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EXCAVATING A TYRANNOSAURUS SKULL, MONTANA.

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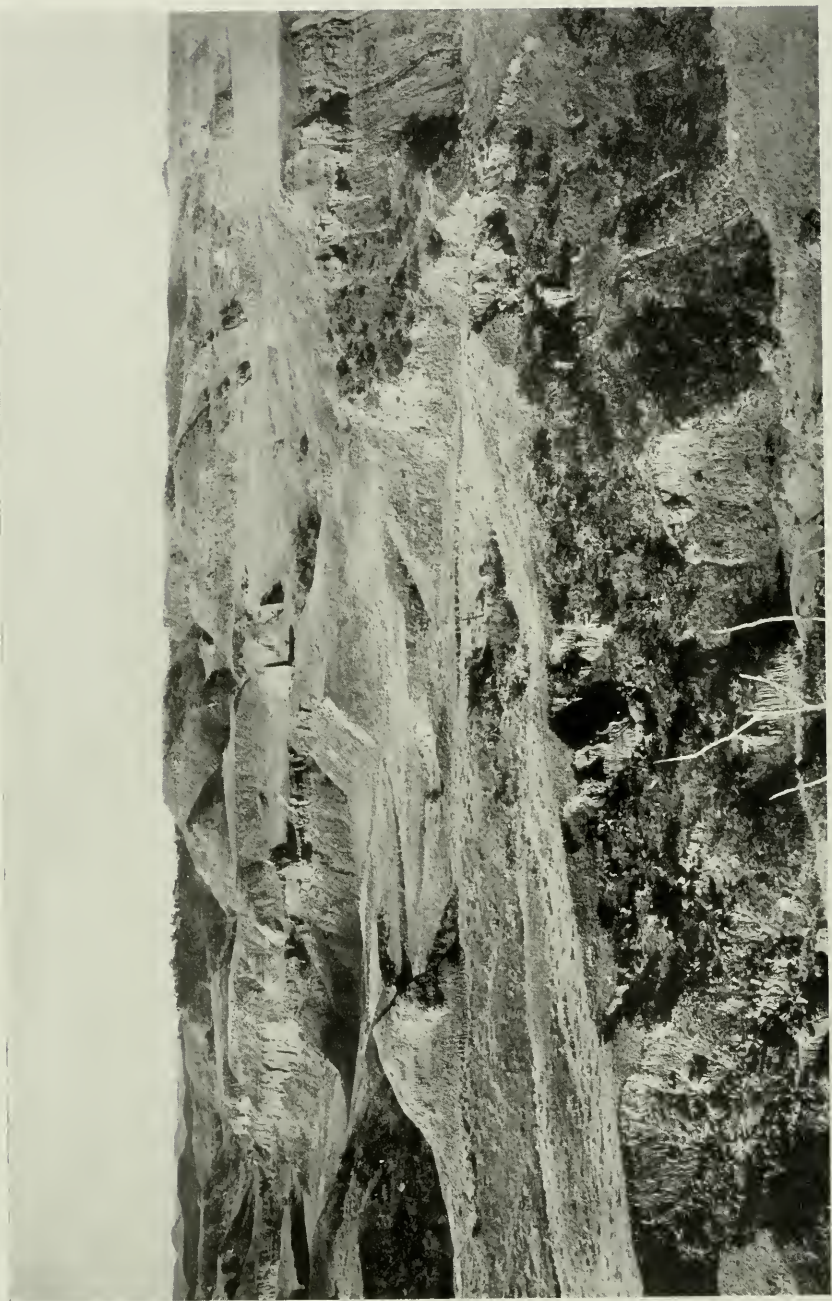
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UPPER DINOSAUR CLAYS, BASAL SANDSTONE AND CONCRETIONS, GILBERT CREEK, MONTANA

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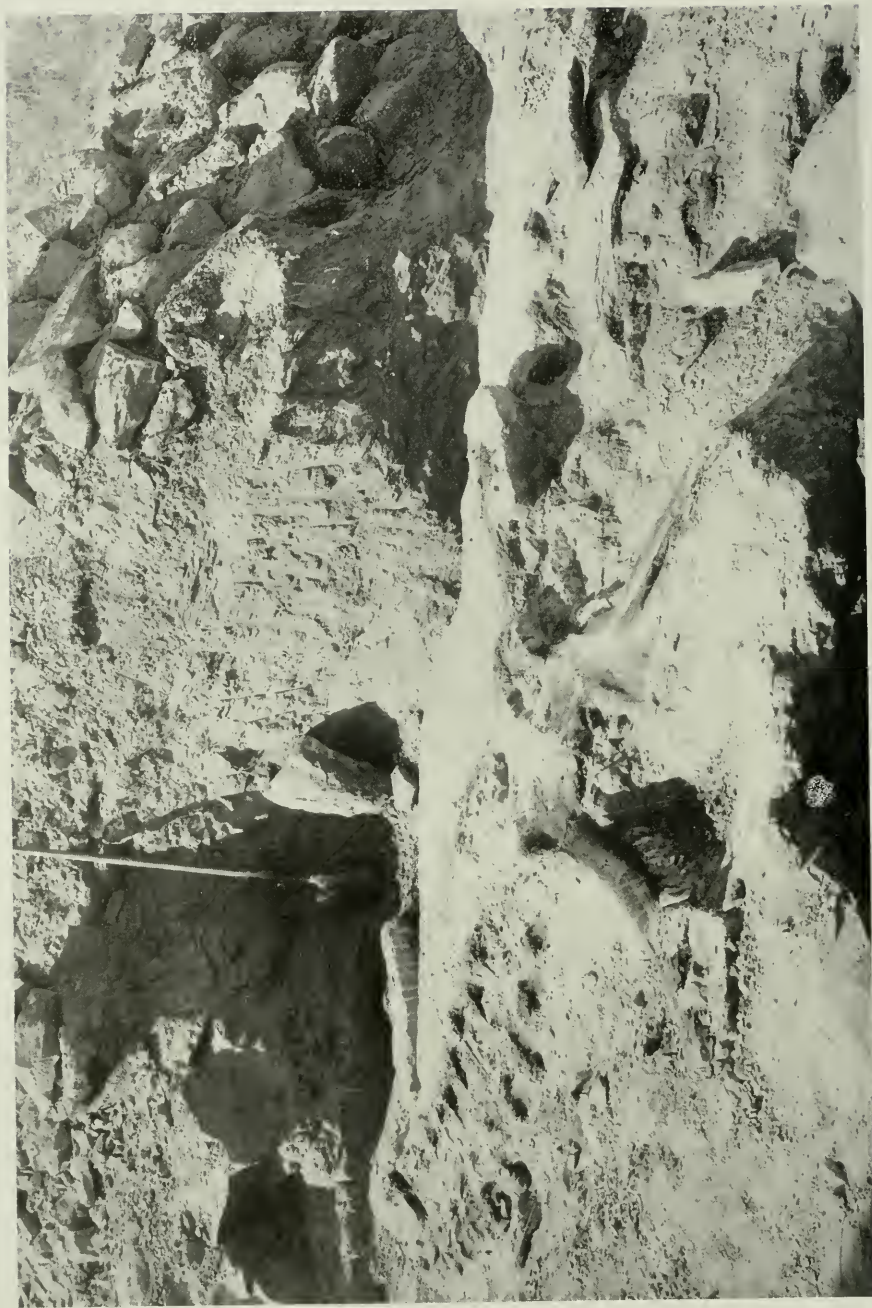
No. 1

THE TYRANNOSAURUS

IN the southeast corner of the Dinosaur Hall are the remains of the largest beast of prey that ever lived. This is the *Tyrannosaurus*, the great Carnivorous Dinosaur of the Cretaceous Period. Forty feet in length, with huge and massive skull, the jaws four feet long armed with sharply pointed teeth each projecting from two to six inches from the socket, this monster is beyond comparison the greatest carnivorous animal that ever inhabited the land.

The Museum has been peculiarly fortunate in securing three skeletons of this rare dinosaur. All of them were found by Mr. Barnum Brown of the Department of Vertebrate Palæontology on different expeditions. The first, from near Edgemont, South Dakota, was discovered in 1900 and includes the lower jaws, many vertebrae and ribs and a few bones from the limbs and feet. The second was obtained in 1902 on Hell Creek in central Montana and consists of a large part of the skull and jaws, most of the vertebrae of the back and the nearly complete pelvis and hind limbs. Since then Mr. Brown has searched diligently for additional remains of this animal, and in 1908 he was so fortunate as to find a skeleton in splendid preservation, and perfect except that it lacked the limbs and the tip of the tail. The rock in which these skeletons were found is a loosely cemented sandstone, but the skeletons themselves are partly or wholly encased in great concretionary masses of flinty hardness. Extracting the bones uninjured from these iron-hard concretions is a slow and difficult task and is not yet complete on the third and finest of the skeletons.

