H. Davis, 1869. The sedentary Indians occupying the most limited expanse, and being also inferior in numbers to the roving bands among and around them.

[12] These facts are generally acknowledged, as well as that they migrated from the North. In addition to the authors already named in the course of this and of our previous paper, we shall merely quote: Gregorio Garcia: "El Origen de los Indios del Nuevo Mundo é Indias Occidentales" Madrid, 1729 (2nd Edition, Original appeared in print about 1606). "New Mexico whence came the seven lineages, which peopled New Spain" (Lib. III, cap. I, p. 81), (Lib. X, cap. III, p. 321). "Historia de la Conquista de la Provincia de la Nueva Galicia," written by the Licentiate Don Matias de la Mota Padilla, in 1742, and published by the Geogr. and Stat. Soc'y of Mexico in 1870 (Cap. I, p. 21). They were the seven tribes of "Nahuatl" stock, the community of language alone being sufficient to demonstrate their common origin.

[13] All the older authors agree in stating that the different tribes settled independent of each other. See Motolinia ("Hist. de los Indios de Nueva España," in Col: de Docum: Vol. I. "Epistola proemial") Sahagun (Lib. X, cap. XXIX, p. 145). "Succesivamente se volvieron los Nahoas, que son los Tepanecas, los Acolhoaques, los Chalcas los Vexotzincas, y los Tlaxcaltecas, cada familia por si, y vinieron à estas partes de México . . . . y asi venidos todos à estas partes y tomada la posesion de las tierras, y puestas las mohoneras entre cada familia." Durán ("Hist: de las Yndias" (Cap. II, p. 10). "He of Xuchimilca after having gone around the entire lagune, was pleased with the site which they now occupy, settled there and took what he needed, without damage to anybody nor any contradiction" (p. 11). The Chalcas settled near the Xuchimilcas "quietly and peaceably." The Tecpanecas did the same, also the Tezcucans and the remainder (pp. 12, 13, and 14). Acosta (Lib. VII, cap. III, p. 456). "At the time these nations settled, the Chichimecas made no show of opposition, nor resistance, only they became estranged and like unto astonished retired into the rocky fastnesses." (It is not devoid of interest to connect herewith the proper assertions of Cortés about the utterances of Montezuma, "Carta Segunda," p. 25, in Vol. I of Vedia.) Gomara ("Conquista de Méjico," p. 432, etc., Vedia, Vol. I). Fray Geronimo Mendieta ("Hist. ecclesiastica Indiana," Lib. II, cap. XXXIV, etc.) Ixtlilxochitl and Torquemada however, have made the opinion current, that all these tribes settled upon Chichimecan *domain*, and were *assigned* to special territories by the original holder of the entire country. But we have already established the nature of Chichimecan occupation of the land, and from it we cannot infer that any *title was held*, neither that any could be *given to new comers*.

sometimes associated (or even perhaps *confederated*) against surrounding tribes.[14]

These settlers, who all spoke closely related dialects of the same language as their predecessors the Toltecs, namely: the "Nahuatl" or *good sound*, were: the *Aculhuans or Tezcucans*, the *Tecpanecas*, the *Xochimilcas*, and the *Chalcas*. The first settled on the Eastern shore of the central lagune, the second to the west of it, while the two last-named tribes clustered around the fresh-water basins of the southeast. In this manner the valley was eventually mastered again by sedentary Indians, who held at bay the surrounding savages;—also defending it from neighbors of their own stock who, occupying at the same time contiguous areas placed under different geographical conditions, while their organization and plan of life were similar, and the language but dialectically varied;—still, eventually, became their most inveterate enemies.[15]

Although quite a respectable literature has arisen on the subject of the organization, customs and manners of these "Nahuatl" tribes of the valley of Mexico, this literature is much richer in facts purporting to be *historical* than in satisfactory *details* on *that subject itself*. We can but discern among the confusions and contradictions (of older authors particularly)—that the different tribes were democratic societies, based upon consanguine groups as units. Chiefs, *elected by the people*, formed their governments, whose highest authorities were the *councils*. The Tezcucans and Tecpanecans seem to have had each *one*, the Chalcas *two*, *head war-chiefs*, elected for life. In regard to their mode of holding and distributing the soil the most varied statements are given, most of these, however, based upon the assumption of monarchial institutions, and even of a great feudal empire with Tezcuco as its capital. Both of

[14] The reports about a preponderance of certain tribes, such as the Tezcucans or the Tecpanecans, resolve themselves into a result of intertribal relations in the valley of Mexico. We need but consult the writings of Ixtlilxochitl for that purpose. (See "Hist. des Chichimèques" cap. XI, XII, XIV, and XVI). Torquemada (Lib. I, cap. XXXVII, p. 62).

[15] For a history of the different tribes composing the specifically latest immigration of "Nahuatl" stock, we refer to all the older authors on Mexican topics. Those of their kindred who settled outside of the valley were especially the Tlaxcallans. The relations of the latter to the valley-tribes were always rather unfriendly. See Torquemada (Lib. III, cap. IX, p. 258, and 259. Cap. XI, p. 264, and 265). Durán (Cap. II, p. 13). But the continuous wars between Tlaxcallan and the tribes of the valley commenced when the latter began to extend their sway under the leadership of the Mexicans (Ixtlilxochitl "Hist. des Chichimèques" cap. XLI, p. 292). It is corroborated by the statements of the Tlaxcaltecas themselves to Cortés ("Carta Segunda," p. 18, Vedia, Vol. I).

these assumptions are disproved by the facts, related even by such authors as have most contributed towards fixing them upon the public mind as recognized truths.[16] We need hardly say here,

[16] In regard to the Tecpanecas, Acosta says (Lib. VII, cap. II, p. 477): "From this it may be inferred, that among them the King exercised no absolute command and rule, and that he was rather a consul, or Dux, than a king." He further compares the Tecpanecas with the "reges" of ancient Rome (See Morgan's "Ancient Society," Part II, cap. XI, p. 297). The council was supreme among the Tecpanecans. See Tezozomoc ("Crónica Mexicana," Lord Kingsborough, Vol. IX, cap. IV, p. 11; also cap. V, p. 12, cap. VI, p. 13, "a esto respondió el rey y senado Tecpaneca: Digéronle: mira atempan-ecatl (que muy bien le conocian) bien conozco la humillacion y sugecion de los Mexicanos; ya es por demas, porque estan alborotados, y corajudos los Tecpanecas:") Durán (Cap. VIII, p. 64, and 65).

The Xuchimilcas were governed by two chiefs (Tezozomoc, cap. XVI, p. 25. Durán, cap. XII, p. 104. "Their chiefs, of which there were two, one of the chief-place ("cabecera" rather lineage) of Xuchimilco called Yacaxapotecutli, and the other from the milpa (this is to be interpreted as descendancy), which is called Pachimalcatltecutli, and together with them meeting many principals, said"): a joint meal after communal style is also attributed to them by Tezozomoc (Cap. XVI, p. 26).

The Chalcas also had two chiefs: (Durán, cap. XVI, p. 134, Montezuma Ilhuicamina said to Tlacaelel: "I wish, if thou agreest, to send messengers to Chalco to the chief of Chalco Quateotl and to his companion Toteocitecutli . . . ."—Tezozomoc, cap. XXII, p. 33. Cap. XXIV, p. 36. Confirmed by the action of Cortés after the voluntary surrender of Chalco, when he installed two chiefs. Bernal Diez: cap. CXXXIX, p. 154 and 155, Vedia, II).

With the Tezcucans or Aculhuas there appears always but one head-chief, but it is equally positive that the office, while remaining in a certain kin, was elective still. The fact is interesting and requires close proof. We adduce here, in a general way, Sahagun (Lib. VIII, cap. XXX. "De la Manera que tuvieron en elegir los señores," p. 318, of 2d Vol.): Durán (Cap. LXIV, p. 496). "Montezuma sent his messengers to Tezcuco, and had all the chiefs of that city and kingdom called to learn from them whom they were inclined to elect . . . ." (p. 497), "the which came, electing for King to Quetzalac-xoyatzin, Neçaualpilli's son . . . ." Tezozomoc (Cap. CI and CII). Ixtlilxochitl concurs ("Histoire des Chichimèques," cap. LXXXVI). Torquemada (Lib. XI, cap. XXVII, pp. 357, 358 and 359), acknowledges that, while the choice was among the *sons* exclusively, there still was a *choice* left, but he contradicts the statements of Juan Bautista Pomar (who wrote about 1582) who says, that this choice extended to the entire *kin* of the deceased head chief. Mendieta (Lib. II, cap. XXXVII, p. 153). "Although the Indians of this New Spain inherited the chieftaincy in direct lines, they took great care in ascertaining which one of his sons had to succeed to him." He mentions the succession in the cases of Netzahualcoyotl and of Netzahualpilli, each of whom were respectively followed by what he calls an illegitimate offspring, but whose mother was a *Mexican* woman. Veytia (Cap. XIV, p. 367). "The council hardly had been informed of the King's death, when it thought proper to elect a successor, after the manner of the Mexicans . . . ." Carlos Maria de Bustamante ("Tezcoco en los Ultimos Tiempos de sus antiguos Reyes," Mexico, 1826. Part III, cap. IV, pp. 218, 219 and 220). Alonzo de Zurita ("Rapport sur les différentes classes de chefs de la Nouvelle-Espagne" translation by Mr. Ternaux-Compans, p. 12). "The order of succession varied according to the provinces, the same custom, with slight differences, prevailing in Mexico, Tezcuco and Tacuba."

The assumption of a feudal empire at Tezcuco has already been discussed. It was an invention of chroniclers, who had a direct interest, or thought to have one, in advancing the claims of the Tezcucan tribe to an original supremacy. Tribal jealousy and rivalry, such a powerful ally of the Spaniards during the conquest, continued to subsist where the Spanish domination was fully established.

that all the tribes of Mexico, issuing from a common stock, speaking the "Nahuatl" tongue, and living under the same geographical influences,[17] had reached an almost identical state of culture. Therefore the result of our investigations of the landed tenure among the Mexican tribe proper, can safely be assumed as applicable to all the other sedentary tribes of (the valley of) Mexico.[18]

While thus horticultural tribes had secured the fertile portions of that valley, dividing its expanse among themselves, and separated by unoccupied "neutral" soil,[19]—a small band of their own linguistical relationship was moving down from the North, and ultimately made its appearance in their midst. Those were the *Mexicans* proper, also called "*Aztecas Mexitin*," "*Aztlantlacas*" or "*Mexica*."[20] This band was composed of Seven Kinships "lineages," whose chiefs jointly composed the government of the whole, a head war-chief, elected for life, directed their movements, but

[17] The difference between the valley tribes and those of the Tlaxcaltecan mountain country, is not even very great. It is in fact but apparent. From the nature of the soil, the kinships of Tlaxcallan were more scattered in location, and therefore were apparently democratic. The same was the case among the Niquirans of Nicaragua. See Oviedo (Lib. XLII, cap. I, pp. 37 and 38), and E. G. Squier. ("Nicaragua," Vol. II. "Aborigines of Nicaragua," cap. II, p. 340–348).

[18] Otherwise the confederacy, on equal terms, existing between the valley-tribes for more than a century previous to the conquest, and of which we shall hereafter treat, could not have been formed, neither could it have subsisted. The fact, however, that all the old chroniclers mention the tribes of Mexico under one common head, and describe their customs, as, in the main, identical,—proves that we can safely assume the Mexicans as typical in that respect. Some tribes were more advanced in certain mechanical arts than others,—but the difference was merely one of details, and not of organic principles.

[19] See "Art of War," p. 135. The boundary line mentioned by Ixtlilxochitl (Histoire des Chichimèques," cap. XXXIII, p. 125), and also by Veytia (Cap. III of Book III, p. 167 of 3rd volume) if, as the latter asserts, it ever really existed, did not divide so much the territory of the tribes, but rather the range over which each one might freely extend, after the formation of the confederacy. Sr. Veytia contends that the remnants of it were still visible at his time, and carried the name "albarrada de los indios."

[20] "Art of War," p. 96, note 1. We have alluded to the common appellation of "Chichimecas." Sahagun (Lib. X, cap. XXIX, p. 147), says: "properly they call themselves Atlacachichimeca, or fishermen that have come from distant lands." This would be a corroboration, to some extent, of Torquemada's assertion (Lib. II, cap. XI, pp. 92 and 93) that the Mexicans introduced the art of fishing in the Mexican valley. We cannot help being struck by the prefixum, "Atlaca." If it decomposes into "Atl," water, and "tlacatl," man, it assigns to the Mexicans an original abode in the neighborhood of the sea, or of very large water-courses. Tezozomoc, in his first chapter, speaking of Aztlan, whence the Mexicans are said to have emigrated, and from which word the name of "Aztecs" is derived, says: "They had in this land and the *lagunes* thereof . . . ." (p. 5). Aztlan itself means "place of the heron," which is an aquatic bird. (See also Veytia, Lib. II, cap. XII, p. 91). He places "Aztlan" towards the extreme north.

this office may not have, at that time, been permanently established;[21]—only temporarily, for emergency's sake.[22] It is barely possible for us to follow the migrations of the Mexicans with any degree of certainty; we can but gather from the various and varied reports and traditions, that being horticultural Indians, fertile lands were sought for by them, and only when they reached the lake-basin did they begin to hope for realization of their desires.[23]—There was yet much unoccupied space around the lagunes, still the newcomers were hardly welcome to the other occupants, who harassed them so long, that at last they fled into the marsh or swamp which then covered the area subsequently converted into the western lagune of Mexico.[24] Thus they retired to ground *which was neither held nor claimed by any of the surrounding tribes*, and on the few solid patches protruding above the morass, they settled, glad to have escaped pursuit and found a resting place on

[21] We have adopted the number seven for these kinships, although the interpreter of the Mendoza Codex (Tab. I, of Vol. I, Lord Kingsborough) says there were ten. "El exercito Mexicano tubo por caudillos diez personas nombradas . . ." (Vol. V, p. 40). Durán and Tezozomoc both say seven, so does Veytia. The two former authors even give the names of the idols which each of these seven clusters worshipped, carrying it along on their migrations. It is needless here to prove in detail the democratic nature of these seven "lineages." Veytia, for instance (Lib. II, cap. XII and XIII), quotes Chimalpain as authority, and although he assigns to the Mexicans a leader ("caudillo") called Huitziton, he still implies that at Chapultepec only "they, emulating the other nations there located, resolved upon electing a King to govern them" (p. 109). Durán (Cap. III, p. 27). Clavigero mentions an "Aristocratic" organization of the Mexicans until the year 1352. "The entire nation was below a senate or conclave of the most respected persons, distinguished through nobility and knowledge. At the foundation of Mexico there were 20 of these" (Lib. III, cap. I). This is a new version. See also Gregorio Garcia ("Origen de los Indios" Lib. V, cap. III). If we eliminate the mythical Huitziton, we find *occasional* head war-chiefs. Veytia even assures us that after Mexico was founded, they elected "one to govern them, although not in the capacity of a King, but as a leader or captain" (Lib. II, cap. XVIII, p. 159).

[22] The *regular* series of Mexican head war-chiefs ("tlaca-tecuhtli") commences about the middle of the 14th century. Previous to it, the office appears to have been filled by occasional braves, as emergency required. Compare Veytia (Lib. II, cap. XII and XIII, with cap. XV, p. 131, and cap. XVIII, p. 159, and cap. XXI, p. 186 and 187). Torquemada (Lib. I, cap. III, p. 83. Cap. IV, p. 84. Cap. XII, p. 95). Mendieta (Lib. II, cap. XXXV, p. 148), and Acosta (Lib. VII, cap. 8, p. 468 and 469), etc., etc.

[23] Motolinia (Trat. III, cap. VII, p. 186). Durán (Cap. III). Tezozomoc (Cap. I, II and III). Acosta (Lib. VII, cap. 4, p. 459). Garcia ("Origen, etc." Lib. III, cap. III, § V, p. 99 and 100. "que los haria Principes, i Señores de todas los Provincias, que havian poblado las otras seis naciones, que antes en ellos havian salido.")

[24] "Art of War, etc.," p. 87, note 5. Idem, p. 150, and note 194, 185, and p. 151, notes 197 and 198.—L. H. Morgan ("Ancient Society," Part II, cap. VII, p. 190 and 191). Among the older authors, Mendieta is very explicit (Lib. II, cap. XXXV, p. 148). "Y eso asiento les cuadró mucho por hallarlo abundante de cazas de aves y pescados y marisco con que se poder sustentar y aprovechar en sus granjerias entre los pueblos comarcanos, y por el reparo de las aguas con que no les pudiesen empecer sus vecinos."

soil *which they might hold as their own*.[25] It would appear that, through loss of numbers in the course of their migrations, as well as through divisions among themselves, the original consanguine groups composing the body, had been reduced to *five*.[26] Now a further and last division took place, one of these kindred clusters seceding from the rest, and establishing itself apart on another sandy expanse where, close to the others however, it grew to become the tribe of Mexico-Tlatilulco.[27] It remained independent until about forty years before the conquest.[28]—The other *four* settled *each one by itself*, but still acknowledging a *common government*, in token of which the tribal place of worship was erected at the spot where these four areas met. Thus the "pueblo" of Mexico-Tenuchtitlan was founded; the seat and home of the Mexicans proper.[29]

[25] Ixtlilxochitl ("Histoire des Chichimẽques," cap. X, p. 72), says that the Mexicans "asked the King of Azcaputzalco for soil" (to settle upon). Torquemada represents their settlement as a flight to a safe place (Lib. II, cap. XI, p. 92). Also Mendieta (Lib. II, cap. XXXV, pp. 147 and 148). Durán (Cap. V, p. 41), has the remarkable passage following: "que aun el suelo no era suyo, pues era sitio y término de los de Azcaputzalco y de los de Tezcuco; porque alli llegaban los términos del uno y del otro pueblo, y por la otra parte del Mediodia, términos de Culhuacan:" (This shows they were on neutral ground, dividing the tribes of their surroundings.) Tezozomoc confirms (Cap. III, p. 9), "estando en terminos de los de Atzcapuzalco, Aculhuaques Tezcucanos y los de Culhuacan." Durán (2° p. 41) further says that they contended to be masters of their soil, without owing allegiance or obedience to any one. See also Tezozomoc (Cap. III) and Motolinia ("Epistola proemial," p. 5). Gomara ("Conquista," p. 431. Vedia, 1st volume).

[26] We have already alluded to the number of chiefs leading the Mexicans at the time of their settlement in the lagune. It varies from four to twenty. But the fact that four "quarters" composed it originally, leads me to the belief that four Mexican kinships remained, one seceding as the tribe of Tlatilulco. This division into four is the only fact reliably ascertained. (See notes 27, 29, 30 and 31).

[27] This fact is too amply proven to need special references. How it occurred we cannot ascertain, since it is related in the most varied manner by the different sources of authority. If the statement is correct that even during their migrations, the Mexicans proper and the Tlatilulcás kept apart, as tribal components, or probably "phratries,"—then the fact of their localizing as tribes independent from each other is easily accounted for. See Veytia (Lib. II, cap. XV, p. 135).

[28] The date of its conquest by the Mexicans is about 1473 ("Art of War, etc." p. 102). It can easily be verified from the date on the so-called "calendar stone" at the city of Mexico. (See "Calendario Azteca" by Señor Chavero.)

[29] The question remains yet undecided as to whether these four "quarters" ("barrios") were four original kinships, or whether they were already four "brotherhoods of kinships" (phratries), analogous to the Roman curiæ formed by (or rather remaining as the last vestige of) original kinships disaggregated. The latter might appear likely from the fact of the greater number of chiefs (than four), mentioned by the old authors. The existence of still lesser groups is plainly acknowledged at the same time. Durán says (Cap. V, p. 42): "On the night after the Mexicans finished the place of worship ("hermita donde su dios estaba"), a large area of the lagune being filled up and room made for the houses, Vitzilopochtli spoke to his priest or keeper and said to him:

Four "quarters" had been formed by the localizing of four relationships composing them respectively, and it is expressly stated that each one "might build in its quarter (barrio) as it liked."[30] The term for these relationships, in the Nahuatl tongue, and used among all the tribes speaking it was: "Calpulli." It is also used to designate a great hall or house, and we may therefore infer that, originally at least, all the members of one kinship *dwelt under one common roof*.[31] The ground thus occupied by the "Calpulli" was

"Say to the congregation Mexican that the chiefs, each one with his relatives, friends and connections, shall divide themselves into four principal quarters, my house being in the centre among them, and that each cluster may build in its quarter as it pleases." These quarters are those which now remain in Mexico, that is, the quarters of San Pablo, of San Juan, of Santa Maria la Redonda, and of San Sebastian. After the Mexicans had divided into these four places, their God commanded them to distribute among themselves the idols ("los dioses"), and that each quarter should name and designate particular quarters where these particular idols should be worshipped. Thus each quarter was divided into many small ones, according to the number of the idols called Calpulteona (it should be "Calpulteoltzin" composed of Calpulli-quarter, and teotl-god), which signifies god of the quarter." (See Acosta, Lib. VII, cap. VII, p. 467.) Tezozomoc, cap. III, p. 9, "y siendo de noche hicieron junta y les dijo el sacerdote Quauhtlequetzqui: hermanos, ya es tiempo que os dividais un trecho unos de otros en cuatro partes cercando en medio el templo de Huitzilopochtli, y nombrad los barrios cada una parte, y asi concertados para dividirse . . . ." Torquemada confirms these statements (Lib. III, cap. XXIV, p. 295), although he protests against the origin of this division. He says: "I confess it to be truth that this city of Mexico is divided into four principal quarters, each one of which contains other smaller ones included, and all, in common as well as in particular, have their commanders and leaders . . . ." He further says (Lib. XIV, cap. VII, p. 545). "These clusters ("parcialidades" kinships) were distributed by calpules, which are quarters ("barrios"), and it happened that one of these clusters held three, four, or more calpules, according to the number of its people . . . ." (We shall investigate hereafter the objection of Torquemada). The same author, however, acknowledges (Lib. III, cap. XXII, p. 288), that the founders of Mexico were "nine families . . . These families commenced the foundation of this illustrious and magnificent city . . . ." One fact results beyond all doubt, that the first settlement of Mexico was made upon the basis of a division into kinships or consanguine groups, localizing on certain areas, which jointly composed the tribe. That the government was democratic has already been established previously.

[30] Durán (Cap. V, p. 42). Acosta (Lib. VII, cap. VII, p. 467). Herrera (Dec. III, Lib. II, cap. XI, p. 61).

[31] Torquemada (Lib. II, cap. LXVIII, p. 194. "Estaba de ordinario, recogido en una grande Sala (ó calpul)." (Lib. III, cap. XXVII, p. 305. Lib. IV, cap. XIX, p. 396, (que asi llaman las Salas grandes de Comunidad. ú de Cabildo). We find, under the corrupted name of "Galpon," the "calpulli" in Nicaragua among the Niquirans, which speak a dialect of the Mexican (Nahuatl) language. See E. G. Squier ("Nicaragua," Vol. II, p. 342. "The council houses were called grepons, surrounded by broad corridors called galpons, beneath which the arms were kept, protected by a guard of young men"). Mr. Squier evidently bases upon Oviedo ("Hist. general," Lib. XLII, cap. III, p. 52. "Esta casa de cabildo llaman galpon . . . ." It is another evidence in favor of our statements, that the kinship formed the original unit of the tribe, and at the same time a hint that, as in New Mexico, originally an entire kin inhabited a single large house. See Molina's Vocab. (p. 11).

