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Natural History

The American Museum Journal



Vol. I

April, 1900

No. 1



THE FIRST HOME OF THE MUSEUM—THE CENTRAL PARK ARSENAL

A Popular Record of the Progress of the
American Museum of Natural History

64029
29/3/05

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American Museum Journal

Volume I

APRIL, 1900

Number 1

INTRODUCTION.



THE AMERICAN MUSEUM
OF NATURAL HISTORY.

under the direction of
President Morris K.
Jesup and a public-

spirited Board of Trustees, and with the liberal co-operation of the government of the city of New York, has enjoyed a remarkable growth during the last two decades. Additions to the building and the furnishing of new halls by the city has barely kept pace with single donations, and with rare and interesting collections made by expeditions in all portions of North and South America, and of recent years in Asia. It has long been felt that the scientific BULLETIN and MEMOIRS, valuable as they are, fail to keep members and the public informed of our rapid progress; and this JOURNAL has been started to give the Museum news in popular and interesting form, as a medium for the prompt acknowledgment of gifts and for making widely known our needs. From month to month a brief outline of the history of the Museum will be given, to be followed by histories of some of the departments. The LIBRARY will report its progress and wants. EXPLORATIONS will be described, visitors

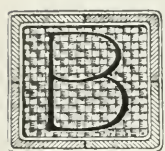
will be kept informed of new or recently arranged exhibitions, and will learn in advance of the many interesting and instructive courses of lectures which are open to all during the winter months, as well as of receptions and scientific exhibitions. In brief, the JOURNAL will keep members informed of all that is going on, and we trust will widen the circle of interest in this noble institution for the education of the people and the diffusion of natural science.

H. F. O.

MEXICAN EXPLORATION.

Mr. Saville has returned from Mexico, where he has been directing the Museum's explorations at Mitla. He has secured among other things: many valuable photographs of ruins, etc., which will be used in subsequent publications of the Museum, some beautiful mosaics, casts of foundations, and of pavements bearing inscriptions. The Duke of Loubat, donor of so many of the objects in the Mexican Hall, visited Mr. Saville while at Mitla, and the Governor of the State of Oaxaca showed his personal interest in the work of the Museum by entertaining Mr. Saville and visiting him during the explorations, as well as by granting him every governmental courtesy.

THE DEVELOPMENT OF THE AMERICAN MUSEUM OF NATURAL HISTORY.



BEFORE 1869 New York did not possess a Museum of Natural History in the best sense of the term, nor indeed any adequate home for the treasures of art. Numerous suggestions and a few impracticable efforts had been made to relieve New York of this unfortunate defect. It had been repeatedly pointed out that in a city of so large and heterogeneous a population, a city of great wealth, and the first visited by all travellers from abroad, the absence of the educational influence of a Museum of Natural History was inexcusable. It had indeed not escaped the observation of the curators of the Museum of Comparative Zoölogy established at Cambridge by Louis Agassiz, that the scientific visitors to that institution were astonished at the backwardness of the metropolis in this respect. It inured, all the more conspicuously, to bring into prominence New York's commercial activity, and lent a sting of justice to the repeated sarcasms over New York's mercenary spirit.

The one body of scientific workers, collectors, and students then in New York was the New York

Lyceum, and this rather diligent group of naturalists maintained an isolated life, quite deprived of all sympathetic interest from, and indeed scarcely recognized at all by, the general public. Here De Kay, Torrey, Redfield, Beck, Jay, Mitchell, Joy, Le Conte, Gray, met to read their papers, exhibit their acquisitions, and after an evening of mutual pleasure disappear again in the currents of New York's social life, without leaving the slightest impress upon the mental attitude of New York toward science.

It could hardly be otherwise. The marked limitation of scientific men is frequently their self-absorption and indifference to public appreciation, and this was in a measure fostered by the indifference of New Yorkers to the themes they devoted themselves to explore.

Before the aspects of nature were revealed to them, through the means of a great Museum, before, in connection with this display, its concomitant educational work in lectures and instructions had begun, how could New York be expected to feel much pride in a purely scientific organization?

Nor, at that early day, had any proper attention been paid by the colleges, university, and high schools of New York to the study of nature, a condition at the time, let us not forget, not unparalleled in England itself.

So the project of a Museum languished. It is true that the Lyceum had gradually gathered a miscellaneous collection of mineral and organic objects, alluded to with some pride by the younger Redfield, and that it had unavailingly endeavored to secure for the collection an appropriate home. It is true a botanical garden—the Elgin Gardens—had secured a temporary realization in a tract of ground between Fifth and Sixth Avenues in the neighborhood of 50th Street. It is true that a permanent industrial exhibition, in which the elements of Natural History were somewhat vaguely embodied, had been projected in the great Crystal Palace, which held the World's Fair of 1853. But these preliminary conditions were impotent and fruitless to create a Museum, and the pay show or the itinerant menagerie yet remained the most substantial representatives of the Natural History Museum in New York.

As far back as 1853 a rugged, almost savage tract of land from 59th Street to 110th Street, and between Fifth and Eighth Avenues, had been secured by an act of Legislature to provide for New York a public park, our present Central Park. Amongst its first officers was Andrew H. Green, to whom indeed the perfecting of a project of a park was measurably due. Mr. Green

had known many of the scientific collectors of New York. His brother, Dr. Green, to whose memory the grateful Ceylonese have erected a hospital, was a scientific man. His own acquaintance with Dr. George P. Marsh, the author of "The Earth as Modified by Human Action," engendered in him scientific tendencies, and at a very early day caused him to consider the means of establishing a Museum in Central Park. An act providing for such an institution was passed by the Legislature; and it was expected that the Lyceum of Natural History would avail itself of this opportunity. But later (1866) its collections were destroyed by fire, and it failed through indecision, and perhaps through a sense of incompetency to push forward a plan whose design was as yet only furtively outlined.

In 1866 there arrived in New York a young man from the Museum of Comparative Zoölogy at Cambridge, who visited Mr. William E. Dodge, Jr., and presented to him a scheme of travel which he proposed, with assistance, to undertake; while at the same time he spoke with enthusiasm of a plan for a Museum of Natural History for New York. His energy and almost boundless hopefulness impressed Mr. Dodge and formed again one of the auxiliary influences hastening the crystallization of the Museum

idea. This young man was Albert S. Bickmore. He soon vanished from the apathetic notice of New York, and began his travels in the East Indies, the colonies of Holland, Japan, China, and Siberia. He returned to London just at the moment when a group of public-spirited citizens in New York had completed a plan for the embodiment of the idea which he so vigorously urged, and which through many formative agencies had now assumed objective realization.

In December, 1868, the following letter was received by Andrew H. Green, then Comptroller of Central Park,—an office unique in the official annals of New York,—which practically laid the foundation of the American Museum of Natural History.

NEW YORK, Dec. 30, 1868.

Commissioners of the Central Park :—

DEAR SIRS :

A number of gentlemen having long desired that a great Museum of Natural History should be established in Central Park, and having now the opportunity of securing a rare and very valuable collection as a nucleus of such Museum, the undersigned wish to enquire if you are disposed to provide for its reception and development.

JAMES BROWN,
ALEX. T. STEWART,
BENJ. H. FIELD,
ADRIAN ISELIN,
ROBERT L. STUART,
MARSHALL O. ROBERTS,

THEODORE ROOSEVELT,
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W. A. HAINES,
J. PIERPONT MORGAN,
A. G. PHELPS DODGE,
D. JACKSON STEWARD,
HOWARD POTTER.

This overture was most cordially received by the Park officials, and the first steps at once taken to incorporate a society under the name of the American Museum of Natural History (April 9, 1869): while, by a wise prevision, collections of birds and animals then offered in Europe, and the Elliot collection of birds in this country, were purchased. Professor Bickmore was communicated with. Mr. Wm. T. Blodgett went to Europe to perfect arrangements and secure co-operation with Mr. D. G. Elliot, then abroad, and a hastily improvised shelter for the new collections was secured at the Arsenal in Central Park. The first period of the Museum's history had fairly begun.

L. P. GRATACAP, A.M.,

Ass't Curator, Dep't Geology.

(To be continued.)



Photographed by

THE READING-ROOM.

W. Orchard

THE LIBRARY.



THE Library alone, in one sense, makes possible the Museum as a progressive, constructive organism, not a mere repository of curiosities. To help make this great instrument of research more effective is to contribute in a most practical and necessary way to the advancement of science: and for the purpose of bringing this home forcibly to the friends of the Museum it may be well to state briefly the present condition of the library, as well as its greatest needs, as preliminary to a series of notes in succeeding issues.

The library, with its forty-odd thousand books of reference, including very many rare and beautiful works of great value to those interested in the history of science, and very many more of present and constant use to investigators, stands today as the joint result, first, of about a score of important gifts and purchases and, second, of the exchange of Museum publications with those of other societies.

It may be interesting to consider each of these factors of the library's growth: first, gifts and purchases, second, exchange.

Of the gifts one might mention

as perhaps most important: the S. Lowell Eliott library of 9500 works, containing rare works on Insects, Geology, Fishes, Birds, Fossils, General Zoölogy, and the early history of America; the Jewett library, containing very valuable early editions of Voyages and Travels; the Jules Marcou library of 3000 volumes on Geology, Palæontology, Mineralogy—very valuable; the Brevoort library, given by R. L. Stuart, containing 2083 books, and 1090 pamphlets on Fishes (up to 1882); and finally, the Jay library of Conchology and general science, the gift of Miss Catherine Lorillard Wolfe.

Naturally, owing to the nature of its growth through the successive addition of private libraries, the library is noticeably lacking in some lines and fairly complete in others. With respect, for example, to Geology, to the science of minerals, and to the literature of the former invertebrate creatures of the earth, the library is fairly sufficient for the actual needs of the investigator. A very full library on Vertebrate Palæontology is also being built up by the curator of that department. In the literature relating to Mammals, Marine Zoolögy, Ethnology, Archaeology, on the other hand, the library is decidedly lacking. Books relating to the great group Reptilia are comparatively few; while the important science of Forestry, already well

reflected in a practical way by the superb Jesup collection of North American woods, is barely represented. Especially is there need of a complete series of the catalogues of the British Museum, of prime importance to all systematists and naturalists.

It is evident, therefore, that the library stands in very different degrees of helpfulness to the different departments of the Museum, and that there is need of a special fund judiciously expended in directions most needful.

The second way in which the library has grown is by exchange; and here again the nature of the growth makes many gaps inevitable. This is a serious difficulty to investigators, who, it would seem, usually happen to want the missing numbers.

The chief method used by the librarian for remedying these defects is the exchange of duplicate publications—a tedious but advantageous work. In this way he has recently obtained a valuable lot of publications from the museum at Harvard. To cope adequately with this difficulty, however, the librarian needs again a special, even if comparatively small, annual fund.

To conclude, the books of the library are at the service of any earnest person, for use in the reading-room alone. The reading-room is open daily from 9 a. m. to 5 p. m.

W. K. G.

THE OBJECTS IN THE
MEXICAN HALL.



THE student of animal life as it existed in geological times and the student of human history as typified in the wonderful ruins of Mexico and Central America have much in common. The same methods of reasoning which have made it possible through the accumulation and sifting of almost limitless evidence to spell out slowly but surely the course of organic evolution are applied in the study of long-buried civilizations. Comparative anatomists, geologists, botanists, all working together, from scattered, often fragmentary bones, from the depth and relations of different strata, from fossilized remains of vegetation, have been able to reconstruct pictorially not only many whole faunæ of the creatures themselves, but to show in outline the action and reaction of different groups, to speak confidently of their life-habits, food, surroundings, and finally, in some instances, to assign very probable grounds for the rise and decline of particular races. The potteries, inscriptions, and ruins of the archaeologist likewise, are all documents from which, by using the same reasoning processes, he can picture to us the noble cultures of the past,

and, less certainly by reason of the youthfulness of the science, throw light on their origin and decline.

Viewed in this light, the remains of the great civilizations that sprang up long ago in America and flowered out with such splendor before the coming of Cortes become of increasing interest.

It is from this view-point that we shall offer from time to time some account of the objects gathered together in the Mexican Hall—in many respects the most important collection in existence for the study of the ancient civilizations of Mexico and Central America.

Two things are now evident as to the civilization which the astonished Cortes found at its zenith. In the first place, it was great and widespread; for hundreds of impressive structures—palaces, temples—have left their ruins throughout all Mexico and Central America. Secondly, it was old: for, *à priori*, civilizations must be old to have grown from barbarism; but chiefly and inductively the primitive stock had had time to branch out extensively. The Nahuas, or Aztecs, of the Valley of Mexico, the Tarascans, the Zapotecs, the Mixtecs, the Totonacs of Vera Cruz, and, highest of all, the Mayas, were probably all of one blood, and yet of different culture.

All these cultures are represented in the objects now in the Mexican Hall. At present our knowledge of them is but begun. As time goes on, and the evidences accumulate and are constantly resifted, science, stepping upward from the ruins and the potteries, through the inscriptions on monuments, through records of the ritual and in ways perhaps now unforeseen, passing from outward things, will enter gradually and understandingly into the inner lives of these long-dead nations.

W. K. G.

AN ANCIENT FIGURE OF TERRA COTTA FROM THE VALLEY OF MEXICO.

Abstract from the *Museum Bulletin*,
Vol. IX., 1897.



THE terra cotta figure shown on the adjoining column was found by an Indian in a cave near the modern city of Texcoco, and is now preserved in the American Museum of Natural History. It was broken in a number of pieces when found, and with these fragments were portions belonging to two other figures of a similar character. The figure is approximately life size, and represents a man with arms extended and mouth opened as if singing or shouting. The hands show that



each formerly grasped some object; the ends of the fingers are broken off. The body is dressed in quilted armor; the head is artificially flattened. It seems evident that we have, in this remarkable specimen of art in terra cotta, the actual portrait or statue of some distinguished war chief of the old Alcolhuan tribe, dressed in armor, and very probably having in his hands his sword and shield.

THE JESUP NORTH PACIFIC EXPEDITION.



R. BERTHOLD LAUFER, of the Jesup North Pacific Expedition, has recently returned from Northeastern Asia. He has spent several years studying the Ainu of the island of Saghalin, north of Yezo, and the Golds and Gilyaks of the great Amoor River that flows northeast through Amoor Province into the Sea of Okhotsch. Dr. Laufer brings with him plentiful spoils, such as weapons, utensils, dresses, which reflect the material life of these isolated tribes, and, what is better, such records of language, customs, and traditions as will substantially aid in the clearing up of important subsidiary questions involved in the great problem, "What

is the history of the peoples of Northeastern Asia?"

To have done with the Ainu rather summarily, we may say that there is now no longer any doubt that they are a people by themselves, only secondarily affected by the Japanese.

As to the Golds and Gilyaks, space permits us but a few miscellaneous facts. Notwithstanding the fact that many minor points still remain to be deduced from a careful study of the material, Dr. Laufer has already outlined the answer to many questions of which the archæologist alone can appreciate the true importance.

Among the spoils from the Golds and Gilyaks, Dr. Laufer prizes highly some weapons (spear-heads, daggers) of steel, inlaid with copper. This art, once learned from the Chinese, is now lost, and these specimens are of considerable rarity. Garments of fish skin, of the texture of thin leather, and covered with well-embroidered patterns, also show that these people were not wholly lacking in the sense of beauty. Weaving of baskets (save rough osier work) is unknown, but boxes are made of birch bark. The decorations on all these objects consist largely of symbols borrowed from the Chinese. The cock and dragon, as well as certain purely conventional abstract Chinese symbols, are used

without knowledge as to their significance. Thus they pass readily into purely geometric designs, often of some complexity.

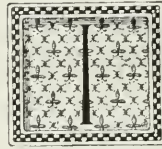
The mythology of the Golds is crude. It includes good and evil spirits, with the Shamans as mediators. The sick man must hew a rude figure of an animal typifying the demon that has stolen his soul. The Shaman by its means (in spirit) goes after the soul and wrests it from the captor. Amulets of wood, leather, bone, often of curious shape, represent animals and mythological monsters. The sun, moon, and other natural objects personified are the subjects of some rather pretty myths.

As with most barbarous peoples, conduct is restricted by many superstitious conventionalities, such as the supposed shocking impropriety of a man's ever seeing his mother-in-law's face. The condition of woman is that of a slave, and upon her the conventionalities bear most heavily.

W. K. G.

The next number will contain some account of the work of MM. W. Jochelson and W. Bogoras, also of the Jesup North Pacific Expedition, who are about to take up again their studies of the people of North-eastern Asia.

THE JAY TERRELL COLLECTION OF FOSSIL FISHES.



IF a European scientist had been asked some twenty years ago—before many of the discoveries by Marsh and Cope—what were the most remarkable creatures which the American continent had produced, he would probably have mentioned the Devonian Fishes of Ohio. For since the time when they were first described by Prof. Newberry, these seemed to every one about as huge and outlandish as any fish-like creatures could reasonably be. Their great bony plates, flattened heads, and stout jaws, which in some cases suggested those of a parrot, gave the veriest layman a most impressive picture of what aquatic life in early days must have meant. This can be better appreciated, perhaps, after one has examined the accompanying cuts from photographs of the head and shoulders of *Dinichthys*, and many a good geologist knows them only by their pictures. This form measured a yard across the back, and its shear-like jaws, of solid bone, were an inch and a half in thickness.

It happens, however, that, as in the case of many other extinct forms, fossils of the Ohio fishes are exceedingly rare,—hardly a fossil has found



Courtesy of the

Macmillan Company

DEVONIAN FISH DINICHTHYS.

its way to European museums; and in our own collection there has hitherto been nothing more to represent them than a single tooth. Not but that there have been found enough fossils to tell us of the many different kinds — and something of the anatomy — of this Ohio fauna. Several collectors have labored diligently in

this field, and as the fruit of many years have gathered together a number of specimens, which have usually found their way to but two museums, those of Columbia University and of Harvard.

It is an item of general interest, therefore, that one of these collections, and a very satisfactory

one, has lately been acquired by the American Museum, a purchase made possible by the generous gift of a trustee, William E. Dodge, Esq. The present collection represents the work of no less than eight years, on the part of the veteran collector of the Ohio fishes, Mr. Jay Terrell, to whose skill and energy some of the most surprising discoveries in this field have been due. The collection is the fourth which he has brought together, the others having been secured by Columbia, Harvard, and Oberlin. The specimens are all from the Cleveland shale (of Upper Devonian age) and were obtained mainly in the region of Vermilion River, Ohio. They occur in large concretions, which are usually exposed by the weathering away of the soft shale. Even when located these are often difficult to obtain on account of the precipitous nature of the valleys in which the section of the shale is shown. A number of the specimens, indeed, were obtained by Mr. Terrell from the cliffs overhanging Lake Erie, accessible only during the winter time when the concretions could be approached from the ice below.

As to these ancient fishes: There can be little question that in all of their forms, large and small, they were ravenous and shark-like in habits. And the large *Dinichthys*, which is figured above, was

certainly a dangerous neighbor, easily the master of all other kinds of animals living in his time. That they quarrelled among themselves is known almost positively, for a specimen has been taken from the rock, whose stout back-plate had been completely crushed in two, bearing in its solid bone deep imprints and gashes which fit the jaw-tips of this species. In another case a portion of a jaw was found separate in the rock, with marks of having been broken off during the animal's lifetime. The particular form, *Dinichthys*, appears to have been nine feet or more in length, but it was by no means the largest member of the family. *Titanichthys* was probably half as large again, but its jaws were less formidable. Other types of these ancient fishes had jaws which were long and delicate, set with a bristling row of teeth. It may be noted that in all of these forms the mouth parts appear to have been capable of a certain degree of independent movement, so that the tips of the jaws could be opened or drawn together, like finger-tips,—in this regard differing widely from any living fishes. Another curious feature is the well-marked socket they show in the middle of the forehead: this may possibly have been occupied by a "pineal eye," which lizards have retained up to the present day. B. D.



THE MUSEUM'S REGAL PYTHON.



THE splendid specimen of a regal python now exhibited at the Museum in the gallery of the East Wing is the

first gift of importance from the New York Zoölogical Park—which promises to become as valuable an ally of the Museum as the London Zoo is to the great British Museum of Natural History.

Last September the Zoölogical Society purchased two regal pythons, one twenty-two and the other twenty-four feet long. The reptile house had not yet been finished, and accordingly the animals were temporarily housed in a stable. During a sudden drop in temperature the escape of an animal caused the watchman to neglect the stove,

and both pythons suffered congestion of the lungs, to which, in spite of careful treatment, the larger one succumbed.

It was immediately sent to the Museum, where careful measurements were quickly taken, a plaster cast made of the form, and minute notes put down as to the brilliant colors of the skin. It happened fortunately that the snake had but recently sloughed off its old skin, and the new skin was brilliant with color. The animal was then opened along the under side and twenty-eight large eggs removed and put in alcohol. The skeleton was also saved. After the removal and tanning of the skin, care having been taken not to stretch it, it was laid out on a piece of wire-cloth and the

outline traced. The wire-cloth, cut out along this outline, was then rolled up and fashioned into a rough model in the final position of the specimen. After covering this with papier maché, so as to reproduce exactly the form of the living animal, the prepared skin was glued over it and sewed along the under side. To reproduce exactly the form, the taxidermist was naturally much aided by studying the other living snake still at the Zoo.

The final operation of imparting to the now faded skin the colors of life was as delicate as it was successful.

W. K. G.

The collection of minerals made by Dr. E. O. Hovey in the Black Hills of the Yellowstone is about to be put on exhibition.

The minerals presented by Mr. Theodore Berdell include valuable specimens of Cripple Creek tellurides, such as nagyagite, lionite, coloradoite, together with some crystals of native tellurium.

The collection of minerals of New York Island, presented to the Museum by the Mineralogical Club of New York, will ultimately embrace the minerals of Greater New York, and will be supplemented with maps and photographs. The nucleus of the exhibit is the Chamberlin collection.

Mr. Gustav E. Kissel has presented the Museum with an aërolite from Ness County, Kansas. The stone is rudely polygonal, about three inches in diameter, and weighs 585 grammes.

In the Hall of Fossil Invertebrates two model cases are now on exhibition which illustrate figured species in Dana's "Geology."

Cases full of Invertebrate Fossils, for the most part imbedded in irregular small pieces of sombre stone, as generally arranged, are not attractive to the eye of the public. At the suggestion of the president a model installation was accordingly devised, and was tried in several cases. The specimens are taken out of the little cardboard boxes and laid on buff-colored cards, serving both as labels and background. Black strips, placed at proper intervals, agreeably break up the monotony of the shelves. Besides this the shelves are tipped downwards so that the specimens nearest the wall can be better seen. The general effect is most pleasing.

We also call attention to the collection of Devonian Fishes presented to the Museum by William E. Dodge, Esq. *Dinichthys*, a typical genus, is described in this number by Professor Dean of Columbia University.



Photographed by

SPECIMEN CASE OF THE HOFFMAN COLLECTION.

W. Orchard

THE HOFFMAN COLLECTION OF BUTTERFLIES.

The author of *Stones of Venice* might well have described adequately the color and form beauty of butterflies. In a brief description of the collection presented last year

by the Very Rev. Eugene A. Hoffman, D.D., LL.D., we must be content with plain statements as to its character and extent.

The Hoffman collection of butter-

flies is of great value in point of beauty and completeness, and includes representatives of the most beautiful species of South America, Mexico, Central America, and India. From so wide a range, with ingenuity, with patience, and not without effort, these beautiful creatures have been gathered together. The collectors, and especially Mr. Denton who mounted them, have surely not labored in vain. And it is plain that the work is not yet finished, for the donor has given authority to the curator to add enough to fill several more cases.

The best of it is that the great beauty of these butterflies will probably long be preserved to us. The fine striations of their wings, which cause the prismatic play of colors, will not, like pigment, speedily disintegrate through exposure.

This is not the case, unfortunately, with other thousands of butterflies which the curator keeps in dark drawers. To exhibit these to the public would cause their speedy destruction—a thing certainly to be avoided. The curator will gladly show them, however, to any one really interested. Lest donors may hesitate to give collections which cannot be generally exhibited, it may be well to say that the collections now hid away in drawers and apparently useless are of great value

for study purposes. Many of them show transitions in pattern and color between species and species and between species and varieties which have a direct bearing on important problems of evolution.

SPECIMENS OF RARE AFRICAN ANTELOPES

The Department of Taxidermy is at present engaged in mounting a collection of rare African antelopes, hitherto unrepresented in the Museum. They were secured by the Field Columbian Museum expedition, and received there in exchange for other skins.

These antelopes are all short-haired and are consequently being mounted by a special method recently adopted by the members of the department. This consists in the preparation of a "manikin" or dummy figure for each specimen, so constructed that when ready to be enveloped by the skin, the legs may be lifted from the body and afterward readjusted. The skin of the legs is not split up behind as is done ordinarily, and as a consequence there are no awkward seams to conceal in the finished specimen. This method of mounting takes no more time and produces a very satisfactory result.

J. R.

The American Museum Journal



Vol. I

May, 1900

No. 2



EXTINCT SABRE-TOOTH TIGER, SMILODON ; SKELETON IN COPE PAMPEAN COLLECTION
RESTORATION BY WOLFF

A Popular Record of the Progress of the
American Museum of Natural History

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THE AMERICAN MUSEUM OF NATURAL HISTORY was established in 1869, to promote the Natural Sciences, to diffuse a more general knowledge of these sciences among the people, and thus furnish both instruction and recreation. The Museum has now a library of over 40,000 volumes on Natural History, and in its halls are exhibited collections which, in many departments of Natural Science, are unsurpassed by those of any other American museum. The material for research is, in many lines, likewise unexcelled.

The Museum is in cordial coöperation with nearly all similar institutions in the world, among which it has already attained high rank. As, however, it is dependent upon private subscriptions and dues from its members for carrying on its work, its progress in many departments will be hastened by an increase of membership.

ANNUAL MEMBERS

Pay \$10 a year and are each entitled to a Subscriber's Ticket, admitting two persons to the Museum on reserve days (Mondays and Tuesdays), and to all Receptions and Special Exhibitions, four course tickets for single admission to each lecture series, and one subscription to THE AMERICAN MUSEUM JOURNAL.

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American Museum Journal

Volume I

MAY, 1900

Number 2



EXHIBITION HALL IN THE OLD ARSENAL.

From a cut in the Annual Report of the Park Commissioners, 1869.

THE DEVELOPMENT OF THE AMERICAN MUSEUM OF NATURAL HISTORY.

(Continued)



MEETINGS were held in succession at the houses of the Trustees, among whom may be gratefully remembered: John David Wolfe, Robert L. Stuart, William A. Haines, Theodore Roosevelt, Morris K. Jesup, A. G. Phelps Dodge. It is appropriate to specify somewhat more clearly Mr. Haines's relation to this enterprise. Mr. Haines was an enthusiastic lover of

shells, and had already, from his extensive correspondence and generous purchases, become known to the world of naturalists as an accomplished conchologist. He had been active in his sympathy and advice in the creation of the new institution, and pushed its designs unflaggingly.

The organization of the new body was quickly concluded, and, with a complete set of officers, and John David Wolfe as President, the

institution thus suddenly born confronted the dangers, discouragements, and difficulties of its struggle towards maturity and permanence.

We have reached that point in the history of the Museum, when the Arsenal in Central Park became its temporary home. The collections bought in Europe, comprising the Maximilian, Elliot, Verreaux, and Vedray collections of birds and mammals, soon arrived, and with promising celerity a group of collectors and naturalists attached themselves to the institution, and either by gifts or services hastened its development. Baron R. Osten Sacken, Mr. Coleman T. Robinson, Mr. A. L. Rawson, Gen. Chas. W. le Gendre, Dr. A. E. Foote, Mr. R. A. Witthaus, Jr., Mr. Robert L. Stuart, Mr. William A. Haines and others were generous donors. Professor Bickmore had been made Superintendent, Dr. J. B. Holder his assistant, and under the energy and incessant application of the former the Museum assumed interesting proportions.

Perhaps it is not improper to advert to the rather cold reception of the new institution by the purely scientific and professional element in New York. This aloofness was a reality, and possibly for a while hindered the growth of the Museum. It sprang from a too formal insistence upon scientific considerations. It was necessary at first to magnify

the popular aspect of the Museum, and gather to it such adherence from wealth or fashion as might more quickly enable it to increase.

Increase did, indeed, come at once. The old Arsenal, a picturesque building, formerly a State armory, and preserved in the park through the strenuous efforts of Mr. Green, was utterly insufficient for the needs of the Museum. Expansion was almost instantaneous. A bill was framed and passed through the Legislature, attached to the "Law relating to the Department of Parks," by which "the Board of Commissioners of the Department of Public Parks, in the City of New York, is hereby authorized to contract, erect, and maintain in and upon that portion of the Central Park formerly known as Manhattan Square, or any other public park, square, or place in said city, a suitable fire-proof building * * * for a Museum of Natural History." But the Arsenal had been most serviceable. Its scarred and battered interior was renewed, new cases were built, and a plentiful application of paint and putty coaxed from its inappropriate design and defective lighting a semblance of propriety, if not beauty.

Purchases and gifts still continued to add to the collections, and about the year 1875 plans were laid for securing the famous Hall Collection



JOHN DAVID WOLFE, FIRST PRESIDENT, A. M. N. H.
From a portrait in the Board Room, by Huntington.

of Invertebrate Fossils, then deposited at Albany.

In the meanwhile (April, 1871), in fact but a short time after the successful opening of the Museum, its first President, John David Wolfe, died, and Robert L. Stuart succeeded him. It was his daughter, Miss Catherine Lorillard Wolfe, who presented the first memorial gift to the Museum, the Jay Collection of Shells and the Jay Library of Conchological Works.

The opening of ground on Manhattan Square proceeded, and on June 2, 1874, the corner-stone of the new building was laid amid ceremonies impressive and prophetic. Dr. S. H. Tyng, Mr. Robert L. Stuart, Hon. H. G. Stebbins, Governor Dix, and Professor Joseph Henry spoke. This first period of the Museum's life cannot be better closed than by the judicious and thoughtful words of the latter: "We may be greatly aided by whatever tends to neutralize the intensified selfishness engendered by the struggle in a large city for supremacy, and the unfavorable effect of extreme exclusion from intercourse with nature, and, above all, the ready indulgence of degrading passions. This is especially the province of museums of art and nature. They not only offer a substitute for immoral gratification by supplying intellectual pleasures, but may also be

rendered sources of moral and even religious instruction. The establishment, the beginning of which we are about to inaugurate is, in accordance with the views we have presented, worthy of the enterprise and intelligence of those who conceived and who have thus far developed it. It is to be a temple of nature in which the productions of the inorganic and organic world, together with the remnants of the past ages of the human family, are to be collected, classified, and properly exhibited. It is to be rendered an attractive exhibition, which shall arrest the attention of the most unobserving, of those who, having been confined all their lives to the city, have come to consider edifices of brick and of stone as the most prominent objects of the physical world."

The years from June 2, 1874, to December 22, 1877, were occupied in the building and equipment of this section, thus inaugurated. The transference to its halls of the collections from the Arsenal was quickly consummated, and on the latter date it was formally opened. Before passing to this, the increase of the collections and the plans for fixing its revenue on a more secure basis require a brief notice.

The Museum collections in their most important features embraced the Verreaux, Vedray, Maximilian, and Elliot collections of birds, and

mammals, reptiles and fishes, the Medary collection of corals, and the Osten Sacken, Robinson, and Witt-haus cabinets of insects.

Specimens covering the whole area of natural science had been donated. These for the most part were individual specimens, unrelated and sporadic gifts of shells, minerals, building-stones, corals, birds, eggs, insects, sea urchins, antlers, nests, mammals, skeletons, anatomical preparations, alcoholics, fossils, and implements. Many of these were notable accessions, many of them poor or valueless, but the insufficient space at the Arsenal made them all equally difficult to dispose of. They could not be classified or well preserved.

The Museum had also received constant additions to its as yet shapeless and diminutive library. Miss Catherine Lorillard Wolfe purchased the collection of shells belonging to Dr. John C. Jay, and by this purchase secured his books accompanying it, which, in a substantial way, laid the foundations of the present library.

Dr. Jay's cabinet of shells had attained considerable celebrity, and many delightful hours of social and scientific intercourse had been passed over its specialties, by its owner, with distinguished naturalists. A large number of the Unios, or fresh-water clams, had been used by Lea

in his famous monograph on this family of shells, and numerous references to his specimens are scattered through the pages of special writers.

But of far greater and different importance was the acquisition by the Trustees of the collection of fossils belonging to Professor James Hall of Albany. It had been said by Louis Agassiz that "whoever gets Hall's collection gets the Geological Museum of America." Agassiz himself, shortly before his death, attempted to purchase it. It formed the largest collection in this country, in point of numbers alone, and in its specimens of the early (palæozoic) periods of geological history, was of preëminent importance. It was almost entirely collected by Professor James Hall, with whose investigations as State Geologist of New York it is identified, as, in fact, much of it was brought together during the survey of this State. It comprised five thousand type or figured specimens used in the great work on the Palæontology of the State of New York.

Before the Arsenal was abandoned the beginnings of a mineralogical cabinet were instituted by the purchase of the collection of minerals of Mr. S. C. H. Bailey, which contained in a limited series an attractive exhibit of beautiful minerals.

In vertebrate remains the fossil collection of Professor Hall was

poor, the superb cabinets of Marsh and Cope, in that day, having no adequate rival in the fragmentary skeletons of a few lizards, sharks, peccaries, and tapirs, the skull of a cat, or the teeth and tusks of a mastodon, which in the Hall Collection represented the vertebrates.

In answer to inquiries made by Professor Bickmore, a letter from Julius Von Haast of the Canterbury Museum, Christchurch, New Zealand, was received at the Arsenal in August, 1873, offering a suite of seven complete skeletons and the principal bones of eleven other species of the gigantic moas of New Zealand.

The correspondence resulted in their purchase. These remarkable remains of huge struthioid birds, associated with the last stages of geological evolution in New Zealand were exhumed at the far-famed locality of Glenmark in New Zealand. A large number of museums all over the world had obtained representative collections from this locality and it was a fortunate opportunity, adroitly and quickly seized, that enabled the Trustees to secure this unique group.

The beginnings, perhaps inconspicuous but sensibly important, of the Archaeological and Ethnological Departments of the Museum were made in these same years. These departments have now assumed preponderant proportions.

Their future development can only be dimly surmised. Amongst the first purchases of archaeological material was that of a few and very precious relics, a remnant from the large collections transported to Salisbury, England, made by Dr. E. G. Davis in Ohio, when he undertook, with Mr. E. G. Squier, the famous examination of the western mounds.

The archaeological treasures of the Museum increased month by month. Purchase and donations alike hastened their expansion. Mr. H. G. Marquand presented over two hundred pieces of Missouri mound pottery, Dr. Jacob Knapp of Louisville, Ky., stone axes and arrow heads, while a second large collection, that of Col. Charles C. Jones, was purchased. This collection was a very valuable addition, and was associated with Colonel Jones's own investigations and publications among the Southern Indians.

Such, in broad outlines, was the growth of the collections before the Arsenal was vacated. This increase, the maintenance of the curators, whose numbers were soon to be added to, and the impending questions of support, as the proportions of the Museum grew, brought the President and Trustees face to face with grave financial difficulties. And the gravity of these questions was deepened by the panic and sudden collapse of credit in 1873.

the effects of which were felt for several years. Through the urgency of the Trustees, work was pushed forward on the new building, and steps were already taken having in view the assumption by the city of the expenses of maintenance, including under that all salaries, and the cost of equipment and its preservation.

It was quite evident that if the Trustees were to assume the quite incalculable outlays necessary for purchases and expeditions, the city, as representing a beneficiary in the enjoyment of these results, should pay the expense of their care and proper installation. Deficit after deficit had been cleared by the Trustees, and indeed on March 10, 1873, it was resolved "that the Trustees *pledge themselves to make up pro rata any deficiency that may occur in the annual current expenses.*"

The Museum was rapidly passing through a transition stage to something more permanent and impressive. Its history up to 1877 was a chronicle of acquisitions, increased or diminished revenues, increased attendance. No element of educational intention, original inquiry, or any serious participation in scientific work had been developed in it. It had no perceptive functions. Such dormancy was natural. Its occupancy of the Arsenal was temporary and provisional. The time

of its curators was employed in devising room, in anticipating additions, preserving specimens, formulating needs and mechanical appliances, renovating and poisoning objects, packing and unpacking. It had no laboratory, no publications, had allied itself with no professed body of scientific students or thinkers. Its immediate care was to keep its collections safe. Under such circumstances the removal of the Museum from the old Arsenal to the new structure in Manhattan Square appeared more and more necessary.

L. P. GRATACAP, A.M.,

Ass't Curator, Dep't Geology.

(To be continued.)

The Zoölogical Society has recently presented the following animals to the Museum: One Ant-Bear (*Myrmecophagus jubata*); one Florida Lynx (*Lynx rufus*); one Bengal Tiger (*Felis tigris*); two Swift Foxes (*Vulpes macrotus*); one Woodland Caribou (young) (*Rangifer floridanus novæ terræ*); one Prong-Horned Antelope (*Antilocapra americana*); one Peregrine Falcon (*Falco peregrinus*); one American Whistling or White Swan (*Olor columbiana*); one Wood Ibis (*Tantalus loculator*); one South African Geometric Tortoise (*Testudo geometrica*); one Leather-Backed Turtle (*Dermochelys coriacea*).



THE COPE PAMPEAN COLLECTION.



NOTABLE addition to the fossil vertebrates in the American Museum of Natural History is the collection of

South American fossil mammals recently presented by Messrs. H. O. Havemeyer, William E. Dodge, D. Willis James, James M. Constable, Adrian Iselin, and Henry F. Osborn. The Museum has hitherto had hardly any representation of these strange extinct monsters of the southern continent; but it can now make an exceptionally complete and representative display of one of the most extraordinary assemblages of animals that ever lived.

The collection formed a part of

the exhibit of the Argentine Republic at the Paris Exposition of 1878. It was gathered by Messrs. Ameghino, Larroque, and Brachet, and described by Dr. Ameghino in a special catalogue.* It was at that time, and still is, one of the finest collections of South American fossils ever got together, and seems to have attracted much attention.

It was purchased in 1878 by the late Professor Cope, with the intention that it should be displayed in the projected Permanent Exposition at Fairmount Park in Philadelphia. The project, however, was not carried out, and the collection remained stored away in the cellar of Memorial Hall, Fairmount Park, for over twenty years, always in the hope that a suitable place would be provided for its exhibition. Finally, in 1899, through the efforts of Professor Osborn and the generosity of the Trustees above mentioned, it was purchased for the American Museum, and will be exhibited in the new hall on the fourth floor of the east wing.

These fossils are found in the Pampean formation, so called from its forming the surface of the *pampas* of the Argentine and near-by states—broad, grassy plains not unlike our own western plains, but nearer the sea-level, and with a somewhat harsher climate. Here

* Exposition Universelle de Paris, Groupe second, Classe huitième. Catalogue Spécial de la Section Anthropologique et Paléontologique de la République Argentine.

and there, where streams cut channels through the sand and fine loam of the pampas, they expose fossil skeletons, of which the first specimens, brought to Europe in the beginning of the century, formed the greatest scientific marvels of the time.

They belong to the most recent geological period, when man had perhaps already appeared upon the earth. South America was at that time inhabited by animals of the most extraordinary characters, some of gigantic size, and most of them unlike any creatures now living. Of these extinct animals there are several hundred specimens in this collection, including nine complete skeletons of as many different species, besides skulls and incomplete skeletons of many more.

The largest of these South American animals were the great Ground-Sloths, somewhat like the little Tree-Sloths which now inhabit the forests of Brazil, but of gigantic size and massive proportions, the hindquarters and tail being especially stout and heavy. They had great digging claws on the feet, which were used in uprooting and pulling down trees in order to feed on their foliage. There were many different species, varying from the size of an ox to that of the largest elephants. Two complete skeletons suitable for mounting, besides many less perfect specimens, represent the

Ground-Sloths in the Cope Pampas Collection.

Smaller than the Ground-Sloths, but more unique in character, were the Glyptodonts, large quadrupeds encased in bony armor. A great hemispherical shield covered the back, a smaller casque the head, and the tail was cased in a long, cylindrical sheath. A number of more or less complete skeletons of these, three or four of which can probably be mounted, are in the collection. The Glyptodonts were allied to the little Armadillos which now inhabit South America—small, nocturnal digging animals with an unsavory reputation as grave-robbers.

The most valuable specimen in the collection is a nearly complete skeleton, finely preserved, of the great Sabre-Tooth Tiger, *Smilodon necator*, an animal twice as large as any living lions or tigers, equalling or exceeding the largest polar bears in size. This ferocious carnivore had great, curving, flattened, sabre-like upper canine teeth to pierce the thick hides of ground sloths and other large animals. In this individual, one of the canines was broken off during life and the stump much worn by subsequent use before the animal died; the other tusk is perfect and projects six inches beyond the skull. The powerful muscles and massive proportions of this beast are well shown in the accom-

panying restoration by Wolf (see cover), presented to the Museum by Prof. D. G. Elliott, of the Field Columbian Museum, in Chicago. The outline restoration of the head, drawn from our skeleton by Mr. Charles R. Knight, illustrates the extraordinarily wide gape of the mouth, giving free play for the huge upper fangs. W. D. MATTHEW.

*Ass't Curator,
Dept. Vertebrate Paleontology.*

THE AMERICAN MUSEUM BULLETIN.



THE scientific publications of the Museum form two series: the "Bulletin," octavo in size, and the "Memoirs," in quarto. The "Bulletin" is intended to be the medium of publication for short articles that do not require large plates. The "Memoirs" are devoted to special monographs or papers requiring large illustrations. The first number of the "Bulletin" was issued in December, 1881, and the first volume was completed five years later. Volume II was completed in the two following years, and Volume III in a year and a half, closing with the year 1891. Since 1891 a complete volume has been issued each year. The volume for the current year is Volume XIII of the series.

These volumes average about four hundred pages each, and consist of from twenty to twenty-five articles, illustrated by numerous text cuts and from twenty to thirty plates.

The articles range in length from one or two pages to a hundred or more, and treat of a great variety of natural history subjects, representing as they do the results of the scientific work of the curators and their assistants in all the different departments of the Museum.

The earlier volumes contained principally papers on Invertebrate Paleontology and Geology, with various papers on Mammals, Birds, and Reptiles. The later volumes include not only papers on these subjects, but articles on Insects, Minerals, and Archaeology. The American Museum "Bulletin" corresponds to the "Proceedings" of the various learned societies, and to the publications often designated as "Bulletin," issued by scientific museums and other similar institutions. The "Bulletin," of course, is not intended as a popular scientific journal, being necessarily technical, yet it contains matter of more or less general interest, easily understood by intelligent readers. It is distributed mainly to other scientific institutions in exchange for their publications, and is thus an important means for the increase of our own library. J. A. ALLEN.

THE LOCAL COLLECTION OF MOUNTED BIRDS.



THE Museum's exhibition collection of birds contains about 12,000 mounted specimens and is divided in four parts: first, a general, systematic collection of the leading types of the birds of the world, occupying the second or main floor of the north wing; second, a systematic collection of the birds of North America, placed in the gallery of the same floor; third, a local collection; and, fourth, a collection of groups of birds in their haunts.

It is the local collection to which, at this season, when migrating birds are thronging Central Park, we would call particular attention.

Doubtless ninety per cent. of the people who visit the Museum to identify birds, desire to ascertain the name of some species they have observed in the vicinity of New York City, and in order to afford them all possible assistance a collection of birds mounted from selected specimens has been arranged.

It includes only the birds which may be found within fifty miles of New York City, numbering 350 species, and the specimens are grouped both systematically and seasonally.

The seasonal collection is, we believe, a new idea in museum exhibition and deserves some description. It is placed in two cases. The first contains the 'Permanent Resident' species, or the birds which are present throughout the year; while the second case is devoted to the migratory species.

The arrangement of this case is changed each month. In January, for example, it contains only the Winter Residents, comprising those species which come from the north in the fall and remain through the winter. In February such early migrants as the robin and purple grackle are added, under the heading 'February Migrants'; and in March, April, and May the migrants arriving in those months are exhibited.

At the end of May all our summer birds have arrived and most of the transient migrants have passed onward to their more northern homes, and the case then contains only the Summer Resident species.

When the fall migration is inaugurated, the required changes are made in this seasonal collection, which, therefore, at all times definitely represents the prevailing conditions of our bird-life.

An illustrated guide of one hundred pages has been prepared to accompany this collection. In it may be found a concise statement of

the general range and local status of all our birds. It is sold at the doors for the nominal price of fifteen cents.

The accompanying cut represents

the most recent addition to the bird groups. It may be found in the Bird Hall on the main floor.

F. M. C.



BOB-WHITE GROUP.

ENTOMOLOGICAL NOTES.