The skull and jaws and the pelvis and hind limbs of the second skeleton have been restored and mounted in the hall, as previously noticed in the JOURNAL. The skull and jaws of the third and finest skeleton of the Tyrannosaur have recently been placed in a case beside them. This specimen, which is the first really complete skull of a carnivorous dinosaur known to science, is of inestimable scientific value. It is beyond question the most impressive dinosaur skull ever found and



4 TYRANNOSAURUS SKELETON UNCOVERED AND READY TO BE TAKEN UP. BIG DRY CREEK FORTY MILES SOUTH OF GLASGOW, MONTANA



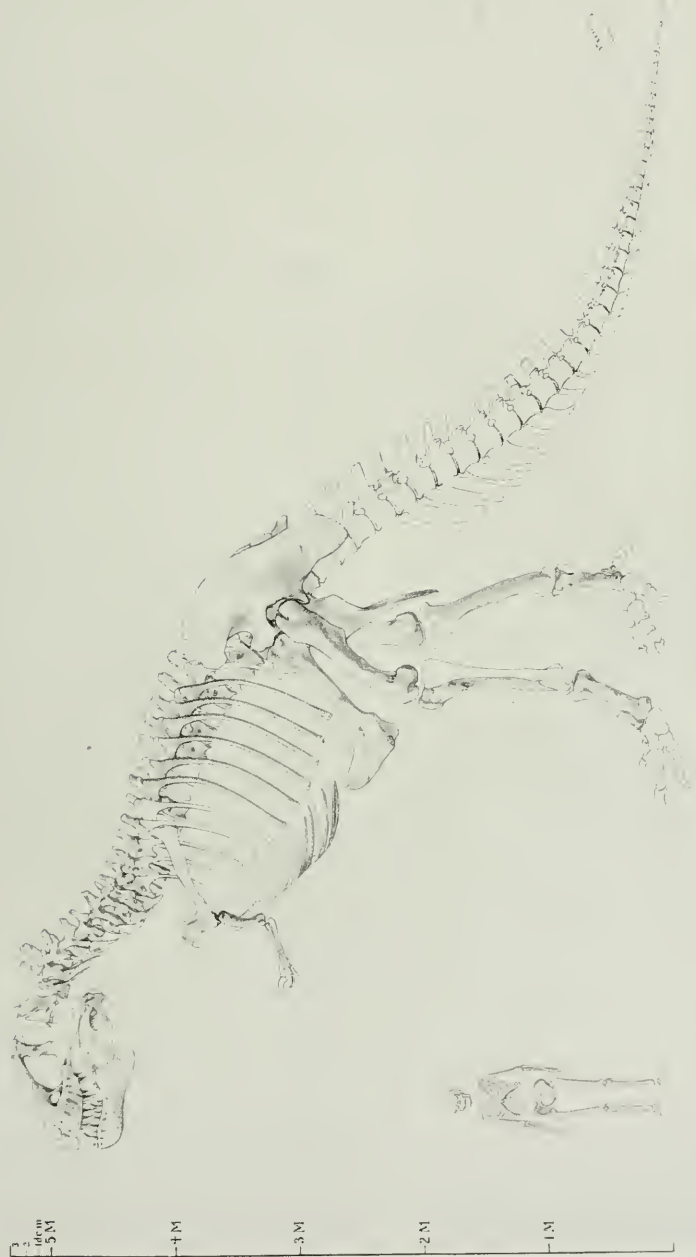
WORKING ON SKULL OF TYRANNOSAURUS. QUARRY FORTY MILES SOUTH OF
GLASGOW, MONTANA



BOXING PELVIS OF TYRANNOSAURUS. TWO TONS IN WEIGHT BIG DRY CREEK, FIFTY
MILES SOUTH OF GLASGOW, MONTANA



TYRANNOSAURUS. MOUNTED SKULL IN MUSEUM



TYRANNOSAURUS. RESTORATION FROM SPECIMENS IN THE MUSEUM

presents several unusual features, notably the distinct sutures which clearly define every element of the skull and the definite size and position of the orbit.

The present arrangement is temporary. As soon as the skeletons can be restored and the missing parts in each modeled or cast, the one from the other, it is intended to make a group consisting of the two *Tyrannosaurs* standing over the mummied carcass of a *Trachodon*, a unique specimen which was purchased last year from Mr. Charles H. Stenberg and noticed in the JOURNAL for April, 1908. This group will make a very effective and striking centerpiece for the Hall of Cretaceous Dinosaurs which is planned for the future development of the Museum.

There is no living beast of prey that compares with the great carnivorous dinosaurs or which habitually attacks the largest herbivorous animals. The lion and the tiger prey upon the medium-sized and smaller hoofed animals; they do not usually molest the great "pachyderms" (the elephant and the rhinoceros), and the indefinite multiplication of these giant ungulates is checked by other means. But during the Age of Reptiles it was different. The *Allosaurus* of the Jurassic, the *Tyrannosaurus* of the Cretaceous, were fitted by nature to attack and prey upon the largest of their herbivorous contemporaries; and the size and power of their weapons for attack far surpass anything seen among modern carnivores or those of the Age of Mammals. Conversely the largest herbivorous dinosaurs wore armor or weapons for defense much heavier and more powerful than can be found among the great pachyderms of modern times, whose thick skin is mainly a protection against accidental injury or the attacks of insects. The great horns and bony neck-frill of *Triceratops* and the armor-plated head and body of *Ankylosaurus* were developed no doubt to resist the attacks of the huge *Tyrannosaur*. Other contemporary dinosaurs like *Trachodon* were unarmored but were evidently adapted to a more amphibious life and sought refuge in swimming beyond the reach of their great enemy. Others again of much smaller size were agile and active and probably escaped by superior speed.

MR. GEORGE S. BOWDOIN, one of the Trustees, has presented to the Museum a fine old native basket from the Hope Islands in the South Pacific Ocean.

A VISIT TO THE OJIBWAY AND CREE OF CENTRAL CANADA

A BAND of Ojibway Indians occupies that region of central Canada lying between Hudson Bay and the Great Lakes, and a band of Cree lies directly north of them. These tribes it was my good fortune to visit during the past summer, sent by the Department of Anthropology of the Museum. On the first day of June starting from Dinorwick, the little Hudson's Bay Company post some 200 miles east of Winnipeg on the Canadian Pacific Railroad, I began the expedition accompanied by two guides, one of whom, Tom Bain by name, was head-guide for the Museum's expedition into the James Bay region in 1908. Our equipment was light, consisting merely of a tent and blankets, food, guns and necessary ammunition. These we carried nine and one half miles to Sandy Lake where we loaded them into an eighteen-foot cedar canoe, our bark for the remainder of the trip.

From Sandy Lake we journeyed four days northward to Lac Seul, touching at several Ojibway villages and camps by the way and coming in rather dangerous proximity to a serious forest fire. We made our first permanent camp at Lac Seul. About eight hundred Ojibway trade at this point, and at first they were inclined to be suspicious of us. They became decidedly hostile and threatening after they learned that our object was to study their manners and customs, so that, although we spent about ten days among them, we were able to secure little information and but few specimens.

At length, finding that our efforts were bringing no results, we set out for our next stopping place, Fort Osnaburgh on Lake St. Joseph, but after a day's paddling found that the guide did not remember the route. We were obliged to return to the Lac, which we reached a little after midnight. For some time before nearing our camping ground we could hear the Indians drumming and singing back in the woods, and after we pitched our camp not far away from where the Indians were, we could hear very distinctly what was going on. The medicine man or shaman was making medicine against us and particularly against me. His incantations, however, proved of no avail, at least we can truthfully say that we have felt no ill effects from his charms as yet. The following morning, we secured a friendly Cree who was living among the Ojibway at this point to guide us on our way to Fort Osnaburgh. The journey

from Lac Seul to Fort Osnaburgh led through the Root River, across the Height of Land into Lake St. Joseph.

The Root River although quite deep is a sluggish stream and narrow most of the way, varying from five to fifty feet in width. Moose, caribou and deer frequent its low and swampy shores. On our first day out we saw a yearling cow moose on the bank, and a shot from my carbine put us in possession of a much needed supply of fresh meat. On the following day we saw two more moose, and owing to the skillful and



YORK BOAT ASCENDING THE ALBANY RIVER

Supplies from Europe for the Hudson's Bay Company are still sent around Labrador into Hudson Bay, a journey of many months.

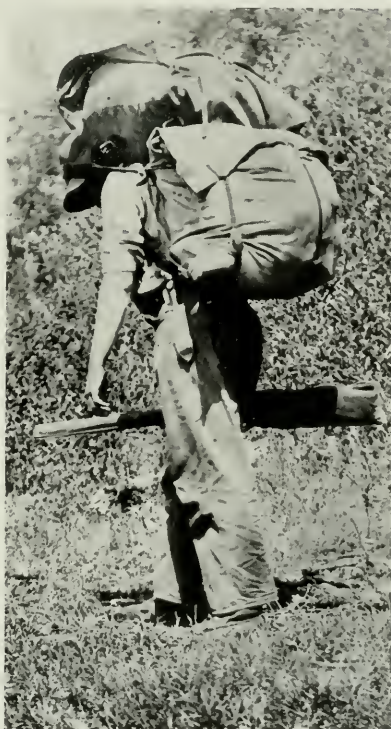
silent paddles of the Indians, were able to approach within fifty feet of one of them before she saw us. The day after, we again saw two moose and on the following day another pair. The last moose which we saw was an immense bull, and his horns, which were still in the velvet, were of enormous size, though it was only the middle of June. During the long time that we watched he remained in the middle of a small round basin caused by an expansion of the river and was evidently feeding on roots or weeds beneath the surface of the water. Sometimes he sank completely out of sight, even the ridge of his back disappearing from view.

My men stated that this was most unusual, though Bain said that he had once before seen a moose go completely under the water.

We found the Indians at Fort Osnaburgh also inclined to be hostile. The band at Lac Seul had sent warning messages that they were to have nothing to do with us, as our purpose in coming to their country was to steal little boys. The fact that I wore spectacles also militated against me, as the Indians believed that my glasses could see completely through them and read their thoughts. The Hudson's Bay Company had suspected several Indians of various petty misdemeanors and these Indians showed their guilty consciences by moving away as soon as we arrived. After some effort, however, we managed to come to friendly terms with these people and gained some results here.

From Fort Osnaburgh we left Lake St. Joseph and descended the Albany River, about four days' journey, when we turned aside and entered Lake Eabamet where the Hudson's Bay Company has long had a post known as Fort Hope. At Fort Hope there had been listed by Government census 513 Indians who were drawing annuities of four dollars each for England's use of the Canadian territory, but the epidemic of influenza which swept the Indians of northern Canada last year had carried away eighty of them during the winter.

We arrived at this place just before the Government men who were to pay the Indians their annuities. Hence we found the Indians all



"PACKING" ON THE MISSANABIE RIVER

All goods and specimens must be transported in this manner part of the way in the forest.