NOT, as Torquemada admits, *assigned* to it *by a higher power*,[32] *the tribal government itself held* NO DOMAIN which it might apportion among subdivisions or to individuals, either gratuitously or on condition of certain prestations; or barter against a consideration.[33] The tribal territory was distributed, at the time of its occupancy, *into possessory rights held by* the KINDRED GROUPS AS SUCH, by common and tacit consent, as resulting *naturally* from their *organization* and *state of culture*.[34]

The patches of solid ground, on which these "quarters" settled, were gradually built over with dwellings, first made out of canes and reeds, and latterly, as their means increased, of turf, "adobe" and light stone. These houses were of *large size*, since it is stated that even at the time of the conquest "there were seldom less than two, four, and six dwellers in one house, thus there were infinite people (in the pueblo) since as there was no other way of providing for them, many aggregated together as they might please." *Communal living*, as the idea of the "calpulli" implies, seems, therefore, to have prevailed among the Mexicans *as late as the period of their greatest power*.[35]

[32] Torquemada (Lib. II, cap. VIII, p. 88, and Lib. III, cap. XXIV, p. 295) attributes the division into "quarters" to a "decree" of the Chichimecan "emperor" Techotlalatzin. But his assertions are disproved in part by his own statements, in part by the positive reports of other authors. Admitting even that the said Techotlalatzin should have wielded the discretionary power attributed to him, although there is strong evidence against it, he would have ruled *after* the foundation of Mexico. (Clavigero, Lib. II, cap. IX. Veytia, Lib. II, cap. XX, p. 178.) Consequently *after* the settling and localizing of the four quarters mentioned had taken place.

[33] The division into "quarters" is everywhere represented as resulting from common consent. But nowhere is it stated that the *tribal government or authority* assigned locations to any of its fractions. This is only attributed to the chiefs, on the supposition that they, although *elective*, were still hereditary monarchs.

[34] There is no evidence of any tribute or prestation due by the quarters to the tribe. The custom always remained, that the "calpulli" was sovereign within its limits. See Alonzo de Zurita ("Rapport sur les différentes classes de chefs de la Nouvelle-Espagne" pp. 51–65). Besides, Ixtlilxochitl says: ("Hist. des Chichim," cap. XXXV, p. 242), "Other fields were called Calpolalli or Altepetlalli." Now calpulalli (from "calpulli," quarter or kinship, and "tlalli," soil), means soil of the kin, and altepetlalli ("altepetl," tribe), soil of the tribe. Clavigero even says that the lands called "altepetlalli," belonging to the communities "of the towns and villages, were divided into so many parts, as there were quarters in the town, each quarter *having its own, without the least connection with the other*." (Lib. VII, cap. XIV.) This indicates plainly that the kinships *held the soil*, whereas the tribe occupied the territorial expanse. The *domain*, either as pertaining to a "Lord," or to a "State," was unknown among the Indians in general. Even among the Peruvians, who were more advanced than the Mexicans in that respect, there was no domain of the tribe.

[35] See Torquemada (Lib. II, cap. XI, and Lib. III, cap. XXII). Durán (cap. V). The quotation is from Herrera (Dec. II, Lib. VII, cap. XIII, p. 190), and is confirmed by Torquemada (Lib. III, cap. XXIII, p. 291), and especially by Gomara ("Conquista de

The soil built over by each "calpulli" probably remained for some time the only *solid* expanse held by the Mexicans. Gradually, however, the necessity was felt for an increase of this soil. Remaining unmolested "in the midst of canes and reeds," their numbers had augmented, and for residence as well as for food, a greater area was needed. Fishing and hunting no longer satisfied a people whose original propensities were horticultural; they aspired to cultivate the soil as they had once been accustomed to, and after the manner of the kindred tribes surrounding them. For this purpose they began throwing up *little artificial garden-beds*, "chinampas,"[36] on which they planted Indian corn and perhaps some other vegetables. Such plots are still found, as "floating gardens," in the vicinity of the present city of Mexico, and they are described, as follows, by a traveller of this century:

"They are artificial gardens, about fifty or sixty yards long, and not more than four or five wide. They are separated by ditches of three or four yards, and are made by taking the soil from the

Méjico," p. 443. Vedia, I). "Many married people ("muchos casados") live in one house, either on account of the brothers and relations being together, as they do not divide their grounds ("heredades"), or on account of the limited space of the pueblos; although the pueblos are large, and even the houses." Peter Martyr of Angleria ("De Novo Orbe," translated by Richard Eden and Michael Lok, London, 1612. Dec. V, cap. X, p. 228), says: "But the common houses themselves as hygh as a mannes Girdle, were also built of stone, by reason of the swellyng of the lake through the floode, or washing flote of the Ryvers fallying into it. Vpon those greate foundations, they builde the reste of the house, with Bricke dryed, or burned in the sunne, intermingled with Beames of Tymber, and the common houses have but one floore or planchin." We are forcibly reminded here of the houses of Itza on Lake Peten, which were found in 1695. "Hist. de la Conq. de los Itzaex," Lib. VIII, cap. XII. p. 494." "It was all filled with houses, some with stone walls more than one rod high, and higher up of wood, and the roofs of straw, and some only of wood and straw. There lived in them all the Inhabitants of the Island brutally together, one relationship occupying a single house." See also the highly valuable Introduction to the second Dialogue of Cervantes-Salázar ("Mexico in 1554") by my excellent friend Sr. Icazbalceta (pp. 73 and 74).

[36] "Chinampa," derives from "Chinamitl." "Seta o cerca de canãs," (enclosure of canes or reeds). Molina "Vocabulario", Parte II, p. 21). This mode of enclosing the ground was very common in the valley. A cluster of settlements between Churubusco and the Eastern lagoon has even obtained from it the name of "Chinampanecas (frequently mentioned in Tezozomoc and Durán.) The word "Chinamitl" has been adopted by the Qquiché of Guatemala, changed into "Chinamit," and used to designate a *kinship*. (See "Popol-Vuh., pp. 301, 304, 306, where "Chinamit" is translated as family.) Even in those remote regions where the territories of Yucatan and Guatemala join, or rather merge into each other, around Lake Peten, where the Nahuatl language is hardly known, we find in the 17th and 18th century, a tribe of "Chinamitas," who are said to have inhabited an area surrounded by Mexican agaves ("Magueyes") as a defensive hedge. ("Hist. de la Conq. de los Itzaex," Lib. VIII, cap. XI, pp. 490–493.) It shows that the original signification of the word, at least, was connected with the notion of a family-lot.

intervening ditch, and throwing it on the chinampa, by which means the ground is raised generally about a yard, and thus forms a small fertile garden, covered with the finest culinary vegetables, fruits and flowers . . . . . ."[37]

Each consanguine relationship thus gradually surrounded the surface on which it dwelt with a number of garden plots sufficient to the wants of its members.[38] The aggregate area thereof, including the abodes, formed the "*calpullalli*"—soil of the "calpulli,"[39] *and was held by it as a unit;* the *single tracts*, however, being tilled and used for the benefit of the *single families*.[40] The mode of tenure of land among the Mexicans at that period was therefore very simple. The tribe claimed its *territory*, "ALTEPETLALLI," an undefined expanse over which it *might extend*, —the "calpules," however, *held* and *possessed within that territory* such portions of it as were *productive;* each "calpulli" being *sovereign* within its limits, and assigning to its individual members *for their use* the minor tracts into which the soil was parcelled in consequence of their mode of cultivation. If, therefore, the terms "altepetlalli" and "calpulalli" are occasionally regarded as *identical*, it is because the former indicates the *occupancy*, the latter *the distribution* of the soil.[41] We thus recognize in the calpulli, or kindred group, the unit of tenure of whatever soil the Mexicans deemed worthy of definite possession. Further on we

[37] "Six Months Residence and Travels in Mexico," by W. Bullock. London, 1824. Cap. XIII, p. 179. It is not devoid of interest to compare the descriptions of this rather superficial, though still truthful observer, with the account of the ancient Chinampas as preserved to us in Tezozomoc (cap. III, p. 9). Durán (cap. VI, pp. 50 and 51). The floats or rafts mentioned by these old authors were nothing else but the chinampas or "floating gardens." Therefore also Tezozomoc uses the term "camellon," or garden-bed. (See also Acosta, Lib. VII, cap. IX, p. 472.) Torquemada (Lib. XIII, cap. XXXII, p. 483). Veytia (Lib. II, cap. XV, p. 142).

[38] Durán (Cap. V). Tezozomoc (Cap. III, p. 8). Acosta (Lib. VII, cap. IX, p. 473). Torquemada (Lib. III, cap. XXXIII, p. 291. Lib. II, cap. XV, p. 101). Clavigero (Lib. II, cap. XVII).

[39] Alonzo de Zurita (p. 51). Ixtlilxochitl ("Hist. des Chichim," cap. XXXV, p. 242). Torquemada (Lib. XIV, cap. VII, p. 545). Bustamante ("Tezcoco en los ultimos Tiempos de sus antiguas Reyes," p. 232).

[40] Zurita ("Rapport, etc.," pp. 52, 56, 57, 60).—De l'Ordre de Succession observé par les Indiens, etc., etc. (copy of an anonymous MSS. from Simancas, contained in the Uguina collection, and translated by Mr. Ternaux-Compans in his "Recueil de pièces, etc., pp. 223 and 224.)

[41] Zurita ("Rapport, etc.," pp. 51–64). Herrera (Dec. III, Lib. IV, cap. XVII, p. 138). Ramirez de Fuenleal, Bishop of San Domingo (Letter of 3 Nov., 1532, Mexico, to the Emperor Charles V. "Recueil" of Ternaux, p. 253). See also the Introduction to the "Real Ejecutoria de S. M. sobre Tierras y Reservas de Pechos y Paga. Perteneciente á los Caciques de Axapusco," in "Col. de Doc." of Icazbalceta (Vol. II, p. XIII).

shall investigate how far individuals, as members of this communal unit, participated in the aggregate tenure.

In the course of time, as the population further increased, *segmentation* occurred within the four original "quarters;" new "calpulli," being formed.[42] For *governmental* purposes this segmentation produced a new result by leaving, more particularly in military affairs, the first four clusters as *great subdivisions*.[43] But these, as soon as they had disaggregated, *ceased* to be any longer *units* of territorial possession, their original areas being held thereafter by the "minor quarters" (as Herrera, for instance, calls them), who exercised, each one within its limits, the same sovereignty which the original "calpulli" formerly held over the whole.[44] A further consequence of this disaggregation was (by removing the tribal council farther from the calpules) the necessity for an *official building*, exclusively devoted to the business of the *whole* tribe alone.[45]

[42] This successive formation of new "calpulli" is nowhere explicitly stated, but it is implied by the passage of Durán which we have already quoted (Cap. V, p. 42). It also results from their military organization as described in the "Art of War," (p. 115). With the increase of population, the original kinships necessarily disaggregated further, as we have seen it to have occurred among the Qquiché (See "Popol-Vuh" quoted in our note 7), forming smaller groups of consanguinei. After the successful war against the Tecpanecas, of which we shall speak hereafter, we find at least twenty chiefs, representing as many kins (Durán, cap. XI. p. 97), besides three more, adopted then from those of Culhuacan (Id. pp. 98 and 99). This indicates an increase.

[43] "Art of War, etc.," pp. 115 and 120.

[44] Torquemada (Lib. III, cap. XXIV, p. 295). "I confess it to be truth that this city of Mexico is divided into four principal quarters, each one of which contains others, smaller ones, included, and all, in common as well as in particular, have their commanders and leaders . . . ." Zurita ("Rapport," p. 58-64). That the smaller subdivisions were those who held the soil, and not the four original groups, must be inferred from the fact, that the ground was attached to the calpulli. Says Zurita (p. 51.) "They (the lands) do not belong to each inhabitant of the village, but to the calpulli which possesses them in common." On the other hand Torquemada states (Lib. XIV, cap. VII, p. 545): "that in each pueblo, according to the number of people, there should be (were) clusters ("parcialidades") of diverse people and families . . . . These clusters were distributed by calpules, which are quarters ("barrios"), and it happened that one of the aforesaid clusters sometimes contained three, four, and more, calpules, according to the population of the place ("pueblo") or tribe." The same author further affirms: "These quarters, and streets, were all assorted and levelled, with so much accuracy, that those of one quarter or street could not take a palm of land from those of another, and the same was with the streets, their lots running (being scattered) all over the pueblo." Consequently, there were no communal lands allotted to the four great quarters of Mexico as such, but each one of the kinships (calpules) held its part of the original aggregate. Compare Gomara (Vedia, Vol. I, "Conq. de Méjico," p. 434. "Among tributaries it is a custom, etc., etc." Also p. 440). Clavigero (Lib. VII, cap. XIV). "Each quarter has its own tract, without the least connection with the others."

[45] Compare Durán (Cap. XI, p. 87). Acosta (Lib. VII, cap. XXXI, p. 470). It appears as if the "tecpan" had not been constructed previous to the middle of the 14th cen-

This building was the "*tecpan*"[46] called, even by Torquemada "house of the community;"[47] it was, therefore, since the council of chiefs was the highest authority in the government, the "council house" proper. It was erected near the centre of the "pueblo," and fronting the open space reserved for public celebrations. But, whereas formerly occasional, gradually merging into *regular*, meetings of the chiefs were sufficient, constant daily attendance at the "tecpan" became required, even to such an extent, that a permanent *residence* of the head-chiefs *there*, resulted from it, and was *one of the duties of the office*. Consequently the "tlacatecuhtli," his family, and such assistants as he needed (like runners), dwelt at the "official house." But this occupancy was in no manner connected with a possessory right by the occupant, whose family relinquished the abode, as soon as the time of office expired through death of its incumbent. The "tecpan" was occupied by the head war-chiefs only as long as they exercised the functions of that office.[48]

tury,—the meetings of the tribe being previously called together by priests, and probably in the open space around the main house of worship. The fact of the priests calling the public meetings is proved by Durán (Cap. IV, p. 42). Acosta (Lib. VII, cap. VII, p. 468). Veytia (Lib. II, cap. XVIII, pp. 156, 159. Cap. XXI, p. 186). Acosta first mentions "unos palacios, aunque harto pobres." (Lib. VII, cap. 8, p. 470), on the occasion of the election of the first regular "tlacatecuhtli:" Acamapichtli,—Torquemada says (Lib. XII, cap. XXII, p. 290), that they lived in miserable huts of reeds and straw, erected around the open space where the altar or place of worship of Huitzilopochtli was built. The public building was certainly their latest kind of construction.

[46] From "tecuhtli" chief, and the affixum "pan," denoting a place. Therefore "place of the chiefs." Molina translates: "casa ó palacio real, ó de algun señor de Salvo" (II, p. 93). The word is also found in the Qquiché of the "Popol-Vuh" (p. 306). "Qui tiepan quib"—Mr. E. Brasseur de Bourbourg acknowledges the Mexican origin of the word, and renders it by "to divide into quarters," although he says that in Mexican it signifies: palace or municipality.

[47] Torquemada (Lib. III, cap. XIV, pp. 269 and 270). "Tecpancalli, que quiere decir, los Palacios Reales, ó el Alcaçar, y casas de Señorio" (Id: Lib. VII, cap. XXI. p. 119. Lib. XIII, cap. XXX, p. 477). But especially in the Sixth Book, 27th chapter, page 48, when, referring to the statements of Father Bernardino de Sahagun who says, that "being in the city of Xuchimilco, he heard one night, etc. etc. . . . . and that inquiring next day why that shouting had taken place.—the Indians answered, that from the Tecpan, or community (municipal house), they had been calling the macehuales to work."

[48] Nearly every author who attempts to describe minutely the "chief-house" (tecpan) mentions it as containing great halls (council-rooms). See the description of the tecpan of Tezcuco by Ixtlilxochitl ("Hist. des Chichimèques," cap. XXXVI, p. 247. "The palace had two courts, the first and largest one serving as public square and market, for which it is still used at present. The second and interior one, was surrounded by the hall of the royal councils, where the King held two tribunals. In the centre of this court a large brasier was burning, which was never extinguished." Id. cap. XXXVIII), by Torquemada (Lib. III, cap. XXVII, p. 305. Lib. II, cap. XLIV, pp. 146 and 147. Lib.

About the time these changes occurred, the dignity of "tlacatecuhtli" seems to have become a permanent feature in the govern-

XI, cap. XXVI, pp. 354 and 355). Cortés himself (Vedia, I. carta segunda, pp. 34 and 35), speaks of the great halls contained in what he calls the "house of Muteczuma." Bernal-Diez del Castillo (Vedia II. cap. XCI, pp. 86 and 87), confirms. See also Gomara (Vedia, I, p. 342 and 343. "Adonde él moraba y residia á la continua, llaman Tepac, que es como decir palacio . . . . . — . . . habia en él muchas salas.") Sahagun (Lib. VIII, cap. XIV, p. 302. "El palacio de los Señores ó casas reales, tenia muchas salas.") The tecpan was near the centre of the pueblo. See Gomara (Vedia I, p. 341. "Llegaron pues á un patio grande, recamera de los idolos, que fué casas de Axaiaca.") Cortés (Vedia, I, "Carta Tercera," pp. 74 and 76, etc.).

Bernal-Diez (Vedia, II, cap. LXXXVIII, p. 84, etc.). According to Sr. Icazbalceta ("México in 1554, note 38, p. 182, to the 2d Dialogue of Cervantes-Salázar), the "old houses of Montezuma" occupied (about) the square west of the present site of the Cathedral. The "new houses" were in place of where the National palace now stands. It is admitted that the Cathedral occupies the site of the main "teocalli," or the old centre of the ancient pueblo. (Torquemada, Lib. III, cap. XXII, p. 290). The correctness of this is conclusively proven by Sr. Icazbalceta in note 40, to the Second Dialogue of Cervántes (p. 194, and plate on p. 197, also the important dissertation on page 201), and in note 51. Thus the central location of the tecpan at Mexico remains established.

The permanent residence of the head war-chief, of his household, and of some assistants,—at the tecpan, is too frequently related to demand further proof, but it is not superfluous here to investigate the point: that this residence was connected,—not with the *person* and *descendancy* of that chief, but with the *office* alone.

We find it mentioned that the buildings occupied by the Spaniards, when they first came to the pueblo of Mexico were the "house of the father of Montezuma" (Axayacatzin, probably). All the eye-witnesses concur in it and we need not refer to them in detail. There was, consequently, a house where the *kinship of the chief lived*,—aside from the tecpan, for since descent with the Mexicans was in the male line,—the son continued to occupy the dwellings of his father and (with communal living as practised in Mexico), of that father's consanguine relations. (That these sons and descendants were bred up to the ordinary pursuits of life, like any other Indian of Mexico, results from the speech as reported by Sahagun (Lib. V, cap. XV), of an old chief to his sons, wherein he exhorts them to cultivate the mechanical arts, and agriculture, adding the remarkable words, p. 117, "nowhere have I seen that any one may maintain himself through his noble descendancy alone.") In the case of Ahuitzotl, Durán relates (Cap. XLI, p. 327), "all the chief and principal men, with the whole tribe, going to the place where the sons of the Kings and great men were kept ("recogidos"), and where they instructed and furthered them in virtuous things, in the use of arms and good manners. Then they took out (Ahuitzotl) from the others, and brought him to the royal palace." Tezozomoc (Cap. LX, p. 100), speaking of the election of Ahuitzotl says: "and these twelve Mexican chiefs went to bring the King Ahuitzotl from the house of Tilancalco." "And they said nothing to him until they were in the great palace" (Cap. LXI, p. 100). The election of Montezuma, however, gives occasion to that author, for another and very important statement (Cap. LXXXII, p. 143). "For, know ye, that many of the sons of the Kings past, are brought up now, some of which have become singers, others Cuachimecs, others Otomies, and the others are preparing to assume your titles of Tlacatecatl, Tlacochcalcatl, Ticocyahuacatl, Acolnahuacatl, Hezhuahuacatl, and a number of others who are and dwell in the principal house Calmecac." It is further exposed, how unwise it would be to elect an *unmarried* man, and finally Montezuma was chosen, whose age at that time is given at thirty-four years, and he was taken out of the Calmecac and escorted to the chief house (tecpan). But the strongest evidence results from the fact that the office was *elective*, and not hereditary. How, while the incumbent of an office changed, could the family of his predecessor still remain in possession of the official building?

ment of the Mexican tribe.[49] Nearly at the same time also, the Mexicans felt the necessity of opening communications with the tribes inhabiting the shores of the great marsh in the midst of which they were living,—in order to obtain some of the commodities produced or held by these tribes. Strong enough for *defence*, but too weak yet for *offence*, the Mexicans approached cautiously their nearest and most powerful neighbors, the Tecpanecas, with the view of securing permission to trade and barter, also for the purpose of obtaining the use of one of the springs of the mainland. This permission was granted, on condition that the Mexicans should pay a certain tribute. This was, however, no kind of feudal prestation, not being in the least connected with the tenure of the soil or occupancy of the territory,—but simply like unto a toll or tax placed on the faculty of barter. The further condition of military assistance being, in all likelihood, also exacted, the Mexicans thus became, not the subjects as it is commonly stated, but the weaker allies of the Tecpanecas.[50]

[49] We have previously alluded (note 22), to the fact that, anterior to Acamapitzin, the series of Mexican head-chiefs appear broken, whereas from the latter onward the office is reported as having been regularly filled. From that time on the term "palacio," as *connected with the office*, appears in the Spanish historians. See Durán, Tezozomoc, Acosta and Torquemada. (Especially "Monarchia Indiana," Lib. II, cap. XIV, p. 98).

[50] All the authors agree upon the fact that the early life of the Mexican tribe on the site of Tenuchtitlan was one of secluded poverty, even of misery. See especially Torquemada (Lib. II, cap. XI. pp. 92 and 93). "In this place they settled ("se ranchearon") erecting poor and small habitations, surrounded by canes and grasses, called by them Xacalli, . . . where they spent their life miserably, the place being poor and destitute, and as people abandoned and poor, persecuted by all the inhabitants of the mainland, they subsisted upon roots of Tulli and other herbs, which grew on the place and on its surroundings." Then they began to fish. (See also Tezozomoc, cap. III. Durán, cap. V. Clavigero, Lib. II, cap. XVII. Sahagun, Lib. X, cap. XXIX, pp. 145 and 146. Veytia, Lib. II, cap. XV, p. 142). Durán and Tezozomoc both assert, that their first step, when the population began to increase, was to seek for traffic, which could only be secured through some kind of connection with their nearest and most warlike neighbors, which at that time were the Tecpanecas. ("Hist. de las Yndias de Nueva España," cap. V, pp. 41 and 42. "Empero juntandose todos en conséjo ovo algunos que fueron de parecer que con mucha omildad se fuesen à los de Azcaputzalco y á los Tepanecas, que son los de Cuyuacan y Tacuba, y que se les ofreciesen y diesen por amigos y se les subjetasen con intencion de pedilles piedra y madera para el edificio de su ciudad . . . ." "Crónica Mexicana," cap. III, p. 9. It was finally agreed to barter, with as little concession as possible on their part). Most of the other authors have transformed this alliance with the Tecpanecas into a feudal allegiance, resulting from the occupation of the soil and from intermarriage. Both are disproved by Durán (Cap. V, p. 41: "pues era sitio y termino de los de Azcaputzalco y de los de Tezcuco; porque alli llegaban los terminos del uno y del otro pueblo, y por la otra parte del mediodía, terminos de Culhuacan; . ." "y que como señores ya de aquel sitio, sin hacer buz ni reconocer subjecion à ninguno, pues su dios los auia dado aquel sitio, fuesen y comprasen piedra y madera, etc., etc.") and Tezozomoc (Cap. III, pp. 9 and 10).