THE collection of "Insects found within fifty miles of New York" in the gallery of the main building now amounts to nearly ten thousand specimens, of which fully seven thousand five hundred are mounted. The long ellipse of cases in the centre of the hall, containing phalanx after phalanx of shield-backed beetles, little and big, of grasshoppers, crickets, moths, butterflies, are suggestive of the far-off ages of coal formation when multitudes of rustling insects must have everywhere crowded the sultry air. Even now their hosts are countless; for right here near New York, in a climate where the different insects are not noticeably many, man's exterminative power is still ineffective against more than seven thousand species.

But this great gathering of insects is defective in that only adult stages are represented. The collection does not show the complex life-histories of the insects, a feature especially necessary both for instruction and for showing how best to destroy those insects which are injurious. As this is a serious defect it is earnestly hoped that some friend of the Museum will take the initial step toward removing it.

A large part of the material of

the department, such as the Angus, Edwards, and Elliott collections must of necessity be kept in drawers, shielded from the destructive effects of continued exposure to light. Although many specimens of moths and butterflies cannot therefore be exhibited in open cases, the curator wishes it known that upon request they may be privately viewed by any student or interested person.

Some of the more especially interesting facts about these drawer collections are that almost any drawer of the series shows how a species grades off in different localities into mere varieties and how these varieties sometimes pass over into an entirely distinct species; also, the frequent marked unlikeness of the males and females of the same species and, finally, in one specimen, the perfect union of male and female characters, so that on one side the wings and other organs are male and on the other, female. Although in the animal kingdom this double-sexed condition is frequent, for example among marine zoöphytes and molluscs, its unusualness in the Lepidoptera might well cause speculation as to what abnormal embryonic or larval conditions produced it. The solution of the question of the origin of sex may possibly be hastened by a critical investigation of such exceptional and outlying cases.

THE JESUP NORTH PACIFIC
EXPEDITION.

DEPARTURE OF TWO OF ITS MEMBERS
FOR NORTHEASTERN ASIA.



ESSRS. Waldemar Jochelson and Waldemar Bogoras, of the *Jesup North Pacific Expedition* of this Institution, have recently started for the northeastern part of Asia, by way of San Francisco and Vladivostok, to continue the work of the Expedition in Siberia.

In the last number of this journal we reported on the results of Dr. Laufer's investigations on the Amoor River and on the island of Saghalin. The region which Messrs. Jochelson and Bogoras are about to visit is situated northeast of the Amoor River. They will study the relations of the native tribes of that area to the inhabitants of the extreme northwestern part of America, and also to the Asiatic races visited by Dr. Laufer and to those living farther west. It is expected that in this manner they will succeed in clearing up much of the racial history of these peoples, and it is hoped that the question as to the relations between the aborigines of America and Asia will be definitely settled. Thus the work of these explorers is part of the general plan of the Jesup North Pacific Expedi-

tion, which was organized for the investigation of the relations between the tribes of Asia and America. It is fortunate that this inquiry has been taken up at the present time, since the gold discoveries along the coast of Bering Sea are rapidly changing the conditions of native life; so that within a few years their primitive customs, and perhaps the tribes themselves, will be extinct.

The expedition, after leaving Vladivostok, will go by sea to the northeastern part of the Sea of Okhotsk, where they will establish their winter quarters. Mr. Jochelson expects to spend the winter among the tribes of this coast, part of whom belong to the great Tungus family which inhabits the greater part of Siberia, while others belong to a little-known group of tribes inhabiting the extreme northeastern portion of Asia. Mr. Bogoras will make a long journey by dog-sledge across that part of the country which is north of the peninsula of Kamtchatka, and will spend much of his time among the Chukchee, whose mode of life is quite similar to that of the Eskimo of the Arctic coast of America. Mr. Bogoras is exceptionally well prepared for this work, since he has spent several years among the western Chukchee, who are a nomadic tribe, and subsist on the products of their large herds of reindeer. There is also a small tribe of Eskimo

living on the Siberian coast, whom Mr. Bogoras expects to visit.

Mr. Jochelson, after finishing his work on the coast of the Okhotsk Sea, will proceed northwestward, crossing the high mountains which stretch along the coast, on a trail never before visited by white man. Over this route he expects to reach the territory of another isolated tribe, the Yukagheer. On a former expedition Mr. Jochelson visited a western branch of this tribe, whom he reached starting from Irkutsk, in southern Siberia. Owing to the difficulties of the passage, Mr. Jochelson will not return to the coast of the Okhotsk Sea, but will continue his journey westward through Asia, and reach New York by way of Moscow and St. Petersburg.

Both Mr. Jochelson and Mr. Bogoras have carried on a series of most remarkable investigations in Siberia, which are at present being published by the Imperial Academy of Sciences in St. Petersburg. The results of their previous investigations embrace a mass of information on the customs, languages, and folktales of the tribes whom they visited.

It may be expected that their journey, which will extend over a period of two years, will result in a series of most interesting additions to the collections of the Museum, and in an important advancement of our knowledge of the peoples of the world.

THE MUSEUM EXPEDITION TO ARCTIC AMERICA.



R. A. J. STONE'S expedition to northern British Columbia, Alaska, and the Arctic Coast, supported by Mr. James M. Constable, has yielded scientific results which amply repay the cost of this praiseworthy undertaking. Mr. Stone entered northern British Columbia by way of Fort Wrangel and the Stickine River, thence to the head of Dease Lake and the Cassiar Mountains, where very important collections of mammals were made; he then descended the Dease River to the Liard River, gathering on the way many valuable specimens, and making from Fort Liard a trip into the Nahanna Mountains. Afterward he continued down the Liard River to the Mackenzie, stopping at Forts Simpson and Norman, from which latter point a trip was made into the main range of the Rocky Mountains. Later another trip was made into the Rockies to the westward of Fort McPherson, and also across the McKenzie Delta and westward along the Arctic Coast to Herschel Island. Then followed a long sled journey of over one thousand miles eastward along the Arctic Coast to beyond Cape Lyon. Returning again to Fort McPherson, he crossed



the Rockies to Bell River, which he descended to the Porcupine, and thence continued down the Yukon to St. Michaels, where he took a steamer to Seattle, reaching this point September 13, 1899, twenty-six months and four days from the date of starting.

On this long and arduous trip Mr. Stone discovered and brought home six or eight new species of mammals, including a fine new Caribou, and obtained a large amount of valuable information respecting the habits and distribution of all the larger Arctic mammals. He also made important geographical discoveries, including several new rivers which flow into the Arctic Ocean; he accurately located other important points, and corrected our latest hydrographic charts of this

region in several important particulars, establishing the fact that the so-called "Eskimo Lake" is, in reality, dry land, traversed by a number of narrow lake-like channels. His successful sled journey, aggregating over three thousand miles, is without a parallel in the annals of Arctic travel. Although unsuccessful in his special quest for Wood Bison and Musk-ox, and although the intense cold of an Arctic winter precluded the preparation of many specimens, the results of his trip include, besides a valuable collection of mammals, a rich store of wholly new zoölogical, geographical, and archaeological information, which will form the basis of a series of papers in the current volume of the Museum "Bulletin."

J. A. ALLEN.



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JAMES MANSELL CONSTABLE.



JAMES MANSELL CONSTABLE, Vice-President of this Museum, died May 12, 1900. Born at Storrington, Sussex, England, in 1812, and coming to this country on a pleasure trip, when twenty-four years old, he decided after his return to England that his future should be connected with this country. His life has since been associated with the material, social, and educational development of New York. Engaged in a business which required all the time and attention of ordinary men, he yet found time to enter with heart and soul into all the public life of the great city and country of his adoption.

Mr. Constable fully realized at an early day New York's need of a Museum of Science, appreciating its popular side, and urging its requirements as meeting helpfully the great want of a wholesome place of recreation for the people. Friends recall his insistence upon this feature, and his delight when the opportunity came which enabled him to become a worker in this great scheme.

Mr. Constable became a Fellow of the Museum in 1871, and ever since that time, as a member of the Board of Trustees, has occupied an official position in connection with the control of the Museum. In 1875 he served on the Auditing Committee of the Museum; the year 1879 saw him a member of the Executive Committee, and later its Chairman; in 1886, immediately succeeding Robert Colgate, Mr. Constable was elected to the Vice-Presidency of the Museum, a position he held at the time of his death. In this capacity his usefulness in the Museum administration was very important, as he was painstaking in his attention to every requisition made upon his time and energy.

It was by the generous financial aid of Mr. Constable that the first relations of the Museum with the cause of public education were established in 1882, which practically formed the beginning of the present Department of Public Instruction of the Museum.

His gifts to various departments were numerous, and amongst his very last expenditures for the Museum was the maintenance of an ex-

pedition to Arctic British America in the interest of the Department of Vertebrate Zoölogy.

The results of this expedition, to quote from a former number of this journal,* "include, besides a valuable collection of mammals, a rich store of wholly new zoölogical, geographical, and archaeological information, which will form the basis of a series of papers in the current volume of the Museum 'Bulletin.'" The "valuable collection of mammals" here referred to include a new Mountain Sheep and several new rodents, one of which (*Phenacomys constablei*) has been named in his honor; and also valuable material for exhibition, including series of specimens of the rare Mountain Caribou and two species of rare Arctic Sheep.

The President's words on Mr. Constable's death were a significant and heartfelt tribute. They were spoken before the Trustees at their Quarterly Meeting, and contained some allusions it seems impossible to omit in this notice. He said, in part: "We shall keenly feel the loss of his presence with us; I more than any of his associates here. He was my friend in all that the word stands for; he was my counsellor and my advisor in administering the many and varied details of the work of the Museum, ever since my

election to the Presidency of this Board.

"Mr. Constable possessed full knowledge of the lesser as well as the greater details of the Museum's work, and his wisdom, ripe experience and judgment were invaluable to me; I always felt secure in seeking his counsel in the management of the affairs of the institution.

"His death is a personal loss to myself, and I shall miss far more than mere words may express, his gentleness, his helpful aid, his ever-present courtesy and encouragement."

GIFTS TO THE LIBRARY.



RECENT gift from the Duke of Loubat of seventy-eight rare volumes includes as the most notable a reproduction of the Vatican Manuscript 3738; this is the latest of the superb reproductions that have been published by the Duke of Loubat and given by him to the Museum.

The full title of the work is "Il Manoscritto Messicano Vaticano 3738 Detto Il Codice Rios, Riprodotto In Fotocromografia A Spese Di Sua Eccellenza Il Duca Di Loubat. Per Cura Della Biblioteca Vaticano, Roma, Stabilimento Danesi, 1900."

* "The Museum Expedition to Arctic America," *this Journal*, Vol. I, No. 2, pp. 31 and 32.

The original Codex Vaticanus 3738, renamed Codex Rios by the Mexican savant Troncoso, is a copy, on European paper, of pictures made by Mexican painters shortly after the Conquest: the copyist was a Dominican Monk, Pedro de Los Rios, and the date, 1556. Padre Rios does not state where the original paintings existed, nor the names of his native informants. Nevertheless there is reason for believing that his copies are reliable. The work was probably introduced into the Vatican Library before 1570, although the first mention of it known occurs in a catalogue compiled during the years 1596-1600. It is copied *in extenso* in Kingsborough, but confusingly on account of the original binder having failed to preserve the sequence of the pages. This fault is corrected in the Loubat Edition, which gives also a transcription of the Italian text, and a coördination of its own pages both with those given in Kingsborough and with those of the Loubat Edition of the sister Codex Tellericano Remensio.

The contents might be summed up in a general way somewhat as follows: The first part treats of the skies, of the planets, of the past and future epochs of the world, and of certain dogmas, rites, and traditions: the second part is the astrological or divinity calendar, recording the

divisions of the Tonalamatl, or period of 260 days: the third part is historical, giving the names of the Aztec rulers of Tenochtitlan (Mexico), and the dates of their reigns, with pictorographs of important events.

Through the Hon. Amos Cummings, the Library has received 237 volumes relating to the different departments of the Government. These are all works which the Librarian has been striving to obtain for several years and their accession, in bulk, is particularly gratifying.

Major-General Daniel E. Sickles, U. S. A., the Hon. William Astor Chanler, the Indiana State Library, the Ohio State Library, and Dr. Franz Boas have severally contributed many important works.

THE exhibit illustrating the life, habits and surroundings of the mammals found within fifty miles of New York now includes everything except the Lynx, the Otter, the smaller rodents, the Mole, and the bats; all of which will be added as the opportunity occurs.

Naturalists and children alike find these groups of great interest. The patience and art of the taxidermist have here conjured up, mainly through stones, dead leaves, and tree-trunks, a series of charming visions of the inner lives of 'Brer Fox,' 'Brer Rabbit,' and other creatures.

THE DEVELOPMENT OF THE AMERICAN MUSEUM OF
NATURAL HISTORY.

(Continued)



THE Art Museum had secured the Deer Park east of the reservoir at 81st Street for its new location, and Manhattan Square on the west side of the Park was allotted to the Museum of Natural History. This region comprised eighteen acres which had been reserved for a park, years before the design of a Central Park was suggested. It included a rugged, disconsolate tract of ground, thrown into hillocks where the gneiss ledges protruded their weathered shapes, or depressed in hollows filled with stagnant pools, and bearing throughout an uncompromising, scarcely serviceable appearance.

The elevated railroad did not then extend beyond 59th Street, the present bridge over the walled bridle-path into the Park was not yet built, and the Museum thus stood isolated both from the Park and from the populous city. The region around was an unsettled district *in transitu* to something permanent and homogeneous. It was compounded in its pictorial aspect of several discordant yet picturesque elements; it embraced old farms, ruinous landmarks of ancient New York, brand new stores, sanitary modern tene-

ments, bewildering mazes of hovels clustered together over swelling knobs of rocky ledges, and pretty kitchen gardens lying in its deep depressions. The banks of the Hudson retained in places woods as old as New Amsterdam, and the daily stage which rolled up the spacious boulevard to Manhattanville added a suggestive touch of antiquity to all.

It had been proposed to make this square into a Zoölogical Garden. Plans of a very extravagant character had been practically prepared. Bear pits and aviaries united with a museum of palæontological restorations had been indefinitely hinted at, and might have materialized, if the more prosaic views of Judge Hilton had not intervened.

The drawing and preparation of the plans for the new building had been finally assigned to Calvert Vaux, whose architectural skill and established reputation for practical good judgment in construction, together with his official relations to the new government of the Park, determined the selection.

The design offered by Mr. Vaux was accepted. For the entire edifice there was contemplated a hollow square, the sides to be formed



ROBERT L. STUART, PRESIDENT, AMERICAN MUSEUM OF NATURAL HISTORY, 1871-81.
From a portrait in the Board Room, by Huntington.

of four great buildings, five hundred feet long, ornate in material and detail, and distinguished by large entrances of architectural dignity and strength. Only a section of this entire fabric was now to be begun. It faintly suggested the stupendous proportions contemplated for the complete building, representing indeed only the fourteenth part of it, and a subordinate part as well. The whole structure was intended to cover fifteen acres and to fill a space three times larger than the basement area of the British Museum.

A building of this great size, with its long hallways filled with classified collections, would, it was hoped, embrace the most diverse kingdoms of nature. The exact sciences might even here find a home, and the technical appliances in the arts room for the exhibition of their numberless adaptations. The world would be its contributor, the nation its patron, and in the most perfect condition of usefulness and vigor, its lecture-rooms would become the schoolhouse of the people.

The new building at length was completed and equipped. Its architecture was hardly striking. Its position in the centre of Manhattan Square gave it a bold relief, which was heightened by a certain incongruity with the surroundings. It could hardly lay any claims to struc-

tural beauty; an impressive solidity conjoined with a dwarfing sense of incompleteness at first disappointed the visitor, until he realized that exterior effect had been exchanged for interior convenience, and that this edifice only represented a fraction of the final colossus it foreshadowed.

The acquisition of the Hall collection with its 80000 to 100000 specimens, including types and figured specimens nearly 7000 in number, made it at once imperative to secure professional assistance in their arrangement and labelling. As the needs of the Museum in this respect were likely to grow constantly, the steps taken to obtain the help of the city in its maintenance were far from premature. The burden of its support could no longer be allowed to rest on the shoulders of the Trustees alone.

Almost immediately upon the opening of the new building alliances sprang up with surveys and with original investigators, while collections and libraries were added to the Museum's possessions. Amongst these latter may be mentioned the gift of the President, Robert L. Stuart, who purchased and deposited the magnificent ichthyological and scientific works of James C. Brevoort. Donations of books and pamphlets and the natural accessions from surveys, societies, institutes, and individuals furnished other

sources of increase, so that in the Annual Report for 1879, the President announced that the library contained 12000 books and 6000 pamphlets. Work on the collections progressed with vigor and success, and was gratefully acknowledged by the Trustees.

The local isolation which had at first seemed discouraging was in process of improvement. The Manhattan Elevated Railway pushed forward its tracks to 81st Street and on to Harlem, and brought Manhattan Square into practical union with all quarters of the city. An extraordinary movement northward was soon developed, and the ridges of rock, unpleasantly encumbered with shanties, were blasted to a level, and covered with houses. Centres of population were created, as in 72d Street and the Dakota Apartments, St. Agnes' Church at 94th Street with its surroundings, and the growing inhabitation of Riverside Drive. These, spreading, met along lengthening lines of contact, and a population was becoming localized directly at the doors of the Museum.

The Park Board spent thousands of dollars upon the embellishment of Manhattan Square. The Trustees saw the urgency of providing more room for their collections. In all directions, within and without, the conditions were prophetic of greater and graver financial responsibilities.

The feature of Public Instruction was inevitably presented on every side: Professor Bickmore, considering its possibilities, conceived in 1880 the scheme of courses of public lectures to city school teachers. This project rapidly materialized and the reader may be invited later to consider its history and results.

The year 1880 closed the administration of Robert L. Stuart; it was also mournfully signalized by the death in his fifty-eighth year of an original founder and first Vice-President of the Museum, William A. Haines.

Mr. Haines had certainly devised in his own mind, at an early day, some form of a Museum. His aptency for natural study, his devotion to one branch of natural science (conchology), led him to regret the absence in New York of a great Museum of Natural History, and he responded instantly to the requests of his fellow-citizens to assume a prominent connection with the first efforts to create one.

In Mr. Haines' nature the principle of *order* ruled. In his business, system was conspicuous. In his collection of shells, with which the writer has been brought closely in contact, system, painstaking accuracy, are most striking. His mind worked instinctively in the direction and under the guidance of precision.

Mr. Stuart resigned his Presidency, Feb. 14, 1881. Mr. Stuart's

connection with the Museum had been made memorable by important changes and advances, which had carried the enterprise forward to a suggestive expression of greatness. Not indeed that the institution at that time was a great museum in any cosmopolitan sense; it had entered, nevertheless, upon a path of continuous improvement; it was somewhat appropriately housed, and steps had already been taken to realize its far more ambitious hopes.

During Mr. Stuart's administration the first section of the Museum was built and occupied, maintenance had been secured in a measure from the city, the Hall collection was paid for, and enormous additions had been made to the collections; while its obvious prominence was bringing it into correspondence with the scientific influences of the country. Mr. Stuart had himself been a benefactor of great value; he had also by wise admonition assisted the material growth of the Museum.

Mr. Stuart's resignation preceded by only two years his demise. He died December 12, 1882, in the 77th year of his age.

Mr. D. Jackson Steward, his intimate friend, has thus summarized his career:

"Mr. Stuart's success as a business man had attracted attention. Born in New York he had with his brother Alexander rapidly added to his modest inheritance, and seizing the opportunities opening in

the sugar business advanced his fortune with marked skill. His gifts to the cause of education, to religious and charitable institutions and projects were numerous. Stuart Hall at Princeton, the Presbyterian Hospital, Dr. Hall's former church, were all largely, the first entirely, indebted to him for their erection. His munificence to the Museum had been equally great, while in the unpublished provinces of private charity, his sympathy had been helpful to thousands."

L. P. GRATACAP, A.M.

Ass't Curator, Dep't Geology.

(To be continued.)

THE WORK AND PROGRESS OF THE DEPARTMENT OF PUBLIC INSTRUCTION.



HE Department of Public Instruction of the American Museum of Natural History was one of the earliest to be established. Its first curator, Prof. Albert S. Bickmore, was one of those instrumental in the foundation of the Museum, and he has devoted himself with such success to the development of his department that under him its work has been extended far beyond the original scope.

It is now coming to be generally recognized that next to actual traveling, one of the best ways to make geography, history, and kindred subjects leave any real effect on the mind, lies through the voice of the lecturer, calling attention in an agreeable manner to the noteworthy

features of good stereopticon views and weaving his comments into one continuous whole.

Realizing this, Professor Bickmore has traversed the world for views; travelling has been his lifelong occupation. He has also constantly studied the most effective methods of stereoscopy. In regard to the photographic qualities of the slides, it is certain that they are remarkably clear and have unusual depth. All of the views are admirably colored. In the new lecture hall of this Museum they will be thrown on two enormous screens each twenty-five feet square.

The relation of the department to the public schools of the State has been one of increasing usefulness. A law passed in 1884 and re-enacted from time to time, authorized the Superintendent of Public Instruction to furnish sets of these lectures free of charge except for the necessary expenses of transportation, upon request of the local school authorities of each city and village of the State having a superintendent of free common schools; and these authorities were further empowered to cause the lectures to be repeated, when convenient, to the "artisans, mechanics, and other citizens" of their respective towns. Also the State Superintendent was authorized to extend the same privileges to any institution instructing a teachers'

training class or any union free school. In accordance with this enactment, in 1895 sixty-six towns and villages availed themselves of these privileges, and through them any school in the State can obtain the slides.

Successful in the common and high schools, this work began to attract the attention of the kindergarten instructors. The law was accordingly amended to provide for this new departure; a special set of lectures was prepared with the cooperation of those interested, and now the system is gradually spreading among the kindergartens.

Appreciation of the lectures was meanwhile growing up outside of the schools. Clergymen and others, availing themselves of that clause in the statute which permits the local school boards to cause the lectures to be delivered to the "artisans, mechanics, and other citizens," delivered free lectures to the people under the auspices of the Boards. As an example of the success of the system in this field one might cite the letter of a clergyman of Watertown, N. Y., who delivered several of the lectures in the city hall. After speaking of the remarkable growth in attendance upon successive evenings, the writer comments upon the interest in the lectures on the part of workingmen.

From localities outside of New



THE ARCH OF PONS ÆMILIUS AND THE TIBER.

[A representative view from the lecture on Italy.]

“The first bridge that was built over the Tiber connected ancient Rome with the Janiculum, the high hill on the other side. It was on this that Horatius stood and held back the advancing hosts of Lars Porsena while the Romans cut the bridge behind him, and he leaped into the yellow river and safely reached the shore of the city. That bridge was rebuilt many times. It was always regarded as having a semi-sacred character: so much so that no iron was permitted to enter into its structure. It remained for a long period, but later on was replaced by a stone bridge, of which this central archway still remains. Therefore we are looking on the place where Horatius held back the Etruscans that came down from Veii, and here he saved his city by his own right arm.”

York State requests are constantly coming in. The Projection Club of Chicago—an association of teachers in that city formed for the purpose of introducing the system into their State—have purchased several sets at their own expense. The Department of Public Instruction of Connecticut has enthusiastically adopted the system; the lectures and slides are so sought after by the schools of the State that the State Board has drawn up quite a formidable set of rules to regulate their distribution. From Dayton, Ohio, Mr. J. H. Patterson, an employer of hundreds of men, and one that co-operates with them in every way possible, writes: “No pictures that I have ever seen in this country or abroad will compare with the ones you have sent us, and I am more enthusiastic than ever on the importance of the stereopticon in imparting knowledge.” He predicts a great spread of the system and comments upon its success in his own town. Finally the Hon. Dean C. Worcester, United States Commissioner to the Philippine Islands, has recently written to the effect that he will endeavor to introduce the system in the Philippines.

The mechanical equipment of the department has of course had to keep pace with the rapidly increasing demands upon it. Twenty-two different sets of slides and lectures

for the common-school series and nearly fifty for the university series have been prepared and each set re-duplicated several and usually many times. Besides this, the Curator has had to give personal instruction in the management of the lectures to many of those who conduct them.

Here at the Museum Professor Bickmore delivers a series of lectures to three sets of people every season. On Saturday mornings the lectures are delivered to school teachers; on Thursday evenings to members of the Museum; on legal holidays they are delivered free to the public, without even the formality of a ticket. The average attendance per lecture during 1899 was nine hundred and sixty. In succeeding numbers we hope to keep our readers informed of the progress of this important educational work. W. K. G.

PHOTOGRAPHS collected by members of the Jesup North Pacific Expedition will be reproduced by the heliotype process in large quarto form, and published under the title ‘Ethnographical Album of the North Pacific Coasts of America and Asia.’ It is intended to issue the Album to subscribers only, in parts of at least 24 plates annually, the whole series to embrace 120 plates. Part I, consisting of 28 plates illustrating Indian types from the interior of British Columbia, has already appeared.

INSECT COLLECTIONS FROM
THE BLUE RIDGE.

NEAR Asheville, N. C., stands Black Mountain of the Blue Ridge Range, covered with virgin woods of chestnut, oak and evergreens, balsams and thick groves of spruce. The mid-day sun beats down through a moist atmosphere and the nights are chilly. The damp woods are dark, knee-deep as it were in vegetable mould, and the laurel grows into trees. The thick layer of dead leaves, the branches and leaves, are the environments for many families, genera, and species, of Beetles predominantly, but also of the Butterfly order, the Grasshopper order and so forth.

The Beetle order is here adapted to fill many rôles. There are leaf-eaters, eaters of roots and woody tissue, carnivores, and, in the dark, lowermost layers of mould, blind carrion and ground beetles. Nor is there less diversity in size, from the loutish Hercules down to the minute Corylophid. The colors accord generally with the twilight of the habitat. In this locality, and here alone are found the species of the genus *Nomaretus*, especially the very rare and prized *Nomaretus imperfectus*, which preys upon snails, and eludes collectors.

The rich insect fauna of this locality has never been thoroughly worked; Curator Beutenmüller therefore devoted four weeks of this summer to its exploration. Though naturally not neglecting any entomological opportunity that offered, the Curator spent the most labor upon the Beetle order, which happened to be "in season." By carefully sifting great quantities of the dead leaves into a bag he circumvented the escape of even the most minute forms. Three weeks' perseverance in this operation rewarded him with the prized *Nomaretus* above mentioned, with several species new to science and with about two thousand specimens in all to add to the Museum collections.

The scientific results of the trip will appear later in one of the Museum publications. Meanwhile the collected material is being prepared for exhibition. Certainly, the scores of minute beetles already mounted on cork slabs and identified, offer an instructive illustration of how easy it is, on account of the small size of the specimens, to take in whole families of insects at a single glance. The meaning of zoölogical classification is perhaps nowhere more luminously apparent than in a well-arranged collection of insects.

One might summarize the results

of this collecting trip as follows: extensive additions to the entomological collections, worth at least twice the cost of the trip; field notes on all specimens—for the purposes of exact investigation perfectly essential; the inspiration of field work accruing to the Curator, that comes only from studying the living animal in its own environment.

W. K. G.

PHYSICAL MEASUREMENTS OF PUEBLOS AND CLIFF- DWELLERS BY THE HYDE EXPEDITION.



THE Museum investigations on the geographical limits and physical measurements of the Pueblo tribes of Utah, Colorado, Arizona, New Mexico, and Mexico, and of the ancient Cliff-dweller and Aztec inhabitants of the same region, have been conducted since their systematic beginning in 1898 by Dr. A. Hrdlička, the expense being borne by Mr. Frederick E. Hyde, Jr.

Dr. Hrdlička has recently completed another season's harvesting of exact data, this year carried on among the Mokis, Zunis, Rio Grande Pueblos and the several divisions of Apaches. The winter will be devoted to analyzing the data obtained. The results of this year's expedition include numerous sets of measure-

ments, detailed physical, physiological and medical observations, and eighty plaster casts of the face, secured among the different tribes.

The objects of this investigation are: first, to definitely settle the racial geography of the region mentioned above—this must be accurately known before trustworthy inferences can be made as to the origin and history of the various tribes; second, to discover the relationship between these surviving tribes and the extinct peoples of the same region.

The first field work in pursuit of these aims was done by Dr. Hrdlička in 1898, when he collected anthropometric data among the Tarahumare, Huichol, and Tepecan Indians of old Mexico. Before this the Doctor had done considerable work on the Museum osteological material from Mexico and the southwestern states; in 1899 systematic investigations were carried on among the Navahos and Utes; 1900 saw the completion of the work in Colorado, Utah, New Mexico, and eastern Arizona. Western Arizona Indians and the greater part of those of Mexico remain to be studied.

THE collection of rare African antelope skins received in exchange from the Field Columbian Museum are now all mounted and placed on exhibition in the Gallery.

CUSTOMS OF THE ANCIENT
THOMPSON RIVER VAL-
LEY TRIBES.



THE problems engaging the Jesup North Pacific Expedition make necessary exact and broad investigation not only of the remaining aboriginal tribes of North America and north-eastern Asia but of their predecessors as well; it is essential that wherever possible the main outlines of the physical characteristics and customs of the latter be reconstructed.

The archaeological collections made by Mr. Harlan I. Smith in the Thompson River Region, B. C., are being arranged by him with the purpose of making the specimens tell a connected story, of helping the visitor, in fact, to mentally reconstruct for himself the life of the ancient people. Consequently the particular objects are exhibited not as being valuable in themselves, but only as so many bits of evidence. Under this view a piece of broken, sooty stone may be of as much value as a carved war-club.

The first division of the exhibit shows by photographs and maps the topography of the collecting-ground. This is followed by an exhibit of the natural resources made use of by the people; the next embraces implements for se-

curing food; a third, implements for preparing food; another, evidences of the dress and ornamentation; another, games, amusements, and narcotics; others, art, methods of burial, and so forth.

The labels strive to be at once clear and brief, referring for details to the illustrated report of the Expedition.

PARIS EXPOSITION. AWARD
TO THE DEPARTMENT OF
PUBLIC INSTRUCTION.



THE admirable work of Prof. A. S. Bickmore and his assistants was recognized in Paris by the award of a Gold Medal, especially to the photographic slides illustrating the lectures: "Across the American Continent" and "The Hawaiian Islands." The "wide system of free education" carried on by this department in coöperation with the State Board of Education was especially mentioned in the award. Professor Bickmore was moreover invited to give two public lectures in the Trocadero illustrating his method of visual instruction.

Mr. Frank M. Chapman, Assistant Curator of the Department of Vertebrate Zoölogy, will give a special course of six lectures on Birds on Saturday afternoons at three o'clock, beginning November 10th.

HUNTING FOR FOSSIL ELEPHANTS, HORSES AND DINOSAURS.



THREE expeditions to the West from the Department of Vertebrate Palaeontology were planned by Professor Osborn. The first, under Mr. Granger with Dr. Loomis of Amherst and three assistants, returned to the Jurassic region, Central Wyoming. One section continued the excavation of the famous Bone Cabin Quarry, and secured some valuable new material, including especially a large part of a *Morosaurus* skull. Another section spent six weeks in prospecting, and was finally rewarded by locating what promises to be an exceptionally fine skeleton of *Diplodocus* in the old Como bluffs; this is now being taken up. The second expedition, into the Laramie under Mr. Brown, was for a long time unsuccessful, but the latest advices indicate the discovery of a large part of an armored dinosaur and still more valuable, the nearly if not quite complete skeleton of the American iguanodont, *Claosaurus*. The third expedition, into Texas under Mr. Gidley and Mr. Zinsser of Columbia University, has also been very successful: the little known Mt. Blanco beds have yielded an

ancestral elephant, apparently new to science, and many remains of camels.

In London and Paris Professor Osborn continued his studies upon fossil rhinoceroses, and made numerous plans for the extension of our collection by exchange and otherwise. Dr. Matthew also has taken advantage of a long journey through the museums of Europe to strengthen our ties with our many foreign friends, and to observe the latest museum methods.

The Museum was represented at the Geological Congress in Paris by Professor Osborn, who presented two papers, one upon the relations of Europe and America during the Tertiary period, and a second upon Museum Methods. The latter related chiefly to our new methods in field and museum work, and was illustrated by twenty-two large bromide photographs which aroused exceptional interest.

VOLUME I of the Report on the Jesup North Pacific Expedition has been completed through the publication of Mr. Harlan I. Smith's memoir on the "Archæology of the Thompson River Region, B. C." Volume II has begun with "Traditions of the Chilcotin Indians," by Dr. Livingston Farrand of Columbia University.



MAIN ENTRANCE.

The completed south façade of the Museum is 740 feet in length. As at present planned the Museum will ultimately have four such façades, one on every side of the square.



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COMPLETED FAÇADE OF THE MUSEUM.

Very encouraging is the growing attendance and interest of the pupils of the Public Schools. From May to December, 1899, inclusive, nearly three thousand scholars, accompanied by their teachers, visited the Museum.



TEACHERS AND PUPILS STUDYING COLLECTIONS IN HALL OF FOSSIL MAMMALS.

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INTERIOR OF THE NEW AUDITORIUM.

THE NEW AUDITORIUM AND THE OPENING RECEPTION. I



THE beautiful new lecture-hall of the Museum was formally delivered to the care of the Trustees on October 30th by the Hon. George C. Clausen, President of the Department of Parks, on behalf of the City. The occasion was marked also by the opening of the new conchological and anthropological halls and by the presence of over 2000 guests. Brief addresses were made by the President, by Controller Coler, Dr. H. M. Leipziger, Hon. Charles R. Skinner, and Bishop Potter. Prof. Albert S. Bickmore exhibited some superb views of the Paris Exposit-

tion taken for the Museum Department of Public Instruction.

The remarks of the speakers might be outlined as follows:

The Trustees and other citizens had not only willingly made munificent gifts to the Museum, but had given their energetic personal service during its extraordinary growth. They had been cordially and invariably supported by the municipal authorities, and the Museum was wholly without a trace of "politics." It was a distinct factor in the advancement of natural science, but chiefly it gave to all the people an opportunity to appreciate Nature. This beautiful auditorium and the

visual-instruction system of Professor Bickmore's department must surely make the natural-history collections still more significant to the people.

The auditorium itself excited considerable interest. It contains about fourteen hundred seats, from every one of which both lecture-screens can be well seen. Its high, sweeping arches make the interior seem spacious and beautiful. Back of the stage are two great solid plaster screens each twenty-five feet square, while for certain purposes a third can be let down in the middle. Up in the central part of the gallery is the chamber from which the views are projected.

This chamber contains some interesting apparatus. The long slate switch-board controlling the stereopticons was planned and designed by Mr. Lucien C. Laudy of the Department of Public Instruction, and Mr. C. C. Sibley. It is divided into four sections, eight pairs of current- and pressure-meters and their lamps, seven sets of resistance coils, many cross-connecting switches, etc. The first three divisions correspond to the three lecture-screens above mentioned; the fourth enables the operator to regulate the total current needed. The stereopticons also are highly perfected mechanisms. By means of speaking-tubes and telephones the operator can communi-

cate either with the lecturer or with the engineer of the dynamos.

The ventilating and heating apparatus also is interesting. The incoming pure air is warmed by passing over steam radiators and is forced in through the top and sides of the hall; the exhausted air is drawn through small openings under the seats. This arrangement does away with draughts and makes it easy to regulate the temperature.

The lecture-hall building is also to be occupied by the Department of Public Instruction. There are offices, rooms for photographing, and rooms for the storing of negatives and for the packing of the many thousands of slides sent out yearly by the Department.

W. K. G.

THE NEW CONCHOLOGICAL HALL.



LARGE part of the conchological collection has been transferred to the new hall on the third floor of the South Wing, which was opened to the public on October 30th.

The collection has been arranged on somewhat novel lines. The shelves of the wall-cases are tipped downwards so as to better display the specimens; and are covered with dark green cloth, on which the shells

are laid directly, without the usual cardboard trays. This soft, dark background brings out the strong curves of the huge *Fusus proboscideferus*, the well-moulded capaciousness of the big Melos and Cymbas, the evolving rhythm and sweep of the beautiful Argonauts; it harmonizes also with the mellow color-schemes and chaste designs of the Harp Shells, the Partridge Tuns, the delicate Olives, and the well-conceived loveliness of many others.

According to the wish of the donor, the D. Jackson Steward collection, which occupies the south side of the hall, will ultimately be classified in accordance with the old Lamarckian system, an arrangement of great interest for historical reasons and of practical value to the conchologist for comparison.

The exhibit of marine univalves on the north side of the hall is illustrated by colored diagrams and maps, showing the anatomy of the typical shell-animals, their geographical distribution, etc., with interesting notes on the natural history.

There is also a beautiful series of specimens cut to show the structure and mode of growth of typical shells, which reveals the manifold and strange loveliness hidden in the penetralia of the shell-animals' houses.

W. K. G.

ARCTIC MAMMAL CLUB.



THE last proof of the late Mr. Constable's generosity toward the Museum was his offer to contribute \$2000 a year for three years towards zoölogical exploration in Alaska, provided that other friends of the Museum would raise this amount to \$5000. The purpose of the exploration is to secure the Alaskan and British Columbian mammals and birds for the Museum, beginning with the very large Alaskan mammals, such as the Kadiac Bear and Alaskan Moose. Mr. A. J. Stone, whose notable journey through arctic America has recently been described in the Museum "Bulletin," is to lead the expedition, and is eminently fitted for this important work.

The executors of Mr. Constable's estate have kindly agreed to allow this offer to stand until the remainder is raised, but as yet little progress has been made. There has been some talk of forming a club for the furtherance of this object, which will probably be called the "Arctic Mammal Club." Mr. G. O. Shields has shown a warm interest in the project. In the meantime, Mr. Stone, with characteristic energy and disinterestedness, has gone to Alaska with the aid of a very moderate sum, paid by the Museum.

THE DEVELOPMENT OF THE AMERICAN MUSEUM OF
NATURAL HISTORY.

(Continued)



R. MORRIS K. JESUP, after serving nine years on the Executive Committee, was unanimously elected President. He succeeded at both a promising and a critical instant. The prospects of the Museum were broadening immensely, but the responsibilities were likewise increasing in exact proportion. New departments were shaping themselves, scientific precision and scientific initiative were demanded, more buildings were needed, the foundation of an endowment fund seemed imminent, and more revenue from the city was deemed urgent.

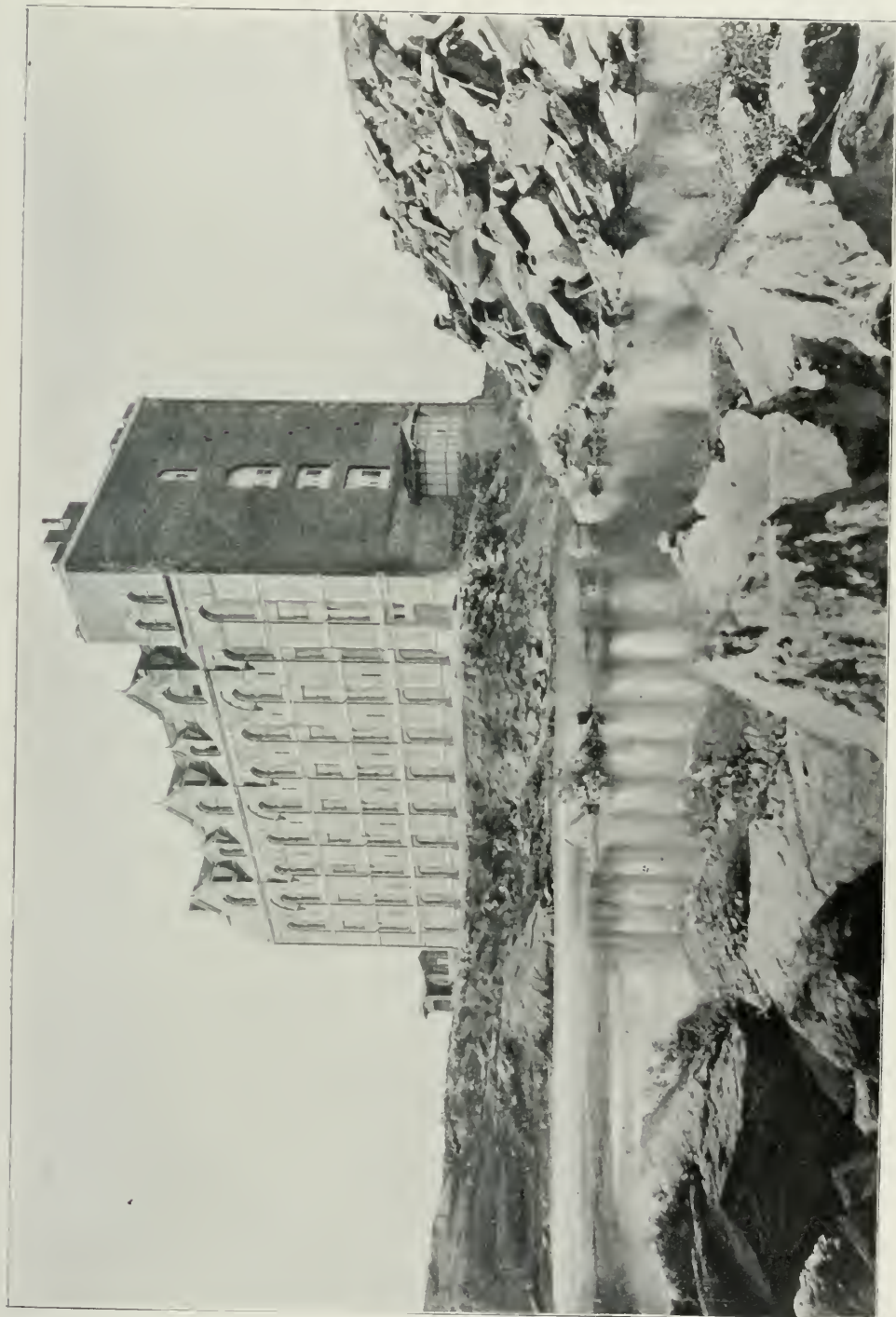
Almost the first step taken by the President, at his own expense and as a gift to the Museum, was the creation of an economic department, having in view a collection of all the woods of the United States that could be devoted to building and manufacturing purposes. The Jesup Wood Collection rapidly expanded, and under the stimulation of Professor Sargent, and the munificence of its donor, reached such proportions as seriously to interfere with the convenience and exhibitions of other departments. It made imperative a

new demand upon the Legislature for more room in a larger building, and formed the starting-point of that marvellous expansion which has established the American Museum of Natural History amongst the great museums of the world.

Amid a variety of pressing questions, the financial one readily took precedence. In November, 1879, it was necessary to raise \$26,000 to clear the Museum of all indebtedness; this sum was almost entirely secured through the individual contributions of the Trustees. In the following year it became evident that the time had come for the exercise of the strictest economy.

While Chairman of the Executive Committee, and just prior to his assuming the presidency, Mr. Jesup had submitted a detailed report on the financial condition of the Museum, in which he earnestly directed the attention of the Trustees to such economic changes as seemed practicable in the future administration of the fiscal affairs of the Institution.

The report also served the purpose of bringing the future president very closely in contact with the administrative workings of the Museum and of impressing him with



VIEW OF MUSEUM BUILDING FROM THE NORTH, AS IT APPEARED AT THE BEGINNING OF PRESIDENT JESUP'S ADMINISTRATION.

the serious requirements of money for its progress or appropriate maintenance. It hence became at once, upon his assuming the presidency, an ever-present purpose in his mind to establish an endowment fund, and to secure adequate recognition from the city.

The President also succeeded in efficiently raising the maintenance fund, and thus secured for the future the legitimate assumption by the city of a reasonable portion of the Museum's operating expenses. It required a persistent effort to establish the necessary recognition of the Museum as an educational institution by the city, and the avenue of intercession most effective was through the demonstration of increased expenses by enlarged buildings. These were urgently needed, and the President deliberately and successfully devoted his earnest attention to the measures requisite to influence the Legislature and the municipal authorities to make appropriations for the extraordinary additions completed since 1880.

Since Mr. Jesup's election as President the central south section, the east and west wings, and the terminal towers have been added to the original north-and-south section, while a great lecture-hall of really remarkable dimensions has been constructed and equipped upon the north extremity of the original

building. This first wing has become imbedded in a group of buildings which have quadrupled its exhibition space, and superimposed upon its comparatively simple control a complication of new responsibilities in lighting, heating, watching, cleaning, and equipment.

The Museum in 1881 began the issuing of bulletins, a step of momentous consequences, and one which resulted in a series of publications of great scientific weight. Besides the new stimulus they imparted to the scientific affiliations of the Museum, these publications were most influential in bringing additions to the Library.