GOVERNMENT PAYMASTER DISTRIBUTING ANNUITIES TO THE FORT HOPE INDIANS



FEAST FOLLOWING THE RECEIPT OF ANNUITIES

The men form the inner circle, while the women and children sit outside

gathered in camp around the Hudson's Bay Company's and Revillon Frères' stores. These Indians also were afraid of us, as they had been warned by messages sent from Lac Seul as to our kidnapping propensities. I almost immediately got myself into difficulty by giving a ten cent piece to an attractive baby. A council was called at once to determine whether I was attempting to charm the child to death or not. But the missionary and the Hudson's Bay and Revillon Company's factors got word of it, came to Fort Hope and persuaded the Indians that our intentions were not bad.

The Indians decided, however, to send for their most noted shaman, Waboose-Inini or "Rabbit Man." The old fellow was hunting some distance from the Fort but put in his appearance a few days later, camping about three miles outside of the Post. He immediately sent word to me that he wished to see me. To this I replied that I was very busy and could not bother with coming. A second messenger shortly arrived inquiring why I was so busy that I could not see so great a man as Waboose-Inini. My reply was that I was learning all about shamanism from another medicine-man — a rival whom we knew the old fellow did not like. Waboose-Inini arrived next morning at our camp and we kept busily employed writing in our notebooks all the morning, while the old man sat about smoking. Toward noon he would have departed, but I asked him to stay for dinner, and on the following day the old man appeared again about meal time. This time he was not only invited to stay, but I gave him something to eat from my plate. He told me that no white man had honored him so before. When on the third day, he happened around at the noon hour and was again invited to dine, his delight knew no bounds and he burst out with, "Tell the young white chief that if there is anything he wants to know, I will tell him. I know everything. These other people are nothing but old women. I am the only one about here who knows how to make medicine."

After this, we were on most friendly terms and the other Indians seeing that I was accepted by the shaman also became friendly so that we were able to secure many photographs and quite a collection of specimens, notwithstanding that the Indians were at first afraid of the camera and in spite of the fact that most of the old customs have gone out within the past fifty years.

Few of the Northern Indians now seem to practise their ancient culture, in fact, they are much less primitive in many ways than our own



ANGLICAN CHURCH MISSION AND INDIAN VILLAGE. FORT HOPE, KEEWATIN



THE MISSION SCHOOL AT FORT HOPE

Ojibway children are still taught their own language by the English missionaries



OJIBWAY LADS. FORT HOPE



OJIBWAY MOTHERS AND BABIES. FORT HOPE



EASTERN CREE "CACHE." BLACK BEAR POINT, JAMES BAY

Supplies placed on scaffold out of reach of dogs and wolves.

reservation Indians who have been in contact with the white people for so many years. The reason for this is twofold. In the first place, most of the tribes in the United States were by nature warlike, while those of the north were hunting peoples, gentle and rather timid in character. In the second place, our Indians have been surrounded by a great number of white people who came among them as enemies. They have been isolated in groups among people whom they dislike. For this reason they have striven to preserve their identity as Indians, in so far as that was possible. In Canada, on the other hand, the white people in the northern district are still greatly in the minority. They have come among the Indians slowly and have come as friends. The Hudson's Bay Company has done a great deal toward rendering the existence of the Indians less difficult. White men's clothing, good food, implements and many other useful things have been given in exchange for fur. The side of the white man which the Indian has seen is an admirable one and worth striving to imitate in every way.

While we were at Fort Hope, the Indians were visited by Government treaty representatives. The arrival brought about much rejoicing on the part of the Indians, exhibited in firing of guns and in daily feasts

and dances. At this time the Indians received the only medical attention which they will have until another year has passed.

After a stay of several weeks at Fort Hope, we decided to leave. Old Rabbit Man seemed very sorry to see me go and, wishing no doubt to do the proper thing, decided to present me with his small daughter, a girl of about eight years of age. Needless to say, I was somewhat embarrassed by this and asked why I was so honored. "Make you fine wife," replied the old fellow. "But she is too young," I replied. "That makes no difference, my friend," said Rabbit Man. "Take her now. Bring her up right. She will love you all the more when she gets older." I finally explained that I was a poor young man and did not catch many beaver and was not in any position at



WIGWAM AT FORT HOPE

The bark wigwam is still occasionally constructed by the Eastern Ojibway.

the present time to support a young lady in proper state. The old man was satisfied and we proceeded on our journey.

Below Fort Hope, along the Albany River as far as Martin's Falls we caught beautiful trout but saw little game. From Martin's Falls we passed down to Fort Albany on James Bay, then coasted Hudson Bay for 120 miles to Moose Fort. Immense flocks of ducks, plover and various water and shore birds were frequently encountered. On one occasion we ran into a herd of white whales which sported about the canoe. My men shot ducks and geese to help out our provisions, and in addition, killed several hawks which they roasted and ate and which, to my surprise, proved quite palatable.

The journey up the river was rather uneventful, except that I was fortunate enough to kill a yearling bull moose about 150 miles south of the Bay. This was the first fresh meat that we had had since the moose I killed on the Root River some two months before. Incidentally, it may be said that we had no vegetables from the time we went in until the time we came out. After a return journey of sixteen days on the Missanabie or Moose River, we arrived at Missanabie on the Canadian Pacific Railroad August 27.

It appears that the Ojibway visited once lived in a neighborhood considerably farther south, possibly in northern Minnesota, whence they pushed northward, almost to Hudson Bay. Since coming to the North, they have not only given up many of the manners and customs of the typical Ojibway of the south but have also taken on some of the customs of the Eastern Cree. In addition they have evolved some new points of culture distinctively their own. All of these factors set them off as a distinct and separate body from the well-known historical Ojibway.

There was secured upon the expedition a series of the articles of aboriginal manufacture now used by the Cree and Ojibway of the Hudson Bay Region. These articles consist of household utensils, games, clothing and a few ceremonial articles. At the same time, full notes on the ethnology and folk lore were made, and the results will soon be published.

ALANSON SKINNER.



MOSS AND BALSAM BOUGHS FOR BEDDING. RUPERT'S HOUSE, JAMES BAY.

MINERAL ACCESSIONS

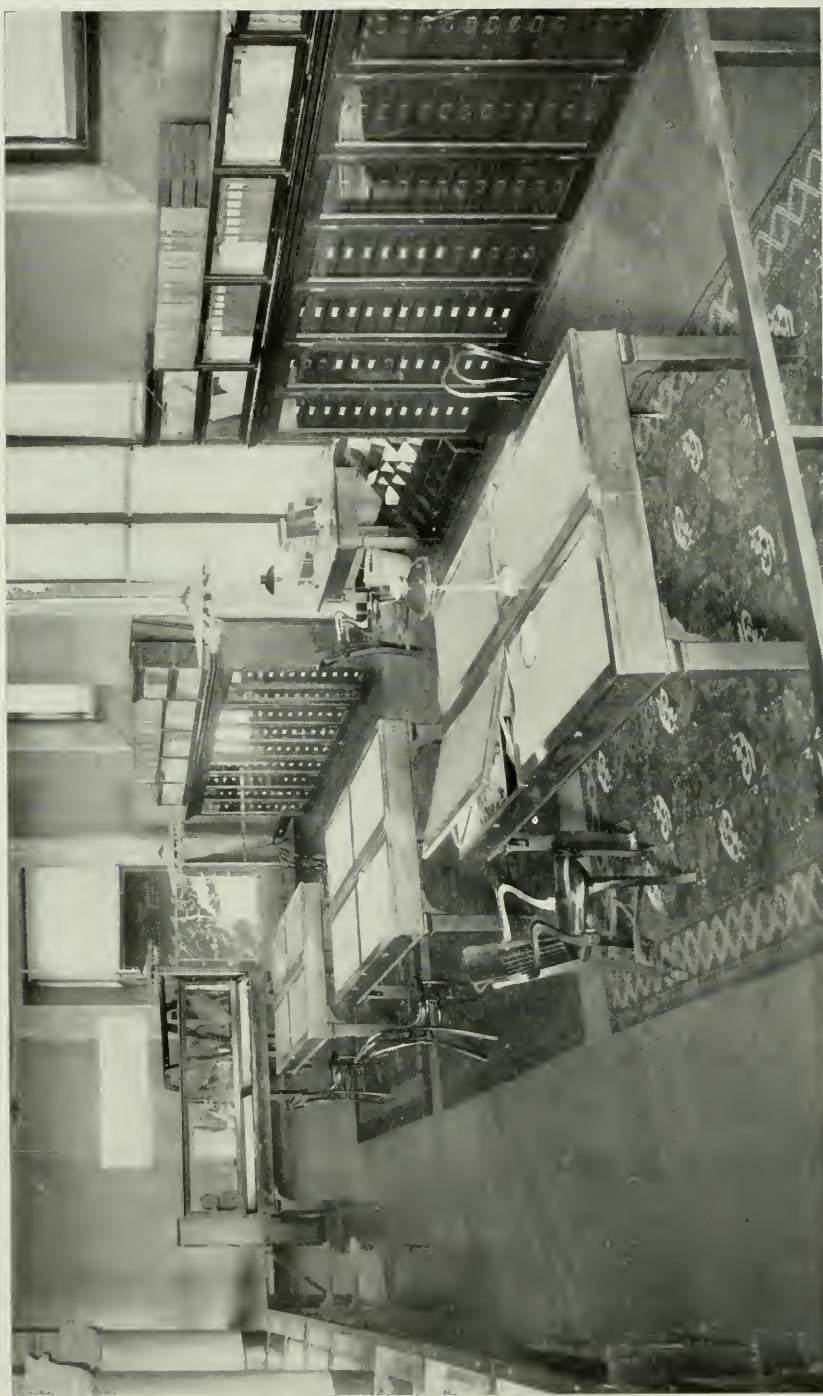
THROUGH the Bruce Fund the Mineral Collection has received some attractive mineral specimens, including several species new to the collection and others from new localities or of unusually perfect crystallographic development. Among the specimens is a group of Iodyrite crystals from Tonopah, Nevada, illustrating some of the hemimorphic forms described recently by Kraus and Cook, a handsome surface of dark-green prismatic Brochantite, a hydrous sulphate of copper, from Chili and a striking veinlet of the same mineral in fibrous form which has been changed to red oxide of copper (Cuprite), possibly, in a measure, through the agency of heat.