Even Torquemada acknowledges the fact, that the Mexicans were originally independent (Lib. II, cap. XI), and that they were connected with the Tecpanecas through trib-

Through the establishment of direct relations with the outside, not only the public business of the Mexicans was increased, but, for the interchange of commodities, a standing market became indispensable. The pueblo of Mexico, formerly shunned by strangers, was now visited by delegations from neighboring tribes, and especially by traders. *Indian hospitality* required that these visitors should be harbored as guests, and the official house of the tribe was the place where this hospitality was afforded; it being the duty of those who occupied it to lodge and feed the strangers.[51]

ute (Lib. II, cap. XV, p. 99), a statement flatly contradictory. In his previous description of the early conditions of the tribes, he represents the Mexicans as outcasts, upon which no other tribe had any claim (pp. 92 and 93). No attempt was made to conquer them, since their retreat was too impenetrable (Torquemada, Lib. II, cap. XI, p. 93. Mendieta, Lib. II, cap. XXXIV, p. 146),—therefore their intercourse with the tribes of the mainland was *voluntary* (Acosta, Lib. VII, cap. VII, p. 467), and necessarily took the form of alliance or league. In this case *military assistance* was the main point. And indeed we do find, in what we may call the "Tezcucan" chroniclers, like Ixtlilxochitl, Torquemada, Veytia, and Clavigero, the Mexicans assisting the Tecpanecas (vide "Histoire des Chichimèques," cap. XV, p. 102. Cap. XVI, p. 108. Cap. XX, pp. 131 and 132. "Monarchia Indiana," Lib. II, cap. XIX, p. 108. "Historia Antigua de Méjico," Lib. II, cap. XXVIII, pp. 236, 237, 238. Cap. XXIX, pp. 241–243. Cap. XXX, p. 250. "Storia de Messico," Lib. III, cap. VIII). Bustamante ("Tezcoco en los ultimos Tiempos," p. 2), who claims to follow Boturini, confirms. The military achievements of the Mexicans in the wars between the Tecpanecas and Tezcucans are not even claimed by these authors as a *due service*, but as the actions of *allies* or *confederates* of the former.

[51] Cortés ("Carta Segunda," p. 35, in Vedia I). "The manner of his service was (of Montezuma), that every day at sunrise, about 600 Lords and leading men were in his house, which either seated themselves, or some walked around in some halls and corridors therein contained, and there remained and spent their time without entering where he was. And their servants and persons accompanying them filled two or three great courts ("patios") as well as the street, which was very large. They remained there without leaving it until night. And at the time they served to eat to the said Muteczuma, they also served all these Lords as well as their attendants. The supplies or stores ("la dispensa y botilleria") were open daily to all those who wished to eat and drink." See also Sahagun (Lib. IX, cap. I, to V, concerning the receptions to traders, by the head-chiefs). Torquemada (Lib. II, cap. LIXIX, p. 231. He states that all his subjected chieftains, 3,000 in number, their attendants included, ate at "his court." Lib. XIV, cap. I, p. 534, speaking of the messengers, says that they were lodged at the "Calpixca" or house of the community. In another place he mentions that house as the "Tecpan." See note 47). Durán describes several religious solemnities, at which the chiefs of neighboring tribes assisted, which the head-chief of Mexico *had to entertain* (Cap. XX, pp. 175 and 176. Cap. XXIII, p. 195. The chiefs of Tezcuco, Tacuba, Chalco, Xuchimilco, etc., etc., were invited to attend, and on their coming they were quartered in the royal houses ("*fuéron aposentados en las casas reales*"). Idem, cap. I, III, pp. 416–421. Cap. LIV, p. 428. The delegates from Chalco, Tlaxcallan, Cholullan, etc., etc., were lodged at the Tecpan ("*en su mesmo palacio real*"). Cap. LVIII, p. 459). Tezozomoc (Cap. XXI, p. 33. Cap. LXI, p. 101, wherein Ahuitzotl is especially enjoined to "give to eat to his people." Cap. LXXXII, p. 144, "y los vasallos recibidos como á tales tributarios, aposentandoles, vistiendoles y dándoles lo necessario para las vueltas de sus tierras . . . . . con los viejos y viejas mucho amor, dándolos para el sustento humano: regalados los principales teniendóles en mucho, y dandóles la honra que merecen: *llamarlos cada dia al palacio que comian con vos.*" This indicates that the hospitality was obligatory, etc.). Zurita ("Rapport, etc.," p. 65). Herrera (Dec. III, lib. IV, cap. XXII, p. 138).

With continued increase of the population, the "tecpan" alone did no longer suffice, thus each "calpulli" erected, within its own area, its own council place for the transaction of its interior business, lodging in it, after the model of the "tecpan," its own chief-men, and exercising there its share of the general hospitality. So Mexico became dotted with public constructions, necessarily distinguished by their size and arrangement from the rest of the buildings.[52]

The chiefs and their families who resided in the official houses, and upon whom devolved the exercise of public hospitality,—continued to participate for their share in the use of the soil held and cultivated by the "calpulli" to which they belonged by descent. But whereas formerly they could improve these lands *themselves*, this became impossible with the increase of public business, and the task of cultivating them devolved, first upon their children and families, afterwards, when even these were required for the duties of the official household,—*upon the other members of the kin.* This was done, not in token of vassalage, but as a remuneration for the public services of the chiefs. The same took place in regard to the "tecpan" and its occupants. With the increase of intercourse, however, the scanty crops raised in this manner became insufficient, and a regular contribution, by each member of the different kinships, towards maintenance of the chiefs and the visitors they had to entertain, was instituted. Certain expanses were set aside, to be worked by communal labor, the products of which were exclusively devoted to what we may term "official purposes." Thus not only was there a tax created, voluntarily by the tribal components, for public purpose, but a new feature was introduced in the distribution of the soil. The mode of tenure,

[52] These houses, sometimes called "calpulli," at other times "calpixca," were the *private palaces*, which the Spanish authors mention. They were but "official buildings;" probably connected with storehouses. As the tribe had its tecpan, so each calpulli, or localized kinship, its own council-house. This results from the organization of the kinship. See also "Art of War," pp. 103 and 104. What distinguished these constructions from the common house or abode ("calli"), were the halls ("salas"), and the "tecpan" was further distinguished by a lookout or tower. (Durán, cap. XXVI, p. 215. Tezozomoc, cap. XXXVI, p. 58). This distinction places it parallel to the so-called "palace" of Palenqué in Chiapas. Compare further: Zurita ("Rapport, etc.," p. 62). "At the annual gatherings, they (the chiefs of the calpulli) distribute gratuitously food and drink, to keep the Indians in good humor." Herrera (Dec. II, lib. VII, cap. XIII, p. 190). If we were to believe the picture presented of Mexico by the authors of the 16th and 17th centuries, Mexico would have possessed innumerable edifices of that kind.

however, was not changed, and no hereditary rights of property were called into existence in favor of the chiefs or their descendants.[53]

For nearly a century after the first settlement of the Mexicans

[53] No mention is made of any tax or tribute gathered for official purposes among the Mexicans until under the last Montezuma, when it is generally admitted, as Gomara says: "That all tributed to the chief of Mexico" ("Conq. de Méjico," p. 345, Vedia, I). Without accepting the views expressed by Robertson ("History of America." Book VII, p. 291. Vol. III, 9th Edition, 1800), who ascribes to the influence of Montezuma a change in the plan of government of the Mexican tribe,—it still appears but natural that as long as the tribe was weak in numbers and resources, the original or typical form of communal Institutions prevailed, whereas with increased population and consequent increase of governmental labor the members of the tribe were compelled to provide for the maintenance of their officers and their families. The first step was to cultivate such patches of land for them as they held being members of some calpulli. These lands were the "pillali," commonly treated of as "patrimonial estates." Torquemada, however, says (Lib. XIV, cap. VII, p. 546): "Another kind of lands they called pillali, or, so to say: Lands of Knights ("hidalgos") or nobles. Of these there were two kinds. In the first case the land was inherited with the nobility, and in the other, the chief gave lands to such as had achieved distinction and valor in war, and were ennobled therefor. To these the chief gave lands for their sustenance, but they could not hold renters ("terrazgueros") but might sell to other chiefs, as if the conditional gift from the chief had not existed: and neither of these two classes could dispose of their tracts to any macehual (common man—perhaps from "maitl"—hand, and "ceualli"—shade,—the hand of some one who gives protection or shade), for in that case they lost them, and the chief entered in their possession. *and they were applied to the calpulli in whose area they were located*, in *order that the said cluster might pay tribute according to the quantity of land contained;*—also, if any one of them died without heirs, the chief inherited" Herrera (Dec. III, lib. IV, cap. XVII, p. 138). "These were lands which went with the Lordship, and which they called lands of the Lordship, and of these the Lords could not dispose, but rented them as they might and the *rents were used in the house of the King, because there, besides all the principals, also ate the travellers, and the paupers*, for which service the Kings were much honored and obeyed. What these rents did not furnish, was supplied by their patrimonial estates." Veytia (Lib. III, cap. VI, p. 195). "For the present we shall but say, that in each pueblo and place there was a tract of land of best quality, which was of the Kings or Lord of the estate . . . . . For the sowing and working of these lands the calpixque, an officer of the republic (state) in each pueblo, daily designated the common people who had to work them, and all the fruit belong integrally to the chief for *the maintenance of his house.*" Ixtlilxochitl (Hist. des Chichim. cap. XXXV, pp. 242, 243 and 244). Bustamante ("Tezcoco en los Ultimos Tiempos, etc." Part III, cap. V, p. 234, etc.). Oviedo ("Hist. gen. y nat." lib. XXXIII, cap. LI, p. 536, of 3d vol.) Now we have already established, that individual tenure of the soil was unknown, it is further proved that the offices were non-hereditary, we cannot fail, therefore, to recognize. 1°. In the "pillali" of Torquemada the original "chinampa" held by chiefs as members of a kinship.

2°. In the tracts of Herrera and Veytia "official lands," specially reserved for the wants of official houses and their occupants. These lands went "with the office."

No date can be assigned to the introduction of this new feature among the Mexicans but we cannot help being struck by the fact that the Tezcucan chroniclers make special mention of it, connecting it with the time when Nezahualcoyotl became chief of Tezcoco (See Ixtlilxochitl "Hist. des Chichim." cap. XXXV. Veytia, Lib. III, cap. VI, p. 195. Bustamante, Part III, cap. V). The connection is *implied* rather than *expressed*, and but *excuses* the suggestion: that such a change might have occurred about the close of the fourteenth and beginning of the fifteenth centuries. Of course we allude here to the Mexicans alone, and not to the tribes of the mainland.

in the lagune, they were confined to their original area and to such artificial garden-beds as they accumulated around it. Meanwhile their allies on the mainland, the Tecpanecas, were making themselves formidable in warfare to the other tribes; the Mexicans assisting. The moment arrived however, when the latter, having secured a defensive position, acquired military experience and greater strength, sought to free themselves from the tax which had heretofore burthened their trade and barter. War ensued, and the Mexicans, now in turn supported by enemies of the Tecpanecas, completely overthrew the power of the latter tribe. By this victory, they not only secured a foothold on the mainland, but became at once one of the ruling tribes of the western valley of Mexico.[54]

The only territorial accession gained by the Mexicans, in fact the only one claimed by them, appears to have been the hill of Chapultepec. They already had the use of the springs rising there, now they acquired their full and unincumbered possession.[55] The remainder of Tecpanecan territory was left to that tribe intact, and in no manner annexed to that of Mexico. The organization of the tribe, its government, and distribution of the soil, remained equally undisturbed. No Mexican representatives were delegated to rule Azcaputzalco or Cuyuacan. But the Mexicans in turn subsequently controlled the military power of the conquered tribe, and, besides, it was thereafter held to tribute. This

[54] Durán (Cap. IX and X). Tezozomoc (Cap. VII, VIII, IX, X, XI, XII, XIII, XIV and XV). Acosta (Lib. VII, cap. XIII and XIV). Herrera (Dec. III, lib. II, cap. XII and XIII). Ixtlilxochitl (Hist. des Chichim.," Cap. XXX, XXXI and XXXII). Torquemada (Lib. II, cap. XXXV, XXXVI and XXXVII). Veytia (Lib. II, cap. I, LI, LII, LIII and LIV). Clavigero (Lib. III, cap. XVII, XVIII and XIX). Bustamante (Part I, cap. XXIII). Prescott ("History of the Conquest of Mexico," Book I, cap. I, pp. 15 and 18).

[55] It is even stated that the petition of the Mexicans for stone and wood to construct therewith a channel leading from Chapultepec to their pueblo, was the cause of the war. See Durán (Cap. VIII, p. 63). Tezozomoc (Cap. V, pp. 11 and 12). Acosta (Lib. VII, cap. II, p. 476. "Con esta ocasion, ora sea que ellos de proposito lo buscassen, para romper con los Tepanécas, ora que con poca consideracion se moviessen, al efecto embiaron una embaxada al Rey de Azcapuzalco muy resoluta diziendo, que del agua que los auia hecho merced, no podian aprovecharse, por auerseles desbaratado el caño por muchas partes, por tanto le pedian los proviniésse de madera, y cal, y piedra, y embiasse sus oficiales que con ellos hiziessen un caño de cal y canto que no se desbaratasse.") Chapultepec remained specifically Mexican soil thereafter, it being the source of fresh water for the pueblo of Mexico. When Cortés moved against the tribe the second time, he seized the hill after a short but desperate struggle. (Cortés "Carta Tercera," p. 71, Vedia I. Bernal-Diez, cap. CL, p. 176, Vedia II. Clavigero, Lib. X. cap. XVII). See also Icazbalceta, in his Introduction to the 3d Dialogue of Cervántes Salazar ("Mexico in 1554," pp. 256 and 257). Veytia (Lib. III, cap. I, p. 142, of 3d vol.). Bustamante ("Tezcoco en los ult: Tiempos." Parte IIa, cap. I, p. 148).

tribute was gathered by stewards, the only Mexicans permanently residing on Tecpanecan soil, and it was distributed in accordance with the tribal organization: among the calpules for the use of their public households and of their individual members, and to the "tecpan" for the maintenance of the tribal government and business; out of the former, a certain share was reserved for the purpose of religious worship.[56]

This tribute consisted of objects held and acquired by the Tecpanecas through trade, war and their own manufacture. But it also included the products of their *horticulture*. These had to be raised annually either on their own garden-beds, or on a certain expanse reserved in each "calpulli" for the production of tribute. The Tecpanecas having the same system of distribution of the soil as the Mexicans, and the kindred group being the unit of their organization also, the latter method was naturally resorted to. Therefore in each one of the areas held by the calpules of the conquered tribe, a certain plot was set off, to be tilled in common by the members of the kin, for the benefit of their conquerors.

[56] Acosta says (Lib. VII, cap. XIII, p. 485), that they took all the lands for themselves: "with this, those of Azcapuzalco were left so poor, that they had not even crops of their own." Durán (Cap. IX, p. 79. "They went to Azcaputzalco and seized ('se entregaron') its lands and distributed them among themselves.") Tezozomoc (Cap. IX, p. 16 and 17). It is difficult to connect these and similar statements with the positive facts asserted by Zurita (Rapport sur les différentes classes de chefs de la Nouvelle Espagne.") "The sovereign of Mexico had beneath him, in all matters relating to warfare, those of Tacuba and of Tezcuco; in regard to all others, their powers were equal, so that neither of them intervened in the government of the others" (p. 11),— by Veytia (Lib. III, cap. III, p. 161), and even by Ixtlilxochitl ("Hist. des Chichim.," Cap. XXXIV, p. 235), which establish the complete *territorial* independence of the Tecpanecas from the Mexicans; even after their defeat. Durán also says (Cap. IX, p. 77): that the Tecpanecas promised tribute and lands. Tezozomoc (Cap. IX, p. 16) confirms, stating that they offered tribute, personal service, and assistance in war. We cannot conciliate these different reports except by admitting that the Tecpanecas submitted to the ordinary manner of Indian conquest, namely: to tribute, to military aid, and for the purpose of tribute, to the reservation of certain tracts whose crops were to go exclusively to the conquerors. Of the latter we have positive proof. See Durán (Cap. IX, p. 79). Tezozomoc (Cap. IX, p. 17). Only these authors mention that these tracts went to persons or individuals. But how is this possible, since no individual possession of land appears in Mexico, at the time of the conquest even; as we shall see further on. The tracts in question must, therefore, have been given to such persons as representatives of certain kinships, or "calpules," as Tezozomoc intimates, saying (Cap. XV, p. 21): "and let us distribute the lands among all of us, in order to hold of them some pastime and sustenance for us, our children and heirs." Besides, Durán asserts: that the division took place for the benefit of the chiefs, and of the quarters ("barrios," or calpules), which tends to prove that there were "official lands" and "lands of the kinship" set off for the conquerors on the conquered territory. That a portion of the latter provided for religious purposes, is established by Acosta (Lib. VII, cap. XIII, p. 485), and by Durán (Cap. IX).

The crops raised thereon were again apportioned by the latter among themselves as we have explained previously, but they did not acquire any title to the *possession*. still less to the *ownership* of the soil itself.[57] Once started on their career of conquest, the

[57] See Durán (Cap. IX. p. 79 and 80). Tezozomoc (Cap. IX, p. 16. "Para amansar y traher á paz á los Mexicanos que tan pujantes y orgullosos estavan contra los Tecpanecas, digéron estos: señores Mexicanos, como vencidos que somos de vostros, y os tenemos dadas nuestras hermanas y hijàs que os sirvan y nuestras mugeres, y nos proferimos á vasallage, y de todas las veces que fuéredes en guerras y batallas con estrañas, irémos nosotros como vasallos, y llevarémos à cuestas vuestro matalotage, y llevarémos á cuestas vuestras armas, y en caso que en las guerras, algunos, à alguno de los Mexicanos muriere, nos proferimos á traheros los cuerpos cargados á vuestra tierra, ciudad, á ser con honra enterrados, y venidos que seais de las guerras, y antes y despues barerémos, y regarémos, vuestras casas, tendrémos cuidado de vosotros con nuestro servicio personal, pues asi estamos obligados conforme á usanza de guerra, y nosotros de servidumbre." The Mexicans then spoke to themselves and said: "you now have heard the promises, subjection, and domination to which the Tecpanecas of Azcaputzalco submit, offering to give us wood, planking, stones and lime for our houses, to plant for us maize, beans, calabashes, spices of the country, chile, and tomate, and to be our servants, and the principals of them to become our stewards . . . ."") This expresses about the amount and measure of subjection of one tribe to another. Zurita further informs us (pp. 66 and 67). "When the Kings of Mexico, Tezcuco and Tacuba conquered a province, they used to retain all the native chieftains in their offices; whether they were supreme or but inferior. The people always kept its property, finally the usages and customs of the established government were respected. These sovereigns designated territories proportionate to their conquests: the vanquished tilled them in common and made plantings appropriate to the soil. This kind of tribute, or homage ("homage-lige"), was paid to officers ("des intendants") established by the sovereigns of Mexico, of Tezcuco, or Tacuba, according as the vanquished had become vassals of one or of the other prince. Besides, they were liable to military service, which obligation rested indiscriminately on all the conquered provinces. The chiefs remaining Lords as before the war, preserved civil and criminal jurisdiction in the full extent of their domain." Nevertheless, we have detailed reports about certain lands having been applied by the Mexicans to certain chiefs (Tezozomoc, cap. XV, p. 24): it was done at the time that such chiefs received certain titles or dignities. These titles and dignities, however, were not hereditary, but elective (Durán, cap. XI, p. 103). "To these four chiefs and titularies, after they were elected princes) they made them belong to the royal council as presidents and members ("oydores") of the supreme council, without whose opinion (or consent, advice "parecer") nothing could be done, and the King being dead, from these and no others his successor had to be chosen, and neither could they be placed in such positions unless they were sons or brothers of Kings, and thus, if one of these four had been promoted, they put another one in his place, and it is to know that they never chose a son of him whom they elected for King, or of him who died, because as I have said, the sons did not obtain the titles through inheritance, but by election. Thus, whether son, brother, or cousin, if the King and his council elected him to any title, it was given to him,—it being sufficient that he belonged to that lineage and was a near relative, and thus the sons and brothers went succeeding little by little, and the title and Lordship remained in that generation (descendancy), being elected successively. These Lords had vassals who to them paid tribute, small pueblos, rented lands ("estancias terrazgueros") that gave them all kinds of supplies and clothing . . . . ." It is also stated that the Mexicans, when they conquered the Tecpanecas, distributed *of* their lands to the quarters (Cap. IX. p. 79. Durán,—and Acosta, Lib. VII, cap. XIII, p. 485. "Señalaron tambien tierras de comun para los barrios de Mexico a cada uno las suyas, para que con ellas acudiessen al culto y sacrificio de sus dioses.")

Mexicans, supported by their allies, sought to extend their power. The tribes of the southeast, the Xochimilcas, the Chinampanecas, (also called the four chieftaincies: "Nauhteuctli") were the first to become their prey. Their fate, after they had once submitted, was the same as that of the Tecpanecans. The territory was not annexed, neither was the organization changed. But they were held to military assistance, and especially to tribute. The latter drew forth, as a consequence, the establishment of tribute-lands, like those which we have already met with at the close of the Tecpanecan war.[58]

When finally, after a contest of unusual length and bitterness, the tribe of Chalco also had to submit to the same conditions of tribute and warlike control,[59] — the Mexicans were really the leading power of the valley.[60] Their means of subsistence, besides, had greatly increased through tribute, among which the crops of the tribute-lands were most conspicuous — as well as through trade. One single tribe of the "Nahuatl" of the valley remained unsubdued, the Acullhuas of Tezcuco. Instead, however, of engaging in a deadly conflict, the result of which might have been equally

If we attentively consider the above, we find:

(1). That no change was made in the tenure of lands, and no conversion of the Tecpanecan territory into a Mexican domain was effected by the conquest.

(2). That certain expanses were set aside, which continued to be held by the conquered, and worked by them after the usual communal plan, but whose crops went exclusively towards the *tribute*.

(3). That these crops were divided, corresponding to the organization of the Mexicans, — between the official requirements — ("tecpan" —) ("calpulli" as official house for the quarters)—the people (quarters "barrios,") and worship. The analogy with Peru (Inca, worship and people), is striking.

The distribution of lands to certain chiefs therefore, mentioned in connection with the conquest of the Tecpanecas, simply indicates that these lands were applied to the maintenance of such offices, and not an hereditary "fief" to a certain family. Durán positively expresses, that the office belonged in the "kin" ("lignea" — "generacion,") and was not hereditary. The lands therefore pertained to the office as a governmental feature of the kinship or calpulli, and not to the person or offspring of any incumbent. In the same way, certain tracts (or rather their crops), went to the tecpan or its occupants, as a governmental feature of the *tribe* (Bustamante, Parte III cap. V, p. 233).