The material already accumulated was not inconsiderable. The superb library of Dr. Jay, purchased and presented to the Museum by Miss Wolfe, formed its nucleus. In 1885 Miss Wolfe supplemented this gift by a further donation of works and serial publications selected with the view of bringing the conchological library up to date; an intention partially achieved. The Brevoort library, the library of Prof. R. P. Whitfield, were also added, the former by the donation of Mr. R. L. Stuart, the latter through purchase. In 1886 Mr. Hugh J. Jewett donated 350 beautifully bound volumes on voyages and travels, many of which were rare original editions. In 1887 the ornithological library of

D. G. Elliot was purchased and presented to the Museum by Mr. Cornelius Vanderbilt and Mr. Percy R. Pyne. This library was of especially well-selected books, and supplemented well the fine ornithological collections. At this time (1888) the Library included almost 10,000 volumes and over 5000 pamphlets.

In 1891, Mrs. M. Schuyler Elliot presented the library collected and owned by her husband, the late S. Lowell Elliot, as a memorial gift. It consisted of 9500 volumes and 3500 pamphlets. In 1892, 400 volumes were donated by Mr. Alexander J. Cotheal, and 168 volumes by Mr. Samuel P. Avery, while in the same year valuable donations were received from Mr. Morris K. Jesup. In 1892 the works on entomology comprising the library of the late Harry Edwards were acquired through purchase by the Trustees. His excellency Señor Porfirio Diaz, President of Mexico, became a friend of the Museum Library in 1894, and gave to it a number of valuable works relating to the archæology of Mexico, with which later the Museum became intimately associated.

In 1895 the Library contained 30,438 volumes. Amongst the last important gifts was a series of exceedingly valuable works bearing on the archæological history of Mexico and Central America, with

which were very thoughtfully included general works of a useful character for library purposes, the whole being given by the Duke of Loubat. Also a group of handsomely bound works of Natural History and travel was presented by Miss Laura P. Halstead. But the most princely gift in recent years to the Library was the memorial presentation of the Jules Marcou library, comprising 3000 volumes, 5000 parts and numbers, 5000 pamphlets, and 1200 maps. This very extraordinary accession was the gift of Dr. Philippe and John B. Marcou.

Since 1880 the Library has been in charge of Anthony Woodward, Ph.D., who has continuously served the Museum since 1877.

The indications hereby shown of the growth of the Library have been general,—the salient points in the history of its enlargement have alone been selected; but a stream of acquisitions maintained from a host of individuals, together with the natural increments derived from exchanges, continued through twenty years, has produced this huge deposit of books, whose classification, elimination, selection, and cataloguing have now become so urgent.

L. P. GRATACAP, A.M.,

Ass't Curator, Dep't Geology.

(To be continued.)

IN CONNECTION with the library it should be noted that the reading-room is open to the public from 9 A.M. to 5 P.M., daily.

MUSEUM ARCHÆOLOGICAL
NOTES RELATING TO MEX-
ICO, CENTRAL AND SOUTH
AMERICA.



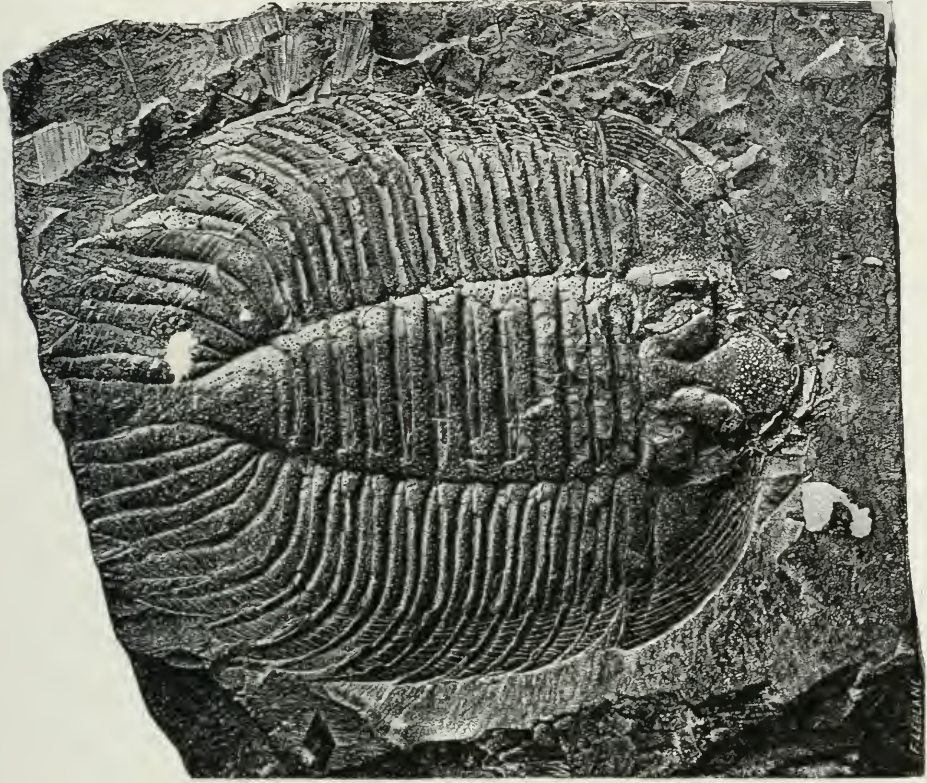
THE activity of the Museum in bringing to light by research, excavation, and collection, the ancient civilizations of Mexico and Central and South America goes on undiminished. The work in Mexico, supported by the Duke of Loubat, was resumed in November when Mr. Saville started southward. The work of the two previous seasons, under the agreement with the Mexican Government, has covered the field pretty thoroughly in Xoxo and Mitla, in the State of Oaxaca. This year the work will be carried on and extended on lines suggested by previous results, and will doubtless add much to the knowledge of Mexican antiquities.

From other quarters also collections are coming in. From the old Caddoe region of northeastern Texas comes a valuable collection of artistically decorated pottery; from Imbabura, a province in Ecuador, a collection of antiquities donated by the Duke of Loubat, which will supplement well the material gathered from the neighboring regions of Colombia. The collections of antiquities from Peru will be greatly augmented by the

superb recently acquired Gaffron collection, which is especially rich in textile fabrics, in featherwork, in gold, silver, copper, and wood carvings, and in pottery. This and other South American material illustrative of the ancient civilizations is now exhibited in the West Gallery.

The Museum explorations in Peru and Bolivia, which have yielded much of this material, are in charge of Dr. Bandelier; they were begun in 1892 under the patronage of Mr. Henry Villard, and since April, 1894, have been continued by the Trustees of the Museum. Dr. Bandelier is now on his way from Peru for the purpose of preparing the results of his researches for publication.

THE hall illustrating the ancient civilizations of South America and the new Ethnological Hall of the West Wing were formally opened on October 30th. The South American collections are particularly rich in material from Peru and Bolivia, some of which is remarkable for its beauty and rarity. Other important collections exhibited in this Hall are from the mouth of the Amazon and from Colombia. The new Ethnological Hall contains the collections from the Indians of the Plains and from northern Mexico, the Eskimo, the inhabitants of the islands of the Pacific Ocean, and from African tribes.



A TRILOBITE (LICHAS BOLTONI), IN THE HALL COLLECTION.
By courtesy of the *Century*.*

THE HALL GEOLOGICAL COLLECTION.



THE Hall collection of fossils is one of the unique and invaluable possessions of the American Museum. Its value cannot be overestimated, and as long as it remains within the walls of this institution it will attract to it the student of geology and the investigator of the ancient and now extinct forms of life. It was collected by Prof. James Hall in his geological studies in New York and

other States, and has a historical interest associated with its extreme scientific importance.

The New York Survey, inaugurated in 1836, marked an era in the history of geological science in this country, and yielded large contributions to natural history as well. Occurring at a period when scientific, rational, and comprehensive principles were being applied to the science, it availed itself of the great advances made in the study by the

* This fine woodcut appeared in the *Century* of August, 1882.

labors of Sedgwick, Murchison, De la Bêche, Bishop, Portlock, and Philips in stratigraphy, and of the work of Agassiz, Lonsdale, Sowerby, McCoy, De Verneuil, De Keyserling, Eichwald, Davidson, and others; and it appropriated whatever had previously survived the test of criticism and observation from the surveys in this country of McClure and Eaton. But it was itself the source of most original observations; it was made upon new ground, and it supplied a wealth of material in palæontological data unequalled by any similar survey in the world, as well as the *rationale* of the earlier formations. It demonstrated the existence in this State of a series of the oldest formations, whose parallel, in the regularity of their succession and the clearness of their demarcation and limits, could nowhere else be found.

Previously the contradictory labors of various Europeans, and the more conscientious efforts of Professor Eaton, had been based upon a misleading presumption that the rocks of Europe should have their exact analogies in those of this country,—a fatal error which vitiated their results and clouded their reasonings. A somewhat narrow and rigid application of continental or English standards, in which three classes of rocks, the primitive, transitional, and secondary, figured, led to

a grouping whereby, even according to the perspicacious estimates of Professor Eaton, the coal measures were brought within the limits of the State, and the western rocks lifted above their natural plane and made to occupy the enforced position of secondary strata, instead of being shown to be the best exposure of palæozoic rocks known anywhere.

According to the system for the division of labor on the Survey, the western parts of the State were allotted to Lardner Vanuxem, the central portions were given to T. A. Conrad, New York island, Long Island, and the Hudson river to Lieutenant Mather, and the Adirondacks to Dr. Ebenezer Emmons. The monotonous regularity of the strata of the western parts of the State repelled the eruptive and catastrophic geological notions of the day, although actually forming the best and most instructive standard for the disentanglement of more complex formations. Professor Vanuxem consequently willingly surrendered his section to Professor Hall, at that time a young man. Mr. Conrad became palæontologist of the Survey, and Professor Vanuxem succeeded to Mr. Conrad's charge.

Professor Hall's attentive examination of his unattractive region revealed to him its geological importance as a key whereby he might solve the problems of geolog-

ical sequence throughout the continent. His provisional tabulation of the fossils enclosed in these strata afforded him a succinct rule whereby he could measure the succession and establish the character of distant formations. With Professor Vanuxem he slowly compiled a new table of formations, energetically established analogies with it in other States by personal observation or through correspondence, and finally brought it to the test of public criticism.

Professor Hall gradually passed into the Directorship of the Survey, and issued a constant stream of reports, memoirs, papers, and volumes, covering not only the work proper to the New York Survey, but a variety of similar work for Iowa, Wisconsin, and Canada. In later years Prof. R. P. Whitfield became associated with Professor Hall, and left indelible marks of his artistic precision and zoölogical instinct upon the work of the Survey.

Professor Hall possessed unusual opportunities for collecting, at a time when the field was unworked and the accumulated detritus of years lay untouched along the base of cliff and hillside. Industrial enterprises of considerable magnitude, as the opening of the Erie Canal, were being started, and the necessary diggings afforded him new chances to collect fine and well-

marked specimens. He appeared at a time when the first-fruits, both of material and fame, were within the grasp of an enthusiastic and accomplished student. His private cabinet contained hundreds of type forms, and collateral investigation in other States added rare and surprising beauties. It was a reservoir into which the whole watershed of geological exploration at that day poured its first and richest streams.

His collection became an object of envy amongst collectors, and was coveted by the institutions of Europe. Its purchase by the Trustees of the American Museum was an event of great significance in giving scientific character to the miscellaneous groups of fossils previously secured by them or occasionally donated. The collection is now exhibited in the large Hall of Geology on the fourth floor of the first section of the Museum, a position given to it when first received, and since retained by it.

The Hall abounds in striking objects: slabs of sandstone from an ancient seashore pitted with small shells past which fine lines and microscopic ridges sweep as though just traced by a retiring wave, nests of quaint trilobites gathered together in graphic groups as they were buried upon the old sea-bottom, ripples crystallized in rigid bars of quartzite, corals clustering in antler-like bunches

torn from the reefs of pre-adamite oceans, long "straight horns,"—the shelly encasements of extinct devil-fish,—innumerable shells, plants, sponges, and exquisite stone lilies (erinoids), whose sculptured calyces are like toy-boxes and their tressy arms like the fringes of a tassel.

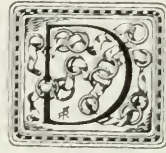
In the profusion of invertebrate forms from Silurian, Devonian, and Carboniferous seas there is a great wealth of curious types. It is as if the bottoms of pre-adamite oceans had been hardened, broken into fragments, and laid out on shelves, exposing the life that flourished upon them. The judgment of the old philosophers who saw in these simulacra of living things only the exuberant creations of a "lapidifying juice" is to-day reversed. They are the sign-manuals, the cartouches of the ages. L. P. GRATACAP.

THE big sturgeon (*Accipenser sturio*) from the New York Aquarium is ready for exhibition. The fish weighed 196 pounds.

SEVEN white sheep (*Ovis dalli*) of Alaska have been received from Mr. Stone of the Constable Expedition. They will be mounted in a group.

A COLLECTION of photographs from nature of the nests of birds found breeding within 50 miles of New York City has been added to the local collection of birds.

PROGRESS OF THE JESUP NORTH PACIFIC EXPE- DITION.



DURING the present year the Jesup North Pacific Expedition has made material progress. On the American side a number of parties have been in the field. Dr. Livingston Farrand has continued his work among the tribes of the west coast of the State of Washington, which was commenced two years ago. This region is very inaccessible, and the tribes living there are still in a comparatively primitive condition. The most interesting problem to be solved in this area refers to the affinities of the Quillayute, a small tribe inhabiting only two villages. Their language differs fundamentally from all the languages of that whole district. In former times another community speaking the same language lived on Puget Sound, but has since become extinct. Dr. Farrand's collections exhibit clearly the close relationship in type between these Indians and their northern and southern neighbors, while in their customs they resemble the people of the west coast of Vancouver Island. They are particularly remarkable on account of their daring whaling expeditions. They attack the whale in

their open boats with their primitive weapons, a full set of which was brought to the Museum by Dr. Farrand. So far, no affiliation of their language with other languages of the Pacific coast has been discovered, but no definite conclusion in regard to this subject can be drawn until the copious notes collected by Dr. Farrand have been fully worked up.

In the interior of British Columbia Mr. James Teit continued his work for the expedition. He extended his investigations among the tribes of the upper course of Fraser River, who evidently transmitted at one time much of the culture of the western tribes of North America to their neighbors on the coast of the Pacific Ocean, and who for this reason are of particular interest to the expedition. It was one of the special objects of Mr. Teit's investigations to collect a full series of baskets from this region. These baskets are remarkable on account of their beautiful designs, all of which are conventionalized representations of realistic subjects. Mr. Teit has successfully accomplished this task; and his collection, together with two others obtained by Dr. Farrand, place the Museum in possession of a series of basketry made by the tribes from the most northern part of British Columbia, southward to Columbia River.

On Vancouver Island Dr. Franz Boas continued his previous researches. In former years he had gathered a considerable body of information on the tribes of this area; but the knowledge of their language, which is necessary for a full understanding of the material heretofore collected, was still deficient. He succeeded in obtaining a large collection of the early traditions of the people in the native tongue, which collection will not only be of great scientific interest, but is also of special value to the Museum, because all these tales are explanatory of specimens previously procured. The industries and manufactures of the people received their due share of attention, and among the interesting results of the investigation was the discovery of primitive methods of agriculture. It was also found that the property rights of the people in land and in fishing-grounds are very well defined. Each family owns a certain stretch of beach on which they dig clams, hillsides on which they gather berries, streams in which they obtain their salmon, and fishing-banks on the high seas from which they procure their halibut. They are most remarkable for the high development of their art of wood-working, and it is believed that a complete series of specimens illustrating this

industry has been obtained for the Museum. Among the specimens collected in this area are also a series of very good old masks and carvings, which supplement the large collections of the Museum in important lines.

The investigations of the expedition during the previous years show that in the development of the culture of the Pacific coast the tribes of Vancouver Island have been most influential.

During the present year investigations were also commenced on Queen Charlotte Islands in the northern portion of British Columbia, and the expeditions sent to Arctic Siberia under the leadership of Mr. Waldemar Jochelson have reached their field of work, but reports from these parties cannot be expected until the coming year.

F. B.

THE MUSEUM SPECIMEN OF THE GREAT ANT-EATER,

MYRMECOPHAGA FUBATA.



THE New York Zoölogical Society has recently given to the Museum a specimen of the Great Ant-eater. Unfortunately the skin was not in a condition fit for mounting, but the valuable skeleton was preserved. By purchase, however, the Museum has secured a nearly similar skin which is now mounted and on exhibition in the Gallery of the East Wing.

Including the remarkable bushy tail the specimen measures six feet eight inches in length, and is twenty-three inches in height at the shoulders. Its prevailing color is dark gray, with a broad, tapering black



THE MOUNTED SPECIMEN OF THE GREAT ANT-EATER.

band bordered with white running from the front of the shoulders obliquely over the back. The Ant Bear frequents the low, swampy savannas along the banks of rivers, and the depths of the humid tropical forests of South and Central America. Its food consists mainly of "white ants" or termites, to obtain which it digs into their great conical nests with its sickle-like anterior claws, and as the insects swarm to the defence of their dwelling it draws them into the long tubular mouth by means of the writhing, sticky, whip-like tongue.

The skeletal characters of the Ant Bear are not less striking. The skull is extraordinarily elongated and tapering; in the back bone, hip and shoulder girdles, and "club-footed" feet it resembles the enormous extinct *Megatheres* or Ground Sloths of South America, while in other respects it is related to the strange Tree Sloths. The Great Ant-eater is in fact a member of the mammalian order *Edentata*, which also includes the shield-bearing *Armadillos* and extinct *Glyptodons* of South America, the *Pangolins* or Scaly Ant-eaters of Asia and Africa, and the aberrant *Aard-Vaark* or Cape Ant-eater of South Africa. Although these grotesque creatures seem so unlike each other, discovery of their fossil relatives is slowly clearing up their divergent evolution from a common stock. W. K. G.

A GUIDE TO THE ETHNOLOGICAL COLLECTIONS FROM THE NORTH PACIFIC COAST OF AMERICA.



THE ethnological material in Hall 105 is so extensive and diverse that many visitors get only confused ideas of the tribes therein illustrated. The small guide-book recently issued will supplement the very intelligible grouping and labelling of the specimens and tend to unify the visitors' impressions.

The brief index is followed by an outline map showing the location of the tribes, and by an exposition of the general exhibit illustrating the fundamental traits of the culture of the North Pacific coast. The industries, household utensils, and clothing are taken up case by case, and then the social, æsthetic, and ethical phases of the culture. The individual tribes are then treated in detail, and finally the prehistoric tribes.

The sentences are brief but coherent, easily read as one passes from case to case. On every double page is the small plan showing the arrangement and numbering of the cases. For detailed information, references are given to the Museum publications. The guide will be given to those asking for it. W. K. G.

RESEARCHES RELATING TO INDIAN REMAINS IN NEW YORK.



DIRTY and dingy seem the isolated fragments of bone implements, of human and animal bones, of crude pottery and what not, that one often sees carefully guarded as "curios." It must be conceded that in themselves, to the mind of normal tastes, such things lack interest as well as beauty. Nevertheless material quite similar, if gathered by an accurate observer who takes careful field notes, may yield, as the result of strict inference, facts that from both the human and scientific view-points appeal strongly to the imagination.

This applies well to the Indian antiquities gathered for the Museum by Mr. Harrington at Throggs Neck, Port Washington, and other places around New York. These explorations were begun last year with the financial assistance of Mr. Theodore Cooper and Mr. William R. Warren. The object is to show the customs and physical characteristics of the Indians that dwelt here before the coming of Hendrik Hudson. At many places these vanished peoples had left traces,—shell-heaps, accumulated through the passing centuries, and sometimes a buried hearth or "fire-hole," once the focus

of a primitive home. Amid unimportant rubbish, these contained such things as bone implements for sewing buckskin, fragments of pottery and pipes, weapons, and household utensils; also parts of the skeletons of wild animals and of domesticated dogs. At Port Washington, Long Island, the ancient graves contained skeletons that were bent up in a crouching position, a burial-custom widely observed.

Except in the upper layers of the shell-heaps there was absolutely no trace of European influence. The lowermost strata, on the contrary, contained, at Throggs Neck, crude and much-weathered argillite implements of very ancient pattern,—in fact, similar to those collected for the Museum by Mr. Volk in the later glacial deposits at Trenton. Other very ancient remains were found five feet below the present floor-level in several old rock-shelters at Armonck.

Enough is already known to prove that these people were Algonquins, akin to the tribes that in King Philip's time caused New Englanders disquietude. Their culture, however, showed some Iroquois influence.

It is important that no time should be lost in exploring all such ancient Indian sites, as they are being rapidly destroyed.

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NOTES AND NEWS.

MUSEUM SEARCH FOR FOSSIL VERTEBRATES IN THE WEST.—The fishes, batrachians, reptiles, and mammals that were evolved during successive geological periods have left their fossil remains in the West in such considerable quantities that the field parties sent out by the Museum in successive years have secured many carloads of fossils. Upon this material have been based numerous important contributions to our knowledge of the history of life.

From the expeditions of the summer and fall of 1900 there have been received fourteen large boxes of mammalian fossils from the Pliocene and Miocene of Texas, one carload of Dinosaur remains from the Jurassic beds of Wyoming, nearly a carload from the Laramie or Upper Cretaceous of South Dakota, including skeletons of a great carnivorous Dinosaur and of a herbivorous Dinosaur of iguanodont type. This material is now being cautiously taken out from the matrix, and it is fascinating to watch the gradual sculpturing out of some rare "medal of creation." While this note is in press they are bringing to light the slight arches and framework of the

skull of a reptile, apparently a very primitive lizard hitherto unknown.

GIFT FROM THE ZOÖLOGICAL SOCIETY.—An important recent gift from the New York Zoölogical Society includes the following animals: A young Moose (*Alces americanus*), an Equine Deer (*Cervus equinus*), an Orang utan (*Simia satyrus*), a Loris (*Nycticebus tardigradus*), an Ocelot (*Felis pardalis*), three Bay Lynxes (*Lynx ruffus*), a Jaguarondi (*Felis jaguarondi*), two Black Leopards (*Felis pardus*), a Raccoon (*Procyon lotor*).

A STRANGE SPECIMEN has been presented to the Museum by Dr. Joseph Y. Mangoun, strange, not in itself, but because it was found where other queer things will no doubt turn up,—the rapid transit subway. It is an Iguana or large lizard, and was found alive in the excavation at 59th Street: it had evidently escaped from captivity.

THE NEW EXCAVATIONS are also being taken advantage of by the Geological Department, which is trying to secure whatever of interest may be unearthed in them.



PAPILIO MEROPE, MALE.
DANAUS CHRYSIPPUS.

PAPILIO MEROPE, FEMALE.
HYPOLIMNASTIS MISIPPUS, FEMALE.

RECENT GIFTS OF BUTTERFLIES AND MOTHS.—There are comparatively few species of Lepidoptera that do not display either some peculiar excellence of outline, or striking pattern of spots and streaks, or glowing symphony of rich, deep colors; but, even among these bright and winged hosts, the beauty of the specimens recently acquired by the Museum is of high rank.

The collection was presented by Mr. William Sachs, of Hoboken, N. J., and contains about three hundred specimens, many of them rare or of peculiar interest. Our illustration shows the male and female of *Papilio merope* from Natal, Africa; the female contrasts sharply with the male, mimicking closely both in form and markings the female of *Hypolimnastis misippus* and both sexes

of *Danaus chrysippus* of the same region, two species belonging to entirely different genera and families. Another remarkable species represented in the collection is *Papilio memnon*; the male is dark with black and blue streaks, the females present two well-marked varieties with many intermediate forms. Variety (1) has tailpieces on the hind wings, variety (2) has no tailpieces and is of entirely different coloration. Very glowing and beautiful in color and shape are the specimens of *Papilio coön* from the Malay Islands, *Teinopalpus imperialis*, *Papilio peranthus* and *Papilio buddha* from India. The collection will shortly be placed on view.

RELATIONS OF THE MUSEUM TO THE AUDUBON SOCIETY.—Twenty-two State Audubon Societies have now been organized with a total membership of over 50,000. Prominent among them is the New York State Audubon Society, which owes its existence largely to the support and encouragement its originators have received from Mr. Morris K. Jesup, who has served as its president since its formation in February, 1897. The Museum is further represented in the executive board of the Society by the Curator and Assistant Curator of Vertebrate Zoölogy, whose assistance in preparing leaflets relative to the eco-

nomic and educational value of birds and to their wanton destruction, has rendered the publications of the Society authoritative, and hence much in demand by other branches.

In addition to distributing many thousand leaflets of this nature the Society aims to inform the public concerning the bird laws of the State by sending annually a poster containing an abstract of the law to each of the 4000 post-offices in the State with a request to the postmaster to display it in a suitable position. In this connection, it should be added that the existing law has been greatly strengthened through an amendment introduced into the legislature at the instigation of the New York Society.

The executive committee of the Society meets twice each month, from October to June, at the Museum, and the annual meetings of the Society are held in the Museum's large lecture hall.

SYLLABUS OF THE MUSEUM LECTURES ON BIRDS.—Bird students who were unable to attend Mr. Frank M. Chapman's course of lectures on 'Birds in Nature,' given at the Museum Saturday afternoons from November 10th to December 15th, will doubtless be interested in the appended brief syllabus of the Course:

1. *Relation of Bird to Man; the Relations of Man to Birds.*—Treating, first, of the economic value of birds through the services they render in preventing the undue increase of insects, in devouring the seeds of noxious plants, in destroying harmful rodents, and in acting as scavengers. Second, of the history of man's relation to birds from what may be conceived to be their earliest connection to the present time, with the object of ascertaining in what way or ways the human race may derive the greatest benefit from birds.

2. *Distribution and Migration of Birds.*—Geographical distribution; seasonal distribution. Migration as a factor in distribution; origin of migration, manner, and times of migration.

3. *Birds' Nests.*—The influences governing the selection of the site and character of the nest.

4. *The Eggs and Young Birds.*—Number, size, and colors of eggs. Development, physical and mental, of the young birds.

5. *Habit and Structure of Birds.*—Form and functions of the wings, feet, tail, and bill.

6. *Colors of Birds.*—Causes of color; color and age, color and season, color and food, color and climate. Uses of color; protective, deceptive, and signalling colors, color and sex.

The lectures were elaborately illustrated with colored slides, most of which were made from nature and were therefore in the highest degree instructive.

THE WISDOM of the City of New York in providing the new and enlarged auditorium is demonstrated by the very large increase in attendance at the lectures, as shown in the following figures for three of the lectures on the Paris Exposition :

Attendance in 1899 :

November 25th.....	763
Thanksgiving Day.....	800
December 2d.....	576

Total for 3 lectures..... 2139

Attendance in 1900 :

November 24th.....	1098
Thanksgiving Day.....	1096
December 1st.....	952

3146,

an increase of 50 per cent. over last year.

The educational investment is evidently a profitable one.

MR. JOHN L. CADWALADER has recently presented to the Museum a valuable and interesting hybrid between the Red Grouse (*Lagopus scoticus*) and Black Cock (*Lyurus tetrix*), which was killed in a grouse drive while flying in a pack of grouse at Millden in Forfarshire, Scotland.

The bird is a male and presents



HYBRID BETWEEN BLACK COCK AND RED GROUSE.

characters of both the male and the female Black Cock, and also of the male Red Grouse. In the main, however, it more closely resembles the Black Cock, with which it agrees in size, the prevailing color above and below being black. The back and sides of the neck, however, are barred with rufous and black, as in the female Black Cock, or Gray Hen, but the rufous and white vermicula-

tions of the back, rump, and upper tail-coverts more nearly agree with those of the male Red Grouse. The wing-coverts are peculiarly marked with numerous terminal white bars and cuneate tips present in neither of the presumed parents. A rufous collar occupies the throat and the black abdominal feathers are more or less tinged with rufous and terminally barred with white. The

tarsi and basal third of the toes are feathered more as in the Red Grouse, but in color are grayish finely barred with black. The hind-toe is small and the nail elongated, as in the Red Grouse. The under tail-coverts are white, and the tail is black, as in the Black Cock; the outer feathers of the latter, however, lack the eminently characteristic lengthening and outward curving of that species.

While hybrids of this nature have been recorded on several previous occasions they are exceedingly rare, and the specimen above described is doubtless the only one of the kind in this country. F. M. C.

SOME OF THE COLLECTIONS IN THE GEOLOGICAL DE- PARTMENT OF THE MU- SEUM.*



HE first valuable series of fossils to be acquired by the American Museum of Natural History was the Holmes collection from the Tertiary deposits of South Carolina. This included the types of the species described in Tuomey and Holmes's works. † The second important series which was obtained was the set of eight mounted skeletons of moas

from New Zealand, constituting one of the best of the J. von Haast series of those birds. There are eight unmounted skeletons in the same collection, thirteen species being represented in all.

The main portion of the department's specimens is composed of the James Hall collection, the acquisition of which in 1875 placed the Museum in the lead among American institutions in respect to Paleozoic fossils, on account of the great number of types and figured specimens contained therein, such specimens being numbered by the thousand. These specimens were described for the most part in the reports of the State geological surveys of New York, Iowa, Wisconsin, and Indiana. Especially noteworthy in the Hall collection, aside from the wonderfully rich New York series, are the Potsdam fossils from Minnesota and Wisconsin; Trenton forms from Wisconsin and Iowa, the unfigured types of which have been republished by Professor R. P. Whitfield with figures in the *Memoirs of the Museum*; Niagara fossils from Waldron, Indiana; corals from the falls of the Ohio River; crinoids from Burlington, Iowa, and the remarkable Lower Carboniferous fauna of Spergen Hill,

*Part of a paper read before Section E of the American Association for the Advancement of Science, June 26, 1900. Reprinted from "Science" November 16, 1900, with some alterations.

† "Pleiocene Fossils of South Carolina," by M. Tuomey and F. S. Holmes. 4to. Charleston, S. C., 1857; "Post-Pleiocene Fossils of South Carolina," by F. S. Holmes. 4to. Charleston, S. C., 1860.

Indiana, both of which last have been republished by Professor Whitfield with figures from the original types, the former in the *Memoirs* and the latter in the *Bulletin of the Museum*.

Other collections which may be mentioned are the Chazy and Fort Cassin fossils from the vicinity of Lake Champlain, containing types which have been described by Professor Whitfield in the *Bulletin of the Museum*; a complete set of the Vermont and New Hampshire rocks illustrating the geological survey of those States by Professor C. H. Hitchcock, and the types of the Tertiary plants from Brandon, Vermont; an excellent series of Paleozoic fossils from Illinois and neighboring States; a large series of unusually fine fossil corals and other forms from the Scholharie Grit of Orange county, New York, which were presented to the Museum by Mr. D. Jackson Steward; corals of Lower Devonian (Upper Helderberg) age from the beds at the falls of the Ohio River, near Louisville, Ky.; fossils from the Cretaceous marls of New Jersey, collected and presented to the Museum by Professor Whitfield, and fine sets of fish remains from the Triassic of the Connecticut valley and the Tertiary beds of Wyoming. The most recent noteworthy addition is one of the Tyrrell collections of placoderm fishes from the Devonian rocks of Ohio.

The arrangement of the collection is that devised by Professor Whitfield when he came to the Museum, and it is worthy of careful consideration on account of the way it has stood the test of time and use. Beginning at the northeast corner of the hall (because that is beside what was originally the only entrance to the room and was understood to be the permanent main entrance thereto) the specimens are arranged stratigraphically in ascending geological order. Under the stratigraphic arrangement, the grouping is by geographical or lithological provinces, first New York, or eastern and then western. Under this again the arrangement is strictly biological, beginning with plants, where present, and then taking the animals in ascending scale. This scheme has been carried out most definitely in the upright cases, while the desk cases contain many of the best specimens and fit into the classification as well as is practicable. A part of each of twelve of the desk cases is occupied by specimens comprising the Dana's Manual series. These illustrate the figures in that standard work on geology and form an epitome of the historical side of the science. Many of the figures are represented by the very specimens from which the originals were drawn. Large specimens showing ripple marks, footprints, concretions,

and other phenomena are placed on the tops of the cases and in other places out of series.

A very valuable feature of the installation is that of separating the biological units from one another so that the individuals, species, genera, families, etc., which belong together can be distinguished on the most rapid inspection. This is effected by means of narrow strips of wood of different colors placed between the trays holding the fossils. single black strips separating different species, red ones genera, white ones families, two white ones limiting orders, and two black denoting the boundaries of classes and higher subdivisions. The specimens, furthermore, are arranged so that one naturally examines them from left to right and from below upwards, except that the upper shelves of the upright cases are occupied by large and small specimens showing the grouping of the fossils in the rocks and the geological features of the beds. More than nine-tenths of the hall is devoted to the American forms, the rest being given up to a synoptic series of European fossils and fossils from other foreign localities.

EDMUND O. HOVEY.

VISITORS to the Mexican Hall will be interested in the folder on the Archæology of Mexico and Central

America, which the attendants will give to those who ask for it. It is a brief guide to the collections, and also gives an idea of the principal explorations and researches relating to this subject which have been undertaken by the American Museum and others; in brief, it contains important general information on a subject little known to the public.

DEPARTMENT OF PUBLIC INSTRUCTION: NOTES.



THE following extract from the speech at the opening of the new auditorium by Hon. Charles R. Skinner, State Superintendent of Public Instruction, will be of interest in connection with the progress of the Museum system of visual instruction:

"Since the Museum became connected with the State Department Dr. Bickmore has prepared nearly two hundred lectures* covering all phases of Education, Travel, History, Biography, Science; and these lectures have been repeated in every portion of the State. Nearly 20,000 different slides (stereopticon views) have been presented. We are familiar with the growth of this system through inquiries which reach our State Department

* From Professor Bickmore's annual report recently submitted to the educational authorities of the State we take the following extract: "The number of lectures prepared under the auspices of the State Department of Public Instruction up to January 1, 1901, will be three hundred and fifty-four upon one hundred and eighty-seven different subjects."—EDD.



A REPRESENTATIVE VIEW FROM THE LECTURES ON THE PARIS EXPOSITION.

and which daily reach Dr. Bickmore in this Museum. Inquiries come from every county in the State, from smaller schools that are not entitled to these privileges, begging that it be extended. From every State in the Union come requests from State superintendents of public instruction, asking how they may secure the advantages of this system. From many nations come inquiries of the same nature, and I was shown a very interesting letter of inquiry from India, where the very purpose which this education serves here was presented as an educational influence upon the people of that country."

THE FOLLOWING LETTER is being sent out by the Department of Public Instruction in response to numerous

letters from various parts of our country :

" DEAR SIR :

Enquiries having been received from educators in many parts of our country regarding our system of Visual Instruction, and the terms upon which our slides may be procured, the following information is given in reply :

We are not dealers in slides, but we are desirous of promoting free public education throughout our land by means of illustrated teaching ; and the State Superintendent of Public Instruction of the State of New York, under whose auspices our entire system is carried on, has given us authority to supply, as a matter of interstate courtesy, the Superintendent of Public Instruction of each other

Commonwealth with *one* series, and *no more*, of our slides *at cost*, after we have finished the work which is required of us by the statutes of our own State. We do not keep a stock of slides on hand but fill each order separately, hence considerable time must elapse before a shipment can be made, and we can only undertake the preparation of such illustrations between May 1st and September 1st. Each lecture is sold complete and not a selection of slides therefrom.

The conditions under which this property must be used are set forth in the circular of the State Superintendent placed herein, and we desire to call your special attention to the following rule :

'In no case shall the use of said apparatus be permitted at any lecture where an admission fee shall be charged, or which shall be given in connection with any other entertainment of any nature, or for the benefit of any Private School, Church, Sunday School, Hospital, or any purpose not connected with the Free Common Schools of the State.'

No copies in any form may be made from our manuscripts or slides.

The lectures now available upon the above terms, are :

Lecture No. 184, Manhattan Island and Highlands of the Hudson, 75 slides, all colored except one . . . \$69.20

Lecture No. 185, The Catskills and the Adirondacks, 73 slides, *all* colored. . . \$64.55

Lecture No. 186, The Lakes of Central New York and Erie Canal, 75 slides, all colored except two. . . \$65.25

Lecture No. 187, Niagara Falls, 88 slides, all colored except eleven. . . \$75.65

Lecture No. 188, Connecticut Valley and the White Mountains, 75 slides, all colored except four. . . \$66.55

Lecture No. 189, Coast of New England

and St. Lawrence River, 72 slides, all colored except two. . . \$65.40

Lecture No. 190, Penna., Virginia, and District of Columbia, 74 slides, all colored except twelve. . . \$62.10

Lecture No. 191, Mississippi Valley and the Southern States, 73 slides, all colored except six. . . \$61.85

Lecture No. 192, Rocky Mountains and the Great Basin, 72 slides, all colored except four. . . \$61.70

Lecture No. 193, The Yellowstone National Park, 74 slides, all colored except one. . . \$67.20

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As we supply the above lectures at cost and thereby enjoy the privilege of being co-workers with the educators who use the results of our labors, we expect that

a clear recognition of our assistance will be made when our illustrated instruction is repeated; and we request that a full record be kept of the locality, the topic, the name of the lecturer, and the character and numbers of each audience, and that these data be forwarded to us on the first day of October of each year, in order that we may include the more important parts of them in our Annual Report to our State Superintendent of Public Instruction.

Further information will be given if desired.

Respectfully yours,
(Signed) ALBERT S. BICKMORE,
Curator."

In the foregoing circular, which has been approved by the Committee on Advice, each ordinary slide is placed at an estimated cost of thirty-five cents in order to provide for packing and postage and also leave a margin for other incidentals. For coloring, the charge, as shown in the above figures, is fifty cents each, which is precisely what the Department pays, except for especially difficult work.

The market price of a colored slide is at least \$1.25, so that the limited number of officials in other States and countries who are thus aided, only pay two-thirds of the regular rate, and the Department is therefore, in reality, a co-worker in the promotion of free public education with all who repeat our lectures in every land.

NEW INDIAN COLLECTIONS FROM CALIFORNIA AND OREGON.



DURING the last two years the Museum has carried on important work among the Indian tribes of North America. Many of these are on the verge of extinction, and little is known of their appearance, of their customs, or of their industries. A number of friends of the Museum have provided the means for making collections among them; in this manner a number of important additions have been made to the Anthropological Department.

The late Mr. C. P. Huntington enabled the Museum to carry on work of this character among the vanishing tribes of California. The Indians of that State are particularly remarkable on account of the enormous diversity of their languages, customs, and appearance. Particularly is this true of the tribes inhabiting the foothills of the Sierra. The tribes of this region are much scattered. Many of them live on small ranches in earth-covered lodges, while others occupy log cabins or rude houses built of lumber. They make beautiful basketry, which in recent years has excited the interest of collectors on account of its fine workmanship and design.



HUT OF MAÏDU INDIAN.

The work of the Museum has been directed principally toward a study of the Maïdu Indians, who inhabit the region east of Sacramento River. During the last two years, Mr. Roland B. Dixon has spent much time among this tribe, and has sent to the Museum a very full collection exhibiting the industries of the people. He has also succeeded in unravelling the significance of the curious designs with which the baskets are ornamented. The patterns represent flowers, mountains and valleys, stone arrow-points, feathers, fish-teeth, etc. Without the help of the Indians, it would be impossible to interpret the significance of these

designs, which consist largely of triangles and other geometrical figures.

These researches have shown that the Maïdu, who at one time occupied a considerable territory, were subdivided into a great many groups, each of which spoke a dialect of its own, so that intercommunication between the people inhabiting the different valleys of the Sierra was made very difficult. Notwithstanding their primitive mode of life, they possess a wonderful store of interesting tales and traditions, in which they account for the origin of the world, for the creation of land and water, of mountains and valleys. It would seem that these



INDIAN BAGS AND BASKETS FROM THE STATE OF WASHINGTON.

tales, many of which compare favorably with the mythology of antiquity, spread from tribe to tribe all over California, no matter how different the languages spoken by the natives.

Mr. Dixon has also collected for the Museum a full series of photographs of these Indians, and supplemented them by a number of plaster casts of faces, which gives an excellent permanent record of the peculiar appearance of the tribe.

Another important collection re-

cently obtained by the Museum was also made in connection with investigations among the vanishing tribes of our continent, the means being contributed by the late Mr. Henry Villard. In former times the coast of Oregon was the home of a multitude of tribes, almost all of which are fast disappearing. They have been gathered on two reservations, but are rapidly being reduced in number, owing to a very high mortality among both children and adults. One of these tribes, the

Alsea, occupied at one time an important position. They held a large stretch of territory just south of the mouth of Columbia River. Our only knowledge of this tribe is based on information obtained by the members of the famous Wilkes Expedition, which collected information on the northwest coast of our continent about 1840. At the present time they are reduced to a mere handful, and their old customs can be learned only by questioning the few old people that survive. The most important question that had to be solved in this region was that of the affiliations of this people. It was not known whether they were related to the tribes of Washington or to those of California. Dr. Livingston Farrand spent the past summer among the remnants of this people; and he found that in language, as well as in appearance and in customs, they must be classed with the tribes of the State of Washington. They are the most southern people on the Pacific coast who are in the habit of deforming their heads by artificial means. A cushion made of bark is placed on the forehead of the infant and held down firmly. By this means the growth of the head is much influenced, so that the forehead recedes and assumes a very flat shape. This curious custom extends from the Alsea northward towards the central part of British

Columbia. In former times it was found in many parts of the world,—in the Mississippi basin, in the western part of South America, in Central Europe, and in many other places. While Dr. Farrand found only a few specimens that remained from ancient times, when the tribe was more powerful, he was more successful a little farther inland, where, on the banks of the Columbia River, he brought together much material illustrating the early culture of the people. Here also is made beautiful basketry, although of a type different from that found in California. Here too we find geometrical designs intended to represent real objects, such as birds and mammals. Some of the utensils of the people show clearly that the culture of the Indians of the Plains has influenced them. Evidently this was due to the ease with which the Pacific coast is reached along the course of Columbia River. In olden times the trade from tribe to tribe must have extended across the plateaus and down Columbia River.

The Museum is deeply indebted to both Mr. Huntington and Mr. Villard in many ways. In earlier years Mr. Huntington donated a valuable African collection. Mr. Villard showed his interest in the Museum on many occasions. He supported Dr. Lumholtz during the early years of his expedition to Mex-

ico and Dr. Bandelier in his work for the Museum in Peru. The latest service to the institution of these two men was their active support of the researches among North American Indians, which were initiated by the Museum. The loss of these friends will always be keenly felt. The collections for which the Museum is indebted to them will be a permanent monument of their active interest.

F. B.

THE GEM COLLECTIONS.

THE FIRST MORGAN COLLECTION.*



IN 1890, through the munificent donation of the Tiffany Gem Collection, by Mr. J. Pierpont Morgan, the

Museum acquired a collection of remarkable popular interest.

It represented the result of a careful and rather exacting search in America for gem material. It also embraced gems and gem material from famous localities, and purported to give a very instructive exhibit of all mineral species used in ornamental work and as cut stones. It had been designated by Mr. George F. Kunz as "one of the finest collections of precious stones, and also the most important, embracing all those found in the United States."

*The second, recently donated by Mr. Morgan, will be described in a future number.

There was no question as to its exhaustiveness. Along with the brilliant series of true gems, there were represented mineral species of merely experimental value as fancy stones, an idea that to the mineralogist might have seemed almost a transient vagary. Here were gathered, cut and polished beads of Rhodonite, brilliants of green Diopside, ovals of the creamy Wollastonite and snowy Pectolite, tablets of Sphene and Cyanite, cabochons of pink Wernerite, squares of the ice-like Beryllonite and the glassy Phenacite, brooches of green Amazon Stone, and tokens of the limpid, yellow Willemite,—all materials which were rather "chanced," it might be said, for their very serious likelihood of becoming gem-stones at all was inconceivable. They added, however, to the variety, the contrasts, and the cumulative sense of value and fascination which the gems awoke amongst the crowding visitors.

A glance at other mineralogical collections in the United States may bring out better the character and value of this one.

There is a beautiful collection of gems in the United States National Museum. It numbers about two thousand specimens, many of which were found in the United States, and furnishes a very complete exhibit of precious stones. Many are

of remarkable excellence, as, notably, the diamonds and pearls presented to President Van Buren by the Iman of Muscat. In 1894 this collection received an important accession in the gift of the interesting and intrinsically valuable cabinet of gems belonging to the late Dr. Isaac Lea, of Philadelphia. Its large accumulation of rubies, sapphires, chrysoberyls, tourmalines, garnets, and other stones is relatively enhanced by a portfolio of drawings, made by its distinguished owner, of inclusions in the various gems.

At Yale College there is an attractive suite of gems combining the Gibbs, Panot, and Tenny cabinets; while at Cambridge are displayed the unique Hamlin tourmalines.

The Tiffany Gem Collection has been continuously increased by additional gifts from its founder since the day of its first exhibition, until to-day it fairly ranks second in the country. A new installation awaits it, and the augmentation of the new collection, so that its future character will far surpass its present limits and lustre.