Among the remarkable mineral developments at Chuquicamata, Chili, which furnishes the Brochantite, are very beautiful light-green pyramidal crystals of Kröhukite, and the collection has secured an admirable example of this unique occurrence. Less noteworthy though valuable are some specimens of minerals which possess individual interest for crystal perfection, and among these may be mentioned a handsome Apatite from Hebron, Maine, which for a long time remained an unattainable ornament of a private collection, a small perfect Spodumene (Kunzite) crystal in its matrix, a New Hampshire Topaz and Phenacite, a beautiful blue Topaz from a new locality in Texas, some ruby Corundum from North Carolina, translucent crystals (viewed through the shorter axis) of Phlogopite from Franklin Furnace, N. J., and a delicately arborescent native Silver. In addition to these, specimens helpful for the scientific illustration of their respective species have been purchased, and the collection sensibly maintained abreast of the rapidly increasing development of the subject, through this indispensable endowment.

L. P. GRATACAP.

THE LOCAL COLLECTION OF INSECTS

THERE are about ten thousand species of insects occurring within fifty miles of New York City, but up to the present year, owing to the pressure of other work and the lack of funds, the Museum collection representing these insects attained to only twenty-five per cent



NORTH SIDE OF INSECT GALLERY

Collection of Local Insects. Meeting Room of the New York Entomological Society

of this number. Now efforts are being made not only to complete the collection, but also to install it in a way convenient for use, so that it may be of value as an aid in the difficult task of identifying specimens and as a record of this branch of the local fauna.

Considerable collecting was done during the past summer to help fill up the gaps in the series, and now the New York Entomological Society has kindly undertaken to assist in the work. In fact the custody of the collection has been turned over to the Society, which has chosen a curator whose duty it is to care for the specimens and to attend to keeping the records. Several times a month members of the Society meet at the Museum and spend the greater part of the day working over the collections, adding from their private collections the species which are lacking and seeing that all specimens are correctly identified and labeled. The importance of the work that they are doing cannot be overestimated. When one realizes that within fifty miles of New York City there are still more than seven thousand species of insects which are not represented in our collection, it will be seen what a task has been undertaken. Considerable progress, however, has already been made. Messrs. Angell, Bischoff, Dow, Englehardt, Harris, Joutell, Leng, Schaeffer and Wintersteiner are taking up the Coleoptera group by group, and of the one hundred twenty-five species which they have considered the local collection now contains one hundred eleven, whereas it formerly contained only eighty-three. Messrs. Comstock, Pollard and Watson are paying particular attention to the Lepidoptera; Dr. Love has undertaken the non-parasitic Hymenoptera; Messrs. Barber and Olsen, the Hemiptera, and Mr. Davis has already straightened out the Orthoptera and Odonata and expects to arrange the lower orders. Thus it will be seen that with the exception of the Diptera and the parasitic Hymenoptera the local insect collection is in the hands of men well competent to take care of them.

In connection with the work and to facilitate the study of the local collection some important alterations have been made on the north side of the gallery of the Insect Hall. The collection has been taken out of the open exhibition cases and put into light-proof cabinets along the side of the hall. Reference books and instruments have been provided and cork-topped tables in which are lockers where students may keep their material. Visitors desiring to consult the collection now may do so by asking the attendant to unlock the cabinets for them. The valuable

library of the Museum and that of the Entomological Society are available for convenient reference.

The space in the exhibition cases formerly occupied by the collection of local insects is being filled with exhibits aiming to show both the practical and theoretical sides of entomology, particular emphasis being laid upon insect ecology, or relation to the factors of environment.

RECENT ACCESSIONS TO THE DEPARTMENT OF GEOLOGY

THE Department of Geology is fortunate in having received recently as a gift from the Delaware, Lackawana and Western Coal Company, through its president, Mr. E. E. Loomis, a fossilized tree stump from the Diamond vein of one of the anthracite coal mines under the city of Scranton, Pennsylvania. The thickness of the coal in this vein was eight feet and its top was seventy feet below the surface of the ground. The vein was exhausted here thirty-five years ago and no mining has been done since. Recently one of the mine officials was examining these old workings and on top of the refuse on the floor of the gallery discovered the fossilized stump of a tree in perfect condition. The trunk was probably more than two feet in diameter and the spread of the remains of the roots is more than ten feet across. The stump evidently dropped from the roof some years after mining had been finished, and the specimen was apparently unnoticed when active operations were in progress, since the bottom of the fossil conformed to the roof line of the workings. The cavity from which the stump dropped shows that the trunk of the tree stood in a vertical position.

Through the generosity of Dr. Charles E. Sloeum of Defiance, Ohio, a Life Member of the Museum, and with the coöperation of the Kelley Island Lime and Transport Company, we have been able to extract from the quarries at Kelley's Island, Ohio, and transport to the Museum a splendid block about 8×10 feet in size representing the glacial grooves for which the Island is famous. Several deep grooves traverse the block, the principal one of which is about 12 inches deep. The higher parts of the surface show glacial scratches at an angle to the deep grooves, indicating a change of direction of movement in the ice during the latter part of its history or the work of a glacier advancing from a different center. Portions of the surface are polished almost as highly as they would be if the work had been done by hand.

SCIENTIFIC PUBLICATIONS DURING 1909

THE scientific publications of the Museum consist of the MEMOIRS, the BULLETIN and the ANTHROPOLOGICAL PAPERS. The wide range of research carried on by the Museum is indicated by the titles of the articles comprising the volumes as given in the following list. Although these articles are technical in character many of them have general as well as scientific interest. They are issued separately and with the exception of those marked with an asterisk may be obtained from the Librarian. Those which are marked with an asterisk are published by E. J. Brill, Leiden, Holland, and are not on sale at the Museum. They may be obtained through G. E. Stechert, Bookseller, 129 West 20th St., New York City.

MEMOIRS.

Anthropology.

VOL. IV, *PART VII.—The Shuswap. By JAMES TEIT. Pp. 443–789, pll. xiii–xiv and 82 text figures.

VOL. VIII, *PART II.—The Kwakiutl of Vancouver Island. By FRANZ BOAS. Pp. 301–522, pll. xxvii–lii and 142 text figures.

VOL. XI, *PART III.—The Chuckchee: Social Organization. By W. BOGORAS. Pp. 537–733, pl. xxxv and 1 text figure.

Zoölogy and Palæontology.

VOL. IX, PART V.—Studies on Fossil Fishes (Sharks, Chimeroids and Arthrodires). By BASHFORD DEAN. Pp. 209–287, pll. xxvi–xli and 65 text figures.

VOL. IX, PART VI.—The Carnivora and Insectivora of the Bridger Basin, Middle Eocene. By W. D. MATTHEW. Pp. 289–567, pll. xlii–lii and 118 text figures.

BULLETIN, VOLUME XXVI.

(Sixty-five plates and 119 text figures.)

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Special Publication.

*The Anatomy of the Common Squid. By LEONARD WORCESTER WILLIAMS. Pp. 1–87, pll. i–iii and sixteen text figures.	
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MUSEUM NEWS NOTES.

THE Department of Vertebrate Palæontology has received as a gift from Mr. Charles Lanier, one of the Trustees, a skull of the great Cretaceous dinosaur Triceratops. This specimen was collected in the Laramie Cretaceous of Seven-Mile Creek, Western County, Wyoming, about 45 miles northwest of Edgemont, South Dakota, by

Mr. Charles H. Sternberg and is considered the second finest example ever discovered.

THROUGH the bequest of Miss Phebe Anna Thorne, the Museum is to receive ten thousand dollars for its permanent endowment. The income of the fund is to be used in such a manner as to perpetuate the memory of her father.

THE path of Halley's comet has been added to the planetarium in the Foyer, and the position of this transient visitor to the solar system will be indicated daily during the next few months, while the comet is visible to the unaided eye.

THE Department of Anthropology has recently been enriched by the accession of two large local collections. The first of these was made on Manhattan Island by Messrs. Calver and Bolton. It is particularly valuable, because the sites on the upper end of the Island, whence the objects were obtained, are fast becoming obliterated. Several skeletons are particularly interesting as being the only authentic remains of the Manhattan aborigines known. There is also a large and perfect pottery vessel of the Iroquoian type from the upper end of Manhattan Island. This collection was described and many of the objects figured by Mr. Bolton in Volume III of the "Anthropological Papers" and in the Hudson-Fulton number of the JOURNAL for October, 1909. The second collection was made on Staten Island during the years 1900-1909 by Mr. Alanson Skinner of the Department of Anthropology and is the largest and most complete in existence from this locality, consisting of nearly 1200 specimens. The collection is described and figured by Mr. Skinner in Volume III of the "Anthropological Papers," and in the JOURNAL for October, 1909. Figures 9, 10, 11 and 12 illustrate specimens largely drawn from this collection.

SINCE our last issue the following persons have been elected to membership in the Museum: Sustaining Members, Messrs. ERNEST C. BLISS, TEMPLE BOWDOIN, WM. H. FISCHER, GEORGE COE GRAVES, WALTER C. HUBBARD, ALBERT TAG, F. D. UNDERWOOD and EGERTON L. WINTHROP; Annual Members, Messrs. FRED'K GIRARD AGENS, G. L. BOISSEVAUX, A. H. CASPARY, F. R. HAZARD, WALKER D. HINES, MINOR C. KEITH, MORRIS KINNEY, ANTHONY R. KUSER, GEORGE A.