[58] Durán (Cap. XII, Id. XIII, p. 114. XIV, p. 123). Tezozomoc (Cap. XVII, p. 28, XVIII, p. 29), and Acosta.

[59] Durán (Cap. XVII, p. 152). Tezozomoc (Cap. XXVI, pp. 39 and 40). Acosta (Lib. VII, cap. XVI, p. 493), etc. etc.

[60] Out of the five Nahuatl tribes who had originally settled in the valley of Mexico, three were then subjected to the Mexicans. Consequently the Tezcucans or Acullhuacans alone remained. Territorially, the latter probably covered the larger expanse, but the Mexicans and their allies had the advantage in position and numbers.

disastrous for both parties, negotiations commenced, terminating with the formation of a *military confederacy*, under the *leadership* of Mexico.[61]

It appears that in this, as in all other transactions of the same nature, mutual concessions had to be made. Thus, while the Tezcucans conceded the military command to the Mexicans, the latter had to admit into the confederacy that part of the Tecpanecas who, since the destruction of Azcaputzalco, recognized in Tlacopan (Tacuba) their chief pueblo. Through *tezcucan* influence it is even probable that the tribute heretofore paid to the Mexicans by that tribe, was relinquished by the former.[62]

The following seem to have been the leading features of the confederacy.

It consisted of the three tribes of Mexico, Tezcuco and Tlacopan. Each of these tribes was territorially independent; as well as in the management of its own affairs: from the two others.[63]

The military command of the forces belonged to the head-war-

[61] Durán (Cap. XIV, p. 124. Cap. XV, pp. 125–132), mentions a *sham* fight between the Mexicans and Tezcucans, ending in a confederacy. Acosta (Lib. VII, cap. XV, p. 490), confirms. Herrera (Dec. III, lib. II, cap. XIII, p. 64), speaks of a voluntary "submission" by the Tezcucans. Tezozomoc (Cap. XIX and XX), asserts that the Tezcucans were actually conquered by the Mexicans. On the other hand, Ixtlilxochitl ("Hist. des Chichim." Cap. XXXIV). Torquemada (Lib. II, cap. LVII, p. 175). Veytia (Lib. III, cap. V). Bustamante ("Tezcoco" Parte IIa, cap. V). affirm that a fight took place, in which the Mexicans were worsted, and after which the Tezcucan feudal "empire" was firmly established. The truth probably lies between the two extremes, and is recognized as such by Torquemada (Lib. II, cap. LVII, p. 175). Durán (Cap. XIV, p. 123), and finally expressed by Zurita ("Rapport," p. 11), as follows: "The sovereign of Mexico was superior to those of Tacuba and Tezcuco in matters touching warfare; in all others, their powers were equal, so that neither of them meddled with the government of the others." Herrera has adopted this view, copying almost textually (Dec. III, lib. IV, p. 133, of chapter XV).

[62] The only confession found in specifically Mexican authors on the subject of the Tecpanecas of Tlacopan is the quotation from Durán (Cap. XIV, p. 123). But Ixtlilxochitl ("Hist. des Chichim.," Cap. XXXII, pp. 218 and 220.) says: "It is plainly visible from this song that the three dynasties named were the principal ones of Mexico, and that the King of Tlacopan was regarded as equal to those of Mexico and Tezcuco.") Torquemada (Lib. II, cap. LVII, p. 175. Cap. XXXIX, p. 144). Veytia (Lib. III, cap. III). Clavigero (Lib. IV, caps. II and III), and Bustamante (Parte IIIa, cap. II, pp. 161, 162 and 163).— All are positive in affirming that the Tezcucans insisted upon having the Tecpanecas as a third member. The Mexican authors not contradicting, and impartial sources, like Zurita and Herrera,— establishing the fact of equality of power, and territorial autonomy (See note 61), we, therefore, feel justified in recognizing the fact as established.

[63] Alonzo de Zurita ("Rapport sur les différentes classes de chefs de la Nouvelle-Espagne," p. 11).

chief of the Mexican tribe, with power probably to delegate the same.[64]

Each of the three tribes elected its head war-chiefs according to its own customs; but the installation in office, *the investiture*, took place with the concurrence of the head-chiefs of the other tribes. This was especially the case in Mexico, where the "tlacatecuhtli" became commander-in-chief of the confederacy.[65]

Each tribe could carry on its own wars, defensive as well as offensive, independently; but if required, the others had to assist, in which case the Mexicans took the lead.[66]

Consequently, each tribe could have its *own conquests*, and levy its *own tribute* upon tribes which it had conquered *alone*.[67]

But wherever the *confederacy* had subjugated a foreign tribe, the spoils as well as all the subsequent tribute were divided among the three members as follows: Mexico and Tezcuco each two-fifths, and Tlacopan one-fifth.[68]

The establishment of this confederacy did not, in any manner whatever, alter the principles already recognized for the tenure and distribution of the soil. It only shows, and the subsequent career of the confederation further supports it, that these principles were common among the three tribes concerned. Wherever their conquests extended, the conquered were not annexed, but simply subjected to tribute, their territory and tribal autonomy were preserved, and no change introduced in the distribution of the soil beyond the reservation of tracts for the raising of tribute. Stewards, "calpixca," were the only representatives of the confederacy or of any of its members, residing permanently with the

[64] Zurita (p. 11). Herrera (Dec. III, lib. IV, cap. XV, p. 133).

[65] Mendieta (Lib. II, cap. XXXVII, p. 153). Torquemada (Lib. XI, cap. XXVI, p. 353). Durán (Cap. XXXII, p. 255; cap. XXXIX, p. 303; cap. XLI, p. 325; cap. LII, p. 409). Tezozomoc (Cap. XLI, p. 66; cap. LVI, p. 91; caps. LX and LXI, p. 100; cap. LXXXII, pp. 142 and 143). Ixtlilxochitl ("Hist. des Chichim.," Cap. I, pp. 2 and 3; cap. LX, p. 49; cap. LXX, p. 102). See also Veytia,— but especially Clavigero, who is very positive (Lib. IV, cap. III. "Besides, the two Kings (of Tezcuco and Tacuba), were honorary assistants to the election of the Mexican Kings. They had but to sanction the election . . . .")

[66] Zurita (p. 67). Herrera (Dec. III, lib. IV, cap. XV, p. 133). Torquemada (Lib. XIV, cap. VIII, pp. 546 and 547).

[67] Herrera (Dec. III, lib. IV, cap. XV, p. 133).

[68] Torquemada (Lib. II, cap. LVII, p. 175; cap. XXXIX, p. 144; lib. XIV, cap. VIII, pp. 546, 547 and 548). Zurita ("Rapport," p. 12). Ixtlilxochitl (Cap. XXXII, pp. 219 and 220). Veytia (Lib. III, cap. III, pp. 164 and 165). Bustamante ("Tezcoco, etc.," Parte II, cap. III, pp. 163 and 165). Clavigero (Lib. IV, cap. III).

tributaries.[69] In short, the same treatment to which the Tecpanecas had once submitted, at the hands of the Mexicans *alone*, was the one received by foreign tribes from the confederacy, from the time of its formation down to its overthrow by the Spaniards. All the conquests intervening did not therefore result in the formation of a *state* based upon feudal notions of territorial domain and vassalage, but simply in a conglomerate of scattered tribes often mutually inimical, who looked with terror to the valley of Mexico as the abode of their conquerors. Over these conquerors the Mexicans held military direction, and the name of Mexico, or its equivalent of "Culhua," was best known. As early as 1518, Juan de Grijalva heard it on the coast of Tabasco.[70] This wide diffusion of the *name*, coupled with the still more extensive spread of the language,[71] and the undisguised dread of the natives before that very name, has created in the minds of Europeans the picture of a Mexican nation, state, and feudal Empire; whereas there was nothing else but the military confederacy of the three leading Nahuatl tribes of the valley of Mexico.[72]

This rapid sketch of the history of the Mexicans, up to the time when they confederated with the tribes of Tezcuco and Tlacopan, has shown to us that in no case was the notion of public domain, of governmental lands, current among the tribes of Mexico. The tribe held no domain,—conquest of another tribe by it did not (as feudal conditions would imply) convert the conquered territory into an annex or dependency of the conqueror, as far as the possession of the soil was concerned. Finally, the confederacy itself, as such, did not even hold a territory of its own, still less did it claim possession of areas occupied by tributary tribes.

It remains now for us to revert again to the distribution of the

[69] Zurita ("Rapport, etc.," p. 67). "This kind of tribute or allegiance ("homagelige") was paid to officers established by the sovereigns of Mexico, of Tezcuco, or of Tacuba, etc., etc. . . . . The chief remaining sovereign, as before the wars, retained the civil and criminal jurisdiction over all their dominions" (Id. p. 66). Andrés de Tapia ("Relacion, etc." Col. de Documentos," vol. II, p. 579). "Art of War" (p. 100, note 17). Torquemada (Lib. XIV, cap. VIII, p. 547). Veytia (Lib. III, cap. VI, p. 197).

[70] "Itinerario de l'Armata del Re Catholico in India Verso la Isola de Iuchathan del Anno M.D. XVIII," in Col. de Docum, vol. I, p. 293, taken from Ramusio. Originally published (1522), in the "Itinerario de Varthema," an exceedingly rare book. Bernal-Diez ("Hist. verdadera." Vedia II, cap. XI, p. 10).

[71] Orozco y Berra ("Geografia de las Lenguas, etc.," Parte II, p. 83, and the splendid ethnographical chart).

[72] Zurita ("Rapport, etc.," p. 11. "The province of Mexico was subject to three principal chiefs, etc. etc. . . ."

soil, and to establish its customs at the time when the Europeans first trod the Mexican shore.

We readily distinguish several classes of lands, bearing each a different name, besides the "altepetlalli," or tribal territory or range. The latter was the widest circumscription for which the Nahuatl language had a term. (The word "Anahuac," which is often used, is utterly inapplicable, as we have elsewhere shown).[73] No other idea of tenure was connected with it, beyond that of *tribal occupation.*

Each of the numerous tribal areas, overrun by the confederacy (provided the natives were of a sedentary character), contained what we have ventured to call tribute-lots. The name given to these tracts was possibly "yaotlalli," but rather "milchimalli" ("lands of war," and "shield-lands").[74] As before said, the soil of these tracts was still held in original tenure by the kinships composing the conquered tribe, but the *crops* went towards the tribute. There is no indication about the size of these areas, and they were the only ones directly connected with the conquerors.

Of those tracts whose products were exclusively applied to the governmental needs of the pueblo or tribe itself (taken as an independent unit) there were, as we have already seen, two particular classes:

The first was the "tecpan-tlalli:"—land of the house of the community, whose crops were applied to the sustenance of such as employed themselves in the construction, ornamentation, and repairs of the public house. Of these there were sometimes several within the tribal area. They were tilled in common by special families who resided on them, using the crops in compensation for the work they performed on the official buildings.[75]

[73] Brasseur de Bourbourg ("Ruines de Palenqué," Cap. II, p. 32, and note 10) makes the very sensible remark that the name "Anahuac" did not at all apply to a "state" or "empire," etc., but in general to all countries situated in the neighborhood of considerable bodies of water;—such as lakes or large streams; or the shores of the sea.

[74] MSS. from Simancas "De l'ordre de succession observé par les Indiens relativement ā leurs Terres et āe leurs Territoires communaux," translated by Mr. Ternaux-Compans in "Recueil de Pièces," etc., pp. 223 and 224. Torquemada (Lib. XIV, cap. VII, p. 546). Clavigero (Lib. VII, cap. XIV. He includes them positively in the soil of the kinships, and treats them as communal lands, the produce of which furnished military supplies). "Yaotlalli" is improper (see "Art of War," p. 135, note 158), but "Milchimalli" is possible.

[75] From "tecpan," chief-house (Molina, Parte II, p. 95), and "tlalli," soil (Id. p. 124). Torquemada (Lib. XIV, cap. VII, p. 546). "There was another class of lands which belonged to the chief's income; and those who dwelt on them and cultivated them were

The second class was called "tlatoca-tlalli"—land of the speakers. Of these there was but one tract in each tribe, which was to be "four-hundred of their measures long on each side, each measure being equal to three Castilian rods."[76] The crops raised on such went exclusively to the requirements of the household at the "tecpan," comprising the head-chief and his family with the assistants.[77] The tract was worked in turn by the other members

called Tecpanpouhqui, or Tecpantlaca, which signifies: people of the palace and rente rs of the King. Such were held to keep in repair the royal palaces, clean the gardens, and to attend to the cleanliness and to the necessities of the royal palaces. They were regarded with much respect, as people most directly connected with the houses of the King. When the Lord sallied forth, they accompanied him, and they paid no other tribute but bouquets (Ramilletes," flower-bunches) and birds of all kind, which they offered to the King. Such lands descended from father to son, but they could not sell them, nor dispose of them in any way, and if one of them died without heirs, or left the place, his house and lands remained for those of his kin ("parcialidad") to put another in his place, according to the commands of the King, or of the Lord."—Herrera (Dec. III, lib. cap. XV, p. 135).—Veytia (Lib. III, cap. VI, p. 196). "Besides these each pueblo also had other kinds of lands called tecpantlalli, or lands of the palace or rentals of the chief, because its crops also went integrally towards the constructions and repairs of the palaces of the Kings, and towards other expenses aside from the sustenance. The people who cultivated them were also plebeians, but they were set apart for it in each place, and were called tecpanpuhque or tecplantlaca, that is, people pertaining to the palaces, and they could not work any other lands." Ixtlilxochitl ("Hist. des Chichimēques cap. XXXV, p. 242. "There were others known by the name of Tecpantlali, or lands which depend from the palaces of the Lords. The Indians tilling them were called tecpanpouhque, or people connected with the palaces of the Lords"). Bustamante ("Tezcoco," etc., Parte III, cap. V, pp. 233 and 234). Clavigero (Lib. VII, cap. XIV). "The ownership of the crownlands, called Tecpantlalli, remained in the King, but certain gentlemen called Tecpanpouhque or Tecpantlaca, *i.e.* people of the palace, had the enjoyment thereof. These paid no tribute but flowers and certain birds which they offered to the King in token of allegiance. But they were obligated to keep the royal palace in repair, or to construct new ones if needed; to tend to the royal gardens, and to care for the vassals in their district. It was their duty to attend court, to escort the King, if he appeared in public; and thus they were highly considered. If one of them died, his son succeeded in all his duties, but he lost his rights by removing from the place, in which case the King gave him the use of another tract, or left it to the community, in whose area the land lay, to assign to him another piece."

The above quotations show conclusively that the soil of the "tecpantlalli" was held and vested in the King, and only the crops went to certain official purposes. The occupants thereof were not serfs, since it is implied that they might remove at their pleasure, but, as any other members of a calpulli, in accordance with what we shall hereafter show, they lost by removal their right of use to that particular tract. They were properly the "official artisans."

[76] Ixtlilxochitl (Hist. des Chichim," cap. XXXV, p. 242). Vedia (Lib. III, cap. VI, p. 195). "This had to be four-hundred of their measures in square ('encuadro,' each side long); each one of these being equal to three castilian rods. . . ." See "Art of War" (p. 944, note 183). "The rod" (vara) is equal to 2.78209 feet English (Guyot).

[77] From "tlatoca" speakers, or "tlatoani" speaker, and "tlalli." Simancas M. S. S. on the customs of succession ("Recueil de Pièces, etc." p. 223). Herrera (Dec. III, lib. IV, cap. XVII, p. 138). "There were other kinds of lands that were attached to the lordship (office!), which they called of the lordship, and of these the Lords could not dispose, and rented them to whom they pleased, drawing much rent from them,

of the tribe, and it remained always public ground, reserved for the same purposes.[78]

Both of these kinds were often comprised in one, and it is even not improbable that the first one may have been but a variety of the general tribute-lands devoted to the benefit of the conquering confederates. Still, the evidence on this point is too indefinite to warrant such an assumption.

While the crops raised on the "tecpan-tlalli," as well as on the "tlatoca-tlalli," were consumed exclusively by the official houses and households of the tribe, the soil itself which produced these crops was neither claimed nor possessed by the chiefs themselves, or their descendants. It was simply, as far as its products were concerned, official soil.[79]

The establishing and maintaining of these areal subdivisions was very simple with the tribes of the mainland, since they all possessed ample territories for their wants and for the requirements of their organizations. *Their* soil formed a contiguous unit. It was not so, however, with the Mexicans proper. With all their industry in adding artificial sod to the patch on which

spending it in the house of the King.") Ixtlilxochitl (Ibid. cap. XXXV, p. 242. "In the best location of the territory there was set off a field, which held exactly four hundred measures in length and breadth. This was called Tlatocatlali or Tlatocamilli that is: land or plantation of the Lord, and also Itonal Yutlacal, or lands on which the inhabitants are compelled to work.") Oviedo (Lib. XXXIII, cap. II, p. 537). Veytia, (Lib. III, cap. VI, p. 195, confirms Ixtlilxochitl almost verbally, adding: "For the sowing and cultivation of these the calpixque, which was an officer of the community in each pueblo, daily designated those who had to attend to it, out of the plebeians and tributaries, and all the crops went to the Lord for the maintenance of his house ('casa' family)." Zurita does not use the term which we have adopted, because he is chiefly struck by the communal tenure, as exhibited in the "calpulalli." The fact of their being communal land, though set off for a special purpose, and *not owned* by the chiefs, is plain.

[78] Veytia (Lib. III, cap. VI, p. 195). It is superfluous to revert to the erroneous impression, that the chiefs might dispose of it.

[79] "Patrimonial Estates" are mentioned frequently, but the point is, where are they to be found. Neither the "tecpantlalli" nor the "tlatoca-tlalli," still less the "calpulalli," show any trace of individual ownership. "Eredad" (heirloom) is called indiscriminately "milli" and "cuemitl" (Molina Parte I*a*, p. 57). The latter is also rendered as "tierra labrada, ó camellon" (Molina, Parte II*a*. p. 26). It thus reminds us of the "chinamitl" or garden-bed (as the name "camellon" also implies), and reduces it to the proportion of an ordinary cultivated lot among the others contained within the area of the calpulli. It is also called "tlalli," but that is the general name for soil or ground. "Tierras o eredades de particulares, juntas en alguna vega," is called "tlalmilli." This decomposes into "tlalli" soil, and "milli." But "vega" signifies a fertile tract or field, and thus we have again the conception of communal lands, divided into lots improved by particular families, as the idea of communal tenure necessarily implies.

they had originally settled, the solid surface was eventually much too small for their numbers, and they themselves put an efficient stop to further growth thereof by converting, as we have seen elsewhere, for the purpose of defence, their marshy surroundings into water-sheets, through the construction of extensive causeways.[80] While the remnants of the original "tecpantlalli" and of the "tlatocatlalli" still remained visible in the gardens, represented to us as purely ornamental, which dotted the pueblo of Mexico,[81] the substantial elements wherewith to fulfil a purpose for which they were no longer adequate had, in course of time, to be drawn from the mainland. But it was not feasible, from the nature of tribal condition, to extend thither by colonization. The soil was held there by other tribes, whom the Mexicans might well overpower and render tributary, but whom they could not incorporate, since the kinships composing these tribes could not be fused with their own. Outposts, however, were established on the shores, at the outlets of the dykes, at Tepeyacac on the north, at Iztapalapan, Mexicaltzinco, and at Huitzilopochco to the south, but these were only military positions, and beyond them the territory proper of the Mexicans never extended.[82] *Tribute*, therefore, had to furnish the means for sustaining their governmental requirements in the matter of food, and the *tribute lands* had to be distributed and divided, so as to correspond minutely to the details of their home organization. For this reason we see, after the overthrow of the Tecpanecas, lands assigned apparently to the head war-chiefs, to the military chiefs of the quarters, "from which to derive some revenue, for their maintenance and that of their children."[83] These

[80] "Art of War" (pp. 150 and 151). L. H. Morgan ("Ancient Society," Part II, cap. VII, pp. 190 and 191).

[81] Humboldt ("Essai politique sur la Nouvelle Espagne," vol. II, lib. III, cap. VIII, p. 50). Nearly all the old authors describe the public buildings as surrounded by pleasure-grounds, or ornamental gardens. It is very striking that, the pueblo having been founded in 1325, and nearly a century having been spent in adding sufficient artificial sod to the originally small solid expanse settled,—the Mexicans could have been ready so soon to establish purely decorative parks within an area, every inch of which was valuable to them for subsistence alone!

[82] The Mexican tribe proper clustered exclusively within the pueblo of Tenuchtitlan. The settlements at Iztapalapan, Huitzilopochco and Mexicaltzinco were but military stations—outworks, guarding the issues of the causeways to the South. Tepeyacac (Guadalupe Hidalgo) was a similar position,—unimportant as to population,—in the North. Chapultepec was a sacred spot, not inhabited by any number of people, and only held by the Mexicans for burial purposes, and on account of the springs furnishing fresh water to their pueblo.

[83] Tezozomoc (Cap. XV, p. 24). See note 57.

tracts were but "official tracts," and they were apart from those reserved for the special use of the kinships. The latter may have furnished that *general* tribute which, although given nominally to the head war-chief still was, "for all the Mexicans in common."[84]

The various classes of lands which we have mentioned were, as far as their tenure is concerned, included in the "calpulalli" or lands of the kinships. Since the kin, or "calpulli," was the unit of governmental organization, it also was the unit of *landed tenure.* Clavigero says: "The lands called altepetlalli, that is: those who belonged to the communities of the towns and villages, were divided into as many parts as there were quarters in a town, and each quarter held its own for itself, and without the least connection with the rest. Such lands could in no manner be alienated."[85] These "quarters" were the "Calpulli," hence it follows *that the consanguine groups* held the "altepetlalli" or *Soil of the tribe.*[86]

We have, therefore, in Mexico, the identical mode of tenure of lands, which Polo de Ondogardo had noted in Peru and reported to the king of Spain as follows: ". . . . . although the crops and other produce of these lands were devoted to the tribute, the land itself belonged to the people themselves. Hence a thing will be apparent which has not hitherto been properly understood. When any one wants land, it is considered sufficient if it can be shown that it belonged to the Inca or to the sun. But in this the Indians are treated with great injustice. For in those days they paid the tribute, and *the land was theirs.* . . . . . ."[87]

The expanse held and occupied by the calpulli, and therefore called calpulalli," was possessed by the kin in *joint* tenure.[88] It

[84] Tezozomoc (Cap. X, p. 18). Zurita ("Rapport, etc.," p. 227). Herrera (Dec. III, lib. IV, cap. XVII, p. 138. "i no era en mano del Señor disponer de estos Tributos á su voluntad, porque se alteraba la Gente, i los Principales." This refers specially to the tribute by quarters "barrios.")

[85] Storia del Messico" (Lib. VII, cap. XIV).

[86] Ixtlilxochitl ("Histoire des Chichim.," Cap. XXXV, p. 242). Torquemada (Lib. XIV, cap. VII, p. 545).

[87] "Narratives of the Rites and Laws of the Yncas, translated from the original Spanish manuscripts, and edited by Clement R. Markham." Publication of the "Hackluyt Society," 1873. "Report of Polo de Ondegardo" who was "Regidor" of Cuzco, in 1560; and a very important authority (See Prescott, "History of the Conquest of Peru," note to Book I, cap. V). Confirmed by Garcia ("El Origen de los Indios," Lib. IV, cap. XVI, p. 162).