In looking over the gem cases, it is quite possible to linger a long time over each group of gems in recounting the interesting facts of their nature, associations, and origins. This superb tourmaline, darkly green, with the hue of a sun-

sprayed spruce, tells of Mt. Mica in Maine, where so many glorious specimens have been discovered. This emerald from North Carolina recalls the industrious search made in the wildest portions of that State for these exquisite minerals, and how the farmers with an avidity whetted by the promise of gains hunted for the "green rocks" or "bolts." These rich "pigeon-blood" garnets recall the ant-hills in New Mexico, where either the ants or scorpions have carried them to the surface to afford free room for the erection of their chambers and galleries. These pale turquoises carry us back to prehistoric excavations in New Mexico which are two hundred to three hundred feet in depth and from which thousands of tons of rock have been taken. This glorious opal, diffusing "like a dying dolphin" the fire of a hundred tints, reminds the spectator of those slow segregations of opaline matter in the matrix of the trachite, which in Mexico occur in such quantity as to create a local industry in mining, exporting, and polishing them.

A certain romantic interest attaches to gems, and as they also irresistibly appeal to our sense of beauty, not unmixed, perhaps, with a more material sense of value, they form to the public a centre of constant charm and admiration.

L. P. GRATACAP.

American Museum Journal

Volume I

JANUARY, 1901

Number 6

NOTES AND NEWS.

CHANGES IN THE ADMINISTRATIVE AND SCIENTIFIC STAFFS OF THE MUSEUM.—On January 1st, 1901, Professor Henry Fairfield Osborn resigned the office of Assistant to the President and was succeeded by Professor Hermon Carey Bumpus, who has hitherto (since 1892) occupied the chair of Comparative Anatomy at Brown University. Prof. Osborn will continue to discharge the duties of curator of the Department of Vertebrate Palæontology, but in order to pursue his investigations as the successor of the late Professor Marsh as Palæontologist (Vertebrates) of the United States Geological Survey he has withdrawn from the general administrative work of the Museum.

Professor Bumpus has had much experience on the administrative side of scientific institutions. He has been Assistant Director of the Marine Biological Laboratory and Director of the Laboratory of the United States Fish Commission, at Woods Holl, Mass.; a member of the Board of Trustees of the Rhode Island Hospital; Secretary and afterward Vice-President of the American Society of Naturalists; and a member of the Board of Management of the Rhode Island School of Design.

In addition to his work as Assistant to the President, Professor Bumpus will organize and develop the new Department of Invertebrate Zoölogy, of which he is now curator, and will also be in charge of the collection of reptiles and fishes.

Louis Pope Gratacap, A.M., assistant curator of the Department of Geology, Mineralogy, Conchology, and Marine Invertebrate Zoölogy, has been appointed curator of the newly established Department of Mineralogy. Mr. Gratacap has continuously served the Museum since 1877, when the institution was first established, and the extensive mineralogical and conchological collections have been under his care. The famous Bement collection of minerals and the superb Tiffany collection of gems lately presented to the Museum are being installed. A full description of these collections will be given in a future number of this journal.

In the Department of Geology, which has attained its present development under the curatorship of Professor R. P. Whitfield, Dr. E. O. Hovey, Assistant Curator since 1894, has been made Associate Curator.

Dr. J. A. Allen's department will

henceforth be known as the Department of Mammalogy and Ornithology. Mr. Frank M. Chapman, Assistant Curator since 1888, has been made Associate Curator.

Professor Franz Boas will exchange his present title of Assistant Curator of the Department of Anthropology for that of Curator in charge of Ethnology, and Mr. Marshall H. Saville, likewise, will be known as Curator in charge of Mexican and Central American Archaeology, Professor Putnam retaining the curatorship of the whole Department of Anthropology, of which Mr. Harlan I. Smith has been made Assistant Curator.

MEMENTOS OF AUDUBON IN THE MUSEUM.—The accompanying illustration was reproduced from a painting recently donated to the Museum by Fordham Morris, Esq., of New York City, who in his letter of presentation states:

"The picture was painted in the late forties, only a few years before his [Audubon's] death, by his sons, John and Victor, both of whom . . . assisted their father in his later works on the Quadrupeds of America. Mr. Audubon was then residing at Audubon Park.

"The picture was left to me by my father's will. I give it to the Museum with the hope that for many years the students and visitors

of the Institution will be pleased to look upon the features of the great naturalist as he appeared in later life, and remember how much our fellow-countrymen owe to his labors in forest and prairie and his brush and pencil in delineating for the benefit of future generations the forms, habits, and habitations of the Birds and Beasts of America."

The painting is now on exhibition in the Library reading-room.

In regard to the other Auduboniana owned by the Museum, a catalogue of which is given below, Miss Maria R. Audubon, granddaughter of the naturalist and author of 'Audubon and his Journals,' in response to a request from the editors, has been good enough to send the following notes:

No. 1. An oil painting, 'The Last Resort,' now in the library, representing a deer pursued by dogs and taking to the water. By J. W. Audubon: presented to the Museum by Mrs. William Moore Carson.

"This picture was painted by John Woodhouse Audubon in the late fifties and is the middle one of a series of three of the same, or nearly the same, size. The first was a herd of deer listening, and was called 'The Alarm.' The last, owned for many years by Mr. Sheppard Knapp, was called, if I remember rightly, 'The Death Struggle,' or perhaps 'The Death.'



PORTRAIT OF JOHN JAMES AUDUBON.
Presented by Fordham Morris, Esq.

'The Alarm' is in England and was owned by Lord Lansdowne. This one, 'The Last Resort,' was purchased by Mr. John Williams of the then firm of Williams & Guion. . . ."

No. 2. An oil painting, 'Wild Turkeys,' now in the library, by John James Audubon: Reproduced in the 'elephant folio,' deposited with the Museum by Audubon's granddaughters, Miss Maria R. Audubon and Miss Florence Audubon.

"The picture of the Wild Turkeys was painted in Liverpool in 1826, with the intention of presenting it to the Royal Institution of that city. The question of space arising, Audubon painted the Turkey Cock alone, and gave that instead."

No. 3. Portrait of John James Audubon, by T. W. Wood. (Hung at the main entrance to the Bird Hall.)

"This portrait was painted in 1893 for Mr. M. K. Jesup, . . . who presented it to the Museum at the time the Audubon monument was unveiled in Trinity Church Cemetery, in April of that year. It is from two or more of the portraits best liked, the one by J. W. Audubon (opposite page 454, vol. 1, of 'Audubon and his Journals') and the one by Inman."

No. 4. A gun belonging to John James Audubon. Presented to the Museum by John J. Crooke. (Hung

at the main entrance to the Bird Hall.)

"This gun is one of several which the family owned when Audubon died, and had no special associations that I know about. It was parted with in 1873 or '74, by one of my brothers, but I never heard the name of the purchaser."

No. 5. Plate of the Great Auk: from 'elephant folio' of 1836, drawn from nature by J. J. Audubon. Engraved, Printed, and Colored by H. Havell, 1836. Presented to the Museum by Gen. J. Watts DePeyster. (In library.)

"The plate of the Great Auk is simply an odd plate of the large edition. General DePeyster was an intimate and very true friend of my grandmother, and may have been presented by her with the plate or may have purchased it from her."

No. 6. Copper Plate of Louisiana or Harris's Hawk, 1837, engraved by Robert Havell, London.

"Copper plates of the same large edition ('elephant folio') have been picked up in various places from time to time, as the entire collection of five hundred was sold either in 1863 or '64. They were all more or less injured by fire in 1845, and when my grandmother, Mrs. J. J. Audubon, was in her old age bereaved of both sons, she sold them at a great sacrifice rather than have the care of them."

RESTORATIONS AND MODELS OF THE EXTINCT
NORTH AMERICAN MAMMALS.



FEW persons are able to form any adequate idea of an animal from its skeleton; even trained specialists are too apt to consider a skeleton in itself instead as the framework of a

increase the educational value and the attractiveness of the hall in this respect, Mr. Charles R. Knight, the well-known animal painter, was invited to undertake the restoration of some of these animals. His very first studies proved that he was



RESTORATION OF THE EXTINCT IRISH ELK.

Made after the model.

Copyrighted by the American Museum of Natural History, 1900.

moving and feeding creature. It was soon found that very few visitors to the Hall of Vertebrate Palæontology appreciated the wonderful story told by the fossil skeletons of the past life of this continent, and in order to

remarkably well qualified for this work, and in rapid succession he made a series of drawings in color which were reproduced in an article, "Prehistoric Quadrupeds of the Rockies," in the 'Century Magazine,'



Copyrighted, by the American

MODEL.

Museum of Natural History, 1900.

Made after the mounted skeleton.

1896. This article attracted widespread attention and it was followed by others in 'Harper's' and the 'Century' in succeeding years. Mr. J. Pierpont Morgan became interested in these drawings and kindly offered to present them to the Museum as rapidly as they were completed. The whole series now includes twenty-seven large water-colors, which represent most careful and minute study of the fossilized skeleton on the part of Professor Osborn, his assistants, Dr. Wortman, Dr. Matthew, and others. A quotation from an article in the 'Century' well indicates the

method followed by the artist in preparing these restorations.

"It goes without saying, that each contains a large percentage of pure conjecture as to the color, hairy or other covering, developed horns and other defences. In fact, these res-



MOUNTED SKELETON.
(By courtesy of Mr. S. H. Chubb.)

torations are regarded as working hypotheses which are of scientific value only in conveying a general idea of the external form and appearance; but they are of very great popular educational value since they serve to interest and attract public attention to one of the most difficult though fascinating branches of comparative anatomy."

Restorations somewhat similar to these have been undertaken ever since the rise of Palæontology, but it is no exaggeration to say that none have been so uniformly successful as this series. The best testimonial to its value is the fact of the demand by foreign museums for the enlarged photographs of these restorations. More or less complete series are now to be seen in London, Brussels, Berlin, Munich, Moscow, and Stockholm. It is proposed finally to issue a portfolio in which all these drawings will be reproduced with careful artistic finish.

Several of the drawings have received two or three months' detailed study, and one of the preliminary steps is the preparation of a carefully executed wax model. The draughtsmanship from these models has given the work of Mr. Knight its remarkably lifelike character, and has thus led to the more careful preparation and finish of the models themselves. The series now includes two of the Dinosaurs, the great

fin-backed saurian, *Naosaurus*, the American Moose-Elk, *Cervalces americanus*, the extinct Irish Elk, *Cervus megaceros*; the latter is here illustrated by reproductions of the skeleton, model, and restoration. The coloring of the models after the colored drawings of Mr. Knight has been done by Miss Helen Morton Cox.

H. F. O.

THE DEVELOPMENT OF THE AMERICAN MUSEUM OF NATURAL HISTORY.

(Continued.)

DEPARTMENT OF VERTEBRATE ZOOLOGY.



IN 1885, when Dr. J. A. Allen assumed charge of this department, the zoölogical collections of the Museum, both in the character of the specimens and in the number of the species represented, were among the first of the kind in the country. The collection of mammals numbered not far from 1000 mounted skins and about 300 mounted skeletons. The collection of birds contained not far from 10,000 mounted specimens, about 300 unmounted skins, and several hundred mounted skeletons.

There were, however, many deficiencies, and efforts had already been made to supply them. In 1880, \$6500 was allotted for this purpose, and from this time on the

collections of both birds and mammals were rapidly increased, including material for study as well as exhibition. Contracts were made with Prof. H. A. Ward of Rochester to supply all the known species of mammals and birds found in North America north of Mexico, not already represented in the collections. An agreement was also made with Professor Ward to secure for the Museum specimens of all the obtainable species of Monkeys lacking to complete the collection. During the following ten years a large part of these deficiencies was supplied.

Among the additions to the collection of mammals, received mostly as gifts from friends of the Museum, may be mentioned the unrivalled group of American Bison, specimens of the Rocky Mountain Sheep, the West Indian and other Seals, a Camel, the Wapiti, Moose, and other American Deer, the Indian elephant "Tip," and the Asiatic Elephant "Jumbo" (skeleton), the group of Orangs, and other mammals.

The establishment of the Department of Taxidermy in 1886 led to the construction of the beautiful and artistic bird groups, which now form so prominent a feature of the Museum exhibition, the late Mrs. Robert L. Stuart having made a generous gift of \$2500 for this purpose. It is difficult to praise too highly these charming bits of

nature, reproduced, in facsimile, from field, forest, lake, and seaside. The eye rests upon them with renewed pleasure at each inspection; they are poems and lessons combined; they arrest the attention of every observer, and stimulate, especially in the young, increased interest in nature studies. Later the preparation of mammal groups was entered upon, the first series including groups of the Muskrat, Woodchuck, Opossum, American Bison, and American Moose.

In the work of preparing the accessories for these groups, the Museum taxidermists were at first greatly assisted by Mrs. E. S. Morige, an Englishwoman, formerly employed at the South Kensington Museum; but the art was rapidly acquired by our assistants, under the supervision of Mr. Jenness Richardson, Chief Taxidermist, and later of his successor, Mr. John Rowley.

In 1899 the total number of groups on exhibition numbered 70, of which 22 were mammals and 48 birds. Their production had involved an expenditure of over \$45,000, and claim may be made that no other museum possesses such an extensive series of groups so admirable in design and execution.

The growth of this department has been greatly promoted by various expeditions sent out by the Museum during the last fifteen



MOUNTED GROUP OF WEASELS IN LOCAL COLLECTION.

years. These include an expedition to Montana by Messrs. Elliot and Richardson in 1887; to the Indian Territory in 1889 by Messrs. Richardson and Rowley; and to New Brunswick by Mr. Rowley in 1893-94. These expeditions, besides greatly increasing the collections in general, were undertaken more especially to secure material and accessories for the various mammal groups already mentioned.

In 1888 Mr. Frank M. Chapman became assistant curator in the Department of Mammals and Birds and has since made numerous expeditions for the Museum, visiting

Florida, Texas, Cuba, the Lesser Antilles and Trinidad, Yucatan, Mexico, and the Gulf of St. Lawrence. The expeditions here mentioned preceded by a short time the later numerous and important expeditions which have brought such a treasury of new material in vertebrate palæontology, and in American archæology and ethnology. Up to the year 1886 the collections of this department included only the specimens on exhibition, and the necessity of providing a study or research collection commensurate with a scientific museum of the grade of the American Museum became strikingly

evident. While the expeditions above mentioned greatly strengthened both the exhibition and study series, both have since received very great additions through a large number of important purchases and gifts, so that at the present time the research collections of this department compare favorably with similar collections in other scientific museums, embracing now about 60,000 birds and 20,000 mammals. A special feature of the study series is the large number of skulls and skeletons of both birds and mammals, but especially of the latter.

The collection of North American birds' nests and eggs is also one of the finest in the country, including several noted private collections, secured by gift or purchase.

As yet little has been done in the way of providing and preparing an exhibit of reptiles and fishes, owing to lack of exhibition space. Several important additions have, however, recently been made, most of which are as yet in storage for lack of exhibition facilities.

The exhibition collections are arranged with special reference to rendering them attractive and instructive to the public. In the case of both mammals and birds they form three separate collections: (1) a general collection, or the mammals of the world; (2) the North American mammals; and (3) the local col-

lection, representing the mammals found within fifty miles of New York City. The mammals constituting the local collection will consist of thirty groups, of which nineteen are now completed, representing all of the more common species of this region. In like manner the birds are separated into: (1) the general collection of birds of the world; (2) the birds of North America; and (3) the local collection, or birds found within the vicinity of New York. The groups of birds, with a few exceptions, may be regarded as a part of the local bird collection.

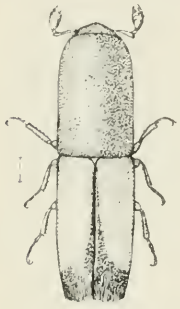
While the collection of mammals has attained such large proportions, it is deficient in many of the leading types found outside of North America. The North American collection is to be extended into the new hall of the East Wing, where will be represented, in the form of elaborate groups, most of the large mammals of the northern portion of the continent, including the Polar and other Bears, two species of Caribou, the Musk-Ox, the Barren Ground and Newfoundland Caribous, Wolverine, Porcupine, Wolves, and other types.

This will necessitate a large outlay in securing materials and in preparing the groups for exhibition. Material for some of the groups has been secured and work on them already begun. L. P. GRATACAP.

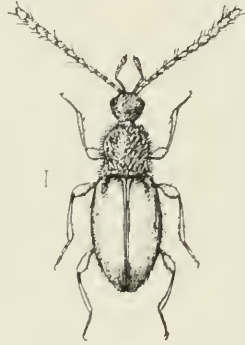
THE BEETLE COLLECTIONS:
NOTES.

GREAT many beetles now on exhibition are so small that notwithstanding the admirable way in which they are mounted (each one being placed on a little triangle of card-board set near the top of a long pin) they cannot be readily examined without a magnifying glass. In order to increase the educational value of these minute objects, the entomological department is preparing a number of enlarged drawings, as illustrated in our plate, which will be placed near the principal genera; this will also be helpful to visiting students and collectors, of whom there are a considerable number. Preparations are being made for the removal of the beetle collections into the new entomological gallery in the east wing, where they will occupy the railing cases that surround the central opening. The 1725 odd species, including about 5678 specimens now on exhibition, are being rapidly added to, and, by the time they are transferred to the new cases, will amount to at least 3000 species and 10,000 specimens. These will include all the ordinary and many rare representatives of the numerous families of the great order *Coleoptera*, from different parts of the world.

It is worth while mentioning in this connection some of the objects in the collection that appeal particularly to laymen. First there are the well-known Tiger Beetles (family *Cicindelidae*), among which one sees many forms with wing-cases in lustrous metallic greens and blues; the label gives notes on their structure and life-habits, saying that they are predaceous, active creatures, abounding "in sunny paths and sandy shores of rivers, ponds, and the ocean"; strong fliers, and slender-limbed, swift runners; with hideous, strong-jawed larvæ that lie in wait for weaker insects. The *Carabidae* or Ground Beetles come next; including as most noteworthy the aberrant *Mormolyce* from Java, with wing-cases greatly expanded and leaf-like. There is a fine display of water beetles (*Dytiscidae*, *Gyrinidae*, and *Hydrophilidae*), all of them ovoid in form, in conformation with their diving habits, and possessing curious oar-like legs. The label gives some good notes on their life-habits, referring also to the voracious larvæ or Water-Tigers, armed with scissor-like jaws that often snip off the tails of tadpoles and young fishes. Very curious are the Rove Beetles (*Staphylinidae*) with their long, uncovered bodies, the hard wing-cases (elytra) only reaching a short way down the back. The Skip-Jacks, Click Beetles, or Elaters (*Elateri-*



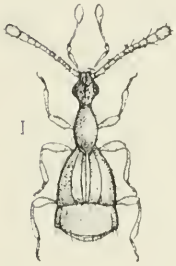
MONARTHNUM FASCIATUM.



EUCONNUS VENTRALIS.



COLYDIUM LINEOLA.



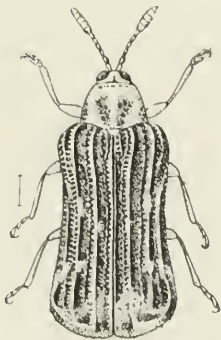
PSELAPHUS ERICHSONII.



MYODITES FASCIATUS.



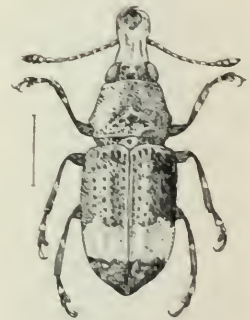
STILICUS DENTATUS.



ODONTOTA NERVOSA.



TRICHOPTERYX HALDEMANNI.



EURYMYCTER FASCIATUS.

(The vertical lines beside the figures indicate the actual lengths of the specimens.)

dæ) are present in crowded ranks. As everyone knows, they have a curious hinge on the under side of their bodies just behind the first pair of legs; when placed wrong side up they throw back the thorax with a sharp click, and the recoil sends them up in the air, to land safely "on all sixes." Here also are the Cocujo, or Fireflies, of Tropical America. Among the great host of the Saw Horned Beetles (*Buprestidæ*) the eye alights quickly on the superb bronze-tinted *Chrysobothris* of China and Japan, and the prismatic violets and greens of the Brazilian *Euchroma*.

The visitor will note the aptness of the name Stag Horn Beetles (*Lucanidæ*), particularly in the typical antlered genus *Lucanus cervus* of Linnaeus. The *Scarabæidæ* are present in closely packed phalanxes and one can make out very clearly the "clubbed lamellate antennæ, the terminal joints being expanded into broad, flat leaves, which at the will of the insect can be closely shut into a compact club or loosely expanded fan-like and laid under the projecting clypeus. . . ." One also notes the "robust, thick, often square body, short fossorial legs with large hooked claws for seizing leaves and stems." This family includes the mammoths among insects, especially the ponderous drab Elephant Beetles and the *Dynastes hercules* of Brazil.

But one might go on indefinitely in this way, singling out the striking or curious forms; one cannot forbear, however, a reference to some of the larger Weevil Beetles, with their grotesque elbow-jointed antennæ and the extraordinary elongation of the head into a "snout" like that of the Great Ant-eater, the large eyes adding to the whole a most grotesque effect. For those interested in the thousands of beetles to be found within fifty miles of this city, there is the extensive local collection in the main gallery.

W. K. G.

VOLUME XIII OF THE MUSEUM BULLETIN.



THE current volume of the Bulletin,* which appeared at the end of December, contains twenty-two articles by the scientific staff of the Museum: there are nineteen plates, seventy-five text figures, and 320 pages of text. We give below a brief summary of the different articles:

Article I.—The Mountain Caribou of Northern British Columbia. By J. A. Allen. (With 18 text figures.)

The fine series of six specimens upon which this paper is based are among the results of the Museum

* 'Bulletin of the American Museum of Natural History,' Vol. XIII, 1900, New York.

Expedition to Arctic America, under Mr. A. J. Stone, which was supported by the late Mr. James M. Constable, and for the continuation of which efforts are now being made.*

From various evidence Dr. Allen had inferred that a third undescribed variety of the Caribou must exist, and Mr. Stone was not disappointed in his expectation of discovering it. The specimens were shot in September, 1897, but owing chiefly to difficulties of transportation they did not reach the Museum until November, 1899. Meanwhile (August, 1899) Mr. Ernest Seton-Thompson had named the species *Rangifer montanus* from an undescribed mounted specimen in the Museum at Ottawa. Mr. Seton-Thompson's description is now supplemented with further descriptive notes and comparative tables of measurements, illustrated by a fine photographic series of the skulls of different species of *Rangifer*; to this are added Mr. Stone's valuable field notes on the habits of the animal. Dr. Allen concludes that "when series of specimens of Caribou from different parts of Alaska . . . and from different parts of the Northwest Territory are brought together, it will be found

that the Caribous of the region north of the United States are differentiated into quite a number of well-marked local forms as yet undescribed."

Art. II.—Observations on and Descriptions of Arctic Fossils. By R. P. Whitfield. (Plates I and II.)

The specimens were collected in the arctic region by the Peary Arctic Expedition of 1898; they include several new species of corals.

Art. III.—Description of a new Crinoid from Indiana. By R. P. Whitfield. (Plate IV.)

The description of a new "stone-lily" is illustrated by a beautiful heliotype plate.

Art. IV.—Note on the principal type specimen of *Mosasaurus maximus* Cope, with illustrations. By R. P. Whitfield. (Plates IV and V.)

Correction and amplification of Cope's description of this great fossil marine lizard from the Cretaceous of New Jersey.

Art. V.—Some Results of a Natural History Journey to Northern British Columbia, Alaska, and the Northwest Territory, in the Interest of the American Museum of Natural History. By A. J. Stone. (With 5 text figures.)

An itinerary is given of the adventurous travels of the explorer in a little-known region; in the "Geographical Notes" accepted charts and maps are corrected in several points,

*See articles in Vol. I, No. 2, p. 31 (May, 1900), and Vol. I, No. 4, p. 51 (November, 1900), of this journal.

and newly discovered rivers flowing into the Arctic Ocean are named in honor of the late Mr. Constable, Mr. Jesup, Dr. Allen, and others.* The 'Notes on Mammals' contain valuable information on the structure and life-habits of the principal mammals, including such fast-disappearing forms as the Wood Bison, Musk Ox, Mountain Sheep; especially interesting is the account of the endurance and agility of a wounded Mountain Sheep.

Art. VI.—Note on the Wood Bison. By J. A. Allen. Notes on a recently killed specimen of this nearly extinct form, the northern variety of the American Bison, and (principally) an account of its decadence.

Art. VII.—Symbolism of the Arapaho Indians. By Alfred L. Kroeber. (With 138 text figures.)

The author's material was gathered for the Museum in connection with the series of investigations on the North American Indians. He shows, among other things, that every decorative design of the Arapaho is also pictorial, and the meanings of the symbols are explained.

Art. VIII.—List of Bats collected by Mr. H. H. Smith in the Santa Marta Region of Colombia, with descriptions of new species. By J. A. Allen.

* See this journal, Vol. I, No. 2 (May, 1900), p. 32.

This is the second paper of several on the collection of mammals made for the Museum by Mr. Smith in this little-worked region. The collections were presented to the Museum by Mr. Morris K. Jesup. Four new species are described.

Art. IX.—Note on an interesting specimen of Calcite from Joplin, Missouri. By L. P. Gratacap. (Plate VI, and 4 text figures.) An apparent crystallographic novelty is recorded in the relation of the two rhombohedrons forming the crystals.

Art. X.—A Shell Gorget from the Huasteca, Mexico. By Marshall H. Saville. (With 3 text figures.)

An archæological specimen from the state of Vera Cruz, Mexico, in the region of the Huastecans, a little-known branch of the Yucatan Maya stock. The gorget is a thin concavo-convex plate on which is carved the figure of a deity.

The author concludes: " . . . there seems to have been a high state of culture among the Huastecans, as seen in this beautiful carving, and a near relationship with the Mayan mythology, which is indicated by the close resemblances noted between the figure and those of the codices."

Art. XI.—An Onyx Jar from Mexico, in Process of Manufacture. By M. H. Saville. (Plate VIII.)

The specimen was found during

the Museum explorations of mounds and tombs at Xoxo in the state of Oaxaca. Being an unfinished piece of work it illustrates clearly the way in which tubular drills of cane, bone, or native metal were used to hollow out stone objects.

Art. XII.—A Cranial Variation in *Macropus bennetti*. By B. Arthur Bensley. (With 1 text figure.) The presence of a supernumerary bone is recorded in the wall of each orbit of the skull of a Bennett's Wallaby (a kind of Kangaroo). Inasmuch as a pair of similarly placed bones (prefontals) is characteristic of lower vertebrates their presence in this specimen may indicate a reversion to an ancestral character.

W. K. G.

(To be continued.)

LECTURES, ILLUSTRATED BY STEREOPTICON VIEWS, TO BE GIVEN AT THE MUSEUM DURING FEBRUARY.

DEPARTMENT OF PUBLIC INSTRUCTION.

Washington's Birthday, February 22, 3.30 P.M. (Doors open at 3 o'clock.) Prof. Albert S. Bickmore—"Paris.—The Banks of the Seine."

(No tickets are required.)

BOARD OF EDUCATION.

Tuesday evenings at eight o'clock. (Doors closed during lectures.)

February 5th—"The Navahos of Arizona and New Mexico." Mr. G. Wharton James.

February 12th—"The Isthmian Canal." Prof. Emory R. Johnson.

February 19th—"The Antarctic: The Cruise of the 'Belgica.'" Mr. H. L. Bridgman.

February 26th—"Brazil and Guiana." Mrs. Florence J. Stoddard.

(No tickets are required.)

LINNEAN SOCIETY OF NEW YORK CITY.

TWO LECTURES ON NATURALISTS' TRAVELS, THURSDAY EVENINGS AT EIGHT O'CLOCK.

February 21st—"The Sea Gardens of Bermuda." Prof. C. L. Bristol, New York University.

February 28th—"A Naturalist on the Coast of Alaska." Dr. C. Hart Merriam, Chief of the Biological Survey, U. S. Department of Agriculture.

(Admission by ticket.)

COLUMBIA UNIVERSITY.

FOUR LECTURES ON TREES, PARKS, AND GARDENS, SATURDAY EVENINGS AT EIGHT O'CLOCK.

February 2—"Trees and Plants in the Gardens of the Renaissance." Prof. A. D. F. Hamlin.

February 9—"The Life of a Tree and the Life of a Forest." Mr. C. P. Warren.

February 16—"How to Distinguish the Trees." Mr. C. P. Warren.

February 23—"Trees and Shrubs for Shade and Ornament in Landscape Gardening." Mr. Samuel Parsons, Jr.

(Tickets of admission are required. They can be procured, without charge, by application to the Secretary of Columbia University.)

American Museum Journal

Volume I

FEBRUARY-MARCH, 1901

Numbers 7-8

NOTES AND NEWS.

THE ANNUAL MEETING of the Trustees of the American Museum of Natural History was held at the residence of the President on the evening of February 11, 1901; the following officers and committees were elected for the coming year: *President*, Morris K. Jesup; *First Vice-President*, William E. Dodge; *Second Vice-President*, Henry F. Osborn; *Treasurer*, Charles Lanier; *Assistant to the President*, Hermon C. Bumpus; *Secretary and Assistant Treasurer*, John H. Winsor; *Executive Committee*, Morris K. Jesup, Charles Lanier, William E. Dodge, J. Hampden Robb, Anson W. Hard, H. O. Havemeyer, Frederick E. Hyde, Percy R. Pyne; *Auditing Committee*, Anson W. Hard, Gustav E. Kissel, George G. Haven, The President *ex-officio*; *Finance Committee*, J. Pierpont Morgan, Charles Lanier, D. O. Mills, D. Willis James, The President *ex-officio*; *Nominating Committee*, D. O. Mills, William E. Dodge, The President *ex-officio*.

It was unanimously voted that the report of Mr. Abram S. Hewitt on the Bement Collection of Minerals and the Tiffany Collection of Gems and Pearls be engrossed, and that a

copy be forwarded to the donor, Mr. J. Pierpont Morgan.

The work of installing these great collections in the exhibition halls is now going on, but will not be completed before next fall. As soon as the collections are ready for inspection, Museum members and the public will be notified. Illustrated descriptions of these collections will then be published in this journal.

The Trustees adopted resolutions of thanks to Mr. Andrew E. Douglass, who has presented to the Museum his valuable archaeological collection.

The Trustees also voted that the name of Andrew E. Douglass should be entered on the roll of Patrons of the Museum.

To Messrs. B. T. Babbitt Hyde and Frederick E. Hyde, Jr., the Trustees extended their hearty thanks for the gift of several large collections illustrating the archaeology and ethnology of the southwestern portions of the United States, and for the great assistance which they have given to the Department of Anthropology by their patronage in defraying the expenses of the archaeological and ethnological expeditions which for the past five years have annually

added to scientific knowledge, and have provided the Museum with valuable material for exhibit and further research.

In resolutions addressed to Mr. Fordham Morris the Trustees accepted with grateful thanks the portrait of Audubon, the Naturalist, painted by his sons John and Victor Audubon, and directed that it be permanently placed in the reading room of the library.

[Inasmuch as a number of mementos of the great naturalist are already exhibited in the Museum additional gifts illustrative of his life and work would now be of especial educational and historic value. Very desirable is a copy of the "elephant folio" edition of "The Birds of America" (1836).]

Resolutions of thanks were also addressed to the Very Reverend Eugene A. Hoffman, D.D., LL.D., etc., who, as recorded in a previous number of this journal,* presented a representative collection of the butterflies of North and South America and Asia, aggregating five thousand specimens.

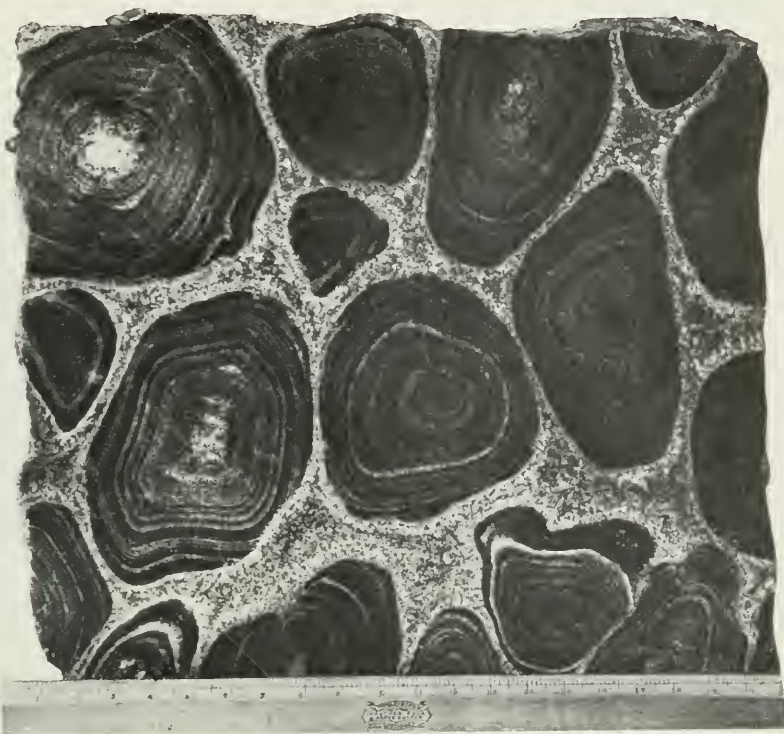
ORBICULAR GRANITE FROM SWEDEN AND FINLAND.—In February the Department of Geology obtained by purchase a handsome slab four feet long by one foot wide of

orbicular granite from Kortfors, district of Örebro, Sweden. This granite, which is sometimes called a "pudding granite," looks somewhat like a conglomerate, but the round, black masses in it are not water-worn pebbles like those of a conglomerate; they are segregations of black oxide of iron, with some black mica, and brown hornblende and a small amount of feldspar, which formed in and from the general mass of the rock while that was still in a molten condition. The different layers or zones of these balls differ somewhat from one another in chemical composition. The slab has been placed temporarily on the top shelf of case S at the north end of the Geological Hall, where it may be readily compared with the two handsome blocks of somewhat similar rock from Finland which are now in case A on the opposite side of the same hall.

The orbicular granite from Finland, a photograph of which illustrates this note, differs from that from Sweden in several points, the most immediately striking of which is that of the size of the balls. The globular masses in the Finland granite are very much larger than those of the Swedish rock, several of them having a maximum diameter of eight and one-half inches. In the Finnish rock the black material is nearly all black mica, while the light-colored

* Vol. I, No. 1, April, 1900, pp. 15, 16.

portion contains both quartz and feldspar. A second glance at the photograph shows us that these masses are not spherical in form, and it has been proven that they are ellipsoids of three dimensions. Another inspection calls our attention to the fact that the outer rings of all the balls in this block are not continuous. This was



BLOCK OF ORBICULAR GRANITE FROM KANGASNIEMI, FINLAND.

caused by some change in the molten rock which raised its temperature again or in some other way caused the outer portions of these already solidified masses to be redissolved or melted off by the other part of the rock-mass. Another large block of Finnish granite, which stands near the one which was photographed, differs from it in having the balls contain a very much larger proportion of feldspar and quartz, the black mica being mostly confined to the outer rings. In both these Finnish specimens and in that from Sweden the minerals composing the concretions are ar-

ranged with their longer crystal axes radiating from the centre like the spokes of a wheel, although the mica flakes are sometimes tangential, while the minerals composing the rest of the rock have solidified without arranging themselves in any definite manner with reference to one another.

Although orbicular granites and diorites are known from several parts of the world, they are sufficiently rare to be of great interest to all students of rocks, and the three specimens to which this note refers form a noteworthy addition to the collection in the Geological Hall.

E. O. H.

THE AMERICAN MUSEUM JOURNAL

LECTURES, ILLUSTRATED BY
STEREOPTICON VIEWS, TO BE
GIVEN AT THE MUSEUM DURING APRIL.

BOARD OF EDUCATION.

(Lectures begin promptly at 8 P.M.)

Tuesday, April 2d, Mr. Walter P. Terry—"The Pan-American Exposition."

Tuesday, April 9th, Mr. Peter MacQueen—"The Philippines."

Tuesday, April 16th, Dr. John C. Bowker—"Spain."

Tuesday, April 23d, Mr. Peter MacQueen—"Campaigning in South Africa."

Tuesday, April 30th, Dr. James Rose-dale—"Life in Palestine."

Illustrated by songs and costumes.

RECENT ACCESSIONS TO THE DEPARTMENT OF MAMMALS AND BIRDS.—Through an expedition to Kenai Peninsula by Mr. Andrew J. Stone in the interests of The American Museum of Natural History, the Museum has received some fine specimens of the Big Alaskan Moose, recently described as *Alces gigas*. This animal is the largest known representative of the Deer tribe, and differs from the Moose of eastern Canada and Maine in its larger size and darker colors, but especially in the great development of its antlers, which are much larger than those of the eastern Moose. Mr. Stone also obtained specimens of two species of Bear and a head of a fine Caribou.

Other recent accessions of note are a collection of mammals from Peru, consisting of about one hundred and fifty specimens and representing some twenty-five species, of which quite a number proved new to science and others had been only recently described from specimens received at the British Museum. With this collection was also received a small collection of birds, which contained many species new to the Museum collection and several new to science.

This and other small collections received from different parts of South America show that even the birds and mammals of this region are still very imperfectly known. It would be greatly to the advantage of the Museum if it could send a trained collector to the less known parts of South America. Not only is the Museum lacking in material from that continent, for exhibition and study, but recent experience shows there is a rich harvest in store for any enterprising institution that will take advantage of it.

EIGHT HUNDRED SPECIMENS of South American and Indian Butterflies, donated last year by the Very Rev. E. A. Hoffman, have been mounted.

Dean Hoffman has also authorized the curator of the Department



ANTLERS OF *ALCES GIGAS*, 74 INCHES SPREAD.

of Entomology to purchase any specimens of North American Butterflies not already represented in the collection given by him to the Museum.

Dr. F. C. Nicholas has presented two specimens of the rare *Papilio homerus* from Jamaica.

IN Vol. I, No. 3, p. 36 of this journal it was stated that "the drawings and preparation of the plans for the new building" were "finally assigned to Calvert Vaux . . ."; also "that the design offered by Mr. Vaux was accepted." This was

meant to refer only to the plan and not to the entire structure. We quote from the remarks of President Jesup made at the reception tendered by the Trustees, in commemoration of the opening of the new auditorium, Wednesday, October 30, 1900:

" . . . it would not be right for me to close my remarks at this time without mentioning the architects who have planned, designed and constructed this hall. I refer to Messrs. Cady, Berg and See. These gentlemen have had the construction of these buildings from the very beginning: and by the magnificence, utility and beauty of the buildings you

are yourselves the best judges of the way in which they have performed their duties."

THE PAPER by Dr. Hrdlička in Volume XII of the Museum 'Bulletin' entitled "Description of an ancient anomalous skeleton from the Valley of Mexico, with special reference to supernumerary and bicapital ribs in man," has been translated into Spanish by Professor A. L. Herrera of the National Museum of Mexico, and published in the Annals of that important institution. The material upon which the paper was based is one of the many valuable finds of the Hyde Southwestern Expeditions.

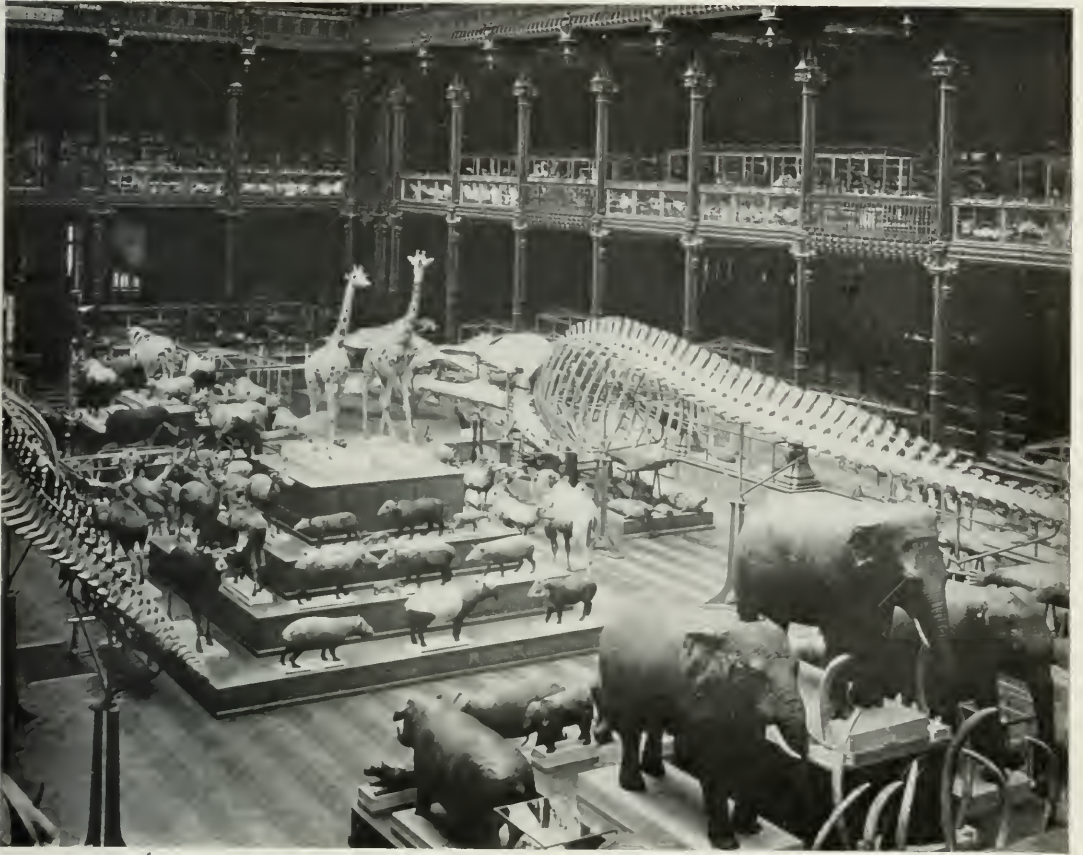
MUSEUM ILLUSTRATED LECTURES ON PARIS. — Professor Bickmore's lectures on the Paris Exposition are being splendidly supplemented by his new series on Paris. The Museum system of visual instruction, which is now highly organized and efficient, has been developed in order to bring into contact with the greatness and beauty of the world both the teachers and pupils of the public schools of New York State. In this latest series of lectures there are thrown on the great twenty five-foot screens over three hundred views of stereoscopic clearness and depth, illustrative of the most glorious city in all the world.

Compared with these views ordi-

nary photographic reproductions can only faintly suggest the charm of the reality. As one follows the well-planned lecture one begins to understand the mystery and nobility of the mediæval Notre Dame, as described by Victor Hugo, one appreciates better the courtyard at Fontainebleau where the Corsican took sad leave of his veterans of the Old Guard,—or the gallery of battles at Versailles, which shows him as the storm-king, in the vortex of Rivoli, Austerlitz, Jena, Friedland. The representative view here reproduced shows the interior of the Museum of Zoölogy in the Jardin des Plantes.

THE ANTHROPOLOGICAL AND ZOÖLOGICAL material secured incidentally by Mr. Barnum Brown in the course of his search for fossil mammals and birds in Patagonia has been transferred by the Department of Vertebrate Palæontology, which conducted the expedition, to the Departments of Anthropology and Invertebrate Zoölogy. The anthropological material illustrates, to some extent, the culture and physical characteristics of several rapidly diminishing tribes of Patagonia and Terra del Fuego, especially the Tehueleches, who are noted for their height.

THE DEPARTMENT OF ORNITHOLOGY has recently placed on exhibition in the local Bird Hall a unique



INTERIOR OF THE MUSEUM OF ZOÖLOGY IN THE JARDIN DES PLANTES.

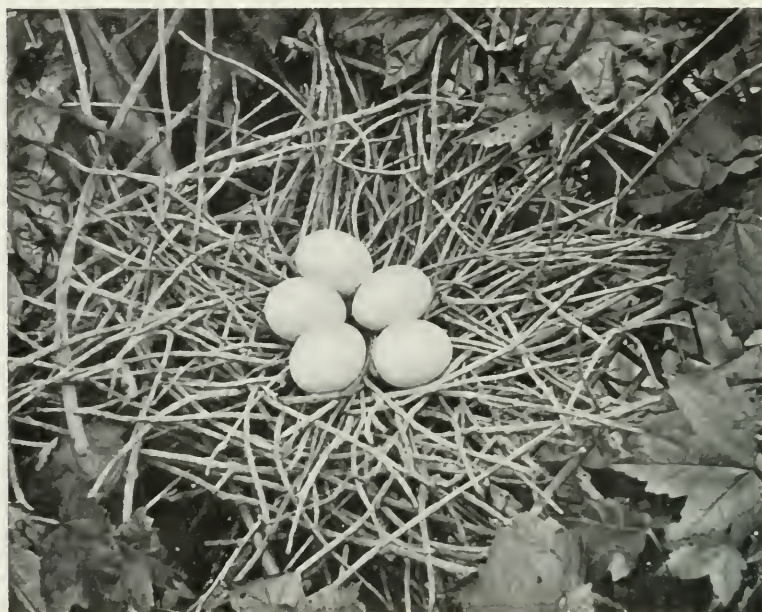
A representative view from the lectures on Paris.

collection of photographs from nature, illustrating the nests, with eggs or young, of most of the species of birds which breed in the region about New York City.