LAVIE, WILLIAM W. LAWRENCE, JAMES MARWICK, JOHN NELSON, CLARENCE PORTER, JOHN F. THOMSON, JULIAN R. TINKHAM and WILLIS D. WOOD, Dr. A. BLAIR THAW, Mmes. GEORGIA C. HUDSON, and RAYMOND VON PALMENBERG and Miss THEODORA WILBORN.

LECTURE ANNOUNCEMENTS.

PEOPLE'S COURSE.

Given in coöperation with the City Department of Education.

Tuesday evenings at 8:15 o'clock. Doors open at 7:30.

The first four of a course of five lectures by MR. CHARLES M. PEPPER on "The Twentieth Century South America."

January 4.— "Panama to Patagonia."

January 11.— "Argentine, the World's Wheatfield."

January 18.— "The Vastness of Brazil."

January 25.— "Colombia and the Andes."

Saturday evenings at 8:15 o'clock. Doors open at 7:30. The first four of a course of six lectures by PROF. JOHN C. OLSEN on "Pure Foods and their Preparation."

January 8.— "Food Values; Cereals and Their Products."

January 15.— "Milk and Milk Products."

January 22.— "Bacteria and Preservatives."

January 29.— "Fats and Oils."

Children are not admitted to the lectures of the People's Course, except on presentation of a Museum Member's Card.

LEGAL HOLIDAY COURSE.

Fully illustrated. Open free to the public. No tickets required. Doors open at 2:45, lectures begin at 3:15 o'clock.

New Year's Day, January 1, 1910. ROY W. MINER, "Sea Animals of Our Shores."

Washington's Birthday, February 22, 1910. EDMUND OTIS HOVEY, "Some American Mining Regions." Particularly those producing Coal, Iron, Copper, Gold and Silver.

MEETINGS OF SOCIETIES.

Public meetings of the New York Academy of Sciences and its Affiliated Societies will be held at the Museum during January as usual.

Scientific Staff.

DIRECTOR.

HERMON C. BUMPUS, Ph.D., Sc. D.

DEPARTMENT OF PUBLIC INSTRUCTION.

Prof. ALBERT S. BICKMORE, B.S., Ph.D., LL.D., Curator Emeritus.

GEORGE H. SHERWOOD, A.B., A.M., Curator.

DEPARTMENT OF GEOLOGY AND INVERTEBRATE PALÆONTOLOGY.

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TOTEM POLE, RIVERS INLET

The American Museum Journal

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No. 2

A VISIT TO THE INDIAN TRIBES OF THE NORTHWEST COAST.

ON an expedition along the northwest coast of America, between Seattle and Skagway, I was able to resume during the past summer the archaeological reconnoissance which I began on the Jesup North Pacific Expeditions of 1897-8-9, and continued on that of the American Museum in 1903. I carried this reconnoissance onward from the northern end of Vancouver Island, where work stopped on the previous expeditions, to Kluckwan, Alaska, some twenty-five miles above Haines on the Chilkat River; obtaining also photographs and other data regarding the ethnology of the region and securing specimens not already represented in the Museum collections. I was accompanied by Mr. Will S. Taylor, mural artist, who made color sketches of the Indians and their natural and artificial environments. These sketches, together with the photographs and the actual ancient costumes and other specimens available in the Museum, will form the basis upon which Mr. Taylor will build up mural decorations for the Hall of Northwest Coast Ethnology, to illustrate the home country, characteristic occupations and social customs of the seven great groups of northwest coast natives.

The scientific results of the trip are interesting because the archaeology of the entire coast north of Vancouver Island as far as Mt. McKinley has been unknown to the scientific world. In the Bella Coola valley about midway along the British Columbia coast I saw chipped implements, marking the farthest north of the art of chipping stone in British Columbia. Evidences were also found here of the relation of the early people to those of the interior. The Bella Coola Indians have apparently pushed down from the interior and crowded in between the peoples already firmly established on the Coast, taking up the coast customs and ways of living very completely. Their language, however, has remained distinct from those of their new neighbors, the nearest peoples speaking the same type of language being found in the interior.

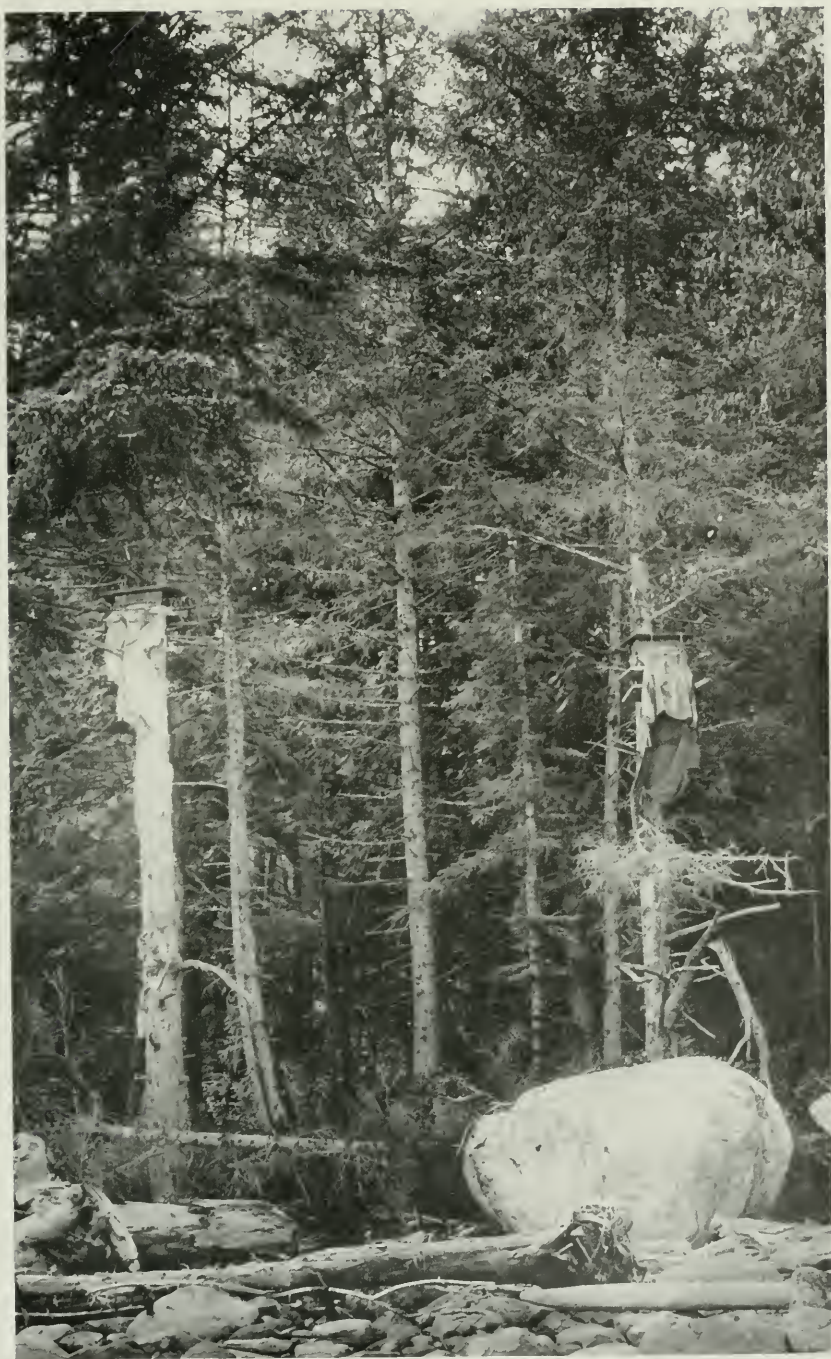
Although the Indians have given up much of their old life and seem

greatly changed even in the twelve years since my first visit, we could still find many purely native manufactures among them. Pictures bruised on the rocks by some of the ancient Indians were seen near Wrangel. In the vicinity of Old Metlakatla, Port Simpson and along the Chilkat River, we found ancient village sites, some of them indicated by the heaps of shell and other refuse discarded for many generations. On the Nass River also was an ancient village site where the Indians still go for eulachon or candle fish. In March these fish ascend the river in great schools and are taken with nets and rakes. The fish are very good food and are so fat that formerly they were used for candles. The Indians' chief interest in eulachon, however, lies in the oil that may be extracted from them, which is considered a luxury and is used as we use butter.