[88] Zurita ("Rapport, etc., etc., p. 50). "The chiefs of the second class are yet called Calpullec in the singular and Chinancallec in the plural. (This is evidently incorrect, since the words "Calpulli" and "Chinancalli" can easily be distinguished from each other. "Chinancalli," however, after Molina means "cercado de seto" (Parte IIa, p.

could neither be alienated nor sold; in fact, there is no trace of barter or sale of land, previous to the conquest.[89] If, however, any calpulli weakened, through loss of numbers from any cause whatever, it might farm out its area to another similar group, deriving subsistence from the rent.[90] If the kinship died out, and its lands therefore became vacant, then they were either added to those of another whose share was not adequate for its wants, or they were distributed among all the remaining calpulli.[91] The calpulli was

21), or an enclosed area, and if we connect it with the old original "chinamitl" we are forcibly carried back to the early times, when the Mexicans but dwelt on a few flakes of more or less solid ground. This is an additional evidence in favor of the views we have taken, of the growth of landed tenure among the Mexican tribe. We must never forget, that the term is "Nahuatl" and as such recognized by all the other tribes, outside of the Mexicans proper. The interpretation as "family" in the QQuiché tongue of Guatemala, which we have already mentioned, turns up here as of further importance), th. is chiefs of an old race or family, from the word Calpulli or Chinancalli, which is the same, and signifies a quarter (barrio), inhabited by a family known, or of old origin, which possesses since long time, a territory whose limits are known, and whose members are of the same lineage." "The calpullis, families or quarters, are very common in each province. Among the lands which were given to the chiefs of the second class, there were also calpullis. These lands are the property of the people in general ("de la masse du peuple") from the time the Indians reached this land. Each family or tribe received a portion of the soil for perpetual enjoyment. They also had the name of calpulli, and until now this property has been respected. They do not belong to each inhabitant of the village in particular, but to the calpulli, which possesses them in common." Don Ramirez de Fuenleal, letter dated Mexico, 3 Nov. 1532 ("Recueil de pièces, etc., Ternaux-Compans, p. 253). "There are very few people in the villages which have lands of their own . . . . the lands are held in common and cultivated in common." Herrera (Dec. III. lib. IV, cap. XV, p. 135) confirms, in a condensed form, the statements of Zurita: "and they are not private lands of each one, but held in common." Torquemada (Lib. XIV, cap. VII, p. 545). Veytia (Lib. III, cap, VI, p. 196). "Finally there were other tracts of lands in each tribe, called calpulalli, which is, land of the calpules (barrios), which also were worked in common." Oviedo (Lib. XXXII, cap. LI, pp. 536 and 537). Clavigero (Lib. VII, cap. XIV). Bustamante ("Tezcoco, etc.," Parte III*a*. cap. V, p. 232).

[89] Zurita (p. 52). "He who obtained them from the sovereign has not the right to dispose of them." Herrera (Dec. III, lib. IV, cap. XV, p. 135), "he who possessed them, could not alienate them, although he enjoyed their use for his lifetime." Torquemada (Lib. XIV, cap. VII, p. 545). Disputes about lands are frequently mentioned but they refer to the enjoyment and possession, and not the transfer of the land. Baron Humboldt ("Vues des Cordillères et monuments indigènes des peuples de l' Amérique," Vol. I, Tab. V), reproduces a Mexican painting representing a litigation about land. But this painting was made subsequent to the conquest, as the fact that the parties contending are Indians and Spaniards sufficiently asserts. Occasional mention is made that certain lands "could be sold." All such tracts, however, like the "pillali" have been shown by us to be held in communal tenure of the soil, their *enjoyment* alone being given to individuals and their families.

[90] Zurita (p. 93). "In case of need it was permitted to farm out the lands of a calpulli to the inhabitants of another quarter." Herrera (Dec. III, Lib. IV, cap. XV, p. 134). "They could be rented out to another lineage."

[91] Zurita (p. 52). "When a family dies out, its lands revert to the calpulli, and the chief distributes them among such members of the quarter as are most in need of it."

a democratic organization. Its business lay in the hands of elective chiefs:—"old men," promoted to that dignity, as we intend to prove in a subsequent paper, for their merits and experience, and after severe religious ordeals. These chiefs formed the council of the kin or quarter, but their authority was not absolute since on all important occasions a general meeting of the kindred was convened.[92] The council in turn selected an executive, the "calpullec" or "chinancallec" who, in war, officiated as "achcacauhtin" or "teachcauhtin" (elder brother).[93]—This office was for life or during good behavior.[94] It was one of his duties to keep a reckoning of the soil of the calpulli, or "calpulalli," together with a record of its members, and of the areas assigned to each family,—and to note also whatever changes occurred in their distribution.[95] Such changes, if unimportant, might be made by him;

[92] Zurita (pp. 60, 61, 62). Ramirez de Fuenleal ("Letter, etc." Ternaux-Compans, p. 249).

[93] Zurita (p. 60). "The calpulli have a chief taken necessarily from among the tribe, he must be one of the principal inhabitants, an able man who can assist and defend the people. The election takes place among them. . . . The office of this chief is not hereditary; when any one dies, they elect in his place the most respected old man. . . . If the deceased has left a son who is able the choice falls upon him, and a relative of the former incumbent is always preferred" (Id. pp. 50 and 222). Simancas M. S. S. ("De l'ordre de succession, etc.;" "Recueil," p. 225). "As to the mode of regulating the jurisdiction and election of the alcaldes and regidors of the villages, they nominated men of note who had the title of achcacaulitin. . . . . There were no other elections of officers. . . ." "Art of War, etc." (pp. 119 and 120).

[94] Zurita (pp. 60 and 61). Herrera (Dec. III, Lib. IV, cap. XV, cap. 125). "I le elegian entre si y tenian por maior."

[95] Zurita (pp. 61 and 62). "This chief has charge of the lands of the calpulli. It is his duty to defend their possession. He keeps paintings showing the tracts, the names of their holders, the situation, the limits, the number of men tilling them, the wealth of private individuals, the designations of such as are vacant, of others that belong to the Spaniards, the date of donation, to whom and by whom they were given. These paintings he constantly renews, according to the changes occurring, and in this they are very skilful." It is singular that Motolinia, in his "Epistola proémial" ("Col. de Doc.:" Icazbalceta, Vol. I, p. 5), among the five "books of paintings" which he says the Mexicans had, makes no mention of the above. Neither does he notice it in his letter dated Cholula 27 Aug., 1554 ("Recueil de pièces, etc.," Ternaux-Compans). Sahagun (Lib. VIII, cap. XV, p. 304) says, "porque primeramente demandaban la pintura en que estaban escritas ó pintadas las causas, como haziendas, casas, ó maizales" (Id. cap. XXV, p. 314). This tends to prove the existence of such paintings. Mendieta (Lib. II, cap. XXVII, p. 135). Torquemada (Lib. XIV, cap. VIII, p. 546), "and in order to prevent any confusion in these lands they painted them on long strips ("lienzos") in the following manner. The lands of the calpules light yellow, those of the principals flesh-red, and the lands of the Kings income of a fiery red color,—so that, on opening one of these rolls, the entire pueblo, its limits and outlines could be seen at a glance." This is another confirmation of our views about the distribution of the soil, and the fact that the two latter classes had but different shades of red, is somewhat significant. See Clavigero (Lib. VII, cap. XIV), who confirms. The explanation of Zurita covers the whole ground, however, and explains both of the last statements.

more important ones, or contested cases, had to be referred to the council of the kinship, which in turn often appealed to a gathering of the entire quarter.[96]

The "calpulalli" was divided into lots or arable beds, "tlalmilli."[97] These were assigned each to one of the married males of the kinship, to be worked by him for his use and that of his family. If one of these lots remained unimproved for the term of two consecutive years, it fell back to the quarter for redistribution. The same occurred if the family enjoying its possession removed from the calpulli. But it does not appear that the cultivation had always to be performed by the holders of the tract themselves. The fact of improvement under the *name* of a certain tenant was only required, to insure this tenant's rights.[98]

Therefore the chiefs and their families, although they could not, from the nature of their duties, till the land themselves, still could remain entitled to their share of "tlalmilpa," as members of the calpulli. Such tracts were cultivated by others for their use. They were called by the specific name of "pillali" (lands of the chiefs or of the children, from "piltontli" boy, or "piltzintli,"

[96] Zurita ("Rapport, etc.," pp. 56 and 62). We quote him in preference, since no other author, known to us, has been so detailed.

[97] "tlalmilli" "tierras, á heredades de particulares, que estan juntas en alguna vega" (Molina, Part II*a*, p. 124).

[98] Each family, represented by its male head, obtained a certain tract or lot for cultivation and use, Zurita (p. 55). "The party (member of the calpulli, because no member of another one, had the right to settle within the area of it. See Id. p. 53), who has no lands, applies to the chief of the calpulli who, upon the advice of the other old men, assigns to him such as correspond to his ability and wants. These lands go to his heirs . . . . ." Id. (p. 56.) "The proprietor who did not cultivate during two years, either through his own fault or through negligence, without just cause . . . . . he was called upon to improve them, and if he failed to do so, they were given to another the following year." Bustamante ("Tezcoco, etc.," Parte II*a*, p. 190, cap. I). The fact, that any holder of a "tlalmilli" might *rent* out his share, if he himself was occupied in a line precluding him from actual work on it, results from the lands of the "calpulli" being represented alternately treated as communal, and again as private lands. Besides, it is said of the traders who, from the nature of their occupation, were mostly absent, that they were also members and participants of a "calpulli" (Zurita, p. 223. Sahagun Lib. VIII, cap. III, p. 349). Now, as every Mexican belonged to a kinship, which held lands after the plan exposed above, it follows that such as were not able to work themselves, on account of their performing other duties subservient to the interests of the community, still preserved their tracts by having others to work them for their benefit. It was not the right of tenancy which authorizes the improvement, but the fact of improvement for a certain purpose and benefit, which secured the possession or tenancy.

child),[99] and those who cultivated them carried the appellation of "tlalmaitl"—hands of the soil.[100]

The "tlalmilpa," whether held by chiefs or by ordinary members of the kin ("macehuales") were, therefore, the only tracts of land possessed for use by individuals in ancient Mexico. They were so far distinguished from the "tecpantlalli" and "tlatocatlalli" in their mode of tenure as, whereas the latter two were dependent

[99] It is just the "pillali" which oppose the greatest difficulties to this investigation, and to a clear conception of the mode of tenure of lands in ancient Mexico. They are generally represented (whenever mentioned), as private domains of the chiefs. Torquemada (Lib. XIV, pp. 545 and 546), distinguishes two kinds of "pillali." The first one he says might be sold.—but he places the restriction upon them, that such as held lands through conquest ("sujecion") or through gift ("merced") of the chief, had to go to the descendants, as majorat; and if they died without heirs, the King, or Lord became such, and they were incorporated into his royal Estates." The other kind was not transmissible at all. Clavigero (Lib. XVII, cap. XIV). We notice here a confusion between official tracts and such lots of the "calpulli" as pertained to the chief's family in consequence of their membership of the Kin. Also between "tribute-lots" and the official tracts, of conquered tribes. Torquemada acknowledges, that the "pillali," upon the death of the family, were incorporated in the calpulli to which that family belonged, "in order that they might pay tribute." This ought to define their true position and nature.

[100] From "tlalli" soil, and "maitl" hand. Hands of the soil. Molina (Parte II*a*, p. 124), has: "tlalmaitl"—"labrador, ò gañan." This name is given in distinction of the "macehuales" or people working the soil in general. The tlalmàites are identical with the "mayeques." See Zurita (p. 224), "tlalmaites or mayeques, which signifies tillers of the soil of others . . . ." He distinguishes them plainly from the "teccallec" which are the "tecpanpouhque" or "tecpantlaca" formerly mentioned as attending to a class of official lands (p. 221, Zurita). Herrera (Dec. III, lib. IV, cap. XVII, p. 138). "These mayeques could not go from one tract to another, neither leave those which they cultivated, and they paid a rent to its masters according as they agreed upon ("en lo que se concertaban") in what they raised. They paid tribute to nobody else but the master of the land." This tends to show that there existed, not an established obligation, a serfdom, but a voluntary contract, that the "tlalmaites" were not serfs, but simply renters. Torquemada (Lib. XIV, cap. VII, p. 515), " . . . . those that were knights ("caballeros") and descendants of the families of the Kings, and Lords, had their particular lands and their rentals, where many of them held renters ("terrazgueros") which served them, tilled the crops and served them in their houses. These lands were called pillali or "land of nobles and knights." We prefer the etymology "piltontli" "niño ò niña, muchacho ó muchacha" (Molina, II, p. 82), or "piltzintli" niño ó niña" therefore lands of the children,—to the derivation from "pilli." The title of chief was "tecuhtli," and the word "pilli" substituted for it is certainly but in connection with the occupation of a particular place of office, and not a title itself. Bustamante ("Tezcoco, etc.," p, 330. "The sovereigns as well as the inferior Lords and other principals had their own patrimonial estates, and in them their mayeques or Tlalmayes, what these gave of rent were tributes of the Lord," Id. pp. 233 and 234).

The "tlalmaites" appear to have been free from other tributes, and free from communal labor outside of the "pillali" (Bustamante, p. 233. Herrera, Dec. III, lib. IV, cap. XVII, p. 138). It is not very clear, however, whether this applies simply to the conquering tribe alone, or also to the tlalmaites of conquered tribes, as towards the tribute due by that tribe to their conquerors. The detailed relations between the two are yet somewhat obscure and confuse in some points.

from a certain office, the incumbent of which changed at each election, the "tlalmilli" was assigned to a certain family, and its possession, therefore, connected with *customs* of *inheritance*.[101]

Being thus led to investigate the customs of Inheritance of the ancient Mexicans, we have to premise here, that the personal effects of a deceased can be but slightly considered. The rule was in general, that whatever a man held, descended to his offspring.[102] Among most of the northern Indians a larger cluster participated.[103] In conformity with the organization of Society based upon kin, when in the first stage of its development, the kindred group inherited, and the common ancestor of this kin being considered a female, it follows that if a man died, not his children, still less his wife, but his mother's descendants, that is: his brothers, sisters, in fact the entire consanguine relationship from which he derived on his mother's side, were his heirs.[104] Such may have been the case even among the Muysca of New-

[101] Ramirez de Fuenleal ("Letter," see "Recueil. etc.," p. 253). "De l' ordre de succession, etc., etc." Simancas MSS. (Id. p. 224). Herrera (Dec. III. lib. IV, cap. XVII, p. 138). Torquemada (Lib. XIV, cap. VII, p. 545). Clavigero (Lib. VII, cap. XIV). These authors mention only the "pillali," but Motolinia (Trat. II, cap. V, pp. 120 and 121), and Gomara (Vedia I, p. 434), apply it in general, and the latter is even very positive about the tributaries ("los pecheros.") Also Zurita (p. 56), although contradictory on p. 51).

[102] Motolinia (Tratado II, cap. V, p. 120). "but they left their houses and lands to their children . . ." Gomara (p. 434). "Es costumbre de pecheros que el hijo mayor herede al padre en toda la hacienda raiz y mueble, y que tenga y mantenga todos los hermanos y sobrinos, con tal que hagan ellos lo que el les mandare." Clavigero (Lib. VII, cap. XIII). "In Mexico and nearly the entire realm, the royal family excepted as already told, the sons succeeded to the father's rights,—and if there were no sons, then the brothers, and the brothers sons inherited." Bustamante ("Tezcoco, etc.," p. 219). In all these cases, Bustamante only speaks of chiefs; but the quotations from Motolinia and Gomara directly apply to the people in general.

[103] Mr. L. H. Morgan has investigated the customs of inheritance, not only among the northern Indians, but also among the pueblo Indians of New Mexico. He establishes the fact, that the "kinship" or "Gens," which we may justly consider as the unit of organization in American Aboriginal Society, participated in the property of the deceased. He proves it among the Iroquois ("Ancient Society," Part II, cap. II, pp. 75 and 76). Wyandottes, Id. cap. VII, p. 153. Missouri-tribes, p. 155. Winnebagoes, p. 157. Mandans, p. 158. Minnitarees, p. 159. Creeks, p. 161. Choctas, p. 162. Chickasas, p. 163. Ojibwas, p. 167; also Potowattomies and Crees, Miamis, p. 168. Shawnees, p. 169. Sauks, Foxes and Menominies, p. 170. Delawares, p. 172. Munsees and Mohegans, p. 173. Finally, the pueblo Indians of New Mexico are shown to have, if not the identical at least a similar mode of inheritance. It would be easy to secure further evidence, from South America also.

[104] "Ancient Society" (Part II, cap. II, p. 75. Part IV, cap. I, pp. 528, 530, 531, 536 and 537).

Granada.[105] It was different, however, in Mexico, where we meet with traces of a decided progress. Not only had descent been changed to the male line,[106] but heirship was limited, to the exclusion of the kin and of the agnates themselves, to the children of the male sex.[107] Whatever personal effects a father left, which were not offered up in sacrifice at the ceremonies of his funeral,[108] they were distributed among his male offsprings, and if there were none, they went to his brothers. Females held nothing whatever, beyond their wearing apparel and some few ornaments for personal use.

The "tlalmilli" itself, at the demise of a father, went to his oldest son, with the obligation to improve it for the benefit of the entire family until the other children had been disposed of by marriage.[109] But the other males could apply to the chief of the calpulli for a "tlalmilli" of their own:[110] the females went with

[105] Gomara ("Historia de las Indias," Vedia I, p. 201). Garcia ("Origen de los Indios," Lib. IV, cap. 23, p. 247). Piedrahita (Parte 1, lib. I, cap. 5, p. 27). Joaquin Acosta ("Compendio historico del Descubrimients y Colonisazion de la Nueva-Granada," Cap. XI, p. 201). Ternaux-Compans ("L'ancien Cundinamarca," pp. 21 and 38).

[106] Motolinia (Trat. II, cap. V, p. 120). Gomara (p. 434). Clavigero (Lib. VII, cap. XIII). Zurita (pp. 12 and 43).

[107] Letter of Motolinia and Diego d'Olarte, to Don Luis de Velasco, Cholula, 27 Aug., 1554 ("Recueil, etc., etc.," p. 407). "The daughters did not inherit, it was the principal, wife's son . . . ." Besides, nearly every author designates but a son, or sons,—as the heirs. There is no mention made of daughters at all. In Tlaxcallan, it is also expressly mentioned that the daughters did not inherit (Torquemada, Lib. XI, cap. XXII, p. 348). In general, the position of woman in ancient Mexico was a very inferior one, and but little above that which it occupies among Indians in general. (Compare the description of Gomara, p. 440. Vedia I, with those of Sahagun. Lib. X, cap. I, p. 1; cap. XIII, pp. 30, 31, 32 and 33. The fact is generally conceded). H. H. Bancroft, "Native Races." Vol. II. Cap. VI, p. 224, etc.

[108] Motolinia (Trat. II, cap. V, p. 120). Torquemada (Lib. XIII, cap. XLII to XLVIII, pp. 515 to 529). Acosta (Lib. V, cap. VIII, pp. 320, 321 and 322). Gomara (pp. 436 and 437. Vedia, I). Mendieta (Lib. II, cap. XL. pp. 162 and 163). Clavigero (Lib. VI, cap. XXXIX. "They burnt the clothes, arrows, and a portion of the household utensils . . . . .")

[109] Motolinia (Trat. II, cap. V, p. 120), "el cual hacer de testamento no se acostumbraba en esta tierra, sino que dejaban las casas y heredades á sus hijos, y el mayor, siera hombre, lo poseia y tenia cuidado de sus hermanos y hermanas, y yendo los hermanos creciendo y casándose, el hermano mayor partia con ellos segun tenia; y si los hijos eran por casar, entrábanse en la hacienda los mismos hermanos, digo en las heredades, y de ellas mantenian á sus sobrinos y de la otra hacienda." Gomara ("Conq. de Mèjico," p. 434). "It is customary among tributary classes that the oldest son shall inherit the father's property, real and personal, and shall maintain and support all the brothers and nephews, provided they do what he commands them. The reason why they do not partition the estates is in order not to decrease it through such a partition . . . . ." Simancas M. S. S ("Recueil, etc., etc.," p. 224). "Relative to the calpulalli . . . . the sons mostly inherited."

[110] Zurita (p. 55). "He who has no land applies to the chief of the tribe (calpulli), who, upon the advice of the other old men, assigns to him a tract suitable for his wants, and corresponding to his abilities and to his strength." Herrera (Dec. III, lib. IV, cap. XV, p. 135).

their husbands. Single-blessedness, among the Mexicans, appears to have occurred only in case of religious vows, and in which case they fell back for subsistence, upon the part allotted to worship, or in case of great infirmities, for which the calpulli provided.[111] No mention is made of the widow participating in the products of the "tlalmilli," still it is presumable that she was one of those whom the oldest son had to support. There are indications that the widow could remarry, in which case her husband, of course, provided for her.[112]

The customs of Inheritance, as above reported, were the same with chiefs as well as with the ordinary members of the tribe. Of the personal effects very little remained since, the higher the office was which the deceased had held, the more display was made at his cremation, and consequently the more of his dresses, weapons and ornaments, were burnt with the body.[113] Of lands, the chiefs only held each their "tlalmilli" in the usual way, as members of their kin, whereas the other "official" lots went to the new incumbents of the offices. It should always be borne in mind, that none of these offices were hereditary themselves. Still, a certain "right of succession" is generally admitted as having existed. Thus, with the Tezcucans, the office of head war-chief might pass from father to son,[114] at Mexico from brother to brother, and from uncle to nephew.[115] This might, eventually, have tended to *perpetuate* the

[111] Such unmarried females were the "nuns" frequently mentioned by the old writers. We shall have occasion to investigate the point in our paper on "the ancient Mexican priesthood." As attendants to worship, they participated in the tributes furnished towards it by each calpulli, of which we have spoken.

[112] Oviedo ("Hist. gen. y nat. de Indias," Lib. XXXIII, cap. LIV. pp. 547–533), reports a conversation with Don Juan Cano, held at San Domingo, 8 of Sept., 1514, in which the said Cano asserts that he married Montezuma's daughter, widow of Quauhtemotzin. There is an indefinite report that, when she married Quauhtemotzin, she was already the widow of Cuitlahuatzin. Intermarriage of widowers and widows took place in Yucatan, but without any ceremony. See Landa, "Relacion de las cosas de Yucatan." Paris, 1865, by Mr. Brasseur de Bourbourg, p. 142, §XXV.

[113] See note No. 108, the same quotations apply to this case. Besides, we refer to the numerous descriptions of funeral rites, or rather cremations, contained, for instance, in Durán, Tezozomoc, Ixtlilxochitl, Veytia, and in Bustamantes "Tezcoco en los Ultimos Tiempos, etc." Also to the cremation of the head chief of Michhuacan, as related by Mendieta (Lib. II, cap. XLI, pp. 164–167). We abstain from special quotations, the subject being amply discussed in all the authors just mentioned.

[114] Zurita (p. 12). Gomara (Vedia I, p. 434). Torquemada (Lib. IX, cap. IV, p. 177. Lib. XI, cap. 27, p. 356, etc. etc.).