The negatives from which the photographs were taken were, with some exceptions, loaned for this purpose by the Department of Public Instruction; this Department having, during the past four years, spared no efforts to secure the most

desirable illustrative material of this kind.

These photographs demonstrate very clearly the value of the camera in the study of birds in nature. Not only is it possible to photograph the nest with its surroundings, but by the exercise of much patience and ingenuity the adult bird may be photographed while on the nest. Pictures may also be made of the young birds,



From nature by E. G. Tabor.

From negative in Dept. of Public Instruction.

NEST AND EGGS OF GREEN HERON.

showing their condition at various ages and development from day to day.

Bird and nest photography is as yet in its infancy, but the camera has already proved of so great assistance to the ornithologist that the next few years will doubtless witness a great advance in apparatus as well as in methods. F. M. C.

THE FIFTH ANNUAL MEETING OF THE AUDUBON SOCIETY of New York State was held in the large lecture hall of the Museum on March 8, 1901. The President, Morris K. Jesup, presided.

The exercises included the annual election,—Mr. Jesup being re-

elected to the office of President and Miss E. H. Lockwood to that of Secretary-Treasurer,—and addresses by Hon. Charles R. Skinner, Dr. T. S. Palmer, William Dutcher, and Frank M. Chapman.

Mr. Skinner spoke of the 'Educational Value of Bird Study,' which,

with the study of the more common forms of animal and plant life about us, he characterized as of more importance than the study, in a foreign tongue, of events which transpired 2000 years ago. He emphasized especially the elevating, purifying influence of contact with nature, and heartily endorsed all educational work which would tend to give us a practical knowledge of creatures with which we might daily come in contact.

Dr. Palmer, who is in charge of the enforcement of the Lacey Act, the federal law regulating the importation, transportation, and sale of animals, spoke of the necessity for laws designed to protect non-game

as well as game birds, and explained in detail the relation of the federal to state laws; the most important provision of the federal law making an animal subject to the laws of whatever State or Territory it chanced to be in.

Mr. Chapman reviewed the work of the Audubon Societies and commented on the remarkable results they had accomplished with very limited means.

Mr. Dutcher exhibited a series of slides, made by himself, on the Maine coast during July, 1900, and showing certain of the larger colonies of Herring Gulls which had been protected from the demands of feather hunters by wardens whose services Mr. Dutcher had secured by means of the Thayer Fund.

AMONG THE ARCHEOLOGICAL SPECIMENS from a mound in St. Clare County, Ill., presented by Mr. Bertrand Bell, a life member of the Museum, is the pottery vessel here figured; which is of a well-known type, representing a beaver.

The beaver is indicated by the head with prominent incisor teeth, gnawing a rounded stick, the ends of which are grasped by the paws: the hind legs are on the sides of the vessel near the rim, the characteristic flat tail of the beaver forming a projection opposite the head. The collection also contains a large number of fine flint implements, and five ear ornaments made of stone, covered with copper.

MR. ERNEST VOLK is now at the Museum arranging for exhibition the archæological material which he has found in the glacial deposits and in several Indian sites near Trenton, N. J. One of the many bits of pottery obtained from the Indian site on the lowlands near Trenton is here



From nature by E. G. Tabor.

From negative in Dept. of Public Instruction.

NEST AND YOUNG OF GREEN HERON.

figured. It is evident that a net was fitted over this vessel while the clay was still moist. Such specimens enable the archaeologist to study the prehistoric fabrics of the eastern United States for comparison with those of living tribes. Thus, on this insignificant fragment of a broken pot, we have impressed the size of the mesh and of the twist of the cord and the sort of knot that was used. These features are well brought out in the impression made by the specimen in soft clay, as illustrated in the left-hand figure. As pointed out in a former note in this journal,* such fragmentary specimens are often of more evidential value than entire and beautiful objects.

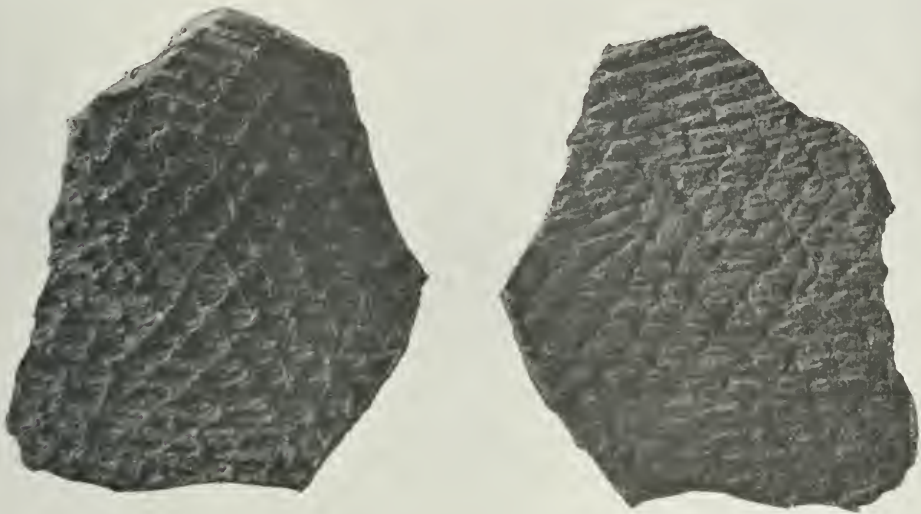
MR. M. H. SAVILLE, in charge of the Museum explorations at Mitla in the State of Oaxaca, Mexico, writes to Professor Putnam under

* Vol. I, No. 3, p. 46.

date of February 3, 1901, as follows :

"I have telegraphed to Mr. Jesup informing him of the discovery which I have just made of basement galleries under one of the largest edifices at Mitla. This is perhaps the most important discovery I have yet made in Mexico. I have finished excavating the courtyard of the quadrangle of the subterranean galleries (see Stevens' work) and the work has been very successful from the scientific standpoint. Until now, we had no knowledge of the substructures of Mitla (see Bandelier's work), and on account of the debris which filled the courtyard, the buildings have presented a flat dwarfed appearance placed on rude mounds. Now that the court of this group is cleared, the buildings are at last seen placed on substructures of the same height as the edifices, with platforms and sloping faced walls of stone beautifully laid and reached by graceful flights of stone steps. This court is absolutely square,—117 feet N. and S., and the same E. and W. The bases are in correct proportion to the size of the 'palaces,' and as cleared the buildings appear elevated to their proper





FRAGMENT OF POTTERY FROM AN ANCIENT INDIAN SITE NEAR TRENTON.

height above the cement floor of the court. In several places where the lower steps have been injured, they had been repaired with cement. The base was covered with a thin coating of cement painted red, and the courtyard floor was also painted red, as well as the buildings themselves. The entrance to the cruciform galleries is in the floor of the court at the point which I have marked in the photograph. I shall have a full series of views, later, of the court and different buildings, as well as flash-light views of the interior of the 'Tomb.' It is about 45 feet long and 45 feet from the end of one arm to the end of the other. The door faces the west, sealed by a large stone which had been thrown there by the Spaniards; but no vandalism had been committed, so that the chambers are in a perfect state of preservation. The grecque panels show one new de-

sign. The cross proper is nearly 9 feet in height. President Diaz has expressed his pleasure at the discovery in a telegram to Batres. . . . "

VOLUME XIII OF THE MUSEUM BULLETIN.

(Continued.)



ART. XVII.*—Cruciform Structures near Mitla. By M. H. Saville. (Plates VIII–XVII and 8 text figures.)

Although considerable exploration had been accomplished at the

* Arts. XIII–XVI are here placed after Art. XVII.

ruined city of Mitla, in the State of Oaxaca, Mexico, very little had been done toward excavating the structures underground, until the American Museum began the work which it has been carrying on under the terms of an agreement with the Republic of Mexico. This paper deals with only a single feature of the Mitla remains, namely the cruciform structures or tombs of the ancient priests, which are by far the most elaborate and important burial chambers found in the New World, both in size and in beauty of stone

work. Four of these are described and figured. The curious mosaic patterns on some of the walls recall similar mosaic work on certain Mayan ruins in Yucatan.

Art. XIII.—A New Species of Pleistocene Horse from the Staked Plains of Texas. By J. W. Gidley. (With 5 text figures.)

The type of this species (*Equus scotti*) was found in the Pleistocene Equus Beds of Texas. This was one of the last of the great line of native horses in America, the evolution of which, from the small four-



Bulletin A. M. N. H., Vol. XIII, Pl. XI.

A CRUCIFORM TOMB NEAR MITLA.



PALACE OF MITLA MENTIONED IN MR. SAVILLE'S LETTER SHOWING PRELIMINARY EXCAVATION IN THE PLAZA.

toed Hyracothere onward, is so well illustrated in the Museum collections. This species was "an animal with a head about the size of a large draught-horse but with the height of body and weight of limbs of an ordinary western pony, with a length of body very similar to that of the zebra or quagga." It is here compared by description and illustration with the Domestic Horse (*Equus caballus*).

Art. XIV.—List of Birds collected in the District of Santa Marta, Colombia, by Mr. Herbert H. Smith. By J. A. Allen. As indicated previously (Art. VIII.), the region is peculiarly attractive as being almost

wholly unworked by zoölogists. The list includes 388 species, several being new to science. The collection was presented by Mr. Jesup.

Art. XV.—Note on the Generic Names, *Didelphis* and *Philander*. By J. A. Allen. A critical analysis and untangling of the confusion in the use of names for the different varieties of the American Opossums.

Art. XVI.—Description of New American Marsupials. By J. A. Allen. Nine new species and subspecies of opossums are recorded, based on specimens from South and Central America and on material already in the Museum.

Art. XVIII.—On Mammals collected in Southeastern Peru by Mr. H. H. Keays, with Descriptions of New Species. By J. A. Allen.

Based on two small collections of mammals made near Lake Titicaca, at an altitude of about 6000 feet. The collections number only 18 species but contain several not previously described and others of special interest; among these are the web-footed Opossum *Chironectes* and a new species of the very rare rodent genus *Dactylomys*.

Art. XIX.—Phylogeny of the Rhinoceroses of Europe. (Rhinoceros Contribution No. 5.) By Henry Fairfield Osborn. (With 16 text figures.)

This paper deals with the numerous species of fossil Rhinoceroses of Europe; besides setting forth a hypothesis of descent it is a preliminary statement of very interesting results in the classification and comparative anatomy of the different phyla or genealogical lines of this extensive and confusing group; which results were obtained by visits in 1898 and 1900 to all the principal museums of Europe. The study was undertaken preparatory to the writing of Part II of the author's memoir on the extinct Rhinoceroses of America on account of the very close and puzzling relations between the types of the New and Old Worlds. The author makes con-

stant use of his long investigations on the time-relations between the many geological horizons of the Tertiary or Age of Mammals in Europe and America; some new conceptions are worked out in the classification; upwards of 25 species are described and assigned to their proper chronological and systematic position, and several new species are established; the fundamental idea being that the different known rhinoceros groups have not been evolved one from the other but that they preserve their separate identity as far back as the known geological record runs.

Art. XX.—*Oryzomys* and *Patriofelis* restudied as Terrestrial Creodonts. By Henry Fairfield Osborn. (Plates XVIII and XIX, and 4 text figures.)

Two very interesting creodonts or primitive carnivores from the Lower and Middle Eocene period had been described by Dr. Wortman in previous volumes of the Bulletin. The slighter form, *Oryzomys*, from the Lower Eocene, if not the direct ancestor, at least stood very close to the line of the stouter *Patriofelis* from the Middle Eocene. The skeletons of both these forms, having been restudied with the results outlined below, are now remounted and placed on exhibition; they are here figured in the plates. "After a searching comparison he [Dr.

Wortman] concluded that *Patriofelis* was probably aquatic in habit and possibly ancestral to the modern Pinnipedia [aquatic Carnivora, *i. e.*, Sea-bears, Walruses, Seals]. A careful restudy of the entire evidence led the writer to the opposite conclusion that these were powerful *terrestrial* or *partly arboreal animals, analogous to the cats in habits of feeding.* In working out this conclusion a new method of determining the angulation of the foot bones is applied, much new light is thrown on the remarkable dentition, and a further analysis of the anatomical characters shows that the resemblances of these forms with the Pinnipedia do not indicate any direct relationship, but are a common inheritance from a much older parent stock.

Art. XXI.—Bilateral Division of the Parietal Bone in a Chimpanzee; with a Special Reference to the Oblique Sutures in the Parietal. By Aleš Hrdlička. (With six text figures.)

The Chimpanzee "Chico," formerly exhibited in the Central Park Menagerie, the mounted skin of which can now be seen at this Museum, was found to possess a skull with unique parietal sutures.

"The divisions of the parietal bones which the specimen presents are not only the first complete divisions of the parietal observed in a chimpanzee, but

are also unique in character, no divisions of the same nature having been observed before, either in man, in apes, or in monkeys."

The three possible ways in which such a suture can have arisen are discussed with reference to similar cranial variations in the higher apes, in human embryos and in adults.

Art. XXII.—A Study of the Genus *Sturnella*. By Frank M. Chapman. (With six text figures.)

The Meadowlark ranges from northern South America to the Plains of Saskatchewan and includes two types or forms, one of which is dark, the other light in color. The former, *Sturnella magna*, has a very wide distribution and varies considerably in color and size, giving rise to local races, which are here enumerated with their ranges. The second form, *Sturnella magna neglecta*, is subject to comparatively little variation; it is smaller and lighter in color than *magna*. The relationships of the two forms to each other have long constituted one of the leading problems in the classification of North American Birds, and its solution is the object of the present paper; the greatly increased collections from previously unrepresented areas now giving the investigator opportunities which have before been lacking. After settling the characteristics of the different races of these

two forms, the author approaches the subject of their relationships by an examination of specimens from the area where their ranges come together. A small part of the conclusions suggested by the present material is thus expressed :

"Assuming that the Meadowlarks originated in the humid tropics, we have as the ancestral form a dark bird, which, spreading northward along the coast and over the Mexican table-lands, retained its dark colors in humid regions. The *neglecta* type originated, therefore, in arid portions of the table-lands of Mexico, where its range is bounded on the south by the humid valley of Mexico. . . ."

W. K. G.

THE DEVELOPMENT OF THE AMERICAN MUSEUM OF NATURAL HISTORY.

(Continued.)



HE mineral collection, which assumed definite form with the purchase of the Bailey Collection in 1874, was first stored at the Arsenal, and finally transferred to the Geological Hall of the present building in 1882. Its attractive features: the beauty of crystalline outlines, the variety of coloring, and the numerous combinations of species, besides some partial economic and

industrial aspects involved in it,—made it a cynosure of visitors in the midst of its less brilliant surroundings. Through many gifts and constant purchases, it has expanded much beyond its first limits.

Three significant incidents in its history, under the presidency of Mr. Jesup, have been the munificent donation by Mr. J. Pierpont Morgan of the Tiffany Gem Collection, the donation by the Copper Queen Consolidated Mining Co. of Arizona, of the incomparable suite of velvet Malachites and Azurites and copper ores, and the increase and general improvement through the purchase of the Spang Collection in 1891. All these events in the history of the collection and its growth formed a natural preparation for the sudden and most remarkable transformation in its character through the acquisition of the Bement Collection, another of Mr. Morgan's great gifts. This last accession is so extraordinary that little more than the record, in this history, of its present possession by the Museum need be made. In addition to this accession the Museum received in 1900 the second great gem collection prepared by Tiffany & Co. This also was donated by Mr. Morgan. A careful survey of the character and contents of both these new collections will be offered later under a separate title.



THE GEOLOGICAL HALL AS IT APPEARED IN 1895.

The conchological section of the Department of Geology was initially represented by the Jay (Wolfe Memorial) collection of shells. This was more than doubled by the purchase in 1893 of the famous Haines cabinet, and by the donation of the Crooke collection of land shells. The addition of this enormous mass of new material has reopened the labors of assimilation and cataloguing, by no means as yet completed.

It seemed fitting that the destination of the magnificent cabinet of shells of Mr. Haines should be in the Museum which his zeal and inde-

fatigable attention has so greatly assisted. This addition has certainly raised the quality and scope of the shell cabinet almost beyond computation. To-day the specimens number over 100,000, embracing more than 15,000 species.

D. Jackson Steward in 1890 presented his private cabinet of shells. They had been selected with reference to their beauty; Mr. Steward's love of color and his very just appreciation of perfection in a specimen led him to prize æsthetic rather than scientific features. The collection is kept separate from the

main collection, and it is hoped to develop from it an illustration of the Lamarckian system of nomenclature.

The collection of univalves, marine and land, to which there have lately been added the lamelli-branches, as now installed on the fifth floor of the central south building presents a very attractive and almost brilliant display of color and form. The system adopted, while not an elastic one, has the merit, in popular appreciation, of beauty and distinction.

The section of Invertebrate Zoology, in the Department of Geology, except in regard to shells, developed slowly through the first years of the Museum's life, and is yet most imperfectly formed. Naturally gifts of corals, crabs, lobsters, sponges, and sea-urchins would very quickly find their way to a museum of natural history, and before the Museum collection left the Arsenal the Medary corals from Florida were purchased. But the foundation of the present exhibit was laid in a collection of corals presented by Mr. Percy R. Pyne, a beautiful gift of one hundred and twenty-five specimens, from Florida and the Pacific Ocean. When upon the death of Dr. Holder this collection and the miscellaneous material associated with it came under the control of Professor Whitfield, the

latter secured some room for it, and a sort of provisional installation. Professor Whitfield added extensively to it by purchase and collection during his trips in the Bahamas and to the Bermudas, and to his zeal the superb examples of *Madrepora palmata* and *Orbicella stellaris* are due.

A very important addition was made by Mr. William E. Dodge in 1898, in a gift of exquisitely prepared specimens of marine life from the Zoölogical Station at Naples, secured there by Dr. E. O. Hovey. These beautiful objects, the flowers of the animal world, were received in glass jars, and formed a suggestion of the almost boundless possibilities in beauty and instruction that this department may eventually realize.

The wonderful variety of the hydrozoans and actinozoans, embracing the medusas, acalephs, jelly-fishes, sea-anemones, and sea-pens, with all the added wonders of the sea worms, tunicates, molluses, and crustaceans, reveal to the mind a field of museum exploration almost inexhaustible. This field, now under the care of a separate department, remains to be appropriated.

Three departments have practically arisen under the administration of Mr. Jesup: that of Entomology, Vertebrate Paleontology, and Archaeology and Ethnology.

Among the first interests of the

Museum was that in insects, when Baron R. Osten Sacken, Coleman T. Robinson, and R. A. Witthaus, Jr., became donors of large collections which were afterwards enlarged by gifts from Lord Walsingham; but the misfortunes of pest invasions had seriously impaired the value of these, and, until Mr. Beutenmüller's appointment as Curator of Entomology in 1889, the collection of insects, while of interest and not inconsiderable in numbers, was abortive and rudimentary.

Mr. Jesup felt an especial interest in the stability and advance of this department, as its close connection, in its economic aspects, with the Department of Forestry and the Jesup Collection of Woods was unmistakable. At the meeting of the Executive Committee (February 8, 1899) it was resolved: "That in the opinion of this Committee it is very important for the proper development of the Museum that it should include a Department of Entomology and that such a department be, and is hereby established."

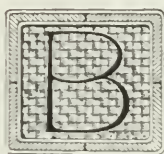
In accordance with this resolution Mr. William Beutenmüller was made Curator, and since his instalment the additions by purchase, by remarkable gifts, and by his own activity have given it an enviable reputation.

L. P. GRATACAP.

(To be Continued.)

MEMOIRS OF THE AMERICAN MUSEUM OF NATURAL HISTORY.

I.—ANTHROPOLOGICAL SERIES.



BEFORE reviewing in outline this series of anthropological contributions it will be of advantage to touch upon the principal expeditions and explorations maintained by the Museum, which furnish the collections and data treated of in the 'Memoirs' and in the 'Bulletin.' The scope and aim of these undertakings are partially indicated by the great collections, illustrative of the laws governing the growth of human culture, that are resulting from them.

The JESUP NORTH PACIFIC EXPEDITION was organized for the investigation of the tribes, present and past, of the whole coast region of the North Pacific Ocean. Part of the vast quantity of material already brought together from this expedition is displayed in the ethnological halls, forming an exhibit of the highest educational and technical value. The culture and physical characteristics of the tribes of Alaska and British Columbia as thus far investigated by the Expedition has been the subject of eight monographs in the 'Memoirs,' and of a serial 'Ethnographical Album,' of

which Part I, containing twenty-eight plates, was issued last year.

The RESEARCHES ON THE NORTH AMERICAN INDIANS have as a special object the description and interpretation of the vanishing customs both of the Indians of the Plains and of several important, rapidly diminishing tribes of California and Washington. Recent volumes of the 'Bulletin' have contained some of the first fruits of this work.

The HYDE SOUTHWESTERN EXPEDITION carries similar methods and aims into the region of the Pueblo tribes and cliff-dwellings, where it is conducting a general archæological and anthropometric survey.

The MEXICAN and CENTRAL AMERICAN EXPEDITIONS are pouring into the Museum halls a great stream of material for exhibition and research, which is contributing to the solution of many fascinating problems presented by the ancient civilizations of Mexico and Central America. A part of the work done in Mexico is represented by Dr. Lumholtz's memoir on the 'Symbolism of the Huichol Indians,' which is elsewhere treated in this number.

The PERUVIAN EXPEDITION: The extensive collections made by Dr. Bandelier in Peru and Bolivia illustrate the highest stage of civilization attained in prehistoric time in South America.

Bearing in mind this partial enumeration of the mainsprings of American Museum studies in Anthropology we may take up in turn the different Memoirs.

Anthropology I, Part I.—Facial Paintings of the Indians of Northern British Columbia. By Franz Boas. 24 pp., 4to., Pls. I-VI.

This paper is the first of the series on the Jesup Expedition. The introduction gives an exposition of the main purposes of the expedition, which is of such importance and interest as to warrant our quoting it at some length.

"Anthropology has reached that point of development where the careful investigation of facts shakes our firm belief in the far-reaching theories that have been built up. The complexity of each phenomenon dawns on our minds, and makes us desirous of proceeding more cautiously. Heretofore we have seen the features common to all human thought. Now we begin to see their differences. We recognize that these are no less important than their similarities, and the value of detailed studies becomes apparent. Our aim has not changed, but our method must change. We are still searching for the laws that govern the growth of human culture, of human thought; but we recognize the fact that before we seek for what is common to all culture, we must analyze each culture by careful and exact methods, as the geologist analyzes the succession and order of deposits, as the biologist examines the forms of living matter. We see that the growth of human culture manifests itself in the growth of each special culture.

Thus we have come to understand that before we can build up the theory of the growth of all human culture, we must know the growth of cultures that we find here and there among the most primitive tribes of the Arctic, of the deserts of Australia, and of the impenetrable forests of South America; and the progress of the civilization of antiquity and of our own times. We must, so far as we can, reconstruct the actual history of mankind, before we can hope to discover the laws underlying that history.

"These thoughts underlie the conception of the Jesup North Pacific Expedition. Its aim is the investigation of the history of man in a well-defined area, in which problems of great importance await solution. The expedition has for its object the investigation of the tribes, present and past, of the coasts of the North Pacific Ocean, beginning at the Amoor River in Asia, and extending northeastward to Bering Sea, thence southeastward along the American coast as far as Columbia River.

"The peculiar interest that attaches to this region is founded on the fact that here the Old World and the New come into close contact. The geographical conditions favor migration along the coast line, and exchange of culture. Have such migrations, has such exchange of culture, taken place? This question is of great interest theoretically. The American continent is widely separated from the land area of the Old World, so that the geographical conditions are in favor of the presumption that in the New World culture developed uninfluenced by causes acting in the Old World. Throughout the Old World migrations have brought the peoples of the most distant areas into hostile or peaceful contact, so that there is hardly a tribe that might be

considered as uninfluenced by others. If the development of culture in the New World has been quite independent of the advances made in the Old World, its culture will be of the greatest value for purposes of comparison. Therefore it is necessary to investigate with thoroughness all possible lines and areas of contact, and among these the North Pacific coast is probably the most important."

The author then goes on to explain that while the general characteristics of the native American race are fairly uniform, a number of distinct and relatively little-varying types have developed, differing in color, in form of head, and in proportions of the body; this implies a long period of occupancy of our continent and a long development of distinct lines of growth in culture. Later on came a mixture of blood and cultural achievements, and there is much evidence for believing that the tribes of the North Pacific Coast have passed through a long and varied history.

The author continues:

"The types of man which we find on the North Pacific Coast of America, while distinctly American, show a great affinity to North Asiatic forms; and the question arises, whether this affinity is due to mixture, to migration, or to gradual differentiation. The culture of the area shows many traits that suggest a common origin, while others indicate diverse lines of development."

"What relation these tribes bear to each other, and particularly what influence

the inhabitants of one continent may have exerted on those of the other, are problems of great magnitude. Their solution must be attempted by a careful study of the natives of the coast, past and present, with a view of discovering so much of their history as may be possible."

The introduction is followed by a sketch map of British Columbia, showing the field of operation of the expedition in 1897, and by an account of the work accomplished in that year. The special subject of the paper, namely, the Facial Paintings of the Indians of British Columbia, is then introduced.

"The art of the Indians of northern British Columbia shows a peculiar development, that has for a long time attracted the attention of investigators. While among most primitive people we find a tendency to the development of geometric designs, the Indians of northern British Columbia use for decorative purposes almost exclusively animal motives. The animal forms are highly conventionalized, and may be recognized by a number of symbols characteristic of the various animals that the artists try to represent. The Indians have adopted a peculiar method of adapting the animal form to the decorative field. There is no endeavor to represent the form by means of perspective, but the attempt is made to adapt the form as nearly as possible to the decorative field by means of distortion and dissection. The more clever an artist is in designing methods of distortion and dissection which fill the decorative field and bring into view all the important parts of the animal body, the greater is his success. It will be seen,

therefore, that the greater the difference between the form of the decorative field and the form of the animal to be represented, the greater will be the difficulty of adaptation. When an animal is to be represented on a bracelet, it is shown as though it were cut from head to tail, and as though the arm were pushed through the opening, the whole animal thus surrounding the wrist. The same method is followed in the decoration of dishes, where the sides of the animal are shown on the sides of the dish, while the opening of the dish represents the back of the animal, its bottom the lower side of the animal. When the animal form is to be shown on flat surfaces, the body is generally represented as split in two, and spread in both directions, so that it appears like two profiles placed side by side.



DESIGN REPRESENTING A BEAR.

The body is represented as split in two and spread out flat.

Bulletin A. M. N. H., Art. X, p. 149, fig. 44.

"The peculiarities of the conventionalism of these tribes appear most clearly where the difficulty of adaptation of the

subject to the decorative field is greatest. I concluded, therefore, that if I could obtain a series of representations on very difficult surfaces, the principles of conventionalism would appear most clearly. No surface seems to be more difficult to treat, and to adapt to animal forms, than the human face. For this reason I resolved to make a collection of facial paintings such as are used by the Indians when adorning themselves for festive dances.

"The subjects that are used for this purpose are largely the crests of the various families. These are laid on in black, red, blue, and green; the colors being mixed with grease, and put on with the fingers, with brushes, or by means of wooden stamps cut out for this purpose."

The collection which is discussed in the present paper was obtained from a Haida chief, one of the most famous artists of the tribe.

The author concludes as follows:

"The explanations given here show that while a considerable series of facial paintings are no more conventionalized than the paintings found on other objects, the intricacy of the decorative field has led the Indians to develop geometrical designs, although no other cases are known in which such designs are applied by these tribes to symbolize animal forms. It is of importance to note that the same decorations may symbolize a variety of objects. Thus the design for the whale's eye, and that for the after-image of the sun, are identical. The head of the eagle, and the evening sky, are expressed by the same painting. The ribs of the bear, the rock-slide, and the stratus cloud are so much alike, that, without a statement on the part of the Indians, it would be impossible to know what is meant. The

collection is of theoretical interest mainly because it shows that the difficulty of adapting the subject of decoration to the decorative field has been a most powerful element in substituting geometrical forms for less conventional designs, and in showing a series of important transitional forms. . . ."

Anthropology I. Part II.—The Mythology of the Bella Coola Indians. By Franz Boas. Pp. 25-128, Pls. VII-XII. The Bella Coola are a small tribe inhabiting the coast of British Columbia, in about latitude 52° north, as shown on the accompanying map. The nearest tribes are the Carrier and Chilcotin to the east and southeast, the Tsimshian to the northwest, and the Kwakiutl to the southeast. The language spoken by the tribe belongs to the Salishan family, more particularly to the group of dialects spoken along the coast of Oregon, Washington, and British Columbia. The great similarity between the Bella Coola and the other Coast Salishan tribes leads the author to assume that at one time the tribes speaking these dialects inhabited contiguous areas. At the present time the Bella Coola are separated from the other tribes speaking Salishan languages by a considerable stretch of country, which is inhabited by tribes of Athapascan and Kwakiutl lineage.

The Bella Coola have developed a complex mythology, which is well



MODELS ILLUSTRATING HEADS AND FACIAL PAINTINGS.

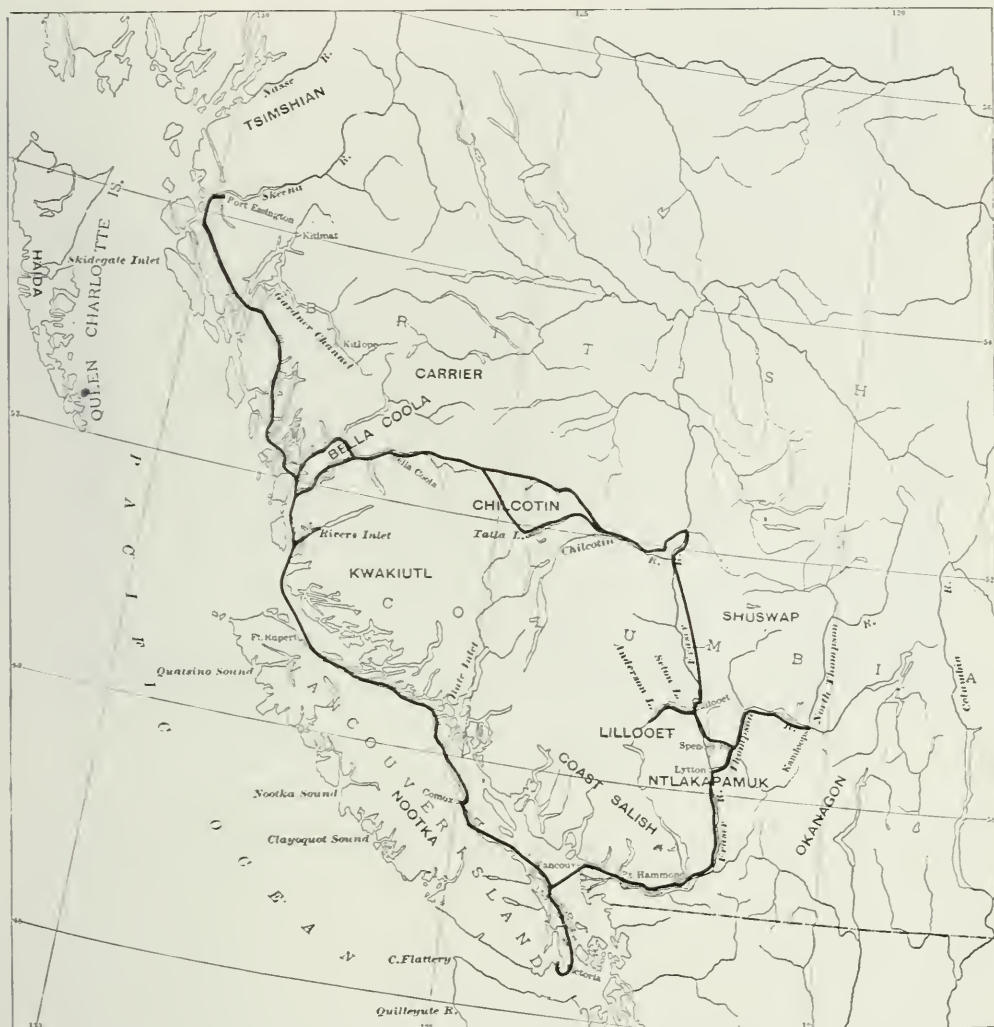
Designs illustrate (1) Ribs of the Bear; (2) The Halibut; (3) Holes made in tree by Woodpecker.

illustrated by the collections made by the author in the course of his investigations for the Jesup Expedition.

"All the collections which have been made heretofore do not bring out clearly the principal characteristic of the mythology of the Bella Coola. The tribes of the North Pacific coast consider the Sun as the most important deity, but at the same time they believe in a great many beings of supernatural power. For this reason their whole mythology is very unsystematic. The Bella Coola, on the other hand, have developed a peculiar mythology, in which a number of supernatural beings have been co-ordinated. A system has been evolved which justifies our terming the supernatural beings 'deities.' The general features of this system are as follows:—

"The Bella Coola believe that there are five worlds, one above another. The middle one is our own world, the earth. Above it are spanned two heavens, while below it there are two underworlds. In the upper heaven resides the supreme deity, a woman who interferes comparatively little with the fates of mankind. In the centre of the lower heaven, that is, in the zenith, stands the house of the gods, in which reside the Sun [Senx] and all the other deities. Our own earth is an island swimming in the ocean. The underworld is inhabited by the ghosts, who are at liberty to return to heaven, whence they may be sent down again to our earth. The ghosts who die a second death sink to the lowest world, from which there is no return."

The master of the house of the gods ('House of the Myths') is



SKETCH MAP OF BRITISH COLUMBIA, SHOWING THE FIELD OF OPERATIONS OF THE JESUP NORTH PACIFIC EXPEDITION IN 1897, AND THE LOCATION OF THE HAIDA, BELLA COOLA, KWAKIUTL, COAST SALISH, AND OTHER TRIBES.

Mem. Amer. Mus. Nat. Hist., Vol. II, Anthropology I. The Jesup North Pacific Expedition. (Opposite page 7.)

Senx, the Sun, who is also called 'Our Father' and 'The Sacred One.' It seems that he is the only deity to whom the Bella Coola pray. There is a second deity in the House of the Myths of equal importance with Senx. A number of inferior

deities live there who have particular charge of the religious winter ceremonial; this is called 'kusiut' and is of the greatest importance for an understanding of the social life and mythology of the Bella Coola; it corresponds to a similar

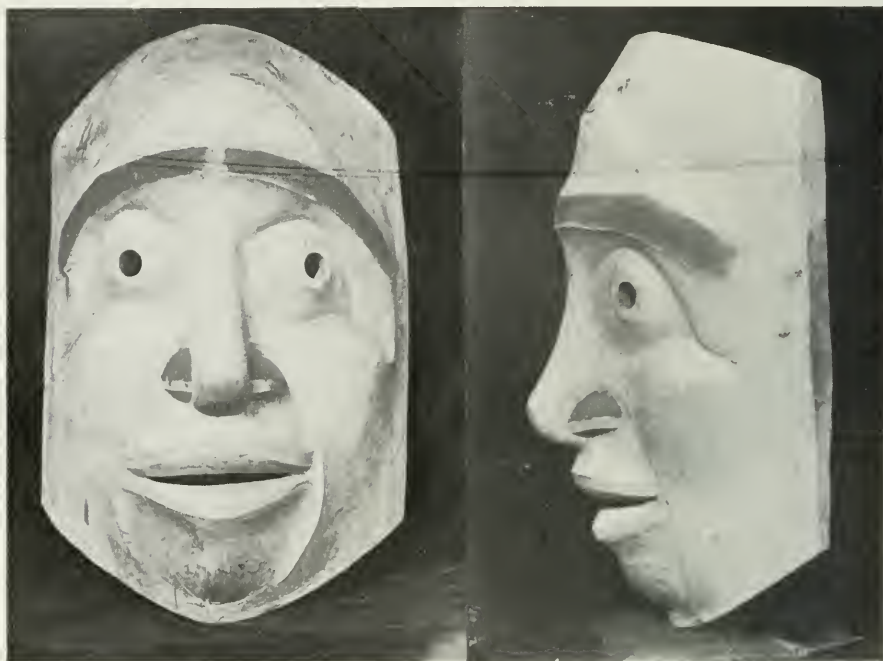


FIG. 2. MASK REPRESENTING THE SUN GOD.

ceremony of the Kwakiutl, from which tribe the Bella Coola doubtless adopted it. The ceremonials performed during the kusiut are mostly dramatic representations of the myths referring to the various deities, and to the part played by them in the initiation of members of various clans into the "Cannibal" and other secret societies. Other deities are more immediately concerned with the affairs of the world; a great many more, such as the spirit that protects the mountain-goat hunter, the being that causes the tides by swallowing the

ocean twice a day, the Thunder-bird, are perfectly well defined individually, but difficult to characterize in a single sentence. Masks representing the deities are used in the ceremonials.

All these deities and corresponding traditions are common to the mythology of the whole tribe, and are tolerably consistent in character. In addition to these, however, there is a group of very contradictory and conflicting traditions that were developed as clan traditions by the twenty-nine village communities into which the Bella Coola were



FIG. 3. DOUBLE MASK REPRESENTING THE GUARDIAN OF THE HOUSE OF THE MYTHS.
(Opened, closed, and profile of outer mask.)

divided, and jealously guarded as secrets by each clan. After analyzing them the author concludes :

“Although a considerable amount of contradiction is inherent in all the mythologies of the north Pacific coast, they nowhere reach such a degree as among the Bella Coola ; and I presume the fact that the traditions are kept secret by the various families accounts for this curious condition.” [Pp. 125-126.]

There are also a number of traditions which furnish important

points of view for an investigation of the origin of the mythology of the whole tribe.

The author's analysis of the social organization, traditions, and linguistic peculiarities of the Bella Coola, shows that they are closely related to the Coast Salish tribes, and at the time of their emigration from that region must have resembled their congeners in general culture. At the present time a striking difference in the laws of intermarriage of

these tribes is that while among the southern Coast Salish there is a tendency to exogamy, the Bella Coola have developed a system of endogamy.

"The question then arises, How did the peculiar endogamic system and the remarkable mythology of the Bella Coola originate from the much simpler forms that we find among the Coast Salish?"

The author answers this question as follows,

"One of the most remarkable features in the inner life of the tribes of the northern coast of British Columbia is the great importance of the clan legend, which is considered one of the most valuable properties of each clan or family. It is carefully guarded in the same way as material property, and an attempt on the part of a person not a member of the clan to tell the tradition as his own is considered one of the gravest offences against property rights. The possession of a clan tradition is felt by the Indian to be one of his most important prerogatives. When, therefore, the Bella Coola settled on Bella Coola River, and were thrown into contact with the northern Coast tribes [especially the Kwakintl], the lack of a well-developed clan tradition must have been felt as a serious drawback. It seems very likely that the jealousy with which the ownership of a clan tradition was guarded by the Coast tribes was very early introduced among the Bella Coola."

But at that time, since the social organization of the Bella Coola was very probably similar to that of the Coast Salish, a child was supposed

to belong to the families of both parents, and had the right to use the traditions of either family; consequently in the course of a few generations the traditions acquired by each family would have spread practically over the whole tribe. The only probable way in which this unwelcome spread of clan traditions over the whole tribe could be prevented was by confining marriages to members of the same clan (endogamy). In the words of the author,

"The curious social system of the Bella Coola developed through the influence of the customs of the Coast tribes upon the loose social unit of the Salish village community. The possession of clan traditions was felt as a great advantage, and consequently the desire developed to possess clan traditions. These were acquired partly by intermarriage with the Coast tribes, as is shown by the fact that many of these traditions are borrowed from these tribes, partly by independent invention. The desire to guard the traditions which were once acquired led to the development of endogamic institutions, in order to prevent the spread of the traditions over the whole tribe."

The final conclusions of the author are particularly instructive.

"Notwithstanding the numerous contradictions contained in family legends, the conception of the world and the functions of the various deities are so well defined that we must consider the mythology of this tribe vastly superior to that of the neighboring tribes. While

the latter believe in a great many spirits which are not co-ordinated, we have here a system of deities. The existence of a systematic mythology among the Bella Coola proves that under favorable conditions the advance from the lower forms of beliefs to higher forms may be a very rapid one.

"Our analysis shows that this system cannot be considered as an importation, but that it probably developed among the Bella Coola themselves. After they removed to their new home, a mass of foreign ideas had come into their possession through contact with their new neighbors. While these new ideas were being remodelled and assimilated, they stimulated the minds of the people, or of a few members of the tribe, who were thus led to the formation of an elaborate concept of the world. The concept which they have developed agrees in all its main features with those created by men of other zones and of other races. The mind of the Bella Coola philosopher, operating with the class of knowledge common to the earlier strata of culture, has reached conclusions similar to those that have been formed by man the world over, when operating with the same class of knowledge. On the other hand, the Bella Coola has also adopted ready-made the thoughts of his neighbors, and has adapted them to his environment.

"Our inquiry shows that safe conclusions can be derived only by a careful analysis of the whole culture. The growth of the myths of the Bella Coola can be understood only when we consider the culture of the tribe as a whole. And so it is with other phenomena. All traits of culture can be fully understood only in

connection with the whole culture of a tribe. When we confine ourselves to comparing isolated traits of culture, we open the door to misinterpretations without number."

W. K. G.

ANTHROPOLOGICAL COLLECTIONS FROM NORTHERN MEXICO.



IN THE ground floor of the West Wing of the Museum have recently been arranged the collections obtained by Dr. Carl Lumholtz during his three expeditions to Mexico, undertaken under the auspices of the Museum. These expeditions extended over the period from 1890 to 1898. Dr. Lumholtz visited the tribes in parts of northwestern Mexico which up to the present time are difficult of access. During the first years he spent much time among the Tarahumare and Tepehuane; but his principal work was done among the Huichol Indians, who inhabit a mountainous region in the State of Jalisco. The tribes of this area are of very considerable interest, because they have preserved their ancient customs and beliefs comparatively uninfluenced by contact with the Spaniards. The country of the Huichol was conquered by the Spaniards during the

seventeenth century, but missionaries did not gain influence among them until much later. The whole tribe of the Huichol numbers about four thousand souls. They live in small villages, but spend the greater part of the year on their ranches, where they raise corn, beans, and squashes. They dress in garments of their own manufacture, decorated with elaborate and artistic designs.

Dr. Lumholtz's collections among these tribes not only cover the whole range of their industries, but illustrate in a most exhaustive manner the beliefs and ceremonials of the people. Their country is comparatively arid, and their food-supply depends largely upon the regularity of the periodical rainfall. For this reason most of their ceremonies are intended to propitiate the gods of rain, and all the objects they use in their ceremonial worship are covered with symbols indicating rain. Most of their gods have control over clouds and rain. In each village there is a large temple, and around the temple stand a number of small houses sacred to the various deities. In these are deposited the offerings made by the people. Woven shields are sacrificed as prayers for health and good luck. These bear designs of the symbols of the deities to whom they are offered. On others are shown the animals sacred to the deity and a

pictorial representation of the object of the prayer. A man who prays for the health of his wife will make an offering on which the figure of a woman is represented in weaving or painting. When he prays for the welfare of his herds, figures of cattle or sheep are represented on his offering. A woman who prays for skill in any kind of handiwork sacrifices a sample of it. No offering is made more frequently than that of arrows, which convey the idea that the arrow is to take the prayer to the deity. For this reason a symbol of the prayer is attached to the arrow. The arrow is frequently stuck into the thatched roof of the temple, and is supposed to take its course towards the deity, carrying the wishes of the supplicant. In the temples are also found chairs in which the god is supposed to sit. Symbols of prayers are often attached to their seats, where they will at once attract the attention of the deity.

The Huichol do not subsist on the products of the soil alone, but they are also hunters, the deer being the principal game. A number of deities preside over the deer-hunt. The people believe that there is a god of the deer in each quarter of the world, and to him they pray for success in hunting. After the first deer of the season is killed, a great feast is celebrated, during which



GROUP ILLUSTRATING CULTURE AND APPEARANCE OF HUICHO INDIANS.

the Indians partake of mescal, an intoxicating beverage made of a particular kind of cactus. This plant plays a very important part in the ceremonials of the Huichol. It does not grow in their own country, and every year they undertake a long pilgrimage for the purpose of gathering it. This pilgrimage is connected with important ceremonies. A certain ritual is prescribed for it, and the travellers are sent out in sacred procession.

The most interesting industry of the people is weaving. The women



make belts, hair-ribbons, and pouches, one of which is represented in the accompanying cut, of cotton and wool. The ribbons and sashes are ornamented with most beautiful designs, all of which have a symbolic meaning. The designs are often so much conventionalized

that it is difficult to understand what the makers intended to represent. Star-like figures are intended to represent flowers. Double triangles represent gourds used as water-bottles; zigzag lines, serpents. The figures of animals are very much distorted, in order to bring about a pleasing decorative effect.