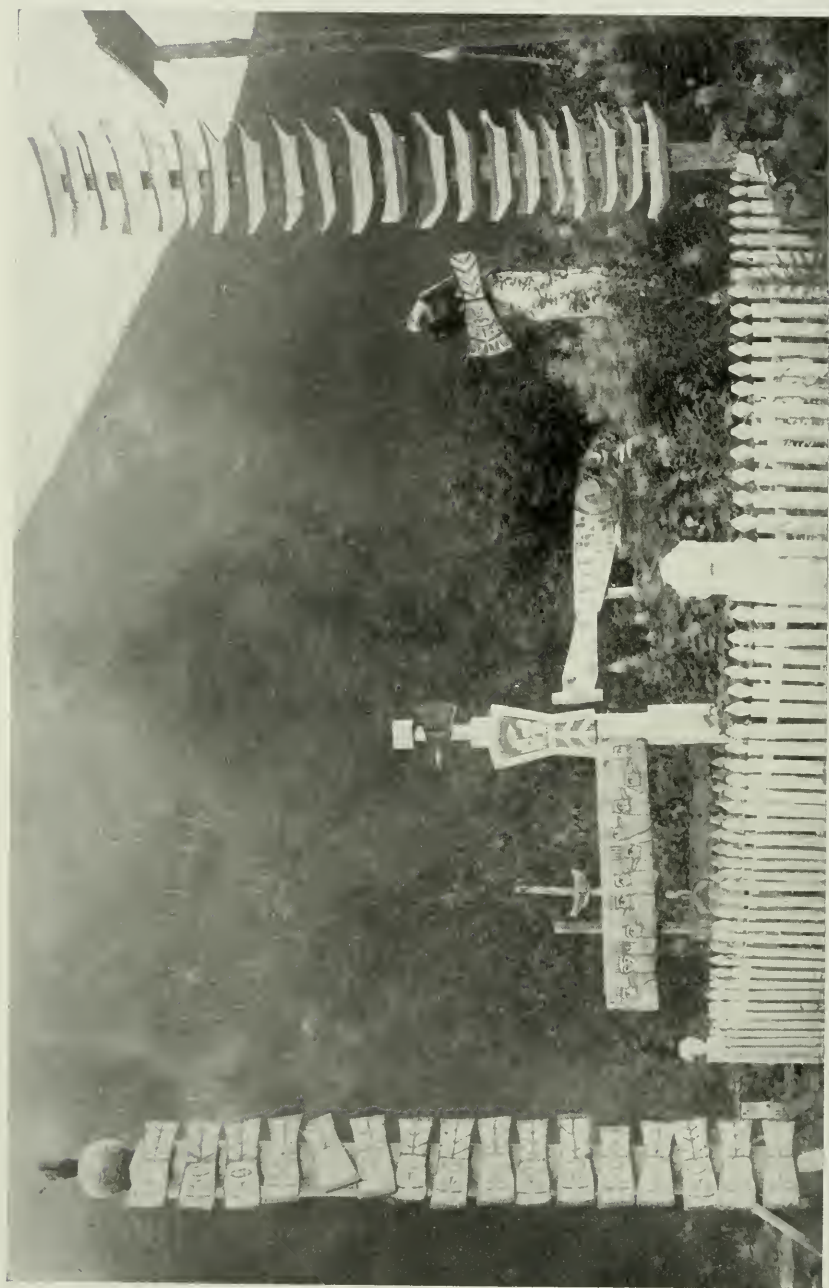
Our first stop of any length was at Victoria, a town perhaps more typically English than any other in North America. The Indians here have been little disturbed, so that even near the city both the southern Salish and the Nootka groups may be studied. Among the interesting photographs and sketches made here were one of an Indian making a dugout canoe from a cedar tree, and one of a Nootka man carving a totem pole.

From Victoria we went by steamer to a small island near the northern end of Vancouver Island, where at Alert Bay there is a tribe of the Kwakiutl. In spite of the influence of several other races living and working in their midst the Indians of Alert Bay in many ways keep to their old methods of living. For instance, although there has been a missionary here for a long time he has not been able to stop burial in tree-tops. The Indians must have practised this custom very recently, as some of the bodies were doubled up in common cheap trunks which can be bought only in the white man's store and are of a sort not made till a few years ago. In the older graves the bodies were placed in boxes made of three pieces of wood split from red cedar. One of the pieces served as the bottom, another as the top and the third was notched and bent around to form the ends and sides of the box. Where the edges of the boards met they were sewed together with spruce roots. Sometimes the boxes were painted and occasionally both painted and carved with the characteristic animal pictures of the region.

Some of the Indians bury their dead in the Christian cemetery, but even then show remnants of old customs. Near one of the graves a fine



GRAVES IN TREES. ALERT BAY



NATIVE CEMETERY, BELLA COOLA

Wooden representations of "coppers" and canoes indicative of wealth and hospitality of the deceased

bureau stood in the wind and rain. Perhaps it had been owned and highly regarded by the woman interred or had been something that she had longed for and now that she was dead her relatives were showing the greatness of their grief by sacrificing a valuable piece of property to the elements. The Indians often erect beside the graves curious monuments such as wooden representations of "coppers," as is shown in the illustration on page 34. These coppers are pieces of metal of distinctive shape and markings. They are of no great intrinsic value, but



TOTEM POLES, ALERT BAY

when bought and sold among the Indians they increase to almost fabulous worth. When a copper is transferred there is always a gathering and a feast. The Indians value a copper so highly that the white store keeper takes the piece of metal as credit and advances groceries and dry goods to the Indians for perhaps a whole year until they are able to go to the cannery and earn money. On coming back from the canneries the Indians always redeem their copper securities and again use them, buying and selling them at enhanced values and with special ceremonials.

From Alert Bay the expedition moved northward to Rivers Inlet, where lives another tribe of the Kwakiutl Indians. There are two villages, one near the Rivers Inlet cannery at the head of the inlet, the other on an island about three miles up stream. Here the river reaches the tide water between tall mountain peaks, still covered with snow in July. At this season of the year the Indians congregate here to work for the salmon canneries. There were Nootka from the west coast of Vancouver Island and also members of the Kwakiutl tribe from Alert Bay. The local Indians with characteristic hospitality invited the visiting Indians to a feast or "cultus potlatch." It was held on Saturday night, when, according to the laws of British Columbia, fishing must not be carried on. We expressed a desire to attend this potlatch, and from time to time during the day, the Indians invited us and reminded us of the event. The chief of the local tribe was very sick and was expected to die. His retainers were going to give the potlatch, so that honor would accrue to him. I am inclined to think that they had a vague idea that it might be of benefit also to his health.

As the darkness gathered the Indians began to move toward the main house of the village. The house was immense and was made of split cedar slabs on a framework of great logs. The rafters, which were just out of reach, were at least three feet in diameter and blackened by the smoke of many years. When we entered this house there seemed to be at least a hundred Indians assembled. At the farther end were the members of the small tribe located at Rivers Inlet. These Indians later furnished music, by beating upon a board with batons and upon a great wooden drum with the fist. Along the left side of the room were gathered the Nootka, and on the right the Kwakiutl from Alert Bay. Some of the men of the latter tribe had positions of honor in great wooden seats which were placed on the floor, where they reclined with their feet toward the fire, their knees partly drawn up and their heads and shoulders resting against the back of the seat. Before the feast began, cordwood was heaped on the fire which furnished the only illumination. When the fire flared up, long shadows were thrown against the blackened walls. Occasionally a dog passed in front of the fire and his weird shadow was thrown against the wall. Sometimes there was a silhouette of a baby, who toddled toward the fire from his mother, only to be drawn back by a clutch upon his skirts. As the evening wore on these children became fretful, and the affectionate

character of the Indians was shown by the way in which the little ones were treated. Some of the older men, in accordance with their rank, preserved the proverbial Indian dignity, but there was enough laughter throughout the assemblage to convince one of the mistake of the popular notion that the Indians are always morose.

At first there was a speech in Kwakiutl by a chief from Alert Bay, in which I caught occasionally the name of the superintendent of the cannery. Then there was a similar speech with much gesticulation by a young man of the Nootka. This was interpreted in Chinook, and since I could understand this jargon, I realized that the Indians were having a labor agitation. Other canneries had been paying bounties to secure the Indians to work for them, and the Indians wanted five dollars for each one who had come to work at the Rivers Inlet cannery. They also thought that the women who put the salmon into the cans were not paid enough. They finally decided not to go out to tend the nets, unless the wages of the women were increased and the bounty was forthcoming.

After the speeches came a dance by the daughter of the chief. She was gorgeously costumed, looking like an oriental princess in a red robe decorated with rows of pearl buttons. She wore a carved and painted headdress, in which were sea lion whiskers carrying eagle down, and which had many ermine skins that hung down her back. The dance was simple and was of short duration, but the mere appearance of so distinguished a person seemed to be considered a great honor. This dance was followed by others, after which the two masters of ceremonies, old Indian neighbors of the owner of the house, brought in a curiously-gowned personage, wearing a grotesque carved and painted wooden mask. This individual followed his leaders part way around the fire, threatening them in screeching tones apparently made with a whistle. Finally, as though out of patience, the Indians turned on him and drove him back a little distance, but he retired with dignity, turning his back upon them. This operation was repeated, until he had gone around the fire several times, when he disappeared with many screeches through a little door at the back of the house, behind the blankets of the masters of ceremonies.

During this performance the fire caught in the roof of the house, but there was no panic among these people, noted as a race for their stolidness. Presently a pail appeared lowered on a rope from the roof. The pail was filled with water and pulled to the ceiling and the water

dashed onto the fire. This was kept up until the fire was out, but the people paid no attention to the interruption, and the dancing and other ceremonies progressed as if nothing unusual were happening. Finally, great cans of tea that had been brewing in the edge of the fire and pilot



CARVED POST, BELLA COOLA

Purchased for the Museum

bread from twenty-eight cases, some of which we had been using as seats, were brought forward, and the cultus potlatch was on.

A real potlatch is a function consisting of the giving out of property as an investment and with the purpose of gaining aristocratic position

in the tribe. The people of this coast formerly were very much given to holding potlatches, but the government officials and missionaries believed that the ceremonies entailed a wasteful throwing away of property and were accompanied by many indiscretions and by much gambling and intemperance, so that a law was passed some years ago making the giving of a potlatch a criminal offence. I am informed now, however, that the cases are thrown out of court by the judges as being unconstitutional or else out of their jurisdiction. Blankets are usually distributed at such potlatches, not only those belonging to the person holding the potlatch, but also those of his relatives, friends and retainers. Sometimes the potlatch is for the benefit of children, so that they will have a certain prestige when older. This sort of a potlatch may be compared to our endowment insurance. The cultus potlatch, however, from which no direct return is expected, may be likened to a dinner or banquet among our own people. So the visiting Indians at Rivers Inlet were given pilot bread and tea to uphold the honor and hospitality of the local tribe.

We next went to Bella Coola, at the extreme eastern end of Burke Channel, about sixty miles inland beyond the usual course of steamers. The Bella Coola River is building out a delta here, so that steamers have to land at a wharf at least a mile long. The outer end of this is only a few feet from the steep mountain side to the north and follows along it until the low delta land is reached. On the end of the wharf is an open shed where all freight is placed until called for by the owners. This shed is never locked, yet nothing is ever stolen from it.