[115] This fact is too amply proven to need special references. We reserve it for final discussion in our proposed paper on the chiefs of the Mexicans, and the duties, powers and functions of their office.

office in the *family*, and with it also the possession of certain lands, attached to that officer's functions and duties. But it is quite certain too that this stage of development had not yet been reached by any of the tribes of Mexico at the time of its conquest by the Spaniards. The principal idea had not yet been developed, namely, that of the *domain*, which, in eastern countries at least, gradually segregated into individually hereditary tenures and ownerships.

There was consequently, at the time when the Spaniards first came into contact with the Mexican aborigines, no established feudal system among the Indians of Mexico. Based exclusively upon kin, aboriginal society then presented to the first Europeans who witnessed it a strange and partly dazzling, partly repulsive; at all events a bewildering, aspect. It is not devoid of interest, and it is even important for us to consider what were the effects of this contact of a people imbued with the principles of medieval feudality with tribes still adhering to far more primitive ideas, upon the latter's mode of tenure and distribution of their lands.

The ostensible basis, on which the Spaniards established a claim to any parts of America whatever, is expressed in the Bull of Pope Alexander VI, executed at Rome on the fourth day of May, 1493. By this act of the Holy See the kings of Spain (Ferdinand and Isabella), in consideration of their devotion to the Catholic religion, and of their zeal in propagating the Christian faith even over the remotest parts of the earth's surface, are made and created absolute possessors, for themselves, their heirs and successors, of all the lands already discovered and still to discover by them or their agents in the new world. The conditions accompanying this grant were that they "manage to send to the said mainlands and islands good men, fearing God, learned, well taught and expert, for to instruct their aforesaid inhabitants and natives in the Catholic faith, and to teach them good manners, with all due diligence."[116] This title, although it partakes of the nature of a

[116] Martin Fernandez de Navarrete ("Coleccion de los Viages y Descubrimientos que hicieron por mar los Españoles desde Fines del Siglo XV," Madrid, 1825. Tom. IIo, pp. 29–35). "Et insupre mandamus vobis in virtute sanctae obedintie, est (sicut pollicemini et non dubitamus pro vestra maxima devotione et Regia magnanimitate vos esse facturos) ad terras firmas et insulas praedictas viros probos, et Deum timentes, doctos, peritos et expertos ad instruendam incolas et habitatores praefatos in Fide Catholica, et in bonis moribus imbumdam destinare debeatis, omnum debitam diligentiam in praemisis adhibentes." Mendieta ("Hist. Eccles. Ind.," Lib. I, cap. III, pp. 20 and 22). Herrera (Dec. I, lib. II, cap. IV, p. 41). Gomara ("Historia de las Indias," Vedia I, pp. 168 and 169). Oviedo (Lib. II, cap. VIII).

fief, still virtually created,—what his subsequently became in Spanish America,—a *domain* of the Spanish crown. Armed with it, and fully convinced of its validity,[117] the Spaniards regarded at once the soil of Mexico as their king's own, and therefore claimed the right as his agents, to dispose of it through distribution according to their home-laws and customs. But, instead of proclaiming this title at once after the landing, as was done on many other points of the American coast,[118] Cortés found it advisable to delay such a formal declaration until after he had, by his own inspection, satisfied himself of the proper ways and means to secure possession. He quickly found out the disconnected state of the country, although he attributed it to causes which were not really existing,[119] and it is well known how he improved it for his plans. He therefore treated secretly, as much as possible, with members of tribes subjected (or rather tributary) to the Mexicans and their confederates,[120] and in consideration of their espousing the Spanish cause, he promised them sundry favors.[121] The oldest document issued by Europeans on Mexican soil embodies such a negotiation with chiefs of the tribes of Axapusco and Tepeyahualco, both pueblos being situated within the valley of Mexico itself.[122] It promises

[117] Herrera (Dec. I, lib. II, cap. IV, p. 41). Oviedo (Lib. II, cap. VIII, pp. 31 and 32). Gomara (Vedia I, p. 168). Mendieta (Lib. I, cap. III, pp. 18–20), and many others. All these authorities can be summed up in Robertson's classical words: "The Pope, as vicar and representative of Jesus Christ, was supposed to have a right of dominion over all the kingdoms of the earth" ("History of America," 9th Edition, 1800. Vol. I, Book II, p. 159). It appears that already Grijalva had, in 1518, taken possession formally of the Mexican coast. (Oviedo, Lib. XVII, cap. XV, p. 525)

[118] Herrera (Dec. I, lib. VII, cap. XIV, pp. 197 and 198). Robertson (Vol. I, Book III, p. 271; also note XXIII, p. 378).

[119] Cortés supposed a Mexican state or empire and his measures were taken in consequence. ("Carta Segunda," Vedia I, p. 12). Gomara ("Conq. de Mèjico," p. 313). Bernal-Diez del Castillo ("Hist. verd. de la conq. de N. España," Vedia II, pp. 32 and 33). Oviedo (Lib. XXXIII, cap. II, p. 261). Torquemada (Lib. IV, cap. XVI, pp. 386 and 387), etc. etc.

[120] Cortés ("Carta Segunda," Vedia I, pp. 13 and 15). Bernal-Diez (Vedia II, cap. XLI, p. 36). Oviedo (Lib. XXXIII, cap. II, p. 261). Andrés de Tapía ("Col. de Documentos," of Icazbalceta, Vol. II, pp. 561 and 562). Gomara ("Conq. de Méjico," Vedia, I, p. 320). But the main evidence is furnished by the document published by Icazbalceta in his second volume of the "Coleccion de Documentos para la Historia de Mexico," in the 2d volume, and entitled: "Real Ejecutoria de S. M. Sobre Tierras y Reservas de Pechos y Paga, perteneciente á los Caciques de Axapusco, de la jurisdiccion de Otumba" (pp. 5, 6, 7, 8 and 9).

[121] "Real Ejecutoria" (Col. de doc. II, p. 7). Gomara (Vedia I, p. 320). Clavigero (Lib. VIII, cap. XI).

[122] The pueblos of Axapusco and Tepeyahualco are situated along the road leading from the city of Mexico to Tullanzinco, in the state of Mexico proper, northwest of San Juan de Teotihuacan. As the Document to which we have already referred im-

to those chiefs lands of their own. The grantees had no conception of the true import of what they accepted, neither did Cortés conceive the nature of *their* ideas. It was the object of the Indians

plies, they were under Spanish rule included in the jurisdiction of Otumba. This document itself requires particular attention. It has been published by Sr. Icazbalceta in the second volume of his documentary collections, and its authenticity has been carefully examined—and, we think, successfully proven—by Sr. José F. Ramirez. Its history is not devoid of interest, and we record it here, partly from the document itself, and partly from the introduction and notes by the late Sr. Ramirez.

On the 9th day of March, 1617, there appeared before the viceroy of New Spain (Marques of Guadalcazar), Leonardo de Salazar "in the name of the governor, alcalde and fiscals" of the pueblo of San Esteban Axapusco and Santiago Tepeyahualco, "of the jurisdiction of Otumba," praying for a confirmation in writing by the viceroy, of a certain grant made by Cortés, and approved by the King and his royal council under seal,—to the aforesaid pueblos. In order to obtain said confirmation it was alleged: that the grant, written on "nine leaves" was so torn and damaged, that it would no longer bear handling,—and that through its loss the inhabitants of said settlements might come to grief. The petition was immediately granted and it was ordained, on the 19 of March 1617, that a copy of the original grant should be executed, and that in such places where the text was torn or obliterated through damage to the originals, common belief or tradition should prevail as far as it related to the contents of the document ("obre la fé que hubiere lugar en derecho"). The desired copy and certificates were accordingly issued on the 21st day of March, 1617.

This copy embodies the mutilated text of a very singular official paper. It appears from it that on the 20th day of May 1519, Cortés executed, in favor of two Indian chiefs of the two aforesaid pueblos, and at their request, a certificate (signed by himself at San Juan de Ulúa on that day and countersigned: Pedro Hernandez), stating that the said chiefs had joined the messengers sent from Mexico to greet and espy Cortés upon his arrival at the coast,—with the intention of approaching him secretly and offering him their assistance in any designs he might have against the Mexicans, whom they said held them severely to tribute. This they achieved, and took allegiance to the crown of Spain. In return Cortés promised to them that "after our journey should be accomplished . . . . . to them should in the first place be made the greatest honor possible in return for so much noble subtility and good-will." He also promised "to make them grandees and Lords of lands where they now have their pueblos." The facts thus alleged were contained in the original document, written consequently about 30 days after the landing of Cortés on the coast of Vera Cruz. But this act itself was included, as a copy, in a further grant, dated 16 December, 1526, in which Cortés acknowledges the services rendered by the two chiefs during the conquest of Mexico, and that after that pueblo had been captured, the said chiefs returned to their tribes "well paid with the booty," relying upon the fulfilment of his original promises. It further states that: six years having elapsed since, and to most of the chiefs who had assisted the Spanish cause, lands had been given, he remembered the chiefs of Axapusco and Tepeyahualco, "and by these presents in the royal name of His majesty gave them four tracts ("cuatro sitios de estancias") . . . . . in the territory of their said pueblos." These lands were freed from all taxes and impositions, and the chiefs and their heirs were invested forever with the lordship and the office of governors ("gobernadores") of the pueblo to which they belonged. This grant of Cortés was confirmed by the Emperor Charles V, and the royal council of the Indies, 2d November, 1537, and on the 9 and 10 February, 1540, the said chieftains were duly installed in their new hereditary positions, and their lands measured off to them.

Doubts were raised as to the genuineness of the document, but these are set aside completely by the fact that, not more than 98 years after its first execution, the Spanish authorities have legally acknowledged it. Some objections relating to imperfections in the text, apparent anachronisms, have been eliminated through the judicious

merely to become free of tribute to the Mexicans, as they had been previously; but no thought entered their mind, at that time, of ownership of the soil.[123] This earliest transaction (probably 20th of May, 1519) was in itself a perfect revolution, or at least the initiatory step thereto. Unbeknown to themselves, these Indians became feudatories to the crown of Spain, and thus the first germ was planted, which, in its development, subverted gradually the aboriginal order of things in Mexico.[124]

Every tribe, which subsequently surrendered to the Spaniards, bowed in the same manner to the new principle introduced. The Indians did not realize it, and as the idea of territorial domain was unknown to them, they could not see the construction placed upon their submission by the European invaders. It was not possible for them to feel or know that, if the council of a tribe agreed to accept the Spaniards in place of their former Mexican conquerors, their *territory* thereby might become alienated. On the other hand the Spaniards, not understanding the principles of Indian organization, completely misunderstood the nature of the contract. They took it for granted, that the tribal government had power and authority over the tribal soil.

When at last Montezuma and such chiefs as were with him, from Mexico as well as from Tezcuco and Tlacopan, being then

notes of Sr. Ramirez, as well as by the careful and thorough treatment of the editor, Sr. Icazbalceta. We cannot refrain from accepting the "Real Ejecutoria" as genuine and from calling the reader's attention to it, as one of the most important documents on the subject of ancient Mexican tenure of the soil. For the purpose of this note, we exclusively dwell on its *authenticity*, reserving the other points concerned for subsequent annotations; two items excepted which we must mention here, namely: It results from the grant of Cortés:

(1). That the chiefs of Axapusco and Tepeyahualco held no lands as their own property, until Cortés granted such to them.

(2). That their offices were *not hereditary*, until Cortés established them as such; through his aforesaid grant. The two conclusions just stated are of great importance for the subject of this paper, and they should be kept present in mind, since we shall have occasion to make further use of the document.

[123] "Real Ejecutoria, etc., etc." ("Col. de Docum." Vol. II, p. 6). Andrés de Tápia ("Col. de Doc.," II, p. 561, etc.) Cortés ("Carta Segunda," Vedia, I, pp. 12 and 13). Gomara ("Conq. de Mejico," Vedia 1, p. 318. Very explicit and positive). Oviedo (Lib. XXXIII, cap. II, pp. 261, 262 and 263). Bernal-Diez ("Hist. verdadera, etc." Vedia II, cap. XLVI and XLVII). Ixtlilxochitl ("Hist. des Chichim.," cap. LXXX, pp. 173, 174 and 175). Torquemada (Lib. IV, cap. XX, pp. 397, 398 and 399). Clavigero (Lib. VIII, cap. IX and XI). Robertson ("History of America," Vol. II, Book V, p. 286). (Prescott Book II, cap. VII).

[124] "Real Ejecutoria, etc." ("Col. de Doc." II, p. 6, "y que desde agora en adelante y para siempre se ofrecian fieles y leales vasallos de su majestad ò emperador . . ." p. 7, "y me suplicaron les diese testimonio de la obediencia que dieron à Dios nuestro Señor y ă S. M.")

in Spanish power, consented to the ceremonies required for their "swearing allegiance" to Spain, Cortés thenceforth regarded the annexation of Mexico to the domains of his liege lord as complete.[125] Montezuma was hereafter considered as a feudatory of the Spanish crown, and it became the duty of that crown's other dependents to protect him. Consequently, when the Mexicans took up arms against their obnoxious guests, they became, in the eyes of the latter, rebels against what was assumed to be their legitimate lord, Montezuma, and, he in turn having been converted into a vassal of Spain, rebels also towards that power itself.[126] This act of rebellion entailed for those participating in it, forfeiture of life and property, at the option of their conquerors. Thus a further title was created for the Spaniards, to seize even lands used or held by individuals, outside of what they believed to be public or lordly domains, and a theoretical right was construed to be a complete and violent revolution.

After the pueblo of Mexico had fallen, the first step of Cortés in regard to the Indians was, therefore, to establish the system of "Repartimientos."[127] This mode had come into existence during the life-time of Columbus, through a Patent dated 22d of July, 1497, authorizing the great admiral to distribute lands in the West Indian Islands among the Spanish settlers for their own use and exclusive ownership.[128] No mention is made, in these letters patent, of the aboriginal occupants of the soil, but Columbus, in a later act of *his own, decided that the Indians should work such lands for the benefit of those to whom he had given them* "and thus" says Herrera, "the Repartimientos or Encomiendas all over the Indies originated."[129] The Indians on such tracts became serfs to their Span-

[125] Cortés ("Carta Segunda," Vedia I, p. 30). Bernal-Diez (Cap. CI, Vedia II, p. 103). Oviedo (Lib. XXXIII, cap. IX).

[126] The term "rebellion" is frequently applied to the uprising of the Mexicans during Cortés' short absence on his expedition against Narvaez, and their subsequent resistance to Spanish power. In fact, it appears so frequently in documents and chronicles of the 16th century, that we may well refrain from special quotations.

[127] Cortés ("Carta Cuarta," Vedia I, pp. 113, 114, 115 and 116). Bernal-Diez (Vedia II, Cap. CLXIX, pp. 237 and 238). Gomara (Vedia I, p. 394). Letter of the troops of Cortés to the Emperor ("Col. de Doc.," I, p. 431). It is also acknowledged by Cortés himself in his letter of 15 October, 1524, to the Emperor, wherein he expressly states ("Col. de Doc.," I, pp. 472 and 473), that he dared not promulgate the latest despatches received by him from the Spanish court, since these enjoined him to abstain from "repartir ni encomendar." Thus he acknowledges having already made "repartimientos."

[128] Navarrete ("Colleccion de Viajus, etc." Tom. II, pp. 215 and 216). Herrera (Dec. I, lib. III, cap. II, p. 66).

[129] Herrera (Dec. I, lib. III, cap. XVI, p. 95). Oviedo (Lib. III, cap. VI, p. 72).

ish conquerors, they could not, at least in later times, be separated from the soil on which they dwelt.[130]

The country of Mexico being very extensive, while the number of the original Spanish conquerors was comparatively small, it followed that, sometimes at least, large areas inhabited by entire tribes, or at least by entire kinships, fell to the lot of a single man. The new owner in such cases found an organized community established upon his grant, and he usually preferred not to disturb this organization, contenting himself with exacting for his individual benefit a tribute levied in a manner approximate to that which had been customary previous to the conquest.[131] Nevertheless, several disturbing influences soon appeared.

The first one was the construction placed upon the obligation of personal labor to be performed by the Indians. It was gradually so extended, that instead of remaining confined to the *land*, it attached to the *person* of the new owner, and thus tended, by admitting forcible displacement, to disrupt the ties of kinship, which formed the basis of the tenure of lands.[132]

In the second place the Spaniards looked upon all tracts set apart by the Indians for governmental purposes, as public domain of the Mexicans, and so, wherever a tribe had resisted their invasion, such official lands were of course regarded as forfeited. They became either property of the crown, or were assigned to some one of the early Spanish immigrants. We have already seen that these lots, although their crops were destined to special uses, were properly communal soil. This mode of tenure was now suddenly abolished, and the principle of *private* or *public ownership* established

[130] Herrera (Dec. I, lib. III cap. XVI, p. 95). Oviedo (Lib. III, cap. VI, p. 72). Mendieta (Lib. I. cap. VI, pp. 32 and 33).

[131] Letter of Ramirez de Fuenleal, Bishop of San Domingo ("Recueil, etc.," p. 244). Letter of the Licentiate Ceynos ("Col. de Doc.," Vol. II, pp. 162 and 163). Letter of Ramirez de Fuenleal ("Col. de Doc." Vol. II, pp. 170, 171 and 172, etc., etc.). Letter of Father Domingo de Betanzos ("Col. de Doc.," II, pp. 190–197). Bernal-Diez (Cap. CCX, p. 313. Vedia II).

[132] That the original intention was merely to have the Indians work the soil for the benefit of the Spanish owners, is proved by Herrera (Dec. I, lib. III, cap. XVI, p. 95), and by Oviedo (Lib. III, cap. VI, p. 72). The latter was a contemporary. But it results, principally from the complaints about the ill treatments of the Indians, and the suggestions for remedy,—that the Spaniards very soon converted this position into one of personal slavery. See Letter of Ramirez de Fuenleal, of 1532 ("Col. de Doc.," II, pp. 167 and 168), of Alonzo del Castillo (Col. II, p. 202). Opinion of the Licentiate Marcos de Aguilar, 8 Oct., 1526 ("Col. de Doc." II, pp. 545 and 546). Joint letter to the Emperor, of 9 Franciscan and Dominican monks ("Col. de Doc." pp. 549–553). Letter of Motolinia ("Col. de Doc." Vol. I), 2 Jan., 1555.

in its place. It is not surprising therefore, to find in the "Libro del Cabildo," or book of the municipality of the young city of Mexico, between the years 1524 and 1529, numerous entries recording the petitions of Spaniards for sites occupied, according to their belief, by private dwellings of Mexican chiefs, and the grants issued in consequence thereof.[133] This applied not only to the "lands of the houses of the community" (tecpan-tlalli), and "lands of the speakers" (tlatoca-tlalli), but especially to the "pillali" or lots assigned to each chieftain as member of a particular quarter. In this manner the soil of the consanguine group, the basis of landed tenure in Mexico, was directly invaded; portions of it being torn from its original connection.

Lastly the Spaniards, finding Indian communities too strongly and permanently organized for a sudden and violent reform, acceded to their maintenance as far as they understood it. But, fully convinced that the chiefs were monarchical or despotic rulers — masters of the soil as well as of its inhabitants,— wherever these chiefs had been personally friendly to them or wherever they regarded it as politic, they confirmed what they conceived to be *their prerogatives.*[134] Thus, regarding them as *owners* of the different classes of official lots, this ownership was formally recognized, and it was acknowledged that they were "lawfully seized in fee thereof." The "tlalmaites" became in law the vassals of those whom they formerly but considered as elective functionaries.

Not content with this, and in order to reward certain chiefs for services rendered during the conquest or good behavior afterwards, the Spanish conquerors also issued to them "Repartimientos, or gave them lands, sometimes unoccupied wastes, as their *own pri-*

[133] Humboldt ("Essai politique sur la Nouvelle Espagne," Vol. II. hb. III, cap. VIII, pp. 64 and 65).

[134] Letter of Father Toribio de Paredes (Motolinia) 2 Jan'y, 1555 (Col. de Doc. I), and especially the long letter of Mendieta, dated Toluca, 1st day of the year 1562 ("Col. de Doc." II). "Sixth: it appears to me that the native and legitimate Lords should be taken into account . . . . . I treat of the particular Lords, touching their lordship of their Indians and pueblos, which they formerly possessed. For I think that some are expelled, and I do not know even if they were not reduced to macehuales and tributaries, and others, although some trifle is given to them it is in the shape of a governorship and in such a manner that, once despoiled from it, they are left destitute" ("se quedan á buenas noches") (p. 538). The good father here represents the true conceptions of the Europeans about the Indian chieftaincy (as a feudal lordship) at the time of the conquest. Also; Letter of the Archbishop of Mexico, Fray Alonzo de Montufar, dated 30 Nov., 1554. ("Cruautés horribles des conquérants du Mexique" Ternaux-Compans, pp. 258, 259 and 260, appendix.)

vate property.[135] Among these is to be classed the grant already mentioned to the caciques of Axapusco and Tepeyahualco.[136]

The documents partaking of the nature of "Repartimientos" contain among their number a donation by Cortés to Doña Isabel Montezuma, daughter of the former Mexican "Tlaca-tecuhtli," which is very interesting for the purposes of this investigation. It is dated 26 of June, 1526, and gives to the grantee, in consideration of the aid lent to Cortés by her father, *the entire territory of the Tecpanecan tribe, at the same time acknowledging that it belonged to her by right "as patrimonal estate."*[137] We know, however, that the Tecpanecas formed the third member of the

[135] "Real Ejecutoria, etc." ("Col. de Doc." Vol. II, p. 20). Grant of Cortés to Doña Isabel Montezuma (Prescott, "Hist. of the Conquest of Mexico," Vol. III, Appendix, pp. 460, 461, 462, 463 and 464). Petition addressed to Charles V, by several Mexican chiefs in 1532 (Appendix to "Cruautés horribles des conquérants du Mexique" Ternaux-Compans, p. 261).

[136] It says: ("Real Ejecutoria, etc., etc." Col. de Doc. II, p. 18, "and since they were such (faithful) servants of H. M., they should be freed, together with their pueblos, from all impositions and contributions forever, and to them should be given four tracts of land ("estancias de tierras"), and they should become perpetual governors of their tribes, and none of their inferiors should ever obtain the office" p. 21. The King and his council of the Indies consequently ordained "by these presents we declare the aforesaid to be free and discharged ("quitos"), not bound to tributes, tenths, premices and other duties or contributions customary or yet to be introduced, and that they and their descendants shall perpetually hold the government of their pueblos, with all the advantages and appurtenances to the four tracts, as Lords thereof, and that it is our pleasure and will. . . ." Lastly, in describing the lands surveyed for the said caciques it says: "and they are rough timbered lands, without any water, of which the aforesaid took possession" p. 24). This shows that certain tracts were set off from the communal soil, to become private property of the chiefs. It is interesting to connect therewith the following statement by Zurita (p. 57). "These lands belonging to the calpullis, it was unjust to give them to the Spaniards, as it is still done. The latter seeing uncultivated lands, demand them from the persons who govern."