During his travels, Dr. Lumholtz also collected a large amount of archaeological material. In the extreme northern part of Mexico he obtained a great deal of pottery of great beauty, the decoration of which is somewhat similar to that on pottery found in the ancient pueblos of the Southwest Territories. He also secured a series of very curious realistic clay figures, many of which represent the occupations of the people of ancient Mexico.

The materials obtained by Dr. Lumholtz illustrate in a very exhaustive way both the archaeology and ethnology of the people of a little-known portion of Mexico. The customs which he found prevailing at the present day give us an insight into what the culture of northern Mexico may have been at the time of the Conquest.

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NOTES AND NEWS.



BRAHMÆA CONCHIFERA.
One of the specimens in the Schaus Collection.

THE PRESERVATION OF THE SCHAUS collection of exotic moths has been assured by the transference of the specimens into new, specially constructed, vermin-proof cases. Inasmuch as other indications of the value of the Schaus Collection appear in the article on the development of the entomological department, a few supplementary statements would now seem timely.

The five thousand-odd specimens

of the collection, representing the principal known genera of Old World moths, were gotten together as a study collection, for comparison with New World forms, by Mr. William Schaus, the describer of many new Lepidoptera, himself an ardent collector, and now the owner of the most complete collection of New World moths in existence.

The study collection of Old World moths was presented by Mr.

Schaus in 1897; partly in recognition of the scientific value of the gift, the Trustees soon after made the donor a patron of the Museum. The collection is especially rich in representatives of the *Bombycidae* (Spinners), *Noctuidae* (Owlets), *Geometridae*, *Hepialidae*. It contains many type specimens and species authentically determined by comparison with British Museum types. This feature of authenticity makes the collection highly useful to specialists and students, who are further benefited by its accessibility in the American Museum.

AS MORE OR LESS DETAILED REFERENCES to the Museum collections of moths and butterflies are made from time to time in these columns, it may be permissible to indicate briefly the chief characters of the Lepidoptera and the differences between moths and butterflies; perhaps in strictness rather an affair of the text-books.

The members of the order Lepidoptera have four wings, which are membranous and covered with overlapping scales. The scales are modified hairs. The mouth parts are adapted not for biting, as in primitive insects, but for sucking. The metamorphosis is complete.

The order is often considered as being divided into two sub-orders:

the Moths (Heterocera) and the Butterflies (Rhopalocera); the Moths being designated in a general way as the Nocturnal Lepidoptera, the Butterflies as the Diurnal Lepidoptera. The moths on the whole are the less specialized in structure. When at rest most moths hold the wings horizontally, whereas typical butterflies hold them in a vertical position. However, many of the Skippers (family *Hesperiidae*, the most primitive butterflies) present an intermediate condition, in that the forewings are held vertically, while the hind-wings are extended horizontally.

The antennae of moths are of various forms (whence the term Heterocera), though usually thread-like or feather-like; those of butterflies have (typically) a knobbed extremity (whence the term Rhopalocera).

Most moths have a *frenulum* or bristle attached to the first rib of the hind-wing near the base, which passes through a loop on the under side of the fore-wing, thus assuring the simultaneous action of the fore and hind pairs of wings in flight. In all the butterflies and in the more specialized moths, this device is superseded by the overlapping of the hind-wings by the fore-wings. In both moths and butterflies, as well as in other insect orders, the ribs or veins of the wings are



ZELOTYPIDAE STACYI

characteristic in number and arrangements. These characters are of great importance in classification. The abdomen of moths is stout, that of butterflies slender, the Skipper butterflies, however, resembling the moths in this respect also. In correlation with the slow, waving flight of most moths and butterflies, the segments of the thorax are not closely consolidated, except in the hawk-moths and others, where the flight is strong and rapid.

The illustration on page 131 shows one of the Australian hepialids or Swifts. The Swifts (family *Hepialidae*), and the very minute *Micropterygidae*, differ from all other moths and butterflies, first, in the great similarity of the fore- and hind-wings, both in form and in the number and arrangement of the veins (an exceedingly primitive feature); second, in the possession of a small lobe or *jugum* on the inner margin of the fore-wing near its base. The *jugum* extends under the costal margin of the hind-wing, while the greater part of the inner margin of the fore-wing overlaps the hind-wing. As does the frenulum of other moths, this device secures the simultaneous action of all four wings in flight. It is, however, a fundamentally different structure; taken in connection with the primitive character of the wings and with the wide geographical separation of the different species of the

two families, it is thought to indicate that these genera are the remnants of what was in time past a numerous group, perhaps comparable in number and variety with the butterflies or moths of the present.

W. K. G.

MR. FREDERICK A. CONSTABLE has presented to the Department of Conchology a very large selection of shells from his private cabinet. Neither the number of separate specimens nor the number of species has been exactly determined, but of the former there are probably some 25,000 and of the latter 5000.

The classification and arrangement of these shells must be delayed, owing to the pressure of other work; but a glance over these specimens shows their admirable preservation and careful mounting. Identifications are complete. The univalves are by far the most largely represented, and amongst these many minute species are conspicuous. The *Neritidae*, *Turbinidae*, *Ampullaridae*, *Melanidae*, *Lymnaeidae*, *Chitonidae*, *Eulimidae*, *Calyptraeidae*, *Bulimidae*, *Helicidae* are numerous represented. Minute forms are common; thus *Columbella minuta* Gld., from Hongkong, *Eulima Hemphilli* Dall, from Florida, Cingulinas from the Pacific, minute Tornatins and Cylichnas, are seen in a hasty inspection.

In view of accessions such as this it is impossible not to emphasize the growing need of a large, commodious, and properly spaced shell hall. A very considerable proportion of the General Collection, including all the Unios, is now hidden from view in drawers under the desk cases. A different method of installation, especially of the small shells now exhibited, is necessary.

A small experimental aquarium containing pond gasteropods will soon be placed on exhibition.

L. P. G.

IMPORTANT GIFT TO THE LIBRARY.—General Egbert Viele, a member of the Museum, has recently enriched the library by the donation of 1200 volumes, 960 numbers of serial publications, 1833 pamphlets, and 66 valuable maps. The bound volumes include works on Travel, Biography, Natural History, Geology, Mineralogy, History, Commerce. The scientific periodicals will be of great use in supplying missing numbers of publications already in the library. The old maps are valuable, for instance in local archæological research. The Topographical Atlas of New York (1874) is the work of the donor, General Viele; it marks the original character of the land, revealing the great extent of made land in this city.

Mr. Ernest Schernikow, another member of the Museum, has donated forty-six volumes on Mineralogy, including crystallographic atlases, and a series of mineralogical manuals, which illustrate the development of the science.

IN THE LAST NUMBER OF THIS JOURNAL, through an omission in transcription the name of Hon. Abram S. Hewitt did not appear on the list of Trustees constituting the Nominating Committee.

FIVE SPECIMENS OF MUSK-OXEN collected by Lieut. R. E. Peary, U. S. N., in Grinnell Land (Arctic America, opposite the northern coast of Greenland) have been mounted and placed on exhibition in the Hall of North American Mammals. The specimens will ultimately be brought together into a group, which will form one of the series illustrating the mammalian fauna of North America. The material belongs to a new form of Musk-Ox recently described as *Ovibos moschatus wardi*. The name was proposed by Mr. Richard Lydekker of the British Museum, in a brief note in *Nature*. It was based on two specimens from East Greenland.

In a recent contribution to the Museum Bulletin,* entitled "The Musk-Oxen of Arctic America and

* Bull. Amer. Mus. Nat. Hist., Vol. XIV, Art. VII, pp. 69-86. Author's Edition, Mar. 27, 1901.



ONE OF THE NEWLY MOUNTED SPECIMENS OF OVIBOS WARDI.

Greenland," Dr. Allen shows that the new form differs from the typical *Ovibos moschatus* not only in the possession of "a large whitish patch on the face as well as in certain other details of coloration" (Lydekker) but more markedly in the shape of the basal portions of the horns, and in the size and contour of the hoofs. The adult males of the new form also possess a characteristic "saddle mark" of light brown on the middle of the back. These differences are thought

sufficient to mark *Ovibos moschatus wardi* as a distinct species (*O. wardi*) instead of as a variety.

Dr. Allen's review of the reports of explorers and others shows that the range of the new form extends from Ellesmere Land of northernmost Arctic America, across Smith Sound and Robeson Channel to the west coast of Greenland, as far south as Melville Bay; thence stretching northeastward along the north coast of Greenland and down the east coast as far as King William Land.

The present range of *Ovibos moschatus*, on the other hand, is limited to the Arctic Barren Ground region to the eastward of the Mackenzie River. Although its eastern limit cannot be positively stated, the range of *Ovibos moschatus* appears to be separated from that of *Ovibos wardi* by a broad zone of insular areas and estuaries. The author infers that "when Musk-Oxen ranged far to the southward of their present limits [as shown by the occurrence of fossil remains of Musk-Oxen as far south as Kentucky] they doubtless had a continuous distribution over a large part of North America, and have become differentiated in comparatively recent times through separation in their gradual retreat northward."

The occurrence of Musk-Oxen in Alaska is fully discussed. It is shown by abundant evidence that while the range of *Ovibos moschatus* formerly extended across Alaska, the recent specimens alleged to have been taken west of the Mackenzie River have really been brought to trading posts on the Alaskan coast by whaling ships coming from the east.

W. K. G.

IN ORDER THAT THE EDUCATIONAL value of the great collections already in the Museum may be increased, there is needed a much further development of the principle exempli-

fied by the mounted groups in the departments of zoölogy and anthropology. The tribal groups show material elements of the culture of a race not as isolated facts but in relation to each other and to man. The groups of mammals and birds represent the living creatures not as mere stuffed skins, but in relation to each other and to their natural surroundings.

This principle will no doubt be worked out ultimately in manifold ways, as fast as the means are provided by citizens of New York. Recently the Museum has been fortunate in receiving two important gifts for the development of such particular suites of specimens in the departments of ornithology and ethnology. As to these, more specific statements will be made later.

Future donations of this character will, it is hoped, provide for the preparation of various series of mounted specimens illustrating the structure and adaptations of the skeletons of the back-boned animals. A brief series of disarticulated skeletons, symmetrically arranged, illustrating in a broad way the comparative anatomy of fishes, batrachians, reptiles, birds, and mammals, would form a proper introduction to sets of mounted skeletons of these different vertebrate classes, representing the principal families and genera. The specimens would be

grouped zoologically, each one mounted in a characteristic attitude, with frequent diagrams showing the relations of the skeleton to the body, and with careful, artistic drawings of the living animals. The classification of the vertebrates would be explained in guide cards that refer to the specimens.

But there is apparently no limit to the fascinating topics of osteology that with even moderate resources can be illustrated in this way. There might be various series showing the development, evolution, and adaptations of the teeth in vertebrates; the evolution and adaptations of the limbs, especially as organs of flight; the adaptive modifications of the skull and of its parts, as, for example, of the beak in birds. Of prime importance is the illustration of the far-reaching natural laws discussed in "The Variation of Animals and Plants under Domestication," and in similar great works. The beauty and extreme instructiveness of such exhibits is well proven in the British Museum and in the United States National Museum at Washington. W. K. G.

A SERIES OF SPECIMENS illustrating the culture of the ancient Indian inhabitants of New York has been placed on exhibition in the Hall of North American Indians. The specimens are selected mainly from those

gathered during the course of the local archaeological investigations carried on by the Museum. The exhibit is carefully arranged on glass shelves in two "A" cases, and the general effect is both comprehensive and artistic.

The specimens in the first "A" case suggest the mode of life of the ancient Algonquin tribes of this region, while those in the second bring out the art and the special characteristics of their conquerors, the Iroquois. Noteworthy are the stone pipes of elaborate design, the arrowheads, celts, and "banner stones." The pottery vessels, carefully reconstructed from numerous fragments, are particularly valuable. They show geometric ornamentations, consisting for the most part of oblique parallel lines, and, occasionally, conventionalized representations of the human face. Evidences of later contact with white men are trade pipes and hatchets of early English and Dutch types. Some slate knives closely resemble those now used by the Esquimaux. A stone celt in its original wooden handle is unique—at least here in the eastern States.

The exploration of Indian sites in the vicinity of the city is being continued. It is hoped that the expenses of the formation of this important local exhibit will be met by special gifts and contributions.

A NEW RACE OF THE GREAT BLUE HERON.



N ethnological collection brought to the American Museum of Natural History from Queen Charlotte Island, B. C., by Dr. Franz Boas, in 1888, contained the heads and necks of two Great Blue Herons so remarkable in their intensity of color as to suggest that the Great Blue Heron, like many other Northwest Coast birds, had been affected in color by the humid climate of that region.

Since the date named, although frequent efforts have been made to secure a complete specimen of the Great Blue Heron from this region, the attempt was not successful until February, 1901, when at Skidegate, Queen Charlotte Island, John R. Swanton, of the Jesup North Pacific Expedition, whose services in this connection were enlisted through the kind coöperation of Dr. Boas, procured a very beautiful adult example. This specimen fully confirms the suspicions aroused by the heads and necks previously mentioned, and shows the Great Blue Heron of the northwest coast region to be a strikingly differentiated form, which, in recognition of his services to the zoölogy of the region it inhabits, has been named *Ardea herodias fannini* after Mr.

John Fannin, Curator of the Provincial Museum at Victoria.

This Heron differs from the Great Blue Heron chiefly in its darker colors, the upper parts, for example, being slate-black instead of bluish gray, and it is therefore a further and, because of the Great Blue Heron's comparatively slight variation in color throughout a wide range, exceedingly interesting illustration of the effects of climate on the colors of animals.

As is well known the rainfall of the Northwest coast, from Oregon northward, is heavier than that of any other part of North America, an annual precipitation of over 100 inches being not infrequent. As a result of the humid climate of this region the animals inhabiting it are of exceptionally dark or saturated color. Thus, among birds, over thirty subspecies or climatic varieties have been described from the northwest coast and without exception they are darker, more richly colored, or more heavily barred or streaked than any other representatives of their respective genera. Their characteristics are well shown by comparison with their allies of arid regions. For instance, the Song Sparrows of the Northwest Coast are rich deep umber in the color of the upper surface while those of the arid Great Basin region of Arizona, where the rainfall rarely exceeds



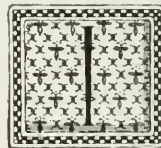
Left-hand figure. Study specimen of Song Sparrow (*melospiza melodia guttata*) from the humid Northwest Coast.
Right-hand figure. Study specimen of Song Sparrow (*melospiza melodia fallax*) from the Arid Great Basin.

six or eight inches, have the same parts of a light sandy tint, as is indicated by the accompanying photographs of specimens from both regions. So different are these birds, in fact, that even to the untrained eye they would appear to be distinct species; but in passing from the

range of one to that of the other it will be found that the changes in climate encountered are paralleled by related changes in the colors of the Song Sparrow. In other words, as the climates intergrade so do the birds. Ornithology furnishes many similar cases and they constitute eloquent exemplifications of the evolution of species by environment. F. M. C.

THE DEVELOPMENT OF THE AMERICAN MUSEUM OF NATURAL HISTORY.

(Continued.)



IN 1889, after a proper review of the material in hand, Mr. Beutenmüller under Mr. Jesup's encouragement began the preparation of specimens for the 'Jesup Collection of Economic Entomology,' which by the end of the year 1890 contained forty groups, large and small. These were exhibited with the Jesup Collection of Woods. Together with a score of carefully prepared water-color illustrations, they represent the life histories of insects injurious to forest and shade trees and show the nature of the injury done to the leaves and wood.

In 1890 the collection of insects which had been gathered, or, more properly, bred, by Dr. S. Lowell Elliot, was presented to the Museum by his widow, Mrs. Margeritha

Schuyler Elliot. The collection was a remarkable one, and consisted of one hundred and forty cases, containing about six thousand six hundred specimens of butterflies and moths in absolutely perfect condition. Almost all the butterflies and moths were bred specimens, and many of our rarer Lepidoptera are represented by entire broods, showing the variation and intergradation of the species. The suites of *Datanas* and *Limacodes* were at that time the largest and finest that had ever been brought together. Almost all the specimens in this collection were obtained in New York City and vicinity.

The material for study and exhibition increased with great rapidity. The curator himself added thousands of specimens, and the Museum became the possessor, almost simultaneously, of two great collections of butterflies: the James Angus and the Harry Edwards collections, numbering respectively thirteen thousand and two hundred and fifty thousand specimens. The Harry Edwards Collection contained hundreds of type specimens and was one of the largest private collections in the world. There were also added numerous examples of insect architecture, of insect mimicry, and of the destructive effects of gall insects on plants. By these acquisitions the entomological interests of

the Museum were raised at one step to a really prominent position.

The period of these material accessions was also marked by the successive entomological contributions prepared by the curator for the Museum 'Bulletin.' Gradually the representatives of the great orders Coleoptera, Hymenoptera, Hemiptera, Orthoptera, Neuroptera, assumed their proper relations in the public halls, the insect ranks having been greatly augmented by the valuable gifts of Mrs. William H. Bradford, Dr. Francis Child Nicholas, Mr. J. W. Drexel.

Especially noteworthy is the collection of exotic Lepidoptera presented by Mr. William Schaus. The five thousand specimens in this collection include numerous types and cotypes, and many African, Indian, and Australian moths of preëminent beauty and rarity.

The most sumptuous gift of recent years, which, through the sustained enthusiasm of the donor, has not yet ceased expanding, is the collection of butterflies presented by the Very Rev. Eugene August Hoffman, D.D., LL.D., etc. The specimens have been most critically selected and attractively mounted. Dr. Hoffman began with the butterflies found in America north of Mexico, and purchased a collection of 475 species and 1650 specimens. Continuing his patronage, Dr.

Hoffman authorized the curator to extend the limits of the collection so as to include the more important species of the world, and a beginning has been made in the securing of specimens from the rich collecting grounds of Mexico, Central and South America, Europe, Asia, Africa, Indo-Australia, and Australia. The final installation of the collection in the new quarters assigned to the Department will bring out the morphological and geographical relations of the different families with diagrammatic clearness.

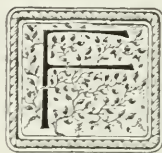
While the growth of the Entomological Department has been encouraging, and while no pains have been spared to develop both the scientific and popular features of the collections, there is still great need in certain directions—notably in the matter of the local collections, which show only the adult stage instead of the complete life history of the insects. Very much to be desired also is a series of diagrams and dissections illustrating insect anatomy and the characters used in classification.

L. P. GRATACAP.

(To be continued.)

THE PORTION of the Hoffman Collection already on exhibition has recently been transferred to the new gallery in the East Wing.

EXTRACTS FROM THE REPORTS OF FIELD PARTIES SENT BY THE DEPARTMENT OF VERTEBRATE PALÆONTOLOGY IN SEARCH OF FOSSIL MAMMALS AND REPTILES, 1900.



FROM the report of Mr. J. W. Gidley, who conducted an expedition into the Loup Fork (Upper Miocene) and Blanco beds of Texas, we excerpt the following:

"The party [including Mr. Hans W. Zinsser of Columbia University] left Clarendon on the 26th day of July traveling south, crossing Mulberry Creek and Prairie Dog Town Fork of Red River east of the plains and ascending the eastern escarpment of the plains by a very steep and rugged trail. . . . From this point [where the escarpment again turns south] we abandoned all trails and travelled along the edge of the plains south-southwest, keeping as near the escarpment as possible, always sending the wagon around the heads of the numerous deep, short cañons cutting back into the plains, whose side walls are so steep and rugged that many of them cannot be crossed even on horseback and none of them with a wagon. With the use of the saddle horses we explored the 'breaks' between camps, thus finding that a large region could be explored with the loss of very little time. . . .

"The exposures examined by our party along this region—which are evidently Loup Fork Beds—seem to be entirely



STRIPPING THE BONE-BEARING LAYER IN SEARCH OF FOSSIL HORSE REMAINS. SHERIDAN BEDS OF TEXAS.



THE NEW MASTODON SKULL IN PROCESS OF EXCAVATION, SHOWING RIGHT TUSK, UPPER TEETH AND LOWER PART OF SKULL. BLANCO BEDS OF TEXAS.

barren of fossils. Therefore after following along the escarpment in the manner described for a distance of about forty miles, we turned away from the 'breaks' and started by as direct a route as possible to Mount Blanco where we arrived August 2d. The prospects here seemed rather discouraging, for it was soon seen that the fossil bearing beds were very limited in area, being less than two square miles in extent, and they at first seemed not to be rich in any but very fragmentary fossils; however our diligent search was rewarded by the discovery of several very valuable specimens, much the most important of which was a skull nearly complete, and lower jaws, five cervical vertebrae, a scapula, fragments of the bones of one fore limb, and several more or less complete ribs, all belonging to one individual of a primitive species of Mastodon which is probably new to science, and which promises to throw some light on the very obscure ancestry of modern and pleistocene elephants. All of this valuable specimen that was visible on the surface, was a small quantity of rib fragments and part of a limb bone, which the writer discovered protruding from and scattered down the slope of a steep bank of sandy clay, very near the bottom of a little cañon or gully. Following up the 'lead' the writer soon exposed the point of a tusk from which the matrix was carefully removed. Tracing it back into the bank about two and one-half feet it was discovered that the proximal end was still held in its socket in the skull. Great then was the rejoicing in camp that night for at one stroke we had discovered a specimen of such rare value (it being the first skull of its kind ever found) that we felt we were amply rewarded for all the hardships we had already undergone and the labors we

were likely to encounter for some time to come."

The report of Mr. Barnum Brown, who conducted an expedition into the Ceratops Beds (Upper Cretaceous) of South Dakota and Wyoming, reads, in part, as follows:

"[Near Cheyenne River] . . . I found specimen No. 8 . . ., a nearly complete skeleton of *Diclonius* (*Claosaurus*?*), consisting of skull, lower jaws, vertebral column, ribs, and petrified tendons, embedded in stratified sandstone resembling a concretion. The extreme caudal end of this specimen was gone, having been eroded by recent rains. A femur, a few petrified tendons, and the pubes of *Diclonius*, together with a complete carapace and plastron of a turtle and a *Triceratops* pubis were found in soft sand surrounding the hard sandstone matrix of the skeleton. This specimen was taken up in five large sections encased in plaster jackets, two of them weighing over two tons apiece.

"In the sandstone matrix surrounding this specimen and in sandstone close by were found impressions of leaves, ferns, palms, rushes, and grasses,—a veritable herbarium of this period, in which I made out and collected nineteen different species. I respectfully point out the possibility of reproducing this foliage in wax for a foreground, when this specimen is mounted. While working this specimen I discovered No. 12, a carnivorous dinosaur. . . . The bones of this specimen were disassociated and scattered, necessitating the removal of a bank of clay, forty feet along the face of the ex-

* *Claosaurus*, a beaked dinosaur of medium height (10 ± feet) resembling the *Iguanodon* of Europe.

posure, and back into the hill a distance of fourteen feet. In many respects this interesting specimen resembles *Ceratosaurus** of the Jurassic formation. It consists of lower jaws (having the large foramen characteristic of *Ceratosaurus*), serrated teeth of uneven height, joined by cartilage not ankylosed. . . . Numerous plates varying from a half inch to six inches across, always found closely associated with ribs, formed the dermal armature. . . . Among the bones were the teeth of *Hadrosaurus*, † *Palaoniscus* ‡ . . . scales of fish and small bones,—all evidences of the animal's last meal. . . .

"In conclusion I wish to mention the finding of three much worn pebbles in the matrix surrounding the cervical vertebrae of *Claosaurus*, preserved in the collection. These stones are metamorphic, about the size of an egg, and are never found in the Ceratops Beds to my knowledge. There seems little doubt that these stones were in the flesh of this specimen when entombed and were probably used in the mastication of food.§ . . ."

The total thickness of the Ceratops deposits was determined by a trigonometrical method to be about 3066 feet, the data being: the dip of the strata, the elevation of the topmost stratum at a given point, and the length of a base line.

* *Ceratosaurus*, a horned carnivorous dinosaur.

† The Duck-billed Dinosaur.

‡ An extinct genus of ganoid fishes.

§ Mr. Brown regards the non-masticatory character of the teeth as in harmony with the hypothesis that *Claosaurus* had a bird-like gizzard. Moreover, similar stones are frequently found associated with the remains of Mosasaurs (marine saurians).

An expedition under Mr. Walter Granger was sent into the Jurassic region of Colorado and Wyoming. Many miles of escarpments in Colorado were thoroughly prospected but without success. However, "only a comparatively small area has so far been examined, and although success has not yet attended the efforts it is not impossible that valuable deposits may be found in the future." In Wyoming the expedition resumed work at the famous Bone Cabin Quarry* and in the Como Bluffs, with much better success.

"The first cutting was made at the point where the work was abandoned on the year previous, *viz.*: the northwest corner. During the season three separate strippings were made uncovering an area of 1400 sq. ft. of the bone-bearing layer. A small section of this area proved barren, but for the most part bones occurred in fair abundance and averaging in quality better than those uncovered in former seasons in the quarry. With very few exceptions all inferior bones were discarded; these represent about one third of the whole number excavated. None of the soft blue clay in which all of the collection of 1898 was found was encountered, the bones occurring in sandstone of various degrees of hardness. The more noticeable features of the third collection from the Bone Cabin Quarry are the absence of any complete feet and the presence of considerable skull material

*So named from the fact that the walls of a sheepherder's cabin had been built out of boulder-like fragments of dinosaurs found on the ground near the quarry.



PACKING, DINOSAUR BONES, ENCASED IN PLASTER, AT THE BONE CABIN QUARRY.

and parts of small dinosaurs of the *Hall*-*lopus* type. The usual methods of collecting were followed except that more care was exercised in covering the exposed surface of the bones with tissue paper to prevent the adhesion of the plaster bandages. The experiment was tried of using, under the plaster, a covering of paste bandages. This was found to be practicable in dry weather and it is undoubtedly of advantage in working out delicate bones such as vertebrae and skulls.

"In the Como Bluff exposure Mr.

Thomson located a connected series of seven cervical and nine dorsal vertebrae of the great herbivorous dinosaur *Diplodocus*, together with seven loose dorsal ribs and several pairs of cervical ribs in position.

"The work of excavating was rendered somewhat arduous, first from its occurrence at a point of the bluff rather difficult of access, and second, from the steepness of the bluff directly over the prospect, necessitating a vertical cut of over 20 feet, which had to be done entirely by hand.

"The entire season's collection in this vicinity amounted to 47 boxes, of which 27 were from Bone Cabin Quarry, 11 from the Diplodocus Quarry, and 9 (mostly small) miscellaneous collections, representing a gross weight of 21,000 lbs.

"Diagrams of both Bone Cabin and Diplodocus Quarries were made, and a geological section from near the mouth of Sheep Creek to the southern side of the Como Anticlinal was drawn by Dr. Loomis. Mr. Thomson obtained a series of some fifty negatives from both Colorado and Wyoming, illustrating the geology, work in quarries, camp life, etc."

In the months of October and November, 1900, another expedition, under Mr. G. R. Wieland of Yale University, made a reconnaissance of the Jurasso-Cretaceous Rim of the Black Hills, South Dakota. Among the material secured were: portions of the skeleton of *Morosaurus*,* a femur of *Camptosaurus*, portions of the skeleton of *Brontosaurus*,† a portion of the shield of some armored saurian presumably allied to *Stegosaurus*.‡ Important stratigraphic results were worked out; the report is accompanied by tables showing the character and thickness of the strata of various sections. W. K. G.

* A large herbivorous dinosaur with a short, deep lower jaw, and a short, high skull.

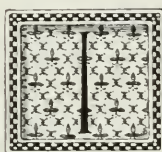
† One of the largest of the herbivorous dinosaurs.

‡ A distinctive feature of *Stegosaurus* was the high, arched back, with a double row of more or less triangular plates set vertically on each side of the backbone, continuous with which were a double row of pointed spines on the tail.

MEMOIRS OF THE AMERICAN MUSEUM OF NATURAL HISTORY.

II.—ANTHROPOLOGICAL SERIES.

(Continued.)



IN the previous section of this review there was given a summary of the principal anthropological explorations and expeditions maintained by the Museum, which furnish material for exhibition and research. The object of the Jesup North Pacific Expedition, namely, the investigation of the tribes of the whole coast of the North Pacific Ocean, was explained; the first two papers on the Jesup Expedition, "Facial Paintings of the Indians of Northern British Columbia," and "The Mythology of the Bella Coola Indians," both by Dr. Boas, were reviewed.

These papers offer definite answers to certain circumscribed problems: first, the relation of the geometric to the less conventionalized designs in the art of the Northwest Coast; second, the origin of a Northwest Coast mythology. They are more or less complete in themselves, and of especial interest to the layman as illustrating the nature of ethnological investigations.

But the full meaning and value of these and of the other contributions to the series are, of course,

cumulative. One should not lose sight of the simple fact that the laws back of natural phenomena cannot be inferred until after the phenomena have been described and classified adequately. "We see that the growth of human culture manifests itself in the growth of each special culture. . . . We must, so far as we can, reconstruct the actual history of mankind, before we can hope to discover the laws underlying that history."* Accordingly these papers are largely descriptive and historical. One ought not to be disappointed because they do not seem to contain great generalizations.

The paper on the facial paintings referred to certain tribes,—Tlingit, Haida, Tsimshian, Nootka, Kwakiutl, which, although speaking different languages, have many well-marked traits of culture in common; for example, the peculiar method of adapting the animal subject to the decorative field by means of distortion and dissection. These are the typical "tribes of the North Pacific Coast." The Bella Coola, whose mythology was discussed in the review of the second paper, resemble the neighboring tribes of the coast in culture, but are not closely related to any of them. They are, in fact, a Salish tribe.

The principal Salish tribes are the Coast Salish, Lillooet, Shuswap, Bella Coola, Ntlakapamuk (Thompson Indians), Okanagon.* The territory of the Salish tribes may be said in a general way to lie to the southeast of that of the North Pacific Coast tribes, both on the coast and, in the interior, along the banks of the Fraser and Upper Columbia rivers. On the northeast, Salish territory once extended to about the fifty third parallel. On the southeast it extended into Montana. Salish tribes were also to be found in the southeastern part of Vancouver Island. Although these tribes were characterized by a "considerable diversity of customs and a great diversity of language,"† there is sufficient similarity between the word-roots of the different dialects to show that they should be classed together under a single linguistic family or stock, the Salishan. It may be well to state that among the native tribes of America north of Mexico there are generally recognized about fifty-eight such linguistic stocks, all of which seem to be independent of each other in origin. An investigation of the culture of the tribes speaking Salishan languages is one of the objects of the Jesup Expedition. The memoir of Mr. James

* See map in previous number of this journal.

† J. W. Powell, *Ann. Rept. Bureau of Ethnology*, 1885-86, p. 104.

* Franz Boas, quoted in this journal, Vol. I, Nos. 7-8, 1901, pp. 116, 117.

Teit on the Thompson Indians, the fourth paper of the series, illustrates very fully the culture of an important Salish tribe.

Anthropology I, Part IV.—The Thompson Indians of British Columbia. By James Teit, pp. 163–392. Pls. XIV–XX.

Dr. Franz Boas, the editor of the memoir, gives preliminary information as follows:

“The following description of the Thompson Indians is based on two manuscripts prepared by Mr. James Teit,—the one a description of the Upper Thompson Indians . . . ; the other a description of the Lower Thompson Indians, . . . as a result of work done by Mr. Teit for the Jesup North Pacific Expedition. To these manuscripts have been added notes furnished by Mr. Teit, explaining the uses, and methods of manufacture, of specimens which he collected for the expedition. Other information was furnished by him in reply to inquiries of the writer concerning questions that seemed of interest. The detailed descriptions of methods of weaving, and the patterns for costumes, are based on examination of specimens in the Museum. The chapter on art and the conclusion were written by the editor. The former is the result of his study of specimens and photographs, and of personal inquiries conducted with the assistance of Mr. Teit.

“Mr. Teit is fully conversant with the language of the Thompson Indians, and, owing to his patient research and intimate acquaintance with the Indians, the information contained in the following pages is remarkably full. Physical characteristics, language, and the mythology

and traditions of the people, are not included in the present description.”

The habitat of the Thompson Indians is “the southern interior of British Columbia, mostly east of the Coast Range, but it extends far into the heart of that range. It is about a hundred miles in length, by ninety in breadth. Through this territory flow three rivers,—Fraser River; its principal tributary, Thompson River; and a smaller tributary of the latter, Nicola River. In the valleys of these rivers, or in close proximity thereto, are found the principal villages of the tribe, while the country on either side is their hunting-ground.”

The country of the Lower Thompson Indians is extremely rugged. The rainfall is abundant, and the whole country is clad with heavy timber, mostly fir and cedar. Game is scarce, so that the Indians depend mostly on the products of the streams for their livelihood. The country of the Upper Thompson Indians is far less rugged. The valleys are covered with sagebrush and other evidences of a dry climate, the mountains with grass and scattering timber. Game, especially deer, is much more abundant. These different environments have to some extent reacted differently on the culture of the inhabitants, the Lower Thompsons being expert canoeists and fishermen, and the Upper Thompsons better horsemen.

Formerly deer, salmon, roots, and berries were the staple food of the tribe. Deer was more important to the upper division, while salmon was the principal food of the lower division. In those days a large portion of the tribe lived in the mountains during the greater part of the year, moving about from one root-digging or deer-hunting ground to another, according to the harvest-time of certain



SMALL ETHNIC GROUP ILLUSTRATING THE LIFE OF THE THOMPSON RIVER INDIANS.

roots and berries, or as the deer changed their feeding grounds during the seasons. The men engaged in hunting and trapping, while the women attended to the gathering and preparation of roots, berries, and other food. Only when winter set in did they return to their winter houses.

Most of the implements and utensils of the Thompson Indians were made of stone, bone, wood, bark, skins, matting, or basketry. Work in stone, bone, and wood was done by the men, while the preparation of skins, matting, and basketry-work fell to the share of the women. There was a certain amount of division of labor, inasmuch as workmen skilled in any particular line of work exchanged their manufactures for other commodities.

For work in wood a number of tools were used. Trees were cut down by means of wedges made of elk-antler, which were driven in with stone hand-hammers. (See cut on following page.)

"The houses of the tribe were similar to those of the Shuswap and Okanagon. Like all the southern tribes of the interior, they used a semi-subterranean . . . hut as

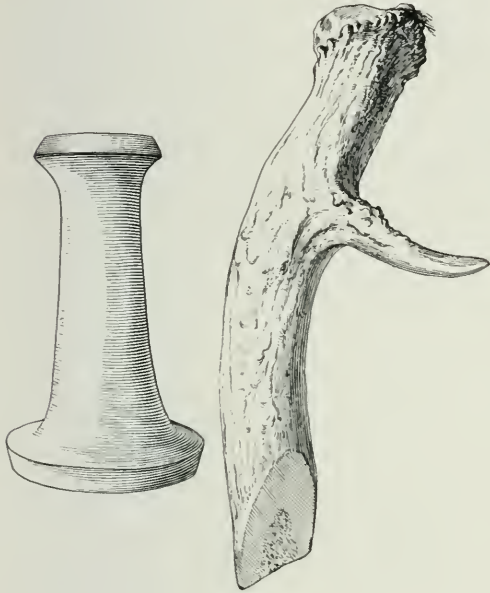
a winter dwelling. These winter houses were generally built in the valleys of the principal rivers, within easy distance of water, and were inhabited by groups of families related to each other, who, although scattered during the hunting and fishing seasons, dwelt together during the winter. . . . The size conformed to the number of people (from fifteen to thirty) to be accommodated. A spot with loose soil was selected for the site of the underground house. The person who desired to build the house asked all his neighbors to assist. Frequently twenty or thirty people came, so that the building was sometimes completed in a single day."

The summer houses were lodges, like those of the Indians of the Plains. An important structure was the "sweat-house," wherein the people fasted on certain occasions. It was semi-ovoid in shape, the framework being made of light willow wands.

The dress of the Thompson Indians, before their intercourse with the Hudson Bay Company, was made almost entirely

of dressed skins, with or without the hair. The skins were scraped and softened in the manner illustrated in the ethnic groups in the exhibition halls of the Museum. The principal articles of clothing were shirts, trousers, and robes.

Basketry-making is an important industry among this tribe. The people



STONE HAND-HAMMER AND WEDGE MADE OF ELK-ANTLER.

make various baskets of birch-bark and beautiful coiled baskets of cedar-twigs. Mat-making, weaving, and netting were also practised.

The men played a number of games, including lacrosse. There were many children's games. Games of chance were popular. Dice were made out of beaver-teeth.

The weapons of the Thompson Indians were bow and arrow, spear, knife, war-club, and tomahawk. For defence, shields and armors made of wood or of hide were used.

Before the arrival of the fur-traders,

the Thompson Indians often engaged in war-expeditions. Regular tribal wars, in which one whole tribe was arrayed against another, were very rare. Most of their warfare was for the sake of plunder, adventure, or revenge. War parties numbered from five or six individuals to companies of several hundred. A man who refused to join in these war-expeditions lost the respect of his fellows. Though many of the chiefs favored peace rather than war, yet there was seldom much difficulty in obtaining men for these expeditions, many joining for the sake of the spoils, others merely from love of adventure or to obtain distinction. War parties were not highly organized. Slaves were taken, but were often ransomed by their friends, or after some years were allowed to escape. Excepting in the case of the so-called Frazer River War of 1858, the relations of the tribe with the whites have been peaceful.

The Thompson Indians had neither hereditary chiefs nor a recognized nobility. The rank of each person was determined by his wealth and his personal qualities. Their "chiefs" were therefore men of the tribe noted for wealth, wisdom, oratorical powers, or prowess in war. . . . When at the same time wise and wealthy, they exerted a very great influence over the people, who willingly obeyed them. Some of them were looked upon as the chief men of certain large districts, the people negotiating through them with strangers; yet they seldom or never acted in matters of public interest without obtaining the consent of all their people. Wealthy persons also held prominent positions in the tribe. The more liberally they gave of their riches, the more highly they were thought of; hence public feasts and presents were frequently given. They made a point of treating

strangers well, that they might become known among the people of other tribes.

Under these conditions the title of "chief" could not be hereditary; but the fact that a man was the son of a chief gained him a certain amount of popularity. If, however, he failed to attain the necessary qualifications, he was not called "chief," nor would he be considered in any way different from the mass of the people.

The hunting territory seems to have been considered the common property of the whole tribe. The berrying and root-digging grounds were also common property.

Blood relationship was considered a tie which extended over generations, both in the male and female line. The relatives of a person killed by a member of some other tribe had to avenge his death by a war-expedition against the offending tribe. If they failed to do so, they were called "women." Time was of no account in this vendetta; and old scores were sometimes paid off after the lapse of ten or twenty years, or even after the death of the originators of the feud.

This idea of the unity of the family is most strongly brought out in the hereditary names of the Indians. Each family had certain names, and no one but members of the family was permitted to use them.

In domestic affairs each male member of age had a right to express his opinion or give his advice, although in most cases the father's or eldest son's advice was taken. The father and eldest son seem to have been looked upon as the highest authorities, although custom required that they should not do anything of importance to the family without first consulting its other male members.

It was considered the man's duty to

hunt, to trap, to fish, to snare, to fight, to make all the tools and weapons, to fell trees, to instruct and advise his children, especially his sons, to help look after the horses, to look after the hunting-dogs, to be energetic, to protect his wife, and to beat her if she were lazy, or admonish her, etc.

Married women had to do almost all the work of the house. Some men, however, helped their wives in the tanning of buckskin, putting-up of lodges, etc., and often manufactured articles for them, such as root-diggers, etc. It was considered the woman's duty to carry all firewood; erect the lodges, keep them clean inside, and light the fire; gather and carry brush for beds, etc.; make all kinds of mats, baskets, sacks, and bags, as well as all clothing, including moccasins; wash and cook; dig and cure or cook roots, and gather and cure berries; help to clean and dry fish, to carry meat or game shot, and to look after the horses; dress all skins for clothing, etc.; fetch water; look after and nurse the children; and educate her daughters to be diligent in their work, and faithful and obedient to their husbands; etc.

The Indians have always been fond of gathering for feasting and talking, as they are at the present day. Feasts of all kinds took place in the winter, when the Indians were in their winter houses. Many feasts were simply social gatherings, where one family who had a large supply of food invited the neighboring families to partake of their abundance and spend a day or so in feasting or conversation. This kind of feast showed the good will and liberality of the donor.

"Although the Thompson Indians, when the white miners first came among them, had the reputation of being treacherous, they cannot be so characterized at



WOMAN DIGGING ROOTS.

the present day. As with every other people, there are both good and bad among them ; but on the whole they are more honest and industrious, intelligent and receptive, than other Indian tribes. They are quiet, sociable, and hospitable ; yet combined with the last two qualities are often pride and suspicion. Some are of a jocular, humorous temperament ; and some are courageous, determined, and persevering, although the last-named quality is not a characteristic of the tribe as a whole. Some show it, however, to a marked degree when hunting or fishing. Being proud, they are easily offended,

but seldom allow their wrath to get the mastery of them. As a rule, they are not vindictive. They admire a man who is athletic, active, energetic, industrious, strong to endure, brave, hospitable, liberal, sociable, and kind. They are fond of the wonderful, of oratory, gambling, story-telling, hunting, and horseback-riding. They are not as proud-spirited as they were, nor do they take as much interest in games, athletic exercises, and fun as formerly. Disease and the knowledge that they are doomed to extinction are the chief causes for this ; while change of pursuits, and the acquirement

of new ideas, also have their effect.

“ At present these people, both socially and otherwise, may be said to be in a state of transition from the customs and modes of life of the past, to those at present in vogue among the surrounding whites. Although some of the old people cling tenaciously to many of the old habits and traditions, the one idea of many of the younger people is, to advance their material condition, and to copy and vie with the whites in many lines of industry, as well as in customs and dress.

“ Ethical Concepts and Teachings.— It is good to be pure, cleanly, honest,

truthful, brave, friendly, hospitable, energetic, bold, virtuous, liberal, kind-hearted to friends, diligent, independent, modest, affable, social, charitable, religious or worshipful, warlike, honorable, stout-hearted, grateful, faithful, revengeful to enemies, industrious."

It is bad to be the opposites of these, the practice of virtue implying praise and reward, of vice, ridicule, censure, and requital.

Some elderly man of a household would often speak to the people until late at night, admonishing and advising them, especially the young of both sexes, how to act and live with one another; telling them the benefits of being good and the results of being evil, also giving his ideas of the future life, etc.; thus teaching them and guiding them by his knowledge and experience. In winter many nights were spent in speech-making of this kind, in relating stories of war, hunting, and other experiences, and telling mythological stories.

The mythology and traditions of the people are not formally treated in this volume. However, the author shows that while certain prayers and customs suggest that a general animism is the fundamental principle of their religion, . . . the ceremonials that were formerly in use suggest that a vague worship of nature formed also a prominent part of their beliefs.

There were many formal observances and practices, relating especially to birth, childhood, puberty, marriage.

"The principle of decorative art of the Thompson Indians is quite distinct from that of the Coast tribes. The former have the conception of animals adapting themselves to the use of man, and assuming the form of implements. The whale becomes a canoe, the seal a dish, the crane

a spoon. The latter adopt this idea very rarely, but decorate their implements with symbolic designs placed on a suitable surface, but without any immediate connection with the form of the implement. In the former, the decoration depends upon form; in the latter, form and decoration have no intimate connection. Comparatively few designs are primarily decorative. Their fundamental idea is symbolic. For this reason by far the greater number of designs may be described as pictographs rather than as decorations. Nevertheless the symbol is often used for purposes of decoration.

"The symbols are mostly painted, etched, or etched and filled with colors. The Thompson Indians have not developed any great skill in graphic art. Their designs are largely attempts at a realistic representation, but the difficulties of execution have led them to adopt a number of conventional expedients to express certain ideas. They use a number of conventional designs, the meaning of which is always understood."

In the conclusion the editor states that:

"In a general way, we may say, therefore, that the Thompson Indians are in appearance and culture a plateau tribe, influenced, however, to a great extent by their eastern neighbors, to a less extent by the tribes of the coast. Their whole social organization is very simple; and the range of their religious ideas and rites is remarkably limited, when compared with those of other American tribes. This may be one of the reasons why, in contact with other tribes, the Salish have always proved to be a receptive race, quick to adopt foreign modes of life and thought, and that their own influence has been comparatively small."

W. K. G.

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Volume I

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Number 11

NOTES AND NEWS.



WE desire to call particular attention to the supplement issued with this number of the JOURNAL. This consists of a "Guide Leaflet" to the Bird Rock Group recently installed in the southwest corner of the gallery of the north wing of the Museum. The leaflet has been prepared by Mr. Frank M. Chapman, the associate curator of the departments of Mammalogy and Ornithology, and is intended to assist the unprofessional student as well as the casual visitor in understanding not only this group, but also its relations to other exhibits in the department of Ornithology and elsewhere in the building.