The population of Bella Coola is scattered through the valley and is made up of Norwegians, Indians and Canadians. There is an Indian village on each side of the River. The one on the north consists of Christianized Indians who have settled here, leaving the pagan Indians on the south side. The houses in the Christianized village are similar to those of the white people of the vicinity. Near the pagan village dwell Mr. John Clayton and his family. He is the venerable Hudson's Bay man who keeps the store and is one of the richest and best known men living on the coast of British Columbia north of Vancouver. In the Christianized village are the church and the home of the missionary, the Rev. W. H. Gibson. Both Mr. Gibson and Mr. Clayton were instrumental in assisting us to secure totem poles for the Museum.

On both sides of the valley the mountains rise abruptly, the upper portions rocky, the lower portions heavily timbered with spruce, hemlock,

cedar and fir, as is also the valley. The mountains look purple in the clear atmosphere. In certain protected parts the snow lingers in July, and here and there may be seen perpetual snow and even blue glaciers. The river is fed from the snow peaks farther to the east and is icy cold. It is very swift and navigated only by long canoes dug out of single tree



PAGAN VILLAGE, BELLA COOLA

Deserted, the inhabitants being away at the canneries.

trunks. These canoes are spoon-shaped at each end and are entirely different from the ocean canoes of the coast. They are poled where the river is too swift for paddling. A stranger's best policy is to sit on the bottom of the canoe and leave its management to the Indian owner.

The older Indians of Bella Coola, those who were not away working at the cannery, were preparing fish for winter use and also drying berries. They raised some of the finest strawberries I have ever seen. To prepare for drying they crush these and various native berries, the red and yellow salmon berries and a large sort of raspberry, into an immense cake which they spread on racks made of split cedar covered with the fresh leaves of skunk cabbage or nettle. Here we found an old man carving spoons out of alder wood and an old woman weaving strips of cedar bark into mats. Indians from the interior come to Bella Coola. They look different from those of the coast, are more active and angular. The costumes of both men and women are slightly different from those of the people of the coast. They wear moccasins, which are not used by the Bella Coola or their neighbors, who spend much of their time in the surf and on the beach.

Leaving this valley of the Bella Coola, which is a most beautiful spot, sometimes called the Switzerland of America, we proceeded up the coast to visit the country of the Tsimshian, who live on the Skeena and Nass Rivers and the adjacent coasts. The regular steamer took us to Prince Rupert, the lively western terminus of the Grand Trunk Pacific Railway, where we chartered a launch and visited Old Metlakatla. A missionary was once located here but he had trouble with his superiors in British Columbia and took his followers, about one thousand Tsimshian, to Alaska, where he established the town of New Metlakatla on a grant of land received from the American government. His followers make some of the finest boats constructed on the North Pacific Coast. In the vicinity of the old town we saw a number of shell heaps marking the sites of ancient villages, where archaeological explorations would undoubtedly reveal the character of the arts of the ancient people of this area and throw some light on their migrations. Continuing with the launch we went up the Nass River near the boundary between Alaska and Canada, visiting the old eulichon fishing grounds, and then crossed into Alaska to stop at many places before turning back at Skagway.

Our longest stay was made at Wrangel, in the country of the Tlingit Indians, where are large numbers of totem poles, carved grave posts and mortuary columns. From Wrangel we made a most interesting trip up the Stickine and Iskut Rivers. The river is too swift for rowing or paddling canoes, and all former ascents had been made by poling, bushing or lining. After proceeding as far up the Iskut as it was possible

to go, in fact to a place where the current was so swift that with full speed ahead of the engine the boat made no progress against the current, we made camp and completed our studies in this direction. Returning to the mouth of the Iskut much more quickly than we went up, we ascended the Stickine to the Great Glacier, and then came back to Wrangel and went by regular steamer to Haines, and thence to Kluckwan by the military road.

Kluckwan is a village of the Tlingit Indians on the old Dalton trail to the Klondyke. Here we saw the Tlingit women making Chilcat blankets. This blanket, as is well known, is one of the most remarkable kinds of weaving done in North America. It is made from cedar bark and mountain goat wool and decorated with woven designs characteristic of the region. In very ancient times the designs were of a geometric character, similar to those of the Tlingit baskets, but the blankets which are seen to-day bear the animal motives common on the carved wooden boxes of these people.

From Kluckwan I returned to the Museum, while Mr. Taylor continued his color studies by visiting the Haida at Masset on the northern end of Queen Charlotte Island and the Nootka at several villages along the western coast of Vancouver Island, before coming back to New York.

HARLAN I. SMITH.

RESULTS OF AN ART TRIP TO THE NORTHWEST COAST.

MURAL DECORATIONS PLANNED TO SHOW INDIAN INDUSTRIES.

PREVIOUS to the starting of last summer's expedition to British Columbia and Alaska it was decided that there should be two distinct series of pictures in the mural decorations of the North West Indian Hall, and that one series, on the west side of the hall, should be devoted to the industries of the Indians, while the other, occupying the east side, should deal with Indian ceremonials.

The industrial series will have its subjects arranged according to the geographical relations of the seven distinct Indian groups: the Tlingit of



MORTUARY COLUMN, WRANGEL, ALASKA

The bodies are within two covered niches in the shaft

Alaska, Haida of Queen Charlotte Islands, Tsimshian near the Nass and Skeena Rivers, Bella Coola between the Burke and Dean Channels, Kwakiutl on the mainland and northeast end of Vancouver Island, Nootka on the west coast of Vancouver Island, and Salish at the extreme southern extremity of British Columbia.

According to prominent writers the typical industry of each tribe serves as a means of commerce and trade among the neighboring tribes, the conditions of the country naturally influencing its products; for example, when the northern Indian is weaving blankets out of mountain goat wool, the southern Indian may be drying clams for the winter's food. Therefore in the first series of paintings the effort will be made to show not only the industries, but also the connections of these industries with those of other tribes. These pictures will present the scenes where the material was procured, how it was prepared and as far as possible the use of the finished article in trade.

To gather the artistic and scientific data for the first painting of the series, showing the weaving of the Chileat blanket, I searched through many towns and villages, often in vain, because the weather-beaten and adze-carved boards of the old houses had their original color hidden under white man's paint. In Wrangel, I made many color notes valuable to my work, yet it was not until I reached the Great Glacier on the Stickine River that I caught the spirit of Alaska. Having waited two days for the dense fog to rise, I at last beheld a beautiful glacier partly covered with snow converging toward a small river of ice at the junction of the mountains. The scene partly in sunlight gave me the first inspiration for the Tlingit decoration. I got the remainder of the subject in the Chileat River section at Kluckwan where two old women, seated in their peculiar fashion on their heels, were creating a blanket, stripping the cedar bark for warp and spinning the wool from the crude wool of the mountain goat.

To obtain data for the second or Haida decoration, I went to Masset, Queen Charlotte Islands, but in all the twelve days spent there, I had but a few hours of sunshine in which to make sketches and so gather in the material I had located. There were days of waiting and watching in the rain. When an opening came in the clouds I had to cover a hasty two miles along the sandy beach to catch on canvas the brilliancy of color displayed — gaining often a severe drenching as an additional reward.

The Queen Charlotte Islands have long been inhabited by the most



CHILCAT BLANKET, (UNFINISHED) AND PATTERN BOARD, KLUCKWAN, ALASKA

skillful builders of canoes, enormous dugouts from cedar trees. Although no canoe was being built while I was there, one six fathoms long had been made the previous winter. The Indians were still interested in it and manifested considerable pride in showing their work. Urged on by their pride, they carefully explained details and in many cases splendidly illustrated them, as a result of which I gained dozens of pencil compositions and many local color notes, so that the Haida painting will show graphically the Indians at work carving and steaming the canoe in the midst of characteristic surroundings.

From Prince Rupert, our headquarters in the north, we traveled to



CHINOOK CANOE, NEAR VICTORIA

The Indian is excavating the interior with an adze

Nass River. On our way we were informed that a native artist lived at Georgetown. To learn that a picture painter, not a mere decorator, existed among these serious-minded peoples who are accustomed to make only abstract designs stimulated my interest. Late in the afternoon we moored beside a raft of logs and had to dance our way for many yards over the moving tree trunks to reach the shore. We finally reached the shack of the artist and, watched by a large and curious family, were ushered into his "studio." He exhibited odd bits of broken glass which when held toward the light showed strange drawings in color,

sometimes almost caricatures. Yet they held a certain charm, telling tales of legendary battles or of wonderful ceremonials. In spite of the difficulties in the way of his work the man was a true artist, an eager spirit, in a race where enthusiasm is rare.

At Redcliff on the Nass River there was most charming art material, the mountains high and partly obscured by clouds dwarfing the houses along the shore. It rained almost continuously, however, during our stay, but there were intervals when we ventured from the boat in spite of the rain. Walking along the shore we found it impossible to get close to the houses, the nettles, grown since the previous fishing season in March,



HAIDA CANOE. ALERT BAY

forming a successful barricade. Even on the outskirts we found it uncomfortable to stay long in one place, because the refuse of last season's catch still retained its disagreeable odor. So I was obliged to procure sketches from a distance.

Once a year the tribes congregate at this place as they have done for years. For one month, while the run of eulichon or candle fish is on, the Indian employs all his time catching the small sardine-shaped fish and preparing it for use. Many hundreds of the fish are dried in the sun to serve later as candles. Many more hundreds are put into water with hot stones and allowed to cook until the oil rises and can be skimmed off to serve later as butter. The third picture, that of the Tsimshian,

will show this eulichon industry. Natives hang fish on racks to dry in the sun, women press the sediment left from the cooking through a coarse mesh to secure the remaining oil. The fire silhouettes the figures and makes plain the method of heating the stones. There is a lean-to, an old building used only at this time of the fishing, and always the Nass River with its sand bars flows in swift current beyond the trees.

One of the pleasantest localities we visited was Bella Coola at the head of Burke Channel, the site that furnished material for the fourth painting of the series. Set back between the mountains the Bella Coola valley with its swift river and its lines of delicately colored cotton-wood trees impresses one at once with its beauty. Here we found excellent gardens, ideal homes and broad fields. On either side of the river were Indian communities, one modern and under missionary influence, the other still retaining its old customs.