[137] This grant has fortunately been published by Mr. Prescott, in the Appendix to the "History of the Conquest of Mexico" (Vol. III, pp. 461–464). It bears the title: "Privilegio de Doña Isabel Montezuma, Hija del gran Motezuma último Rey Indio del gran Reyno y Cibdad de México, que bautizada y siendo Christiana casò con Alonso Grado, natural de la villa de Alcantara, Hidalgo, y criado de su Magestad, que habia Servido y servia en muchos oficios de aquel Reyno. Otorgado por Don Hernando Cortes, conquistador del dicho Reyno, etc., etc." Its date is 26 June, 1526. The Doña Isabel is mentioned as "the principal and legitimate heiress of the said Lord Moteçuma," and the concession itself is worded as follows: "con la qual dicha Doña Isabel le prometo y doi en dote y araas ă la dicha Doña Isabel y sus descendientos, en nombre de S. M. y como su governador y capitan general destas partes, y porque de derecho le pertenece de su patrimonio y legitima, el Señoria y naturales del Pueblo de Tacuba, etc., etc." The following pueblos are added: Yeteve, Yzqui-Luca, Chimalpan, Chapulmaloyan, Escapulteango, Xiloango, Ocoiacaque, Castepeque, Talanco, Gatscrio, Duotepeque, Tacala. Notwithstanding the defective orthography (Escapultango in place of Azcaputzalco, Duotepeque instead of Ometepec, etc.) we easily discern the territory of the Tecpanecan tribe; a fact still further proven by the own words of the grant: "the aforesaid settlements and pueblos are subjected to the pueblo of Tacuba and to its Lord."

"Nahuatl" confederacy of the valley of Mexico, that they and their soil were totally independent from the Mexicans.[138] Still, Cortés honestly assumed it to have been a part of the Mexican domain, and on this assumption based his disposition of it, fully convinced that he was performing an act of honest restitution. This gives a measure of the erroneous ideas then prevailing among the Spaniards on the mode of tenure and distribution of lands in ancient Mexico.

Thus a state of things was inaugurated which could not fail, eventually, to create the most unfortunate results. The Indians among themselves were placed on very unequal footings. In some sections the calpulli, even the whole tribe, were left undisturbed, in others their lands were assigned to Spanish individuals. Again, certain tracts were taken away from the communal soil, and became private property of individual conquerors. But the most disastrous influence certainly was exercised by the assignment of landed property to individual Indians. It created an inequality of condition in each and every aboriginal community against which those least favored revolted, whereas the preferred ones, now combining authority with landed property, were tempted to abuse their new position.[139] Of this division and strife among the

[138] In addition to the testimony already adduced, we refer here to the Letter of Fray Toribio (Motolinia) and Fray Diego d' Olarte, dated Cholula 27 Aug., 1554. "All the others obeyed to Montezuma, to the sovereign of Tezcuco, and to him of Tacuba. These three princes were closely confederated; they divided among themselves the lands (countries) which they conquered." ("Recueil de pièces, etc.," p. 403.) In the "Relation of the services rendered by the Marquis of the Valley (Cortés)," executed between 1532 and 1535—and presented to the Emperor by the Licentiate Nuñez, reference is made to the original grant *to* Cortés, of lands containing: "23,000 vassals" which territory included the Tecpanecan pueblos of Cuyuacan and Atacubaya. These pueblos were claimed "through the intrigues of the president Nuño de Guzman and of the auditors Matienzo and Delgadillo" as belonging to Mexico, but the case was tried in New Spain, and Cortés furnished ample proof "how the said lands are distinct, in limits and jurisdiction, from the city of Mexico, and that the Lords of Cuyuacan and Atacubaya always possessed them peaceably and in fact" ("Col. de Doc.," Vol. II, p. 56). If now this was the fact with those two villages, how much more so was it with Tacuba and its surroundings, which were the chief places of the Tecpanecan tribe; as third member of the Nahuatl confederacy of the Mexican valley.

[139] The grant to Cortés mentioned in the preceding note, is an instance of the agglomeration of several pueblos under a single owner. There must have been many more: since he created originally but 200, "Repartimientos" over the whole territory. The Licentiate Ceynos, in his letter of 22 June, 1532 ("Col. de Doc.," Vol. II, p. 159), mentions "until 400 persons" of which 200 had to settle in the city of Mexico. The Bishop Fuenleal in his "Opinion" of 1532 ("Col. de Doc.," II, p. 176), mentions (among others) the following Repartimientos: "Huexotzinco to Diego de Ordáz." The province of

Aborigines themselves the Spaniards naturally profited for further encroachments. Many "encomenderos" used the authority of the chiefs to turn their Indian serfs into actual slaves, others in turn improved the new perspective opened to the natives towards the acquisition of private lands, for the purpose of undermining the influence and authority of the chieftains.[140] Frequently, also, the ignorance in which the Indians were, as to the

Tepeaca to Pedro Armildez Chirino,— Chilchota to Juan de Sámano, etc., etc. Each of these, especially the first one, comprised several villages, nay a whole tribe.

Compare the letter of the Archbishop Montufar, 30 Nov., 1554 ("Cruautés horribles, etc." Appendix, 255-260). Zurita (pp. 63 and 64). The complaints are principally, against such as held offices under the conquerors, and such to whom lands were given out of the calpulalli. The petition of Montufar is a terrible accusation against the Indian chiefs. Gomara, however, qualifies it as one of the good effects of the conquest that the Indians since that time "hold lands" (Vedia I). Motolinia (Trat. I, cap. I, p. 17) is very severe on the collectors of rent for the whites. But these collectors must have been mostly Indians,— *chiefs*, as he himself acknowledges in his Cholula-letters.

[140] Motolinia (Trat. I, cap. I, p. 17). Montufar (pp. 255-260). Zurita (pp. 63 and 64). Ceynos, Second Letter, 1 March, 1565 (Col. de Doc. II, pp. 240 and 241). Zurita (p. 83) is of special importance, exposing the intrigues of the Spanish conquerors among the Indian communities, inciting the natives to litigations against their chiefs. Mendieta, in his remarkable letter from Toluca, 1 Jan'y, 1562, to Fray Francisco de Bustamante, commissary general, at Mexico, devotes his principal attention to the pernicious influence of the Spanish interpreters and lawyers, inciting the Indians to litigation before the "Audiencia" and not before the viceroy. He says for inst. (p. 532), "that without comparison their condition and behavior was better at their time of gentility than now. For at the time they were heathens they did not know of lawyers ("letrado" properly men of letters), scribes, nor attorneys, neither of litigations, nor to spend in such (squabbles) their properties and ruin their souls. To-day, since the opportunity is afforded to them, and they being naturally quarrelsome, disposed to tackle and injure each other, they are so fond of it as to have them continually on hand, without cause nor reason, and (such are) always the worst and most abject of the tribe. Therefore not a single community is found in New Spain which is not disturbed, and does not spend nearly as much in litigation as they pay of tribute to H. M., or to the encomendero every year. And since they are of little understanding, and not versed in law, I hold all what the interpreters and attorneys gain by it as so much of a robbery as if they would take it from the houses at night. Such do not even deny their base actions, but confess openly that they do it, without any other excuse than that H. M. gives them permission." On p. 536, he says: "certain particular Indians in all the settlements do great mischief, knowing that they have recourse to the court, and among the pretenses to cover their malice they use two most commonly, which are: demand account of the communal property, pretending that the principals spend it, and the other, to have the conduct of their officers investigated under color that these abuse of their position (power)." Zurita (p. 83), speaking of the intrigues against the chiefs says: "the ordinary tribute and prestations failing, they fall into the most abject misery, become dejected, dare not speak, and do not know where to apply for protection. For all this the rebels do not cause any loss to the encomendero as to his tribute . . . . In this manner they ruin the chiefs in a very short time, for all their property consists in the work of their vassals, as soon as that ceases, if it was but for a single day, they lack every requisite for life." (This quotation is in itself, we think, the most ample confirmation of what we have advanced upon the subject of aboriginal tenure of the soil, and fully disproves what has been assumed in regard to the chiefs holding and owning lands of their own). See also Memorial of Bartolomé de Las Casas (Col. de Doc. II, pp. 229 and 230).

real import and value of landed concessions, was taken advantage of to deprive them of such subsequently, either through litigation or through barter for worthless trifles.[141] Unacquainted with the new order of things suddenly forced upon them, unable therefore to profit by it for subsistence, the natives of Mexico could not help being *degraded* instead of *elevated* and bettered in condition by such a transition which displaced them, in the course of a few years, from a state of tribal and communal society into one of civilization.[142]

Consequently a state of disorganization began to prevail, which threatened to ruin the country. At the same time, however, while the Indians, forlorn in the maze of difficulties in which their conquerors themselves also floundered about, were in a perfectly helpless condition, a sudden protection and relief arose to them. On the 13th of May, 1524, "one day previous to the vigils of Pentecost," there landed at San Juan de Ulúa, a cluster of twelve Franciscan friars, sent to Mexico in response to the original call of Cortès, for the purpose of converting the Indians.[143] These monks

[141] Zurita (pp. 63 and 64). Mendieta (Letter, in Col. de Doc. II).

[142] The Europeans opened a wide field for activity. They were superior to the Mexican aborigines, not only in organization, but especially in mechanical arts and inventions for the purpose of subsistence. It was now required of the Indians to suddenly take hold of all these improvements, which it had taken the Europeans centuries upon centuries to secure through long experimenting.— and to become familiar with them in a short time, as well as to feel happy and contented at once under a state of society which tore asunder all those ties of kinship forming, since time immemorial, the basis of their organization. It was asking too much of them altogether, and if besides what was asked was even enforced violently,— then the degrading consequences could not be avoided. Therefore, the most ardent advocates of the Indian cause took great care to insist upon letting the natives alone in their communities; even prohibiting the access thereto to the Spanish colonists. Bartolomé de las Casas, in his joint memorial with Fray Domingo de Santa Tomás, in favor of the Indians of Peru, written about 1560 ("Col. de Doc." Bibliographical notes, p. XLII,) says: "Lo segundo, que porque los Españoles son siempre del bien de los indios contrarios, y en especial lo son y han de ser impedidores de aqueste negocio y concierto, que han de estorbar por cuantas vias pudieren que los indios no paguen à S. M. ni puedan pagar este servicio; por tanto es necesario que se prohiba que ningun comendero èntre por ninguna causa ni razon en los pueblos de los indios que tienen encomendados, ni sus mujeres, que son las mas crueles y perniciosas, ni negro, ni criado, ni otra persona suya (p. 233)." Alonzo de Zurita, in his memorial written at Mexico between 1554 and 1564 ("Col. de Doc.," II, p. XLVII), insists strongly upon keeping the Indians apart from the Whites (p. 335). In regard to the actual degradation, see Mendieta's letter, of 1 Jan'y, 1562 ("Col. de Doc.," II, p. 532). Motolinia ("Hist. de los Indios de N. España," Trat. I, cap. I).

[143] The Franciscan friars obtained their first concession from Pope Leo X, by a bull dated 25 April, 1521 (Mendieta, lib. III, cap. V, pp. 186–190). This bull was executed in favor of Fray Francisco de Quiñones (de los Angeles), and Fray Juan Clapion. But these fathers never reached Mexico. Previous to it, three Flemish missionaries, Fray Juan de Tecto, Fray Juan de Aora, and Fray Pedro of Ghent had gone to New Spain

fully realized what was asked of them, but they went still further by becoming, not only the spiritual advisers, but actually the material protectors, of the aborigines. Basing upon the authority conferred by the Pontiff at Rome, they publicly denounced, not only the individual acts of the Spaniards, but even those of the royal officers.[144] This could not fail to incite the Indians to resistance, and when the conquerors resorted to violence, not only did the oppressed find refuge and protection in the newly erected convents, but one of the most distinguished Franciscans, Fray Toribio, of Benavent (Motolinia), even notified the agents of the royal "audiencia,"—who had come to Huexotzinco to seize the fugitives and bring them to justice,—to leave the settlement forthwith, threatening, in case of non-compliance, with excommunication.[145]

The protection thus afforded would have been far more efficacious, had the good Friars understood at that time the true nature of Indian land tenure, and their usages with respect to the distribution of the soil. They might then have accompanied their violent protests with a rational remedy. Restoration of the ancient customs, limiting the Indian clusters to their territories actually tilled, without disturbing their original organization, would have been the proper way. Alongside of such communities, ample room would have remained for the settlements of whites, and the unavoidable contact between both races would have changed slowly and more permanently the condition of the natives, lifting them up gradually to the practical appreciation of ideas of civilization. But

of their own accord, and without Papal sanction. But, while Fray Pedro de Gante, for instance, rendered valuable service to science through one of his letters, it is among the "twelve apostles of Mexico" that we find those who have equally combined heroism in protecting the Indians, with due regard to the conservation of their memories and historical traditions. These "twelve" were: Fray Martin de Valencia, Fray Francisco de Soto, Fray Martin de Coruña, Fr. Juan Xuares, Fray Antonio de Ciudad Rodrigo, Fr. Toribio of Benavente, Fr. García de Cisneros, Fr. Luis de Fuensalida, Fr. Juan de Ribas, Fr. Francisco Ximenez, Fr. Andrés de Cordoba, Fray Juan de Palos (Mendieta, lib. III, cap. X, also cap. XI, etc.). We shall have further occasion to use their writings, therefore this humble tribute of gratitude to their memories.

[144] Compare the beautiful introduction to Motolinia's "Historia de los Indios de Nueva-España," by Sr. José F. Ramirez, in Sr. Icazbalceta's "Col. de Documentos" (Vol. I, Introd. p. XLVII to p. I), which quotes an act of Gonzalo de Salazar, 28 July, 1525 (contained in the first "Libro de Cabildo" of Mexico), containing a complaint, against the Franciscan friars for "meddling with matters of civil jurisdiction and government." See also the report of Herrera about the convention ("Junta") at Barcelona, in Spain in 1529 (Dec. IV, lib. VI, cap. XI, p. 118, etc).

[145] Introduction to Motolinia ("Col. de Doc.," Vol. I, p. L). Torquemada (Lib. XV, cap. XXII, pp. 56, 57–59).

even in their letter to the emperor, dated 1st of September, 1526,[146] the "apostles of Mexico" insisted upon a thorough establishment of what Mr. Prescott so justly calls the "vicious" system of Repartimientos, representing that an immediate and thorough intermingling of both races alone could promote the interests of conversion.[147]

Still, an improvement in the system gradually took place. The civil and criminal jurisdiction over the natives, which formerly had been vested in each landholder,[148] was placed in the hands of special officers of the crown. It was directed that the owner should reside on his property, that the Indians could not be separated from the soil and finally, on the 20th of November, 1542, the "new laws and ordonnances for the government of the Indies" were promulgated, which contained such restrictions upon the "Repartimientos," that their further extension and increase was rendered impossible, and the number of those existing, greatly limited. The Indians themselves were declared direct vassals to the crown of Spain.[149]

Although in many parts of Spanish America these laws were but "obeyed though not executed,"[150] they still called forth a

[146] "Col. de Documentos" (Vol. II, pp. 155, 156 and 157). Joint letter of Franciscan and Dominican monks (p. 549, etc.).

[147] "Col. de Doc.," II, pp. 155–157, 549, etc.; also letter of Fray Domingo de Betanzos (pp. 190–197). Notwithstanding the agreement between Franciscan and Dominican monks on that point, Las Casas continued to protest in the most vehement manner, against the "Repartimiento." See his memorial, jointly with Fray Domingo de Santo Tomás (Col. II, pp. 231–236), and to the council of the Indies, of 1562 or 1563 (Col. II, pp. 595–598), in which he says: "Thirdly, that the encomiendas or repartimientos of Indians are iniquitous, per se wrong, therefore tyrannical, and such administration is tyrannical also. Fourth, that such as give them commit a mortal sin, like those who maintain them, and if they do not give them up, they cannot be saved."

[148] It was customary for each "encomendero" to exercise civil and criminal jurisdiction within his "Repartimiento."

[149] "Nuevas Leyes y Ordenanzas para la Gobernacion de las Indias" (Col. de Doc., II, pp. 204–227), dated Valladolid (Spain), 4 June, 1543, promulgated at Mexico, 24 March, 1544. Herrera (Dec. VII, lib. VI, cap. V, pp. 110–113). These new laws were the cause of bloody disturbances in Spanish America. Gomara (Vedia I, pp. 249 and 250).

[150] "Se obedece. pero no se cumple." There are many evidences of this saying having been put in actual practice. Joaquin Acosta ("Compendio historico dol Descubrimiento y de la Colonizacion de Nueva Granada," 1848, cap. XVII, p. 316). At the arrival of the Licentiate Armendariz in Cauca, sent to enforce the new laws, Belalcazar at once had them promulgated, but took the responsibility of forthwith also suspending their execution. He wrote to the King from Cali, in 1544, in regard to his action. Acosta says: "Entonces comenzó en el nuevo mundo Español á campear la formula irrisoria de se obedece, pero no se cumple; con que se eludian las ordenes que no les convenia ejecutar á los funcionarios de aquellas apartados comarcas." Herrera (Dec. VII, lib. VII, cap. XXIII, pp. 157 and 158).

marked improvement, at least in the personal condition of the Indians. They were, hereafter, at least to some extent, protected from the bodily slavery in which the former acts had plunged them. In regard to the tenure of lands, however, the laws wrought no change. Further direct spoliations became more difficult, but the new principle of private ownership had been firmly implanted, not merely *around* but *among* the natives themselves, and the obliteration of the ancient usages, by the extension of this principle, could not be stayed.

Of the aboriginal mode of tenure of lands and of their distribution, but one vestige remained — the last monument so to say, and the one which embodies, happily, all its principal features. These are the lands of *kinship*, held in common by the consanguine group or calpulli, and called as we have seen, "calpulalli," by the Mexicans.

Although their order had been very much disturbed since in many cases the official tracts, "tecpan-tlalli" and "tlatoca- tlalli," as well as those apportioned to the chiefs as members of the kin, "tlalmilli," were appropriated by the conquerors,— the bulk of the "calpulalli" could not, for a long time, be disintegrated for private uses, notwithstanding the still more nefarious influence exercised by the donation of lands to individuals, with the faculty of barter or sale, in the very heart of the organization itself. Even up to the present time, these communal tracts are still found in Mexico, occupied and tilled by the aborigines after their original customs.[151]

[151] Mr. James Pascoe, an English gentleman, resident of Toluca, has in a letter reported upon by the French "Journal des Missions Evangéliques" (1874), given a detailed description of the condition of the Indians in his vicinity. His statements about their communal system of tenure, the eligibility of their chiefs, etc., etc. ("gobernadores") are very positive and plain.

Mr. Stephens, in "Travels in Yucatan" (Vol. II, cap. I, pp. 14 and 15), described the mode of life of the settlement ("rancho") of Schawill near Nohcacab, which settlement contained about "one hundred labradores, or working men, their lands are held and worked in common, and the products are shared by all. Their food is prepared at one hut, and every family sends for its portion, etc., etc."

Brantz-Mayer: ("Mexico as it was and as it is," 3d Edition, 1847). While at the hacienda of Temisco near Cuernavaca: "he pointed out to us the site of an Indian village, at the distance of three leagues, the inhabitants of which are almost in their native state. He told us, that they do not permit the visits of white people; and that, numbering more than three thousand, they come out in delegations to work at the haciendas, being governed at home by their own magistrates, administering their own lands, and employing a Catholic priest to shrive them of their sins; once a year. The money they receive in payment of wages, at the haciendas, is taken home and buried; and as they produce the cotton and skin for their dresses, and the corn and beans for their food, they purchase nothing at the stores" (p. 175). Hon. E. G. Squier, in his ex-

At a late hour, comparatively, the government of Spain recognized the importance of maintaining this last vestige of Indian land tenure. It was brought to it, not only by the incessant clamor of ecclesiastics of various orders,[152] by the necessity of restraining the power of the new settlers over the aborigines, which power threatened (as in Peru) to endanger Spanish domination itself,[153]—but especially from the conviction, that it was best suited to the wants of the Mexican natives, being the mode of

cellent work on Nicaragua, makes the following very important observations on the tenure of lands there: (Vol. I, cap. 290 and 291). "The municipality of Subtiaba, in common with the barrios of some of the towns, holds lands, as I have said, in virtue of royal grants, in its corporate capacity. These lands are inalienable, and are leased to the inhabitants at low and almost nominal rates. Every citizen is entitled to a sufficient quantity to enable him to support himself and his family; for which he pays from four rials (half a dollar), to two dollars a year. This practice seems to have been of aboriginal institution; for under the ancient Indian organization, the right to live was recognized as a fundamental principle in the civil and social system. No man was supposed to be entitled to more land than was necessary to his support; nor was he permitted to hold more than that, to the exclusion or injury of others. In fact, many of the institutions of the Indians in this country were recognized, and have been perpetuated by the Spaniards." The bearings of these remarks, upon our subject, are easily noticed, and need no further comments. That part of the indigenous population of which the learned traveller treats, are from the same stock as the Mexicans.

The document which has already occupied our attention, namely: the grant of Cortés to the chiefs of Axapusco and Tepeyahualco (See note 136) also furnishes evidence of the existence of these communal tracts in Mexico, and their recognizance by the Spanish government. This grant was the object or cause of a long suit, which we shall refer to hereafter,—the inhabitants of the two pueblos suing their chiefs for restitution of the communal property. This shows that the "calpulli" in *fact*, if not in name perhaps, still existed at least in the past century. The litigation alluded to occurred between the years 1755 and 1764.

[152] These protestations were mainly issued at the example of the indefatigable Las Casas. It would be superfluous to refer to them in detail. But it is remarkable with what freedom of language this violent though noble character was permitted to speak. We have already quoted (note 147), his memorial to the council of the Indies (written in 1562 or 1563). In that document he goes so far as to say: "First, that all the wars called conquests ("conquistas" applying it to the New World exclusively), were and are unjust and the very acts of tyrants. Second, that all the Kingdoms and Lordships of the Indies are held by us through usurpation only . . . . Fifth: that the King our Lord, whom God may keep safe and prosperous, cannot, with all the power God has given him, justify the wars and robberies made to these people, nor the Repartimientos and encomiendas,—more than he could justify the wars and robberies committed against the Christian by the Turks . . . . . Eighth: that the natives of all these parts and wherever we may have entered the Indies have a perfect right to make war upon us or to expel us and wipe us off the face of the earth, which right they will preserve until the day of judgment" (Col. de Doc. II, p. 598). This is strong talk from the Bishop of Chiapas, not only against the Emperor, but against the Holy See, which had *donated* the Indies to Spain.