Separate copies of this leaflet may be obtained from the floor attendant, or at the entrance to the building.

THE past summer has been a season of great activity, especially in the several departments of the Museum that send expeditions into the field for the collection of specimens. Some notes of the results of the work of the various parties will be found in the present and future numbers of the JOURNAL.

LECTURES.

THE DEPARTMENT OF PUBLIC INSTRUCTION announces the following lectures for the first half of the ensuing season :

To Teachers of the Public Schools, Saturday mornings at 10:30 :

Oct. 26th and Nov. 2d.—The Pan-American Exposition of 1901.

Nov. 9th and 16th.—London : The City and the Thames.

Nov. 23d and 30th.—London : Its Museums and Galleries.

Dec. 7th and 14th.—London : Its Environs.

The Members' Course will be given Thursday evenings at 8:15, with the following programme :

Nov. 21st.—The Pan-American Exposition of 1901.

Dec. 5th.—London : The City and the Thames.

Dec. 12th.—London : Its Museums and Galleries.

Dec. 19th.—London : Its Environs.

PROFESSOR BICKMORE had the honor of being appointed a juror on the entire United States exhibit at the Pan-American Exposition, and therefore was accorded special privileges for photographing the government exhibits at the Fair. The illustrations form a special

feature of his official report, and slides from the same negatives are to be used in his lectures.

The negatives for Professor Bickmore's three new lectures on London have been prepared by Messrs. J. H. Abegg and Henri Hoffer, who also prepared the wonderful illustrations of Paris and the Universal Exposition which were used for the lectures last year. These gentlemen received special privileges in London, particularly the British Museum and the Museum of Natural History, and also the National Gallery; they had permission also to photograph the interior of palaces and private grounds of particular interest in and near the Metropolis. Thus there has come to the American Museum an especially valuable and complete set of views of London, which will no doubt be appreciated as much as was the set of last year on Paris.

THE PUBLIC LECTURES given under the coöperation of the city Department of Education with the American Museum of Natural History began Tuesday evening, October 8th, with the following programme for successive Tuesday evenings until the middle of December:

October 8th.—Russia, by Peter Mac Queen.

October 15th.—Scotland and Burns, by Peter Mac Queen.

October 22d.—The Passion Play, by John C. Bowker.

October 29th.—A Tramp through Switzerland, by E. C. Chorley.

November 5th.—Saunterings in Merrie England, by Thomas Edw. Potterton.

November 12th.—The American in Holland, by Dr. Wm. E. Griffis.

November 19th.—The Castle-Bordered Rhine, by Thomas Edw. Potterton.

November 26th.—Imperial Berlin and other German Cities, by Prof. H. E. Northrop.

December 3d.—Constantinople, by Jesse L. Hurlbut.

December 10th.—Rome, by Wm. Freeland.

December 17th.—Cities of the Baltic, by G. R. Hawes.

The popularity of the Tuesday evening courses in the past few years has been such that a new course for Saturday evenings under the same auspices has been inaugurated this year. It began October 19th with the following programme:

Six lectures on Astronomy by Prof. Robert W. Prentiss—

October 19th.—The Sun; Its Phenomena.

October 26th.—The Sun; Spectrum Analysis, Light and Heat.

November 2d.—The Moon; Its Appearance, Motions, Scenery, and Physical Condition.

November 9th.—The Planet Mars; Is it Inhabited?

November 16th.—The Planets; Their Telescopic Appearance and Physical Condition.

November 23d.—Comets and Meteors; Their Mutual Relations.

Three lectures on Nature Study
by Edward F. Bigelow—

November 30th.—Journeys about Home
Roadsides, Fields and Forests.

December 7th.—Travels in a Swamp.

December 14th.—Haunts of Nature.

All of these lectures are profusely
illustrated by stereopticon views.

CONVENTIONS.

THERE will be a meeting of the
American Ornithologists' Union in
the large lecture hall of the Museum
from the 12th to the 14th of No-
vember inclusive. Various papers
and illustrated lectures will be pre-
sented, and the general public is
cordially invited to attend the ses-
sions. All who are interested in
birds and bird-lore will find much
of value in these meetings.

ON the 14th of November the
national conference of the Audu-
bon societies of America will be
held at the Museum. As the meet-
ing of the Ornithologists' Union
occurs at the same time and place,
the conventions of the two bodies
will be merged for the time being.
A cordial invitation is extended to
the general public to attend the
sessions.

DEPARTMENTS OF MAMMALOGY AND ORNITHOLOGY.

DR. J. A. ALLEN, Curator of the
Department of Mammalogy and

Ornithology, has recently returned
from a three-months' trip abroad,
the purpose of the trip being scien-
tific study at foreign museums, par-
ticularly at the British Museum.
He took with him for comparison
with the type specimens and other
historic material quite a collection
of mammals from South America.
His work abroad was principally at
the British Museum (South Ken-
sington), where five weeks were
spent in studying the rich collection
of South American mammals, which
contains the types of many species
described by Waterhouse, Bennett,
Tomes, Gray, Thomas, and others.
Thanks are due to the Curator of
the Department of Mammals at
the British Museum, Mr. Oldfield
Thomas, for the freest access to the
collections and for valuable personal
assistance.

The material taken abroad by Dr.
Allen included a complete suite of
the mammals of Patagonia, collected
by the Princeton Expeditions, and
through the opportunities available
at the British Museum the species
were all satisfactorily determined.
Also much original work was done
on the South American Opossums
of the genus *Didelphis*, and on
various genera of the family *Octo-*
dontidae.

The recent additions to the De-
partment of Mammalogy and Orni-
thology include a large and very

important collection of mammals and birds from the State of Vera Cruz, Mexico, which contains good series of specimens of several species not before represented in the Museum collection. The Museum has also received from the Duke of Loubat a valuable collection of mammals, collected chiefly in the State of Jalisco, which adds much valuable material. A third collection of mammals and birds has been received from Venezuela, collected by Mr. Klages; and a final installment of birds and mammals of the H. H. Smith Collection from the Santa Marta District of Colombia has also come to hand.

Each of these shipments includes a number of very desirable specimens available for mounting for exhibition, as well as important material for the investigation of South American mammalogy.

DURING the past summer, Mr. Frank M. Chapman, the associate curator of the Departments of Mammalogy and Ornithology, made an extended trip in the western British Possessions. In Manitoba he secured material for groups of cormorants, Wilson's phalarope, and the yellow-headed blackbird. In the Selkirk Mountains he secured the specimens needed for a group of the American dipper or water-ousel.

DEPARTMENT OF GEOLOGY.

THE DEPARTMENT OF GEOLOGY sent Dr. E. O. Hovey, the associate curator, into the Black Hills region of South Dakota and Wyoming during July and August to collect fossils from the marine Jurassic beds exposed there. He obtained a large amount of valuable material illustrating species heretofore almost entirely unrepresented in the Museum. A portion of what was sent in is now on exhibition in Alcove No. 14, on the west side of the Geological Hall (No. 405) and in one of the Cretaceous cases in the centre of the hall.

DR. A. C. HADDOX, Professor of Anthropology in the University of Cambridge, England, is spending several weeks in the United States studying the collections in that branch of science. While in New York he is the guest of the Museum.

AN ICHTHYOSAUR WITH YOUNG.



THE American Museum has just received a royal gift from the Museum of Stuttgart, Würtemberg. It comes through Prof. Eberhard Fraas, who made a long tour of exploration in the fossil beds of the Rocky Mountain



ICHTHYOSAURUS QUADRISCISSUS QUENSTEDT.

region with Professor Osborn last spring. The fossil is a superb specimen of an Ichthyosaur, from the Jurassic quarry of Holzmaden, a little town not far from Stuttgart, which is famous for its Ichthyosaur remains. The specimen just received by the Museum is on a slab, 9 feet 3 inches in length and 2 feet 5 inches in breadth. It is a perfectly preserved example of the species *Ichthyosaurus quadriscissus*. Ichthyosaurs, or marine, externally fish-like fossil reptiles, have been found in abundance both in Germany and in England, but what renders this specimen unique is the fact that it contains indications of several young animals within the body-cavity of the mother, thus giving a beautiful demonstration of the fact that the Ichthyosaurs were viviparous, bringing forth their young alive. The young animals are surprisingly large, the head of the largest being $9\frac{1}{2}$ inches long, or half as large as that of the mother Ichthyosaur. The backbone and paddles of the young are well developed and prove that they were abundantly able to swim and take care of themselves immediately upon birth. This is one of the most remarkable features of the adaptation of the Ichthyosaurs to marine life. The ancestors of these animals undoubtedly lived upon land and were oviparous—but as they became more and more

sea-faring in habit there must have been a gradual retention of the young in the abdominal cavity until a later and later period of development. The visits of marine animals to the land for the purpose of egg-laying are very hazardous, as is shown by the life of the marine Turtles, which also live far out at sea and are always obliged to return to the seashore to deposit their eggs.

THE DUKE OF LOUBAT'S REPRODUCTIONS OF THE ANCIENT MEXICAN CODICES.



THE Museum has just received from the Duke of Loubat his latest reproduction of Mexican codices, the Codex Ferjevary-Mayer. The original is in the Free Museum of Liverpool, having been purchased by Mr. Mayer from the collection of M. Ferjevary of Budapest. Its whereabouts seems to have been lost to students until about six years ago, when it was noticed by Mr. M. H. Saville in the back of a basement case in the museum in Liverpool. It is reproduced in Kingsborough's great work, but the pages are not given in their proper sequence. The present edition (Loubat's) is an exact fac-

simile of this most important codex, which was made on deerskin, and not maguey-paper as has been generally supposed. The pages are nearly square, measuring $6\frac{3}{4} \times 6\frac{1}{8}$ inches. It contains two blank pages forming the covers, the work being folded screen fashion, and forty-four pages of paintings in colors. The book comes to us with a short introduction by the Duke of Loubat, but a study of the codex by the eminent Americanist, Professor Seler of Berlin, is now in press, and will soon be issued.

This is the seventh of the magnificent reproductions—copies of which are now on exhibition in our Mexican Hall—which the student of American antiquities owes to the liberality and intelligence of this patron of science.* They are as follows:

Codex Vaticanus, No. 3773, published 1896.

Codex Borgia, published 1898.

Codex Cospiano, published 1899.

Codex Telleriano-Remensis, published 1899.

Codex Vaticanus, No. 3738, published 1900.

Tonalamatl Aubin, published 1900.

Codex Ferjevary-Mayer, published 1901.

* In addition, we should include Codex Borbonicus, published in 1899 by Leroux of Paris, through the initiative of the Duke of Loubat, who made its publication possible, and who presented the Museum with the copy on exhibition here.

SUMMER WORK OF THE DEPARTMENT OF VERTEBRATE PALÆONTOLOGY.



OUR expeditions for fossil vertebrates were sent out by the Department. The season opened inauspiciously with the failure of the expedition to the Black Hills region for Dinosaurs, all the prospects which had been located proving worthless. But the subsequent successes in other fields were so brilliant as to more than compensate for this early failure.

The old Bone Cabin Quarry which was discovered in 1898, and has been worked on an extensive scale for two years past has yielded remarkable results. The shales of the quarry gave place to sandstones, which were more rich in skull material. In the season of 1900 two skulls were found, both unique, one of a carnivorous Dinosaur and one of the herbivorous Sauropod *Morosaurus*. During the past summer another equally complete carnivorous Dinosaur skull with lower jaws has been found, also a less perfect skull, believed to belong to *Brontosaurus*, and portions of three others. These, however, while the most important discoveries, represent only a small part of the splendid Dinosaur material found in this quarry, which

filled 50 boxes. Toward the end of the season the fine collection found by Mr. W. H. Reed, the well-known collector, was secured, together with all the rights of two of his prospects; one of them is a quarry which promises very well. This party, consisting of Messrs. Granger and Kaisen, returned about October 15th.

The signal event of the year is the gift of the special fund of \$15,000 for the exploration of fossil horses, by a generous friend of the Museum who desires his name to be withheld for the present. The Museum already has a fine collection of fossil horses, secured through the purchase of the Cope Collection and through expeditions sent out since 1890. But this liberal gift has enabled the curator to plan for exhibition and exploration on an unprecedented scale; so the evolution of the horse can be demonstrated to the public not only by means of the feet and skulls, as at present, but by a long series of mounted skeletons. Complete fossil skeletons are most rare, and it is therefore a cause for congratulation that the Eastern Colorado expedition, led by Dr. Matthew and Mr. Brown, and including Mr. Thompson of the Museum and Dr. Loomis of Amherst, secured a perfect skeleton of *Anchitherium*, a collateral ancestor of the horse, and materials

for a complete composite skeleton of *Protohippus*, believed to be one of the true ancestors of the horse, besides much comparative material. Almost equal good fortune attended the Texas expedition for fossil horses led by Mr. J. W. Gidley. The first day's exploration resulted in the discovery of the remains of a small herd of *Protohippus*, including eight skulls and other parts of the skeleton; these, though somewhat crushed, are very complete.

The expeditions for fossil horses are not precluded from bringing in other materials which are found *en route*, and noteworthy discoveries have been made by both parties of fossil mammalian contemporaries of the horses, especially *Amphicyon*, the giant dog of the period, the skull of a Mastodon, and the shell and tail of a Glyptodont related to *Hoplophorus* of the Brazilian bone caves. Altogether 20 boxes were sent from Texas and 32 boxes from Eastern Colorado, the latter containing remains of 110 animals belonging to numerous species, including Camels, Rhinoceroses, and Oreodonts.

In the spring an extensive trip through the Jurassic of Colorado was made by Professor Osborn, accompanied by Professor Eberhard Fraas of Stuttgart. The latter has shown his friendship for this Museum by presenting in exchange a magnificent specimen of *Ichthyosaurus*

quadriscissus nearly nine feet in length, and containing several young ichthyosaurs in the abdominal cavity. This is believed to be the most interesting specimen of its kind which has yet reached this country; and the Museum is greatly indebted to Professor Fraas for its selection.

Three important purchases have been made. (1) The collection and quarry of Dinosaurs from Mr. Reed, alluded to above. (2) A magnificently preserved predaceous fish from the Kansas Cretaceous, commonly known as *Porthetus molossus*. It is a few inches under 16 feet in length and lacks only the central portion of the spines and ribs, the vertebral series, head, and tail being complete. It was found by a well-known explorer of the fossil vertebrates, Mr. Charles H. Sternberg. The specimen will be appropriately mounted in the Marine Reptile corridor, immediately over the contemporary Mosasaur skeleton from the same region. (3) The skull of a fossil Mammoth from Texas, with tusks 11 ft., 4½ in. in length. This will crown the series of fossil proboscidean skulls, which now comprises two complete primitive Mastodon skulls, one very primitive Elephant skull (*Elephas mirificus* Leidy) and two fine Mammoth skulls including the one above mentioned.

H. F. O.

AMERICAN MUSEUM OF NATURAL HISTORY

The Bird Rock Group



BY

Frank M. Chapman

Associate Curator of Mammalogy and Ornithology

SUPPLEMENT TO AMERICAN MUSEUM JOURNAL
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BIRD ROCK FROM THE SOUTHWEST.

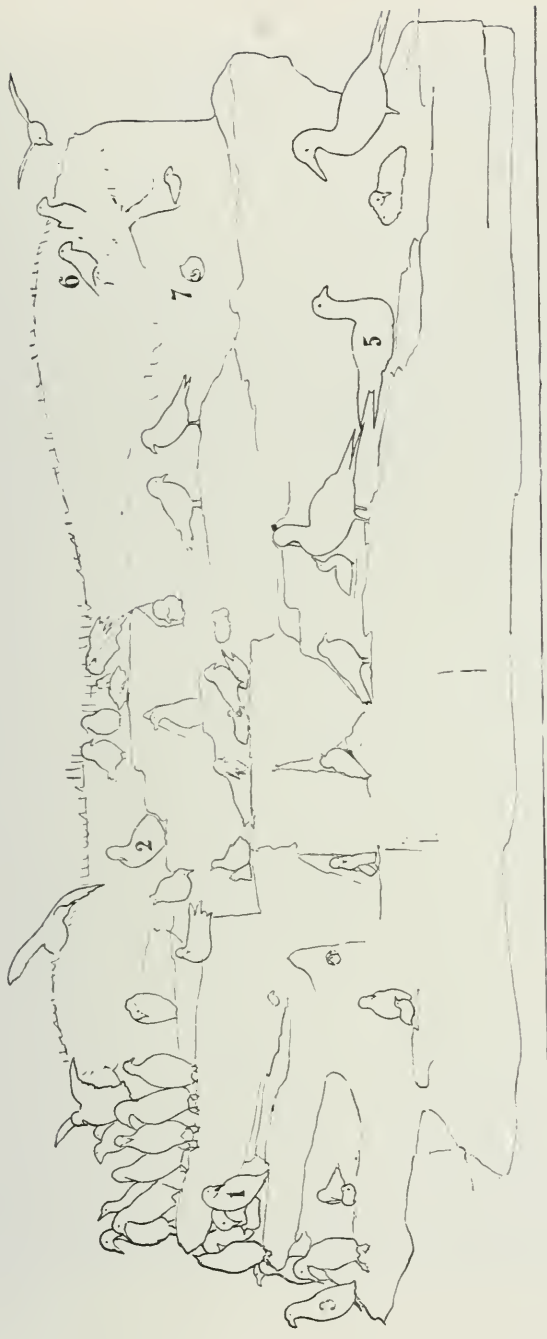
Distant about one half a mile.

(From "Bird Studies with a Camera," by permission of D. Appleton & Co.)



THE BIRD ROCK GROUP.

The group is 17 feet 6 inches long, 6 feet 10 inches high, and contains 73 birds



KEY TO THE BIRD ROCK GROUP.

- 1, Common Murre. 2, Brünnich's Murre. 3, Razor-billed Auk. 4, Kittiwake Gull. 5, Gannet. 6, Puffin. 7, Leach's Petrel.



LEFT HALF OF THE GROUP.

A DESCRIPTION OF THE BIRD ROCK GROUP ON
EXHIBITION IN THE AMERICAN MUSEUM OF
NATURAL HISTORY, REPRESENTING A POR-
TION OF A "BIRD ISLAND" OF THE NORTH AT-
LANTIC AND THE NESTING-HABITS OF ITS
OCCUPANTS.

BY FRANK M. CHAPMAN,

Associate Curator of the Department of Mammalogy and Ornithology.

ISLANDS AS BIRD PROTECTORS.

To the preserving influence of island-life we owe the continued existence of many birds which have long ceased to live, or, at least, to nest, on the mainland. This is true of the great oceanic islands as well as of the sand-bars, reefs, and rocks on which sea-birds rear their young, and even of the tiny islet of reeds or vegetable mould which forms the nest of the Grebes (see Group of Pied-billed Grebes in the Main Bird-Hall). In every instance, however, whether the island be a thousand square miles or one square foot in extent, it owes the preservation of its bird-life to the same cause, and this cause is the entire or comparative absence of bird enemies.

Oceanic islands, or those which have had no connection with the mainland, are, as a rule, without terrestrial mammals, and consequently destructive animals such as wolves, foxes, cats, both wild and domesticated, minks, weasels, etc., are wanting, even when the conditions are favorable to their existence, while the barren rocky islets, reefs, and sand-bars are uninhabited, not only by these predaceous species, but also by the birds' worst enemy—man.

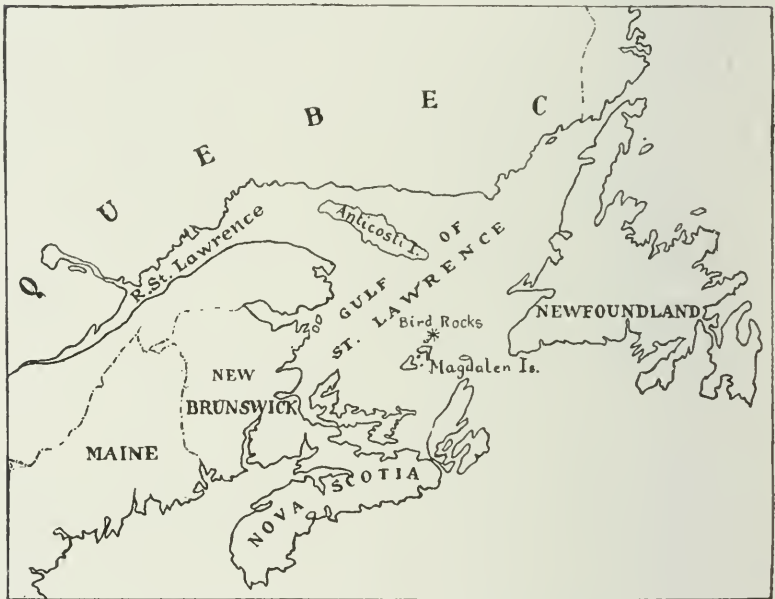
Thousands of instances could be cited to illustrate the importance of the part played by islands in protecting birds, but we need go no farther than our Atlantic coast to be convinced that were it not for islands we should long ago have lost a number of birds which now never nest on the adjoining mainland. For example, practically all our remaining Terns or "Sea Swallows" now breed only on islands, the remaining large colonies of these birds off the New York and Massachusetts coasts being found on

The Bird Rock Group.

Gardiner's, Fisher's, Muskeget, and Penikese Islands. Martha's Vineyard, between the two last named, contains the sole survivors of the Heath Hen or Eastern Prairie Chicken (see gallery, case J). Certain islets along the coast of Maine form suitable homes for Herring Gulls (see gallery, case B), and going farther north, into the Gulf of St. Lawrence, we find several rocky islets, which, either because of their isolation or precipitousness, are ideal resorts for sea-fowl. Chief among these is

BIRD ROCK.

Bird Rock, and its neighbor Little Bird Rock, belong to the Magdalen Group, and are situated fifty miles northwest of Cape



MAP SHOWING LOCATION OF THE BIRD ROCKS.

Breton, the nearest mainland, and twelve miles east of Bryon Island, the nearest member of the same group. It is 351 yards long, from 50 to 140 yards wide, and rises abruptly from the sea to a height of from 80 to 140 feet. Its vertical rocky walls are weathered into innumerable ridges, shelves, and crevices—fit sites for the nests of the sea birds which for centuries have made



NORTH SIDE OF THE ROCK, WEST OF THE CRANE.
(From "Bird Studies with a Camera," by permission of D. Appleton & Co.)

the Rock their home. The birds, furthermore, have found an abundance of food in the surrounding waters.

Bird Rock is the home during the summer of seven species of birds. Named in the order of their abundance they are: Common and Brünnich's Murres, Razor-billed Auks, Gannets, Kittiwake Gulls, Puffins, and Leach's Petrel. Gannets are known to nest in only one other place in this country, Bonaventure Island, about 150 miles northwest of Bird Rock, and the remaining six species rarely or never nest on the mainland; facts which illustrate how well the Rock has filled its office of bird protector. We shall see, however, that owing to man's agency the inhabitants of Bird Rock have greatly decreased in numbers since its discovery.

HISTORY OF BIRD ROCK.

The history of the Bird Rocks begins with their discovery by Jacques Cartier, the venturesome French navigator, in June, 1534. Cartier wrote: "These islands were as full of birds as any meadow is of grass, which there do make their nests, and in the greatest of them there was a great and infinite number of that that we called Margaulx that are white and bigger than any geese, which were severed in one part. In the other were only Godetz and Great Apponatz, like to those of that island that we above have mentioned. We went down to the lowest part of the least islands, where we killed above a thousand of those Godetz and Apponatz. We put into our boats as many as we pleased, for in less than an hour we might have filled thirty such boats of them. We named them the islands of the Margaulx."

The birds Cartier called "Margaulx" were undoubtedly Gannets; his "Godetz" were probably Murres and Razor-bills; while there is every reason to believe that his "Great Apponatz," which he had previously found and unmistakably described, were the now extinct Great Auk. It is also of interest to know that at this time, during the proper season, the Rocks were the home of Walrus.

Audubon, whose energy in exploration no ornithologist has surpassed, was the first naturalist beholding Bird Rock to leave us a description of its wonders. On June 14, 1833, during his cruise to Labrador, in the Schooner *Ripley*, he wrote in his journal the following graphic account of the day's experiences: "About

ten a speck rose on the horizon, which I was told was the Rock. We sailed well, the breeze increased fast, and we neared the object apace. At eleven I could distinguish its top plainly from the deck, and thought it covered with snow to the depth of



GANNETS ON NESTS.

Photographed from nature by F. M. Chapman.

(From "Bird Studies with a Camera," by permission of D. Appleton & Co.)

several feet; this appearance existed on every portion of the flat projecting shelves. Godwin [the pilot] said, with the coolness of a man who had visited this Rock for ten successive seasons, that what we saw was not snow but Gannets. I rubbed my eyes,

took my spy-glass, and in an instant the strangest picture stood before me. They were birds we saw—a mass of birds of such size as I never before cast my eyes on. The whole of my party stood astounded and amazed, and we came to the conclusion that such a sight was of itself sufficient to invite any one to come across the gulf to view it at this season. The nearer we approached, the greater our surprise at the enormous number of these birds, all calmly seated on their eggs or newly hatched broods, their heads all turned to windward and toward us. The air above for one hundred yards, and for some distance around the whole Rock was filled with Gannets on the wing, which, from our position, made it appear as if a heavy fall of snow was directly above us.”¹

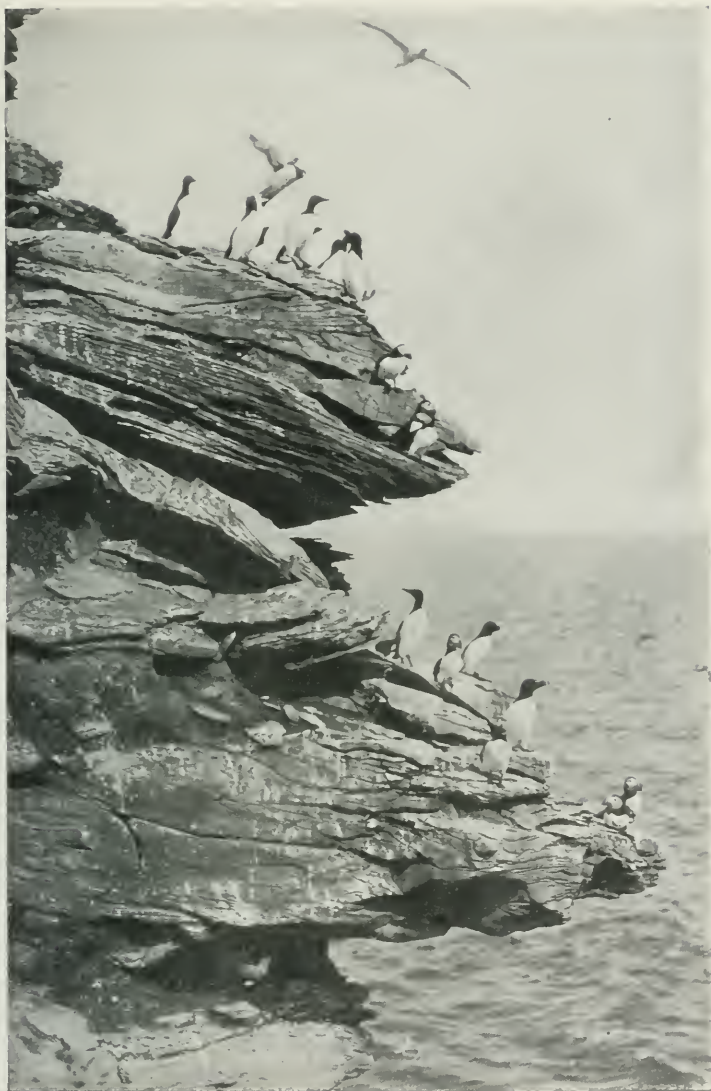
After this description one can readily imagine Audubon's disappointment when the freshening wind prevented his landing on the Rock, and we therefore must turn to the account of Dr. Henry Bryant as that of the first naturalist to set foot on Bird Rock. This was on June 23, 1860, when, after a climb which he characterized as both “difficult and dangerous,” Dr. Bryant reached the top of the Rock. In addition to the birds found living on the sides of the Rock, he states that its entire northerly half was tenanted by Gannets, and after measuring the area they occupied, he estimated that this one colony alone contained no less than 100,000 birds, while the number living on the sides of the Rock and on Little Bird he placed at 50,000.²

Bryant was followed by Maynard, Brewster, Cory, Lucas, and others, but in the meantime a change had occurred which made the Rock more accessible and at the same time greatly reduced its feathered population. In 1869 a lighthouse was erected on its summit and within three years the colony of Gannets nesting there decreased from 100,000 to 5000 birds; while nine years later only 50 birds remained.

This practical extermination of the summit-nesting birds was due in part to the light-keepers, who evidently did not care for the close companionship of 50,000 pairs of by no means sweet-voiced birds, and, later, to the use of a cannon, which, during the fogs so prevalent in this region, was discharged at short

¹ Audubon and his Journals, I., p. 360.

² Bryant, Proc. Bost. Soc. Nat. Hist., 1861.



GANNET (FLYING OVER), MURRET PUFFINS, AND RAZOR-BILLED AUKS.

Photographed from nature by F. M. Chapman.

(From "Bird Studies with a Camera," by permission of D. Appleton & Co.)

intervals to warn vessels of their proximity to the Rock. To the use of this cannon is also in part attributable the diminution in the ranks of the other birds inhabiting the Rock, and, writing of his visit in 1881, Mr. William Brewster remarks: "At each discharge the frightened Murres fly from the Rock in clouds, nearly every sitting bird taking its egg into the air between its thighs and dropping it after flying a few yards. This was repeatedly



THE LANDING AT THE BASE OF THE ROCK, SHOWING CRATE.
(From "Bird Studies with a Camera," by permission of D. Appleton & Co.)

observed during our visit, and more than once a perfect shower of eggs fell into the water about our boat."¹

BIRD ROCK TO-DAY.

In spite of the great decrease which has occurred in Bird Rock's population, it still remains one of the ornithological wonders of our Atlantic coast. Unfortunately, however, the

¹ For a further history of Bird Rock see Brewster, *Proc. Bost. Soc. Nat. Hist.*, 1883. Lucas, "The Auk"—New York—V., 1888, pp. 129, 278; also, in connection with the identity of Ap-ponatz, Hardy, *Ibid.*, 380, Chapman, "Bird Studies with a Camera."

wholesale collecting of eggs and wanton killing of birds by fishermen, combined with the results of firing the gun-cotton bombs, which have superseded the cannon, are causing a continued diminution in the number of birds inhabiting the Rock,



THE LANDING ON TOP OF THE ROCK, SHOWING CRANE.

(From "Bird Studies with a Camera," by permission of D. Appleton & Co.)

and unless the Canadian Government soon takes proper steps to afford them protection, it is quite probable that in time only a fraction of their present numbers will remain. To make, therefore, a permanent record of this characteristic phase of island life

the writer visited the Rock in July, 1898, and procured for the American Museum of Natural History the material and photographs which made possible the preparation of this group.

It is quite as difficult to land on Bird Rock to-day as it was in Audubon's time, but good fortune brought us to the spot during calm weather, and the boat in which the light-keeper met our schooner was readily beached on the hand's-breadth of shore constituting the only port of entry. Once landed, however, the top is now easily reached in a small crate which is hoisted by means of a crane and windlass, operated by the keeper of the lighthouse. The experience of passing so near nesting Murres and Kittiwakes that they may almost be touched is not the least interesting part of a journey through space which it is believed most visitors to the Rock will find possessed of more or less novelty. Alighting on the grassy summit of the Rock, one sees that it contains, in addition to the light- and bomb-houses, a small collection of buildings for the storage of supplies which are brought only twice each year, and for the accommodation of the keeper, his family, and three assistants. With the exception of a few Puffins and Petrels, which live in burrows, no birds now nest on top of the Rock, but they crowd the jutting ledges or eroded shelves of the precipitous faces of the island. In places one can easily clamber down to these ledges and there he will be surrounded by curious groups of sea-fowl, some fearlessly standing, while others whirl by in an endless procession.

In view of the years of persecution to which these birds have been subjected, they are still remarkably tame, and, to a bird-lover, it is an especially grateful experience to be at once received into their ranks. No one, indeed, who has not had the experience can imagine the peculiar sensations which possess the naturalist when, for the first time, he visits a bird island where essentially primeval conditions prevail, and where the birds are so abundant and so unsuspicious that one seems to have reached the heart of the bird world and found existing there the ideal relation between man and the lower animals.

THE BIRDS OF THE ROCK.

Murres (*Uria lomvia* et *Uria troile*). The Murres, together with the Razor-billed Auk and the Puffin, are members of the



(From "Bird Studies with a Camera,"
by permission of D. Appleton & Co.)

KITTIWAKES AND YOUNG ON NESTS.

Photographed from nature
by F. M. Chapman.

family Alcidae, a group of sea-birds found only in the North Atlantic and North Pacific. (Several allied species may be found in the general collection of North American Birds, see gallery, Case A.) Everywhere they are island-nesting birds, indeed some of the largest bird islands in northern seas are inhabited almost entirely by Murres:—the Farne Islands off the eastern coast of northern England, the Farallones at the entrance of San Francisco



COMMON MURRE AND EGG.
From the Group.

Bay, and St. Paul Island in Bering Sea, are tenanted by countless individuals of these birds. Murres feed on fish, which they secure by diving, using both wings and feet in propelling themselves while under water. Their note is a hoarse call sounding somewhat like the syllable *murre*, whence their common name. They make no nest, but lay their one peculiarly shaped and colored egg on an exposed ledge of rock or in a similarly unprotected place. The shape of the egg is supposed to be an adaptation to the requirements of the nesting sites, from which a more elliptical or spheri-

cal egg would roll and fall. The pear-shaped Murres' eggs, however, when moved by the bird or wind, revolve about their own point, practically without change of position. The wide variation in the colors of Murres' eggs, no two of which are alike, is thought to aid the birds in recognizing their own eggs.



BRÜNNICH'S MURRE.
From the Group.

When hatched the Murres are covered with a sooty black down. In some instances they are taken to the water when still very young; in others they acquire the power of flight before leaving their birth-place.

Murres' eggs are edible, and for this reason they are often gathered in large numbers by fishermen, or, when they can be disposed of, by "egggers" who make a business of visiting the

haunts of the birds during the egg-laying season. It is stated that some twenty years ago 30,000 dozen Murres' eggs were gathered annually on the Farallone Islands and sold in the San Francisco markets. As a result of this wholesale robbing, the birds decreased in numbers so rapidly that the United States Government forbade their further molestation. It is greatly to be hoped that the Canadian Government will soon take steps to afford similar protection to the Murres of Bird Rock.

Two species of Murres inhabit Bird Rock, the Common Murre (*Uria troile*) and Brünnich's Murre (*Uria lomvia*). To the casual observer the differences distinguishing them are not at once apparent, and the presence of two such closely related birds, of similar habits, in the same place, is an interesting illustration of the retention of specific differences under circumstances unusually favorable for interbreeding.

The Common Murre has a longer, more slender bill and browner head than Brünnich's Murre, which has a relatively short and thick bill with the basal edges of the lower mandible grayish and swollen, and the head dark. The downy young of the Common Murre are sooty black, sprinkled with white; those of Brünnich's Murre are decidedly browner. The Common Murre breeds in the North Atlantic from Bird Rock and the British Islands northward. In winter it ranges southward to the coasts of Massachusetts and northern Africa.

Brünnich's Murre breeds from Bird Rock northward, but is rare in the eastern Atlantic. In winter it is found occasionally as far south as New Jersey, and, sometimes it reaches the interior states as far west as Michigan, by way of the St. Lawrence River and the Great Lakes.

Some Murres have a white ring around the eye extending backward in a white stripe behind it. They are known as "Spectacled Murres," but whether they constitute a distinct species, or are merely an individual variation, is as yet unknown. One individual of this kind is shown in the group.

Razor-billed Auk (*Alca torda*). The Razor-bill is the nearest existing relative of the extinct Great Auk, which it resembles in general appearance, but from which it differs in possessing the power of flight. This species lays its single egg, which is more elliptical than that of the Murres, in natural cavities or other-

wise protected places, and the young are born covered with a brownish down.

The accompanying illustration of the Razor-billed Auk and Great Auk is of interest not alone because the former is and the latter was an inhabitant of Bird Rock, but also because it permits of a comparison of two closely allied birds, one of which has retained, while the other has lost, the power of flight. The Great



GREAT AUK AND RAZOR-BILLED AUK. SHOWING COMPARATIVE SIZE.

From specimens in the American Museum.

Auk, unlike the Razor-bill, nested on low islands to which it could gain access by means of the feet alone. It fed on fish, migration was unnecessary, and as a result of disuse it evidently lost the power of flight, its wings serving only as paddles for propulsion under the water. Hence it fell an easy victim to fishermen, who, landing on the islets to which it resorted, killed it in great numbers for its flesh. The last living Great Auk was seen in 1844, and all that remains of the myriads described by the early voyagers is some 77 skins, a few skeletons, and 70 eggs.

(See especially in this connection the skin, skeleton, and cast of the egg of the Great Auk in the Main Bird-Hall.)

The Razor-bill breeds from the Bird Rocks and British Islands northward and in winter is found as far south as Long Island and the Mediterranean.



KITTIWAKE GULL ON NEST.

From the Group.

Kittiwake Gull (*Rissa tridactyla*). From six to eight hundred Kittiwake Gulls nest on Bird Rock. They place their nests of sea-weed on the less accessible ledges and doubtless for this reason are less preyed upon by man than are the Murres. Kittiwakes are the only birds on the Rock which lay more than one egg; their nests containing two or three. The young are born covered with down, and during their first winter differ from adults in having the tip of the tail and hind neck black. The birds of this species feed on fish and drink salt water in preference to fresh. Their name is derived from their singular call,

which resembles the syllables *kit-ti-wake*, several times repeated. Kittiwakes nest from Bird Rock and the British islands northward, and in winter range southward to Virginia and the Canaries.

During their winter wanderings Kittiwakes are true sea-gulls,



GANNET.
From the Group.

rarely visiting our inner harbors and bays, where the common winter gull is the Herring Gull, the adults of which, though much larger, are not unlike adult Kittiwakes in color; those born the preceding summer being grayish. (See gallery, case B, for this and other species of American gulls.)

Gannet (*Sula bassana*). Gannets nest on certain small islets off the British coast, in the Faroes, and in Iceland, but in America breed only on Bird Rock and Bonaventure, 150 miles to the west. In the winter they range southward, keeping usually well

The Bird Rock Group.

off-shore, to northern Africa and the Gulf of Mexico. Of the 100,000 Gannets which were estimated by Mr. Bryant to be nesting on the top of Bird Rock in 1860, no mention being made of those occupying the sides, only about 1,500 remain. Gannets are remarkably impressive birds when on the wing, possessing in an unusual degree power and grace of motion. They secure their food of fish by diving, often from a height of forty feet or more, half closing their wings and plunging into the water with terrific force. The young are born naked, but their black skin is soon covered by white down, which, before they leave the nest, is replaced by gray plumage.

Gannets are the only representatives of their family in northern waters, the remaining species of the group being found in the tropics, where they are known by the name of Booby. Whenever found, however, they are island-nesting birds, not one species of Gannet, so far as known, nesting on the mainland. (For other species, see gallery, case C.)

Puffins (*Fratercula arctica*). Not more than two hundred Puffins breed on Bird Rock. They place their nest, with its single white egg, at the end of burrows which they excavate near the summit of the Rock. When captured, the birds make every effort to use their singularly formed bill, and as a weapon of defense they can inflict a dangerous wound with it.

When walking or perching they stand erect on the toes, while the Murres and Razor-bills rest on the whole foot. Puffins are called "Paroquets" by the French Canadians, and both in appearance and actions they resemble those birds. The call of the Puffin, however, is a hoarse grunt, instead of the shrill squawk emitted by the Paroquet.

Closely allied species are found in the North Pacific (see case, this hall), where they are an important article of food among the natives, who also employ their singularly formed bill in the ornamentation of their ceremonial garments. Aprons with Puffin bills attached to them to produce a rattling noise as the wearer danced, may be seen in hall No. 106, on the ground floor of the Museum.

Leach's Petrel (*Oceanodroma leucorhoa*). Puffins sometimes share their burrows with the Leach's Petrel or "Mother Carey's Chickens," but these interesting little birds also excavate burrows

of their own. They make their nest of grasses and feathers and lay therein a single white egg.

Although diurnal at sea, where they are a familiar sight as in their search for food they course to and fro over the wakes of vessels, Petrels are nocturnal on land, visiting their nests only



PUFFIN.

From the Group.

at night to feed their young or change places with their mate, who has passed the day upon the nest. At birth the young are so thickly covered with gray down that they have little resemblance to birds. Their nocturnal habits have led to the general belief that Petrels never visit the land and that they hatch their egg beneath their wing.

Petrels are relatives of the Albatross, which, with other members of the same order (Tubinares, or tube-nosed birds, in

reference to the peculiar shape of the nostrils), may be found in gallery, case C, and main Bird Hall, case B.

THE MAKING OF THE GROUP.

In the accompanying group the preceding seven species of birds are shown with their nests, eggs, and young. While the attempt to bring them within the comparatively narrow limits of a museum case has necessitated the combination of typical sec-



LEACH'S PETREL AND YOUNG IN NEST.

From the Group.

tions of the Rock, the birds nevertheless have been arranged with due reference to their association in life, and it is believed that when taken in connection with the photographs from nature displayed on top of the case, the group correctly represents the conditions of bird life prevailing on Bird Rock.

The birds were mounted and their surroundings prepared, under the writer's direction, by Mr. H. C. Denslow of the Museum's Department of Taxidermy.

Privileges Enjoyed by Members.

Free admission to Museum on Mondays and Tuesdays.

Free admission to Special Courses of Lectures.

Four complimentary Lecture Tickets are sent to each Member.

Four complimentary Admission Tickets are sent to each Member.

The Journal is sent free to Members.

Guide Leaflets are given free to Members.

The use of the Library is enjoyed by Members.

The Study Collections may be consulted by all Members.

The Museum is open to the public WEDNESDAYS, THURSDAYS, FRIDAYS and SATURDAYS and on all LEGAL HOLIDAYS, from 9 A. M. to 5 P. M. On SUNDAYS from 1 to 5 P. M. On TUESDAY and SATURDAY EVENINGS from 7 to 10 o'clock.

On MONDAYS and TUESDAYS, Members, Pupils (accompanied by teachers), Special Students and Artists are admitted free. Others are admitted on the payment of twenty-five cents.

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Volume I

NOVEMBER-DECEMBER, 1901

Number 12



EXHIBITION HALL, DEPARTMENT OF VERTEBRATE PALÆONTOLOGY.

THE DEVELOPMENT OF THE AMERICAN MUSEUM OF NATURAL HISTORY.

(Continued.)



THE Department of Vertebrate Palæontology has been developed entirely during Mr. Jesup's administration. Its very rapid growth, which has been practically achieved since 1890, has not in the main resulted from purchases or donations, but from the energy with which expeditions have been organized for field work. The Department was

established in 1890, and Professor Henry Fairfield Osborn was given its curatorship at about the time he was leaving Princeton to take the chair of biology at Columbia University.

Professor Osborn's work and investigations in the evolution of the mammalian life of the American continent were well known. His analytical and descriptive studies embraced a wide range of subjects

connected with the fossil mammalian fauna of the Tertiary deposits of the West. He had written extensively upon the development of the mammalian tooth, while on the interesting question of the evolution of the ungulate foot, on the correlation of Tertiary horizons in America with those of Europe, as well as on the systematic position of numerous new species of fossil Ungulates, Carnivores, and Dinosaurs, he had also studied and written at length. Professor Osborn has recently assumed the charge of the vertebrate palæontology of the United States Geological Survey, and in this capacity has succeeded Professor O. C. Marsh.

Appreciation of popular needs, and qualifications as an exhibitor under the restraining sense of scientific precision, taste and judgment, were necessary on the part of the curator to meet the problem of installing this new type of objects to the best advantage. The field presented fascinating possibilities. Here in America the researches of Marsh and Cope had revealed to the world a series of extinct creatures which throughout—in their reptilian and mammalian characters, and their evident progressive modifications—presented new facts in evolution. Professor Osborn proposed to supplement the unfinished work of Marsh and Cope and to bring

it all to the recognition of the New York public in his exhibition halls, while at the same time incorporating the scientific results in the publications of the Museum. This object has been and is still being accomplished.

The first step essential to this end was the organization of expeditions to the West, to the great continental lake basins where the members of these extinct faunæ were afterwards found in such unexampled numbers and variety; also the selection of a competent collector and the elaboration of adequate methods in shipping the specimens obtained.

Dr. J. L. Wortman, widely known as the discoverer of some of the most famous types described by Professor Cope, and as the author of a valuable treatise on the teeth of the Vertebrata and of numerous less elaborate papers, was chosen to lead these expeditions. Aided by Messrs. Peterson, Granger, and Gidley, his success surpassed expectation. Gradually there was evolved under his direction a most satisfactory method of taking up the specimens, packing and removing them from the matrix. First, they were covered with thin sheets of muslin or of tissue paper, stuck on with gum-arabic water, over which strips of gunny sacking were bound; these were covered over with plaster and

the whole, thus rigidly retained, was shipped without danger of dislocation. While very small objects were not treated in this way, of which, in this case, there was no necessity, the large bones and masses of articulating skeletons were most admirably preserved, and were received at the Museum almost or exactly as if removed that instant from their original bed. Mr. A. Hermann, as head preparator, superintended their treatment on arrival at the Museum, and devised and executed the splendid mountings which now give them unique prominence. In 1894, Dr. W. D. Matthew, a graduate of the School of Mines, Columbia University, was appointed Assistant Curator in charge of the cataloguing and arrangement of the exhibition and study collections. Dr. O. P. Hay was engaged in 1900, especially in connection with the Cope collection.

Since 1890 every year has seen its expeditions from the Department fitted for the West, where collecting and exploration have been assiduously prosecuted. New Mexico, Wyoming, South Dakota, Nebraska, Utah, Kansas, Colorado, have been visited in the diligent search for fossil treasures. At the present time the collection includes over ten thousand specimens of fossil mammals and seven hundred

of fossil reptiles, not including the second Cope collection, consisting of between five and eight thousand specimens of reptiles, amphibians and fish, which have been as yet only partly catalogued.

In 1895 the famous collection of North American Fossil Mammals of Professor E. D. Cope was purchased by the aid of several of the Trustees, of friends of the Museum, and of the Curator.

In 1897, this Department had extraordinary success in the field; as a result of four expeditions eighty boxes were filled, requiring nearly two freight cars for their transportation. Excavating in Wyoming for the oldest type of mammals, the exploring party made an unexpected discovery, first of one, then of two dinosaur skeletons, of magnificent dimensions, and in a remarkable state of preservation. Thus was inaugurated the second great division of the work, viz., the history of the reptiles in North America.

Besides the Dinosaurs found in Wyoming, a good beginning was made in eastern Kansas in the search for Pterodactyles (flying reptiles) and Mosasaurs (marine swimming lizards).

The scientific results of these expeditions cannot be epitomized here. The series of fossil Rhinoceroses, the Uintatheres (six-horned, sabre-

toothed, hoofed mammals), the strange skulls and the stupendous skeleton of the Titanotheres, the discovery in the Ganodontia of the North American origin of the enormous Ground Sloths of the ancient pampas, the series illustrating the evolution of the horse and the camel, the recent additions of huge Dinosaurs, and the practically complete skeleton of the great marine lizard, are palpable results and are on a scale which all can appreciate. Behind or with all this are the innumerable minute remains and difficult or intricate questions which these expeditions have secured or solved, and which the initiated alone understand.

The camera was carried into the field, and an excellent group of photographs obtained, some of which, enlarged into window transparencies by Professor William Stratford, are now so placed that the visitor can obtain an exact idea of the appearance of the beds in which the fossils are found. Nor is the visitor left to himself in the visualization of the animals whose bones are now the only evidence of their past existence. Mr. Charles R. Knight, an artist and enthusiast in the study of animals, prepared some sketches for Professor Osborn, which showed unusual talent. Mr. Knight was encouraged to continue his promising efforts. From study

of the skeletons, and under direction, his trained imagination has created a series of remarkable and most interesting paintings. About twenty-five of these water colors, embracing both mammals and reptiles, have been presented by J. Pierpont Morgan, Esq., and now decorate the hall. Photographic reproductions of them have been furnished to the museums of London, Munich, Brussels, Oxford, Stuttgart, Cape Town and other cities and countries.

L. P. GRATACAP.

(To be continued.)

RECENT WORK OF THE DEPARTMENT OF ANTHROPOLOGY.



ALMOST all the field parties that have been at work for the ethnological division of the Anthropological Department of the Museum have returned.

A number of parties have been at work for the Jesup North Pacific Expedition. Mr. W. Bogoras has returned from his expedition to the Chukchee, Eskimo, and Kamtchadal of eastern Siberia, and is on his way to New York from St. Petersburg. His collections from the Eskimo of East Cape have arrived at the Museum. They comprise a consider-

able number of skulls and many specimens illustrating the culture of the tribe. His studies bring much new material relative to the languages, customs, folk-lore, and physical types of these tribes. A report has been received also from Mr. W. Jochelson, who went to Siberia with Mr. Bogoras and who has been working on the north coast of the Sea of Okhotsk, and who is at present on his way to the Yukagheer and Yakut of eastern Siberia. Among the most interesting results of the studies of these two investigators are the definite proof that the customs and myths of the people of northeastern Siberia are in many respects quite similar to those of Alaska and British Columbia and the establishment of the fact that an early connection between these tribes must have existed. An account of the plans of this Siberian expedition was given in the *JOURNAL* for May, 1900.

The most important work of the Jesup North Pacific Expedition on the American coast has been done by Mr. John R. Swanton, who spent a whole year among the Haida Indians of Queen Charlotte Islands, British Columbia. Mr. Swanton has definitely cleared up the question regarding the significance of the totem poles and other carvings of this people. His scientific collections embrace a vast amount of

information about the tribe which will be published in the memoirs of the expedition.

Encouraging reports have been received from Captain George Comer, who is collecting for the Museum among the Eskimo of Hudson Bay. Investigations were made also in regard to other Indian tribes of North America. Work was carried on among the Sac and Fox Indians by Mr. William Jones, who made a valuable collection and secured much ethnological information. The work on the Shoshone, which was inaugurated by Dr. A. L. Kroeber in 1900, was carried on during the present year by Mr. H. H. St. Clair, Jr., who succeeded in making a very interesting collection.

The publications of the Department also have proceeded satisfactorily. A number of monographs will soon be published. These embrace the results of the Huntington Expedition to California, which was in charge of Dr. Roland B. Dixon; the results of the Mrs. Jesup Expedition to the Arapaho Indians, which was in charge of Dr. Kroeber; a description of the Eskimo of Hudson Bay by Prof. F. Boas, and a description of the conventionalism of the Huichol Indians by Dr. Carl Lumholtz.

The publications of the Jesup Expedition (which are under way) embrace one volume of Kwakiutl texts

by Prof. F. Boas; a discussion of the mythology of the Indians of the west coast of Washington by Prof. L. Farrand; a description of the conventionalism of the Amur tribes by Dr. Berthold Laufer, and a description of the antiquities of the Lower Fraser River by Mr. Harlan I. Smith.

LOCAL ARCHEOLOGICAL WORK.

THE NEW YORK archaeological explorations, which have been carried on under the care of Mr. M. R. Harrington during the past two summers were resumed at Armonk, Westchester Co., last spring. Several "rock-shelters" in this region were explored and many objects relating to the life of the ancient inhabitants were brought to light.

The work was then continued at two ancient shell-heaps or "kitchen-middens" on the north shore of Long Island, in the vicinity of Oyster Bay and Glen Cove. At these points a very complete collection of implements of bone, antler and stone were found. Potsherds, many of them decorated with incised designs, bones of numerous animals used by the Indians as food and portions of several human skeletons were also discovered. Photographs and drawings were made of all the sites examined.

The results as a whole have been very satisfactory, though the lack of human remains is a disappointment.

MEXICAN CARVED STONES.



THE Anthropological Department of the Museum is in receipt of a very interesting collection of Mexican petroglyphs, found and secured in 1898 by Dr. A. Hrdlička, while on an expedition for the Museum. The collection consists of twenty stones of various sizes (the largest being about two and a half feet square), covered mostly on one, but in two instances on both sides, by pictographs. The stones are from the ruins on the mesa of Totoate, in the State of Jalisco. A few of the blocks were found detached, but the majority had to be laboriously chiseled from the bed-rock by an ordinary geological hammer, the only implement obtainable.

The carvings on the stones are deep and unusually well executed. In a number of instances the figures represent a curve, possibly a coiled snake; in other instances they are composites of dots and curved and straight lines. Coil-figures are met with on the petroglyphs of the ancient Pueblo region, but the more or less intricate dot-and-line figures are thus far without any analogy and are

unintelligible. A most intricate and interesting rock-carving covering the surface of many square feet was left *in situ* in the hope that a cast might be made in the future.

The collection has been detained since 1898 by Mexican authorities, on the supposition that it consisted of valuable antiquities; but this point having been satisfactorily settled, it was eventually released. This result is largely due to the kind assistance rendered by the American Consul at Ciudad Juarez and Mr. Woodside. The collection forms a valuable addition to the other Mexican and southwestern exhibits in the Museum. It will be supplemented by two rock-carvings, one very large and one small, both showing a coil similar to that on some of the Mexican slabs obtained by Dr. Hrdlička in 1899 in the Navaho country.

A SOMATOLOGICAL EXHIBIT.



R. ALEŠ HRDLIČKA has begun the making of a collection of human and other brains for the purposes of scientific comparison and study, as well as for exhibition in the Anthropological Department. The series consists of the brains themselves, taken as soon as possible after death and immersed, with all

their membranes, in a four per cent. solution of formalin, which preserves them indefinitely for study. Casts in plaster of Paris of the brains and of the brain cavities of the skulls are also used for exhibition. Three lines of investigation are being followed and will be illustrated in the cases. The first, or morphological, series will show the degrees of development of the chief nerve center or the brain as completely as possible from that of the simplest animal to that of the most complex (man). The second, or zoölogical series, will take up each great subdivision and show the typical brains of each. The third series will illustrate the degrees of development from the lowest to the highest of individual species, man in particular, but the horse, the dog and others as well. These series, when completed, should prove of considerable scientific as well as popular interest, since they will have a very important bearing on many phases of the question of evolution in general.

As a part of the proposed somatological exhibit, of which the series indicated above form a portion, there has been arranged by Dr. Hrdlička, at the suggestion of Prof. Putnam, a case of exhibits made up from material collected for the Museum by Dr. A. F. Bandelier in the vicinity of Lake Titicaca and showing:

1. Normal, undeformed ancient Peruvian crania.
2. The various kinds and degrees of artificial deformation of the skull, once practiced in Perú.
3. Mummified bodies.
4. Various kinds and grades of trepanation of the skull. Trepanning seems to have been practiced as a religious rite as well as for surgical reasons.
5. Crania with accidental defects (the results of shots, fractures and other artefacts) to contrast with the trepanned skulls.

The case containing these interesting series is No. 32, in the south-east corner of the Peruvian Hall, on the gallery floor of the west wing of the Museum building.

CONVENTIONS.

THE NINETEENTH CONGRESS of the American Ornithologists' Union, with Dr. C. Hart Merriam as president, was held in the Museum from the 12th to the 14th of November, with a large attendance. The programme comprised twenty-one papers.

THE ANNUAL CONVENTION of the Audubon Societies of the United States was held at the Museum Thursday afternoon, November 14th, under the presidency of Frank M. Chapman. It was decided by vote of the members present that the separate organizations throughout the country should retain their individ-

uality, instead of being merged into a national body. Instead of a national society, the plan of having a national conference committee was adopted. Each organization is to have one member on the general committee. Annual conferences of this committee will be held. The prosecution of the objects of the different organizations will in future consist of separate efforts to get satisfactory laws in each State, as has already been done in the Federal Congress. The work of the new committee will be to see that the existing United States laws for bird protection are enforced, and that none of them is repealed.

MEMBERS' DAY

Tuesday, November 26, the Morgan gift of gems and precious stones and the Bement collection of minerals, also the gift of J. Pierpont Morgan, Esq., were displayed to the members of the Museum and their friends, prior to their opening to the general public. The whole building, including offices and laboratories, was thrown open and many persons availed themselves of the opportunity to see the inner workings of the institution. The attention of visitors was called to the new acquisitions in all departments, of which there has been an unusually large and important number during the past year. At four o'clock Prof. Bickmore repeated his illustrated lecture on the Pan-American Exposition.

AMERICAN MUSEUM OF NATURAL HISTORY

The Saginaw Valley Collection



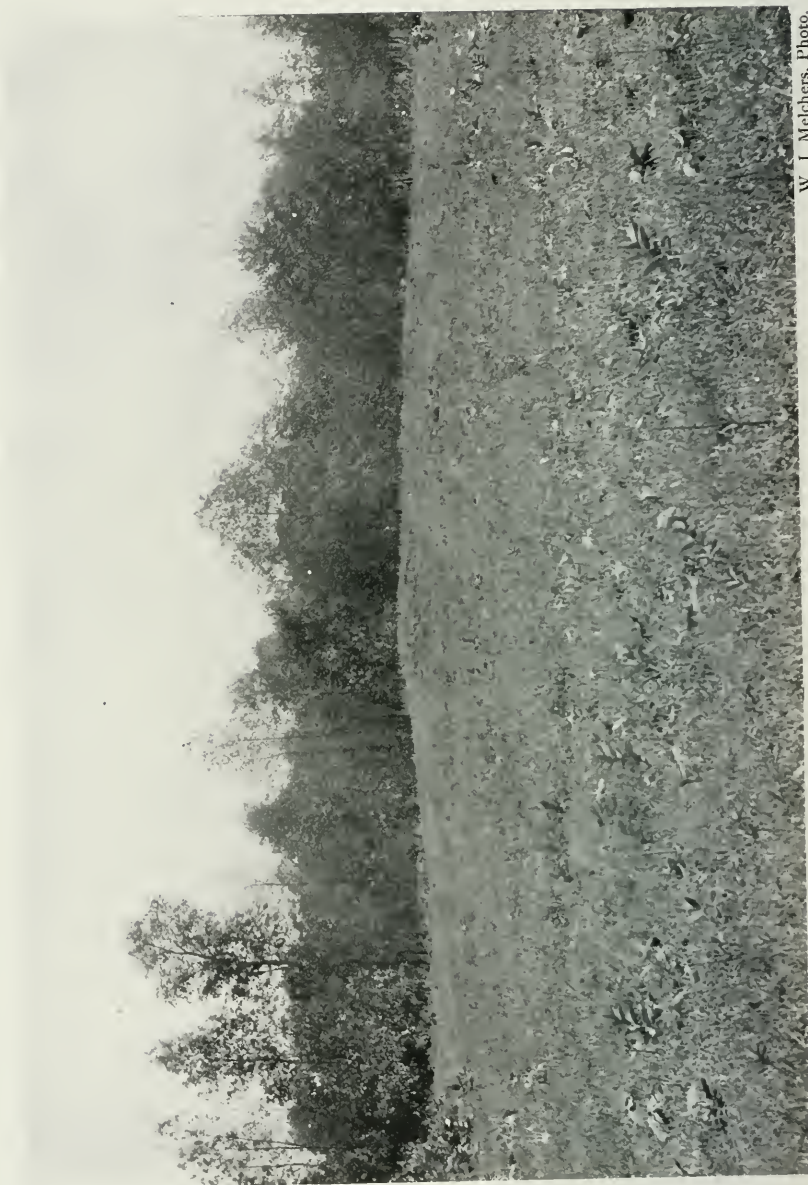
FRAGMENTS OF ANCIENT POTTERY FROM SAGINAW VALLEY, MICHIGAN.

BY

Harlan I. Smith

Assistant Curator of Archaeology

SUPPLEMENT TO AMERICAN MUSEUM JOURNAL
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W. J. Melchers, Photo.

FOBEAR MOUND No. 1.

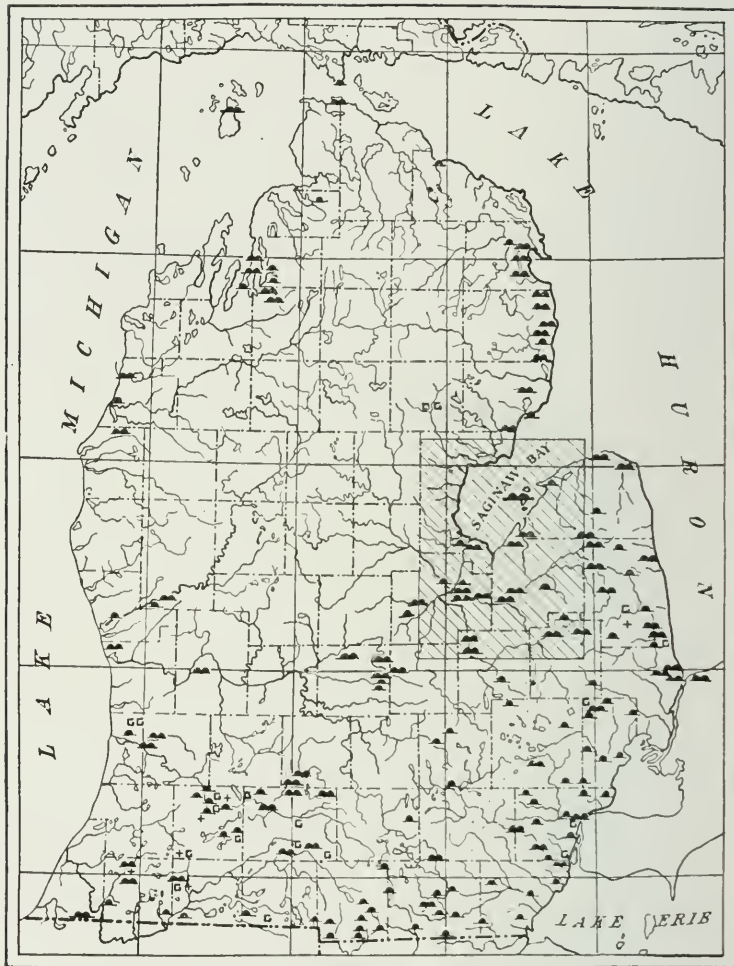
THE CULTURE OF THE PEOPLE ONCE INHABITING
A LIMITED AREA NEAR SAGINAW, MICHIGAN,
AS ILLUSTRATED BY MATERIAL IN THE AN-
THROPOLOGICAL DEPARTMENT OF THE AMER-
ICAN MUSEUM OF NATURAL HISTORY.

BY HARLAN I. SMITH,
Assistant Curator of Archaeology.

THE rude archaeological objects found in the Saginaw valley, Michigan, and exhibited in the American Museum of Natural History show that the prehistoric people who lived in that area were largely occupied with striving for the necessities of life. The region, although not at all desolate, was still too far north to support a civilization that would leave traces of a culture so largely given to art and ritual as those to be found in Mexico, the Southern States or even in the Ohio valley. Such a collection of rather rude implements and objects has value, however, in that it gives evidence regarding the lives of the early inhabitants of the country.

The objects from the Saginaw valley were found in such places that we now know where there were a number of rather important villages and a still larger number of small villages or camp sites, besides what were probably scattered habitations and burial-places—all of the early people of this region. It is quite evident from areas where certain stray objects were found, and from the scarcity of other evidences in such areas, that the people also made trips to points remote from the villages, probably for fishing and hunting, the gathering of fruits and roots or the securing of material out of which to make arrow-points and pipes; and that the objects were lost on the way. It would seem that the character of the country, with the scattered distribution of its products, was the cause of the segregation of the people into small villages, and possibly of their establishing small outlying camps for the purpose of being, at certain seasons, near points suitable for such occupations as are above noted.

The importance of the collection exhibited in these cases is chiefly that it indicates the character of the culture of the people, the location of their habitations, burial-places, caches and



Scale.
25 0 25 50 75 100 MILES

ARCHEOLOGIC MAP OF MICHIGAN

▲ = MOUND.

□ = INCLOSURE.

+ = UNDEFINED ANTIQUITIES

⌘ = CEMETERY.

A larger map of the cross-lined area will be found on page 8.

mounds, as well as that it shows something of their resources, industries and customs. It is undoubtedly the largest archæological collection from the Saginaw valley, and was made and presented to the Museum by the writer, whose investigations of the region, although supplemented by later work, were chiefly accomplished during the period from 1883 to 1891. Practically all the objects to be found on the surface of the particular sites from which the



W. Orchard, Photo.

Wedge Shaped.

CELTS OR CHISELS.

About $\frac{2}{3}$ Natural Size.

Adze Shaped.

collection was obtained have been secured; but it is probable that further search, especially below the surface and in the neighboring fields, would bring to light other specimens of similar nature.

The Saginaw valley, including the entire area draining into Saginaw Bay, occupies the east-central portion of the southern peninsula of Michigan. It is a well-watered, level country, formerly covered by dense forests of pine, oak, elm, ash, maple, hickory and other trees. The lowlands are occupied by swamps, which in places are largely grown up with wild rice, known to botanists as

Zizania aquatica Linn, a staple produced by nature in such abundance that it was of great importance to the primitive people of the region. The streams which were of the most importance to the prehistoric inhabitants of the valley were the Saginaw river and its main tributaries, including the Shiawassee, Flint, Bad, Cass, Tittabawassee and their branches, while the Pigeon, Sebewaing, Kawkawlin and Rifle were not unimportant. Bordering the lower



CHERT NODULE IN LIMESTONE.

From Bay Port Quarries.

W. Orchard, Photo.

courses of the rivers there are numerous bayous with low sand ridges scattered over the land between them. At the head waters the streams flow more swiftly and undercut their banks, and large bayous and swamps are less frequent.

Chert or impure flint was extensively quarried and chipped into implements by the prehistoric inhabitants of the valley, and in the chipped implements found on the village sites and hunting-grounds this material largely predominates. A specimen of limestone of Subcarboniferous age bearing a nodule of chert, obtained at the modern quarries at Bay Port, Michigan, is illus-

trated on the preceding page, and may be seen in the case. This outcrops in a nearly circular line cut by the head waters of the Cass, Shiawassee and Tittabawassee and intersecting Saginaw Bay near Point Lookout and Bay Port.

When white men first visited this region, it was inhabited by the Ojibwa Indians. The name of this tribe is variously spelled, as Chippewa, Otchipwe, etc. Their descendants preserve traditions that the Sauk or Sac Indians formerly occupied the valley and were driven out by the Ojibwa and their allies, while the Sac and Fox Indians of Iowa, for their part, have traditions to the same effect. A collection from these Ojibwa Indians is shown



SLATE TABLETS POSSIBLY ORNAMENTS.
About $\frac{2}{3}$ Natural Size.

W. Orchard, Photo.

in another part of the Museum (Hall No. 106, on the ground floor). They were found subsisting on a variety of natural products, chief among which were wild rice, maple sugar, squash, corn, wild fruits and game.

The prehistoric villages were located along the streams, because of the importance of water, wild rice, fish and the land animals which frequented the river banks for food or visited them for water. Furthermore, the canoe was an easier means of transportation than the trail, and even trails were more easily formed along the ridges parallel to the rivers or along the banks than elsewhere. The outcrops of chert and pipestone also are

ARCHÆOLOGICAL MAP OF THE SAGINAW VALLEY,
MICHIGAN, SHOWING THE PRINCIPAL
ANCIENT SITES.

SAGINAW BAY, EASTERN SHORE, HURON COUNTY.

- | | |
|-----------------------------------|----------------------------|
| 1 North Island Workshops. | 4 Bay Port Cache. |
| 2 Heisterman Island Village Site. | 5 Sharpsteen Village Site. |
| 3 Bay Port Village Site. | 6 Sebewaing Village Site. |

SAGINAW RIVER VALLEY, SAGINAW COUNTY.

- | | |
|--------------------------|-----------------------------------|
| 7 Hoyt Camp Site. | 12 Esterbrook Camp Site. |
| 8 Wright Graves. | 13 Mobray Camp Site. |
| 9 Saginaw Graves. | 14 Ka-pay-shaw-wink Village Site. |
| 10 Germain Village Site. | 15 Green Point Mounds. |
| 11 Ayres Camp Site. | |

SHIAWASSEE RIVER VALLEY.

- | | |
|------------------------|----------------------|
| 16 Merrill Cache. | 19 Albee Workshop. |
| 17 St. Charles Graves. | 20 Chesaning Mounds. |
| 18 St. Charles Mounds. | |

FLINT RIVER VALLEY.

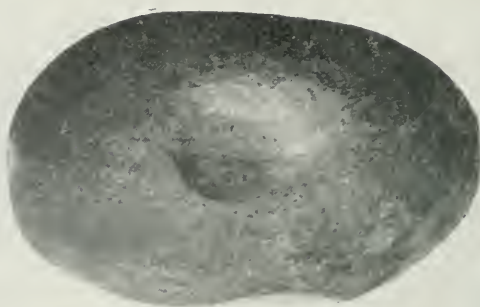
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|------------------------------|-----------------------|
| 21 Foster Village Site. | 23 Stewart Cache. |
| 22 Peonagowink Village Site. | 24 Morse Cache No. 1. |

CASS RIVER VALLEY.

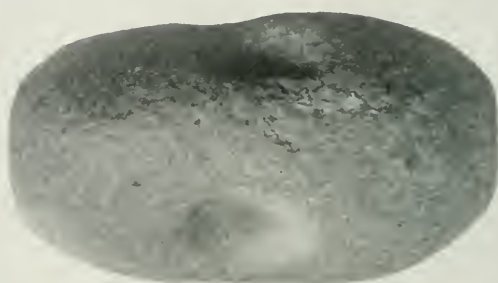
- | | |
|--------------------------|---------------------------------|
| 25 Wille Cache. | 30 Cass Village Site. |
| 26 Fisher Village Site. | 31 Bow Village Site. |
| 27 Fobear Mounds. | 32 Cook Village Site. |
| 28 Andross Village Site. | 33 Simons Prehistoric Cemetery. |
| 29 Lull Earthwork. | |

TITTABAWASSEE RIVER VALLEY.

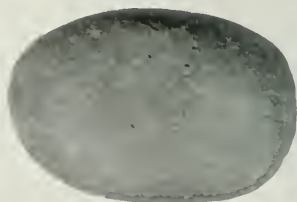
- | | |
|----------------------|--------------------------------|
| 34 Little Camp Site. | 37 Frazier Village Site. |
| 35 Morgan Camp Site. | 38 Tittabawassee Village Site. |
| 36 Andrews Workshop. | 39 German Camp Site. |



W. Orchard, Photo.



HAMMER-STONES.
About $\frac{1}{2}$ Natural Size.

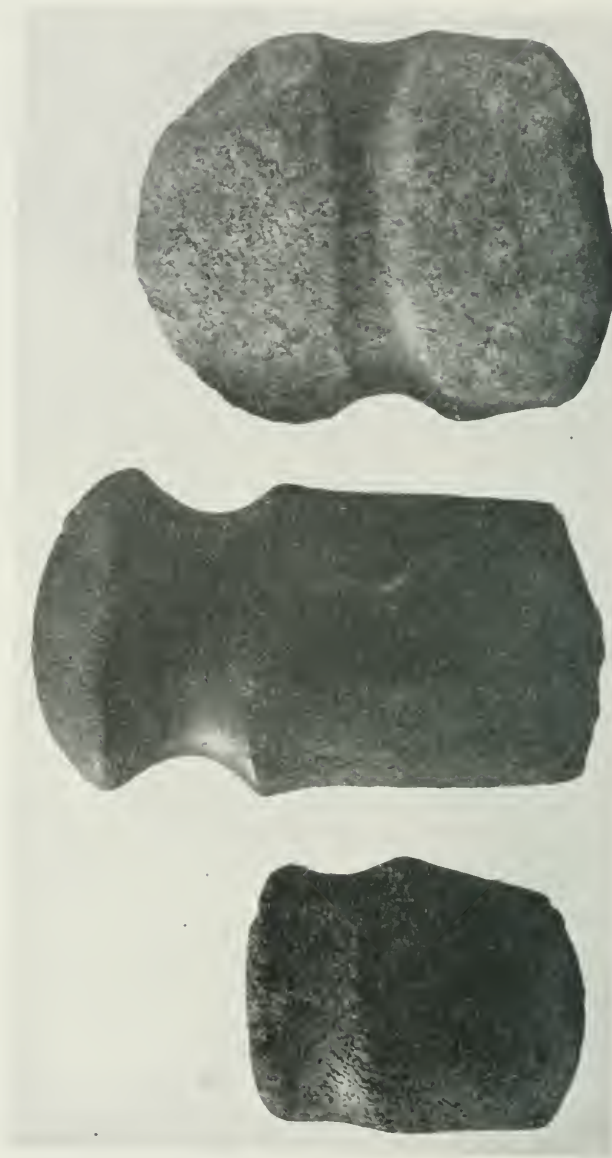


exposed by the rivers, while in other places they are covered with soil. From such exposures canoes could easily descend to villages along the rivers, while to carry the material by trail to inland settlements would have been laborious. The evidences from the numerous village sites and the burial-places, mounds and other remains, indicate that the conditions of life in pre-historic times were similar to those which existed when the Indians were first met by white men. Fragments of pottery; pebbles which have been burned and broken, probably while used as supports for the round-bottomed pottery cooking-vessels; ashes and charcoal; the broken bones and shells of animals; arrow, knife, spear, scraper and drill points of chert; points made of bone for arrows or awls; celts or chisels; hammer-stones; grooved axes; ornamental objects, etc.—all are to be seen in this case. A number of such objects when found on the surface of the ground at a particular place, especially if pottery is present, constitute the evidence which proves the spot to have been a village site. Charcoal and ashes alone are not conclusive proof of a village site, since such remains may have been left by white people of recent times.

PARTICULAR SITES.

North Island Workshops.—At the western limit of Wild Fowl Bay is North Island, on the northern side or highest part of which chert implements were found in all stages of manufacture, from the nodular masses occurring in the substratum of the entire island to the finished chipped points for spears, arrows, knives and similar objects. Here also were found chips, flakes and other discarded fragments of the same material,—the waste from the processes of manufacture,—indicating the site of an ancient workshop. Chipped implements of other material than chert have not been obtained at this locality.

Heisterman Island Village Site.—The highest portion of Heisterman Island is the northeastern side and there the sand ridges slope to the marshes known as the Middle Grounds. These marshes are frequented by fish, and wild fowl assemble here in large numbers to feed on the wild rice. The rice alone, which does not border other portions of the island, may have



W. Orchard, Photo.

GROOVED STONE AXES AND GROOVED STONE HAMMER.
About $\frac{1}{2}$ Natural Size.

determined the site of this prehistoric village. The limestone bearing chert suitable for the manufacture of arrow-points underlies the island and outcrops on its western shore within easy access of this site. Hammer-stones, chipped points for arrows, knives, spears, drills, etc., and chipped flint implements resembling small hoes were gathered here, as well as fragments of pottery and a piece of a pottery pipe. Many of the potsherds are neatly ornamented, some by incised designs, others by designs made by pressing twisted cord or twine into the clay while it was soft. Another important locality is the one known as Bay Port Village Site, from which the grooved stone hammer used for our illustration was taken.

Near some of the villages hidden deposits or caches have been found, fourteen in all having been discovered in the Saginaw valley. The specimens from a number of these may be seen in this collection. That the quarries from which the Indians obtained their raw material have yet to be found is possibly because signs of them may have been obliterated by modern quarrymen or by the grinding of the ice or the beating of the surf against the lake-shore outcrops during the many years which must have elapsed between the time when the Indians abandoned the quarries and the time when the first archæologist saw the site. The caches seem to indicate that expeditions were made to these quarries and a large number of the partly finished forms were chipped, and that they were taken to the vicinity of the permanent camp and cached in the earth, where the stone would be kept from becoming weathered.

Bay Port Cache.—One cross-section of a chert nodule and forty-seven "turtle-back" blank forms, constituting a cache, were found two feet below the surface, in the muck jungle, about a hundred feet from the shore of Wild Fowl Bay, and a quarter of a mile east of the wharf at Bay Port. The place is between the bay and the sand ridge on which the Bay Port village site is located. The specimens in the cache were found in one long row, overlapping one another somewhat like shingles on a roof. It is probable that the material of which they were made was obtained near the spot, since the outcrop of Subcarboniferous rock, which occurs for some distance along the beach westward from the wharf, bears concretions the material of which is similar

to that of the cache specimens. There are several outcrops of this rock within a mile, especially along the beach to the west. In this cache there were some blades of peculiar form, having a straight beveled edge on one side. It seems probable that this was caused by flaking the pieces for turtle-backs from a round concretion. The first flake removed would be symmetrical, but each of the succeeding flakes, if the material were used without waste, would have one side beveled where the one before it had been removed from the nodule. Not all of the flakes had been subjected to sufficient chipping to remove the signs of this bevel.



W. Orchard, Photo.

SEGMENT OF NODULE, RUDE BLANK AND CHIPPED POINT.

From the surface of the Esterbrook Village Site.

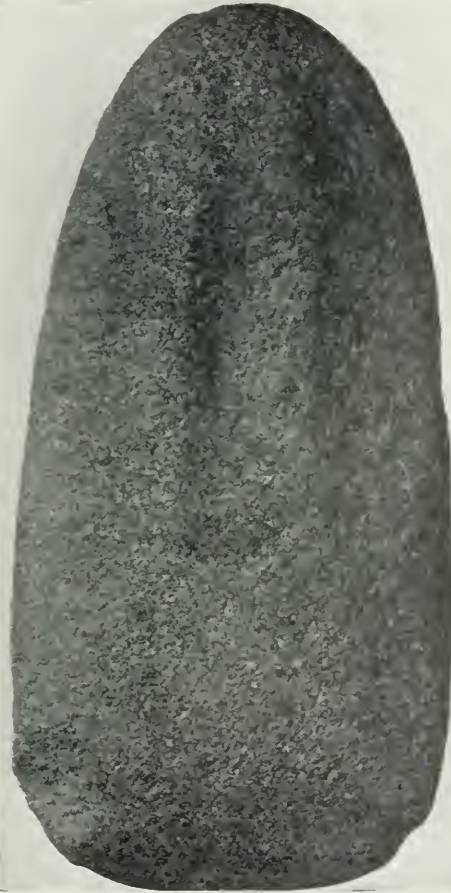
About $\frac{2}{3}$ Natural Size.

More or less evidence has been found of the existence of a number of village sites, burial-places, mounds and prehistoric battle-grounds from Bay Port southward along the shore of Saginaw Bay, on the western shore of the bay and along the lower course of Saginaw River. There are Ojibwa traditions also which tend to confirm the archæological evidence. From such sites the quantity of material in this collection is not sufficient to warrant a detailed description of it in this place. This, however, is given in a summary of the Archæology of Saginaw Valley, Michigan, published in the *American Anthropologist* beginning with Part II, 1901. The fragments of pottery, arrow-points and

other objects found on the surface of the sand ridges along the eastern side of Saginaw River in the city of Saginaw, indicate a number of village sites which were separated by bayous. From one of the latter series there has been obtained one of the so-called "bird-shaped" stones which is evidently in process of manufacture. The greater portion of the surface shows the pits caused by "pecking," as it is technically called, that is, the bruising of the surface of the stone and the brushing away of the crushed particles until it has assumed the shape desired. At either side of what was to have been the head, the next process in the manufacture had been taken up, as is shown by the rubbed surfaces. It is probable that this rubbing was done with a rather coarse stone, and that the implement would have been finished by polishing.

Mobray Village Site.—This site, which is on the east side of the river in South Saginaw, had on its surface

a sandstone pipe decorated with neatly arranged pits. Rock which outcrops in the bottom of the Cass river was mentioned as



W. Orchard, Photo.

"FLUTED" OR CORRUGATED STONE CHISEL.

"Fluted" celts are found only in Michigan and Wisconsin and this form is rare. Collected by Mr. Albert Barkels. Natural Size.

early as 1859 in the State geological reports as being material used by the Indians of the region for their pipes. It is possible that this pipe was made of similar material which was brought down the Cass by canoe, that being the most natural way; an idea which is strengthened by the fact that the early pioneers depended on the canoe, at first, for transportation along the same route.

Ka-pay-shaw-wink Village Site.—This is a large village site on the east bank of the Saginaw river, just below the junction of the Tittabawassee and

Shiawassee rivers. The archaeological evidence found at this locality coincides with the Ojibwa traditions, which state that in ancient times a great village of the Sac Indians was located here. A cache consisting of fifty-nine blades was found about a foot below the surface at this spot. The implements found in it are leaf-shaped, average about one and one-fourth inches in length and are of chert. One of the blades had been specialized by notching at the base. This cache is known as Golson Cache No. 2. There are two large dome-shaped mounds on the western side of the river, opposite the Ka-pay-shaw-wink village site, and it is related by the Indian tradi-



W. Orchard, Photo.

PIPE MADE OF SANDSTONE.

Collected by John Rambow on the Mobray
Camp Site. Natural Size.

tions that a part of the exterminated Sacs were buried in them. They are known as the Green Point mounds.

Wille Cache.—A cache consisting of two celts and about 175 chipped blades of triangular shape averaging an inch and a half in length was found in a small marsh hole or periodic pond near the north bank of the Cass river about three miles from Saginaw. Specimens are shown, also, from various sites on the Shiawassee

and Flint river, but, as in the case of many of the other sites in the region, they must be here passed without further mention.

Fobear Mound No. 1.—A group of four mounds was found on the land of Mr. Leonard Fobear on the south side of the Cass river nearly opposite the Wille cache, or about four miles above Saginaw. One of these was thoroughly explored in 1894 and a number of skeletons, besides fragments of pottery, chips of chert and other objects of like nature were found in it. Persons not acquainted with archæological field-work often ask how the explorer knows where to dig, hence a brief outline of the beginning of operations at this mound may be of some interest. On



Harlan I. Smith, Photo.

THE EASTERN OF THE GREEN POINT MOUNDS FROM THE SOUTH.

first visiting this locality, the author viewed it from several directions and felt that the mound was of such slight elevation and so much like the natural knolls in the same meadow with it that it might be only a natural rise in the ground; but, on walking over the middle of it, he noticed in the short meadow grass some yellow soil which had been thrown up out of a woodchuck burrow. Such material must have come from below the reach of the plow, since all the surface soil was black. In the yellow earth were several fragments of pottery, but such bits are to be found anywhere in the surface soil of the neighboring fields. A human tooth lying among the potsherds suggested the idea that a human



W. J. Melchers, Photo.

SKELETONS AS FOUND IN FOBEAR MOUND NO. 1.

skeleton might be underneath, and that the knoll was in reality a burial mound and not a natural elevation, for human teeth have not yet been brought up from the interior of natural knolls. On excavating the mound, several human skeletons were found near the base of the burrow. Thus the wood-chuck, of interest to the student of mammals, was of assistance to a worker in another department of science.



W. Orchard, Photo.

CASS CACHE No. 2.

Cass Cache No. II.—This cache, consisting of 22 blanks and 12 pieces of nodules of chert, very similar to that of the Subcarboniferous outcrop, was found just below the surface of the earth, near the south bank of the Cass river, at a point about four miles above Saginaw. The 12 pieces of raw material lay in a pile and the 22 blades were spread out near them. Chips and



THE ANDROSS URN.

W. Orchard, Photo.

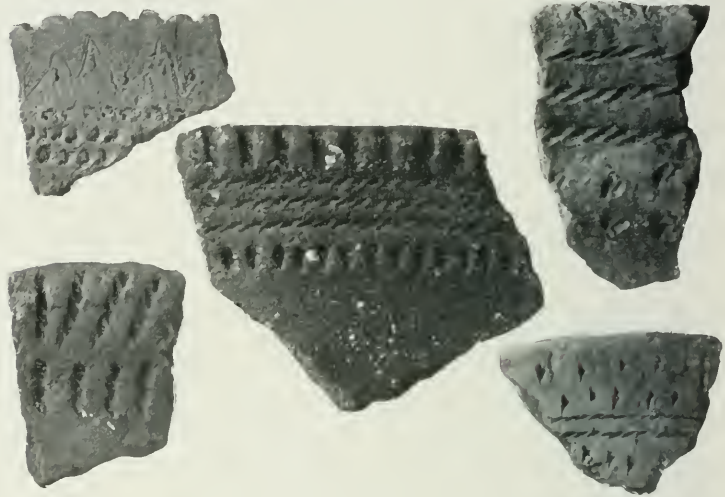
flakes, also, were abundant near the cache, and it is possible that this was a workshop, the raw material being piled in one place and the worked rock in another, beside it. The blanks found here included both forms described under Bay Port Cache.

Andross Village Site.—This site is at Bridgeport, about six miles from Saginaw, and is one of the many which have been found on the Cass river. It is worthy of note, because it furnished the large pottery urn which is illustrated on page 20, and which is, perhaps, the most interesting specimen in the collection. While a pioneer was plowing on the site, the foot of one of his oxen suddenly sank into a hole. On investigation, the farmer found that the ox had broken through the bottom of an urn which had been turned mouth downward over the head of a human skeleton. This urn is three feet nine inches in circumference and one foot eight inches in height, but before it was broken it must have been at least two feet high. It is reported that a number of similar urns have been found near Detroit, and one was dug up at Point Lookout on the west side of Saginaw Bay; but unfortunately all these specimens have been broken or lost, so that the Andross urn is probably unique.

Andrews Workshop.—On the Tittabawassee river, as on the other streams, we find a number of village sites and burial-places. One is on a sand ridge east of the river, near Paine's Station, about five miles west of Saginaw. Here the wind had blown under some buildings and removed the light sand, leaving a deep hole of considerable area. Over the surface of the sand remaining in this hole were left wagon-loads of chips and flakes of chert, arrow-points in various stages of manufacture, small hammer-stones and a few other objects, all indicating that the place was once a workshop. The hammer-stones are merely pebbles that have been battered in pounding, or pebbles which have been provided with a pit on either side, so that the thumb and middle finger may grasp them more securely. These were used in breaking up the pieces of chert and bringing them somewhat into the form of the chipped points for arrows and similar implements. It is probable that a bone implement was used for the finer flaking necessary to finish the object.

Some copper beads which were found on this site are of particular interest, since they show that the native copper from Lake

Superior, was hammered into the form of beads which are altogether different from those made of the thin rolled copper furnished the Indians by the white people during more recent times. These beads had evidently been at this place for a long time, a circumstance indicated by the corroded condition of the copper. The copper salts due to corrosion are of a preservative nature and have kept from total destruction portions of the cord on



W. Orchard, Photo.

FRAGMENTS OF POTTERY FROM FRAZIER VILLAGE SITE.

Nearly Natural Size.

which the beads had been strung. Had these beads been of shell or stone, or of any other material that did not produce such a salt, the cord would not have been preserved, and we should not have known that it was of vegetable fibre, but might quite properly have supposed that the beads had been strung upon a thong of buckskin.

Frazier Village Site.—This was a very large village site and was located on the south side of the Tittabawassee river near Paine's Station, about five miles above Saginaw. It is mentioned in the Ojibwa traditions as being the place where a large village was captured by the invading force. At this spot some fragments of pottery were secured which have decorations made with cords

like those of the Heisterman Island pottery. A mound of unusually large size is said to have been located on this site and the many human skeletons found here are supposed to have been those of the unfortunate Sacs. This mound has been entirely removed for the commercial purpose of obtaining the sand of which it was constructed. It

seems possible that the site was really a burial ground in a natural knoll of sand.

A cache consisting of over 300 pieces was found about a foot below the surface on this site. In the cache, which was located within a few hundred feet of the Frazier mound, were found four varieties of blades: First, large, black, leaf-shaped implements, about 8 inches long, made of black, concretionary chert and having a very delicate stem



W. Orchard, Photo.

REPRESENTATIVE SPECIMENS FROM FRAZIER CACHE NO. 1
About $\frac{1}{2}$ Natural Size.

formed at the tip of the base by two notches; Second, similar implements, about 3 inches long, showing concretionary structure very plainly, the centre being black and hard, the tips grading off by successive rings to a comparatively soft yellowish chert; Third, small forms made of yellow chert and

evidently intended for specialization; Fourth, a few of the latter specialized by notching. Objects made of the same material are only rarely found in the region, hence these were probably brought from a distance. A cache, a few feet from the preceding, consisted of one large, black, leaf-shaped implement, similar to those of the last mentioned and surrounded, it is said, by thirteen rubbed stones.

The foregoing description contains but a general indication of the archæology of the Saginaw valley, as outlined by a single collection. Those who care to pursue the inquiry further are referred to the more detailed descriptions published in the *American Anthropologist*, though even these are not supposed to exhaust the theme presented by this limited area alone. Thorough explorations in the mounds, graves and village sites are necessary to supplement what is now known from the surface evidence and from the few explorations which have been made beneath the surface.

Of the archæology of many other parts of Michigan still less is known, and it is of the greatest importance that thorough work should be done in several centres of culture, not only in the Saginaw valley, but also in other parts of Michigan and in fact throughout the Central States, in order to solve the enigmas that have long puzzled the students of the early Americans. The Mississippi and St. Lawrence valleys are rich in archæological material, but it is almost useless to indulge in speculations derived from scattered bits of evidence from widely separated parts of the country. The time has come when our studies must be based upon exhaustive and detailed investigations made in a scientific manner, at one place. These may then be compared with the results of similar studies carried on at all other parts of the region of which knowledge is desired and substantial progress will be made toward unraveling the history of the early Indian tribes in this country.

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