[153] It is well known that the liberation of the Indians from personal servitude was a measure, not only of humanity and justice, but also of policy, on the part of the Spanish government, to weaken the growing power of the conquerors and early colonists. The troubles in Peru give a good example of the state of affairs.

tenure of lands corresponding to undisturbed aboriginal society. Thus the calpulli were, to a limited extent, protected, nay fostered, and recognized in law, even as late as the past century.[154] Like all remains of "ancient society," *they* also are bound to disappear, or be transformed in a manner suitable to the exigencies of a higher culture. But it may not be amiss to quote, at the close of this investigation, a tribute paid to their value for the wants of Indian society by Alonzo de Zurita, a Spanish official of perspicacity, deep knowledge, and honest judgment, in his memorial to the King of Spain, written about the year 1560.[155]

[154] The litigation over the grant to the caciques of Axapusco and Tepeyahualco, to which we referred in note 151,— is commented upon as follows by Señore J. F. Ramirez in his letter proving the authenticity of the document, dated 30 Sept., 1865, and printed in the Introduction to the "Real-Ejecutoria, etc., etc." "D. Juan de los Santos, D. Antonio Estéban, D. Juan and D. Lorenzo Morales, with the title of caciques and principals of Tepeyahualco, and with the right of successors and lawful descendants of D. Juan and D. Fernando Morales "companions (they said), of the illustrious Hernan Cortés in the conquest and pacification of these kingdoms" had been in possession of the municipal government of that pueblo and of Axapusco, and consequently of the administration of their communal property. The dexterous policy of the Spanish government soon conceived the danger of that system, *which was very general in its origin*, and therefore sought to undermine it in its own particular way. It sought, therefore, to develop the municipal (communal) principle of institutions, and setting the democratic element to action, thus placed the caciques in opposition with their former subordinates, destroying their influence and power. In the present case, the viceroy authorized the pueblos mentioned to elect their municipal authorities, and thereby Santos and the Morales were removed from the administration of the properties." These remarks are very important. But the parties appealed from this division and a long suit ensued. The chiefs based their claims upon the grant of Cortés *exclusively* (pp. XIII and XIV), and the pueblos attacked the authenticity of that document; at the same time invoking the rights of possession ("plenario de posesion.") The result of the litigation is described as follows: "declaring the possession in favor of the pueblos, condemning Santos to restitution of the fruits (proceeds), but leaving aside the rights of the parties upon the point of ownership" (juicio de propiedad). The whole case shows that the Spanish government recognized:

First: The communal organization of the tribes, and the elective constituency of its chieftains.

Second: That the hereditary office of chiefs, and the hereditary ownership of lands, were Spanish innovations ("que á su principio fué muy ordinario"). Now this origin ("principio") is certainly not intended to go farther back than the conquest.

Third: That the only right and title, as claimed by the chiefs, was derived from the grant of Cortés, and that they did not claim any prior right, connected with descendancy or with privilege of caste.

Fourth: Consequently, that the Spanish government itself recognized the anterior democratic constituency of the Indian community, and its customs, regarding them as prevailing even over the acts and disposition of Cortés,— although to him the Spaniards owed the conquest of the country.

[155] Rapport sur les différentes classes de chefs de la Nouvelle Espagne," pp. 63 and 64. The original of this highly important report to the King of Spain, has been printed once, but very defectively, in the "Collecion de Documentos Inéditos relativos al Descubrimiento, etc., etc." It is much to be regretted that my learned friend, Sr. Icazbalceta, has not incorporated that copy of it pertaining to Sr. Ramirez, in his valuable

"The good order reigning in the calpullis is a strong reason to protect them in law, and to prevent them from becoming intermingled, as they are already nearly everywhere; for once broken up, the harmony which they originally exhibited can never be reëstablished again. The ignorance about these institutions, and the little regard paid to them, are the cause that many Indians were given lands out of their calpullis, which they (originally) had received only to cultivate, and (this) on their simple assertion that they and their ancestors had held and tilled them. In doing this, they but follow the advice of the Spaniards (mestizoes) and mulattoes, who involve them in litigations, and who live from these squabbles. . . . . In vain the chiefs deny such assertions, claiming that the lands belong to the calpulli; they are not heeded, the rightful owners are despoiled, and those to whom they are adjudged do not profit by it, since they sell them, or alienate them (otherwise) to the detriment of the calpulli."

Out of the scanty remains thus left of certain features of aboriginal life in ancient Mexico, as well as out of the conflicting statements about that country's early history, we have now attempted to reconstruct the conceptions of the Mexican aborigines about tenure of lands, as well as their manner of distribution thereof. Our inquiries seem to justify the following conclusions:

1. The notion of abstract ownership of the soil, either by a nation or state, or by the head of its government, or by individuals, was unknown to the ancient Mexicans.

2. Definite possessory right was vested in the kinships com-

"Coleccion de Documentos para la Historia de México."— Alonso de Zurita lived in America from 1540 till 1550; or about nineteen years. Of these he spent two at St. Domingo, three years in N. Granada, Sa. Marta, Cartagena, and the Cabo de la Vela, three years in Guatemala, and about eleven in Mexico. His "Report" consists of a series of answers to queries put by the King, and sent from Valladolid, Dec., 1553. If we could obtain all the answers given to these questions from all parts of Spanish America, and all as elaborate and truthful as those of Zurita, Palacio and Ondogardo, our knowledge of aboriginal history and ethnology of Spanish America would be much advanced.

posing the tribe; but the idea of sale, barter, or conveyance or alienation of such by the kin had not been conceived.

3. Individuals, whatever might be their position or office, without any exception, held but the right to use certain defined lots for their sustenance, which right, although hereditary in the male line, was nevertheless limited to the conditions of residence within the area held by the kin, and of cultivation either by or in the name of him to whom the said lots were assigned.

4. No possessory rights to land were attached to any office or chieftaincy. As members of a kin, each chief had the use of a certain lot, which he could rent or farm to others, for his benefit.

5. For the requirements of tribal business, and of the governmental features of the kinships (public hospitality included), certain tracts were set apart as official lands, out of which the official households were supplied and sustained; but these lands and their products were totally independent from the persons or families of the chiefs themselves.

6. Conquest of any tribe by the Mexicans was not followed by an annexation of that tribe's territory, nor by an apportionment of its soil among the conquerors. Tribute was exacted, and, for the purpose of raising that tribute (in part), special tracts were set off; the crops of which were gathered for the storehouses of Mexico.

7. Consequently, as our previous investigation (of the warlike institutions and customs of the ancient Mexicans) have disproved the generally received notion of a military despotism prevailing among them,—so the results of this review of Tenure and distribution of lands tend to establish: "that the principle and institution of feudality did not exist in aboriginal Mexico."

REPORT OF THE TREASURER.

REPORT OF THE TREASURER.

To the Trustees of the Peabody Museum of American Archæology and Ethnology in connection with Harvard University:

The Treasurer respectfully presents his Eleventh Annual Report in the following abstract of accounts, and the cash account hereto annexed:—

The Collection Fund is charged with

9 Massachusetts 5 per cent. Coast Defence Specie Notes, due July 1, 1883, each for $5,000, numbered 46 to 54, registered, the gift of George Peabody, Esq.		$45,000 00
Balance of Worcester & Nashua R. R. Co. Note of July 5, 1875, at 6 per cent.	$7,965 28	
Note of Worcester & Nashua R. R. Co. of July 5, 1876, at 5 per ct.	1,691 89	
Note of Worcester Gas Light Co., Note, Jan. 4, 1876, at 6 per ct.	1,300 00	
Note of Worcester Gas Light Co., Note, Jan. 15, 1876, at 6 per ct.	600 00	
Balance in the hands of the Treasurer	1,789 38	
		13,346 55
Income from Mass. 5 per cent. Specie Notes in currency	2,337 89	
Income from Mass. 5 per cent. Specie Notes of Professor Fund in currency	2,337 88	
		4,675 77
Sale of Reports		8 12
Income from Treasurer's Investments		631 90
		$63,662 34

And Collection Fund is credited with

9 Mass. 5 per cent. Specie Notes, as above, each for $5,000		$45,000 00
Balance of Worcester & Nashua R. R. Co. Note, July 5, 1875, at 6 per cent.	$7,465 28	
Note of Worcester Gas Light Co., Jan. 4, 1876, at 5 per cent.	1,300 00	
Note of Worcester Gas Light Co., Jan. 15, 1876, at 5 per cent.	600 00	
Cash in the hands of the Treasurer	1,666 14	
		11,031 42
Payment for Explorations and Collections	2,061 70	
Payment to Dr. Edward Palmer, on account of appropriation for Explorations in Mexico	500 00	
Payment to F. W. Putnam, Curator, on account of Explorations in Tennessee	200 00	
Payment to F. W. Putnam, Curator, on account of Plates for Report	200 00	
		2,961 70
Payment to F. W. Putnam, Curator, one year's salary	1,800 00	
Payment to Harvard College, for Rent of Rooms	750 00	
Payment for Rent of Deposit Safe	30 00	
Payment for Books	52 50	
Payment for printing Report and other printing	854 90	
Payment for Incidental Expenses	1,181 82	
		4,669 22
		$63,662 34

The Professor Fund consists of

9 Massachusetts 5 per cent. Specie Notes, as above, each for $5,000, numbered 55 to 63, registered, the gift of George Peabody, Esq.; the income appropriated to Collection Fund, until Professorship is filled		$45,000 00

The Building Fund is charged with

12 Massachusetts 5 per cent. Specie Notes, as above, each for $5,000, numbered 64 to 75, registered, the gift of George Peabody, Esq.		$60,000 00
7 Bonds of Worcester & Nashua R. R. Co., at 7 per cent., due April 1, 1893	$11,000 00	
42 Shares of State N. Bank, Boston, cost	5,040 00	
5 Bonds of Boston, Barre & Gardner R. R. Corporation, each $5,000, 7 per cent., cost	4,675 00	
Balance in the hands of the Treasurer	322 60	
		21,037 60
Income from Mass. 5 per cent. Specie Notes, in currency	3,117 19	
Income from Investments by the Treasurer	1,594 29	
		4,711 48
		$85,749 08

And Building Fund is credited with

12 Mass. 5 per cent. Specie Notes, as above, each for $5,000		$60,000 00
Cash in the hands of the Treasurer		1,654 48
Payments for the erection of the Building	23,886 92	
Payment for Incidentals	207 68	
		24,094 60
		$85,749 08

Mr. Peabody's Gift of $150,000 in Mass. 5 per cent. Specie Notes remains unchanged, except in the Registration of the Notes. The use of this Fund appears in the Eleven Annual Reports, as follows: —

The Expenditures are

For Explorations and Collections	$30,527 35
For Salary and Incidentals	20,469 79
For Erection of the Building	52,786 92
For Incidentals of the Building	207 68

And there is now Invested.

For Collection Fund, at par	56,031 42	
For Professor's Fund, at par	45,000 00	
For Building Fund, at par	61,654 48	
		162,685 90
		$266,677 64
$150,000, and an annual income of 7 per cent., in 11 years will amount to		$265,500 00

STEPHEN SALISBURY, *Treasurer.*

CAMBRIDGE, February 18, 1878.

Dr.

STEPHEN SALISBURY, *Treasurer of the Peabody Museum of American Archæology and*

1877.		*For Collection Fund.*		
Jan.	17.	To Balance of Account		$1,789 38
July	3.	To rec'd of F. W. Putnam, credit for payment, May 10		100 00
July	5.	To rec'd 6 months' Interest on Balance of Worcester & Nashua R. R. Note of July 5, 1875, 6 per cent. .	238 96	
July	5.	To rec'd 6 months' Interest on Worcester & Nashua R. R. Co. Note of July 5, 1876, 5 per cent. . . .	42 29	
				281 25
July	6.	To rec'd 6 months' Interest on Worcester Gas Light Co. Note, to 1st, 6 per cent. (5 per cent. after) . .	39 00	
July	6.	To rec'd 6 months' Interest on Worcester Gas Light Co. Note, to 1st, 6 per cent. (5 per cent. after) .	18 00	
				57 00
July	7.	To rec'd 6 months' Interest on Mass. Specie 5 per cent. Notes to 1st, $1,125, Gold, at 5¼ per cent. .	1,184 06	
July	7.	To rec'd six months' Interest on Mass. Specie 5 per cent. Prof. Fund Notes, to 1st, $1,125, Gold, at 5¼ per cent.	1,184 06	
				2,368 12
Aug.	18.	To rec'd for Worcester & Nashua R. R. Co. Note, July 5, 1876, $1,691 89, Interest 5 per cent., $10 35 . .		1,702 24
Oct.	5.	To rec'd of F. W. Putnam, credit for payment, July 31	400 00	
Oct.	5.	To rec'd of F. W. Putnam, Curator, for Reports sold	8 12	
				408 12
Nov.	26.	To rec'd of Dr. Edward Palmer, credit for payment, August 24		300 00
Nov.	28.	To rec'd on part of Worcester & Nashua R. R. Co. Note of July 5, 1875		500 00
1878.				
Jan.	3.	To rec'd 6 months' Interest on Mass. 5 per cent. Notes to 1st inst., $1,125, Gold, at 2 9-16 per cent. . . .	1,153 83	
Jan.	3.	To rec'd 6 months' Interest on Mass. 5 per cent. Notes of Professor Fund, to 1st, $1,125, Gold, at 2 9-16 per cent.	1,153 82	
				2,307 65
Jan.	7.	To rec'd 6 months' Interest on Worcester Gas Light Co. Note, to 1st, at 5 per cent.	32 50	
Jan.	7.	To received 6 months' Interest on Worcester Gas Light Co. Note, to 1st, at 5 per cent.	15 00	
				47 50
Jan.	17.	To rec'd Interest to 5th inst., on Balance Worcester & Nashua R. R. Co. Note of July 5, 1875 . . .		235 80
		Carried forward		$10,097 06

Cr.

Ethnology in connection with Harvard University, in Annual Cash Account, Jan. 22, 1878.

1877.				
Jan.	19.	By paid Dr. Edward Palmer, on account of Explorations in Utah, $100; Post Orders, 50 cents . . .		$100 50
Jan.	30.	By paid Dr. Edward Palmer, on account of Explorations in Utah, $100; Post Orders, 50 cents . . .		100 50
Feb.	3.	By paid Rent of Safe Deposit		30 00
Feb.	5.	By paid Harvard College, Rent of Rooms, to 1st inst.		750 00
Feb.	26.	By paid W. J. McIntire, for Antique Specimens, from Prebyoloff Islands, A. T.		75 00
Apr.	3.	By paid F. W. Putnam, Curator, 3 months Salary .	$450 00	
Apr.	3.	By paid F. W. Putnam, Curator, Engravings, Report	100 00	
Apr.	3.	By paid Augustus Story, balance for Photographs .	23 50	
Apr.	3.	By paid Hastings & Co., for Photographs of Gas Tablets	4 00	
Apr.	3.	By paid George J. Engelman, for Missouri Pottery .	200 00	
Apr.	3.	By paid A. J. Colburn, for Indian Skeleton and Stone Implements	20 00	
Apr.	3.	By paid Sawin's Cambridge Express	19 10	
Apr.	3.	By paid F. W. Putnam, Curator, for Books . . .	10 75	
Apr.	3.	By paid F. W. Putnam, Curator, for Incidentals . .	11 33	
				838 68
Apr.	27.	By paid Salem Press, for Binding Reports		36 25
May	8.	By paid Dr. Edward Palmer, on account of Explorations in Utah, $100; Post Orders, 50 cts. . . .		100 50
May	10.	By paid F. W. Putnam, Curator, on account of Expense of Moving		100 00
June	11.	By paid S. F. Baird, for Casts of Faces of Indians .		150 00
June	21.	By paid Dr. Edward Palmer, on account of Explorations in Utah, $100; Post Orders, 50 cents . . .		100 50
July	3.	By paid F. W. Putnam, Curator, one quarter's Salary	450 00	
July	3.	By paid F. W. Putnam, Curator, Expenses of Moving	135 62	
July	3.	By paid F. W. Putnam, Curator, Incidentals . . .	85 10	
July	3.	By paid F. W. Putnam, Curator, Books	15 00	
July	3.	By paid F. W. Putnam, Curator, for sundry expenses of Moving	200 00	
				885 72
July	24.	By paid Salem Press, for Printing Report		695 15
July	31.	By paid F. W. Putnam, Curator, Appropriation for purchase of Collections	200 00	
July	31.	By paid F. W. Putnam, Curator, Appropriation for Explorations in the South	200 00	
July	31.	By paid Dr. C. C. Abbott, for Explorations in New Jersey	50 00	
				450 00
Aug.	10.	By paid P. Schumacher, on account of Explorations in California, $250 Gold; premium 5¼ per cent., $13 12; Telegraph Transfer, $5.33		268 45
Aug.	11.	By paid J. N. Curtis, Janitor, for July	50 00	
Aug.	11.	By paid Henry Gillman, on account of Explorations in Florida	100 00	
				150 00
Aug.	17.	By paid Dr. C. C. Abbott, on account of Explorations in New Jersey		50 00
Aug.	24.	By paid Dr. Edward Palmer, on accoont of Explorations in Utah		300 00
Sept.	8.	By paid P. Schumacher, on account of Explorations in California, $150 Gold, at 3½ per cent.		155 25
Oct.	8.	By paid F. W. Putnam, Curator, one quarter's Salary	450 00	
Oct.	8.	By paid J. N. Curtis, pay as Janitor for August and September	100 00	
Oct.	8.	By paid F. W. Putnam, Curator, for Explorations in Tennessee (Appropriated July 31)	301 55	
Oct.	8.	By paid F. W. Putnam, Curator, for Collections purchased (Appropriated July 31)	61 70	
Oct.	8.	By paid F. W. Putnam, Curator, for Incidentals . .	77 22	
				990 47
Oct.	15.	By paid P. Schumacher, on account of Explorations in California, $100, Gold, at 3½ per cent. . . .		103 25
Nov.	20.	By paid Walworth Man'f'g Co., for Fire Irons, etc. .		20 19
		Carried forward		$6,450 41

Dr.

Brought forward	$10,097 06

$10.097 06

				Cr.
		Brought forward		$6,450 41
Nov.	26.	By paid Dr. Edward Palmer, on account of Explorations in Utah	30 50	
Nov.	26.	By paid Dr. Edward Palmer, one-half of appropriation for Exploration in Mexico	500 00	
Nov.	26.	By paid F. W. Putnam, Curator, for Explorations in Tennessee	200 00	
Nov.	26.	By paid F. W. Putnam, Curator, for paid for Missouri Pottery	45 00	
Nov.	26.	By paid Paul Schumacher, for balance for Collections in California	45 00	
Nov.	26.	By paid F. W. Putnam, Curator, for Incidentals	118 41	
				938 91
Dec.	28.	By paid F. W. Putnam, Curator, Appropriation for Plates in Report		200 00
1878.				
Jan.	8.	By paid F. W. Putnam, Curator, Salary one quarter, to 1st	450 00	
Jan.	8.	By paid F. W. Putnam, Curator, for paid for Books	26 75	
Jan.	8.	By paid F. W. Putnam, Curator, for paid for Incidentals	41 18	
Jan.	8.	By paid J. N. Curtis, Janitor, 3 months pay to 1st	150 00	
Jan.	8.	By paid Sawin's Express	163 67	
Jan.	8.	By paid E. T. Jenks, for Tin Cases	10 00	
				841 60
Jan.	22.	By Cash in hands of the Treasurer		1,666 14
				$10.097 06

Dr.

For Building Fund.

1877.				
Jan.	17.	To Balance in hands of Treasurer		322 60
Feb.	5.	To rec'd on sale of $2,000 Worcester & Nashua R. R. Bonds, at 3 per cent. advance, and Interest . .		2,108 60
Apr.	4.	To rec'd 6 months' Interest on Worcester & Nashua R. R. 7 per cent. Bonds to 1st	315 00	
Apr.	4.	To rec'd 6 months' Interest on Boston, B. & Gardner R. R. 7 per cent. Bonds to 1st	175 00	
Apr.	4.	To rec'd Dividend on State Bank Stock, 2½ per cent.	105 00	595 00
May	8.	To rec'd on sale of Boston, B. & Gardner R. R. Bonds, $5,000, at 1 per cent. advance and Interest . .		5,086 94
July	7.	To rec'd 6 months' Interest on Mass. 5 per cent. Notes, to 1st, Gold	1,500 00	
July	7.	To rec'd on sale of above, $1,500 Gold, at 5¼ per cent.	78 75	1,578 75
Oct.	2.	To rec'd 6 months' Interest on Worcester & Nashua R. R. Co. Bonds		315 00
Oct.	6.	To rec'd Dividend on State Bank Stock, 2½ per cent.		105 00
Oct.	8.	To rec'd on sale of $9,000 Worcester & Nashua R. R. Co. 7 per cent. Bonds at 6 per cent. and Interest, $12.25		9,552 25
Oct.	17.	To rec'd on sale of 42 shares of State N. Bank at 8¼ per cent.		4,546 50
1878.				
Jan.	3.	To rec'd 6 months' Interest on Mass. 5 per cent. Specie Notes, to 1st inst., Gold	1,500 00	
Jan.	3.	To rec'd on sale of above, $1,500, Gold, at 2 9-16 per cent.	38 44	1,538 44
				$25,749 08

For Building Fund.

Cr.

1877.				
Feb.	5.	By paid John Farquhar & Sons, for Roof of Building		2,187 38
Feb.	27.	By paid Robert H. Slack, Architect, on account		250 00
May	7.	By paid G. W. & F. Smith, on account of Iron Work	1,250 00	
May	7.	By paid Robert H. Slack, Architect, on account	200 00	
				1,450 00
May	14.	By paid John Mack, on account of Plastering		500 00
June	4.	By paid John Mack, on account of Plastering		800 00
July	5.	By paid John Mack, Balance on Contract, Plastering	1,226 00	
July	5.	By paid Waldo Bros., for Tiles	143 60	
July	5.	By paid Joseph W. Greggs, for Tiles	52 12	
July	5.	By paid Edward F. Meary, for Tiles	134 50	
				1,556 22
July	13.	By paid Hancock & Greeley, on account of Carpentry		2,500 00
Aug.	1.	By paid Robert H. Slack, Architect, on account		225 00
Aug.	3.	By paid Robert H. Slack, Architect, on account his order to Th. Lyman		125 00
Aug.	15.	By paid William Lumb, bill of Plumbing	470 12	
Aug.	15.	By paid F. P. Canfield, bill of Elevator	500 00	
				970 12
Oct.	11.	By paid Hancock & Greely, balance of Carpentry	2,552 17	
Oct.	11.	By paid G. W. & F. Smith, balance of Iron Work	1,470 30	
Oct.	11.	By paid Walworth Man'f'g Co., for Steam Apparatus	1,918 70	
Oct.	11.	By paid Wm. C. Poland & Sons, balance of Masonry	6,931 14	
Oct.	11.	By paid Joseph W. Greggs, for Slate	8 43	
Oct.	11.	By paid Robert H. Slack, for balance of $2,500, as Architect	100 00	
				12,980 74
Nov.	20.	By paid Bliss & Perkins, for Gas fittings	109 75	
Nov.	20.	By paid W. H. Wentworth & Co., for Soapstone	82 50	
Nov.	20.	By paid American Rubber Co., for Steppings	81 90	
				274 15
1878.				
Jan.	8.	By paid Sawin's Express	8 52	
Jan.	8.	By paid Worcester, Bros., for Furniture	16 45	
Jan.	8.	By paid W. P. Richardson, for Coal	97 50	
Jan.	8.	By paid T. E. Saunders, for Cloth for Cases	9 42	
Jan.	8.	By paid G. G. Page & Co., for Wooden Trays	38 10	
Jan.	8.	By paid C. A. Sawyer, for Painting Tables	2 25	
				172 24
Jan.	17.	By paid A. Baumerster, for Plumbing	68 31	
Jan.	17.	By paid American Rubber Co., for Mat	35 44	
				103 75
Jan.	22.	By Cash in the hands of Treasurer		1,654 48
				$25.749 08

I certify that I have examined this account, and find the items to correspond with the vouchers, and to be correctly computed, and that the securities are in the Treasurer's possession.

S. F. HAVEN, *Auditor.*

Jan. 22, 1878.