I learned here the fascinating facts of the bread-making industry. Down in the flats, near the mouth of the river, the families gather during the summer and make bread for themselves and their neighbors. Seated in a rope chair, high up in a hemlock tree, a native scrapes away the inside bark of the tree. Below in the sunlight children hold out a cedar blanket to catch the shreds as they fall. Near them is the large pit in the ground to which they carry the bark for cooking. Hot stones are put over the surface of the pit, and over these stones alternate layers of moist skunk cabbage leaves and the scraped bark. Four days are required for the cooking, at the end of which time the bark is ground into a pulp by means of pestle and stone, and then is left in the sun to dry.

Everywhere during the expedition I studied the commercial transactions of the Indians, but it was not until I reached the Kwakiutl tribe, on the northeast end of Vancouver Island that I found material for the fifth picture. Since the traders have taken away from the Indians all the skins and furs, tribal currency has been limited to blankets, though to a large extent it has given place to the money of the United States and Canada. We find the Kwakiutl Indian still using blankets for exchange in their potlatches, and therefore I have chosen this tribe to illustrate the fact that a basis of finance did exist. It must have been no unusual thing in the past to see ornamented natives unload canoes full of blankets, while groups of waiting "financiers" stood in picturesque arrangement before their houses and totem poles.

When I reached the west coast of Vancouver Island, where I went in

search of data for the sixth painting, the Nootka Indians had returned from fishing and hop-picking. Villages were no longer deserted, and activity showed on all sides. Along the shores canoes with swan-like barbed prows and straight high sterns were being hewn. At Clayoquot I secured the locality, color and facts for a whaling picture,—on the brilliant sandy beach the whalers had returned from a successful hunt, while the inhabitants of the village welcomed a dignified old chief in his ceremonial costume.

Briefly, then, I am trying to show in this series of mural paintings that the trading among the tribes of the northwestern coast was mainly through the products of their own industry. The Tlingit exchanged their Chilcat blankets for Haida canoes. The Haida traded their canoes for the eulichon grease of the Tsimshian. The Bella-Coola who were the bread makers exchanged their bread with neighboring tribes. Thus through all the coast tribes we find distribution of industrial products going on, and to-day the results of this commerce are evident, for in the extreme south one finds the work of the tribe living farthest north, and vice versa.

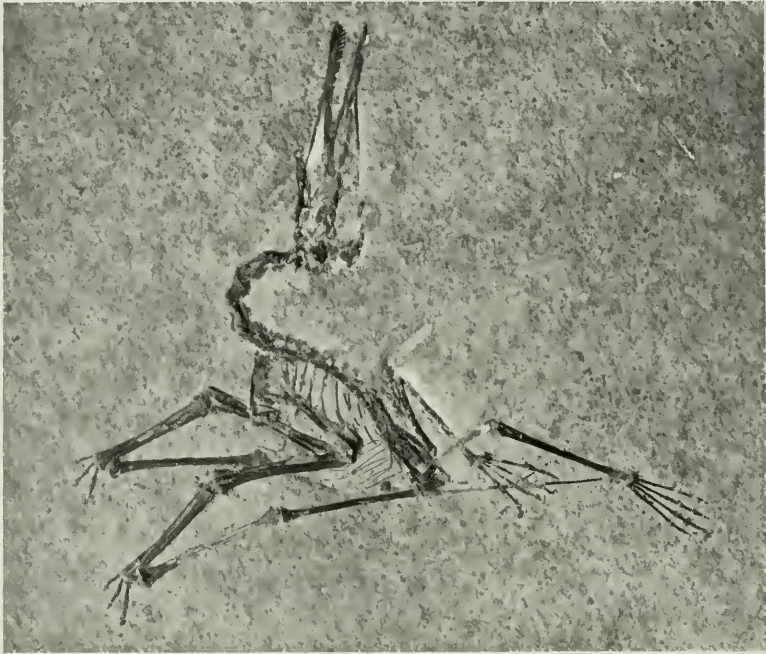
WILL S. TAYLOR.

A COMPLETE PTERODACTYL SKELETON.

THE Museum has recently acquired through exchange with the Munich Palæontological Museum a complete skeleton of a small Pterodactyl of the Jurassic Period. This beautiful little specimen is from the lithographic limestone quarries of Solenhofen in Bavaria and is one of the most perfect specimens of its kind ever found. The Munich Museum has a unique series of these rare fossils from these quarries and parted with this one in exchange for a complete fore and hind limb of *Brontosaurus* which we were able to get together out of the great collections obtained from Bone Cabin Quarry. The Solenhofen specimen is exhibited in a table case in the Dinosaur Hall, together with specimens of the much larger but less perfectly preserved Pterodactyls found in the chalk beds of western Kansas.

The Pterodactyl (from the Greek *πτερόν*, wing, and *δάκτυλος*, finger) was a flying reptile named from the fact that the bones of one finger of

each fore limb were extremely long, carrying a film of skin to enable the animal to fly. The Pterodactyls of Jurassic time were small, none



PTERODACTYLUS ELEGANS. SOLENHOFEN. BAVARIA

of them exceeding the modern eagle in size, and their habits were like those of the present day bats.

A COLLECTING EXPEDITION TO THE FLORIDA REEFS.

MESSRS. Alessandro and Ernesto G. Fabbri, members of the Museum who are greatly interested in marine zoölogy, have recently placed their new yacht "Tekla" and their personal services at the disposal of the American Museum. Thanks to their generous offer, it will accordingly be possible during the present winter to obtain valuable collections at various points along the coast of Florida. For this work in collecting, the vessel is admirably adapted: it is suffi-

ciently large (90 feet in length and 17 in beam) to be depended upon in all weather; it is light in draft and when necessary can be taken into water shallower than 4 feet; its gasoline engines take up relatively small space and there thus remains plenty of room for collecting operations; its equipment includes various forms of trawls and dredges and the mechanical appliances which will enable them to be used in all waters to a depth of about 200 fathoms. Particular effort will be made to increase the Museum's collection of fishes from the rich fauna of the



THE FABBRI YACHT "TEKLA"

semitropical waters, and colored drawings of the fishes, moving pictures and, in the case of the larger kinds, plaster casts will be secured. Saw-fish are not uncommon in Florida waters and it is hoped that good specimens of them may be caught. Effort will also be made to obtain a large specimen of the devil-fish, *Manta*, which sometimes attains a spread of 20 feet. Tarpon are readily taken in the waters to be visited and ample material will be brought back for a "habitat group." Mr. John T. Nichols, Assistant in the Department of Ichthyology, left the Museum January 18 to join the "Tekla" at Miami and will spend six weeks in the collecting work.

MUSEUM NEWS NOTES.

THROUGH a bequest of the late Mrs. Georgiana Colgate Stone the Museum has received a portrait of her father, Robert Colgate, by Huntington. Mr. Colgate was one of the founders of the Museum and served for many years on the Board of Trustees.

SINCE our last issue the following persons have been elected to membership in the Museum: Life Members, MESSRS. W. B. BOURN, GEORGE W. BRACKENRIDGE, SAMUEL POMEROY COLT, BAREND VAN GERBIG, GEORGE SCOTT GRAHAM, T. A. GRIFFIN, H. E. HUNTINGTON, O. G. JENNINGS, WM. G. LOW, FRANK E. PEABODY, FREDERICK T. PROCTOR, JOHN A. ROEBLING, ALANSON SKINNER, CHARLES CHAUNCEY STILLMAN, JAMES N. WALLACE and GEORGE PEABODY WETMORE and MMES. W. L. HARKNESS and JAMES R. JESUP; Sustaining Members, MESSRS. R. R. COLGATE and HENRY GOLDMAN; Annual Members, MESSRS. J. FRANCIS A. CLARK, A. S. DWIGHT, A. O. EIMER, JOHN B. FARISH, JOHN L. GOLDEN, IVAN L. C. GOODING, HORACE S. GOULD, MAXIMILIAN GRAB, HENRY GRAVES, JR., DE COURCY L. HARD, HENRY RAWLE, J. O. VON SCHMID, FRANK McMILLAN STANTON, WILLIAM E. STIGER, BENJ. STRONG, JR., ROBERT B. SUCKLEY, GEO. H. SUTTON and THEO. N. VAIL and MMES. FRANK H. RAY and FITCH W. SMITH.

THE Department of Anthropology is fortunate in having received as a gift from Mr. George S. Bowdoin another beautiful example of the feather capes for which the natives of the Hawaiian Islands were once famous. This cape was originally the property of King Kamekameha III and was given by him to Mr. Mackintosh, from whom Mr. Bowdoin obtained it. The cape is described and illustrated in Brigham's book on the Hawaiian Islands.

FREDERICK I. MONSEN gave a special lecture to the Members of the Museum on Thursday evening, January 13, upon the life and manners of the Indians of the Southwest, with stereopticon views and motion pictures selected from his well known collection of photographs made by himself during the past twenty years. For the remainder of the month a large collection of his photographs were on exhibition in the West Assembly Hall.

THROUGH the generosity of Mr. J. Pierpont Morgan the Museum is receiving as fast as issued the magnificent series of volumes on "The North American Indian" now in process of preparation and publication by Mr. Edward S. Curtis, who is so well known for his studies and photographs of the descendants of the aborigines of North America. This work is to consist of twenty quarto volumes of text profusely illustrated with photogravures and accompanied by as many supplementary volumes of folio plates. Thus far five volumes of text with their supplementary volumes of plates have been issued and delivered.

LAST month the modeled mount of the hippopotamus "Caliph" was placed on exhibition in the Department of Mammalogy. Caliph was a familiar sight to the visitors at the menagerie in Central Park, where he was one of the chief attractions for about thirty-five years. He was the largest hippopotamus in captivity on record and probably was as large as any known. He died in January, 1908, of acute indigestion, and his body was presented to the Museum by the Department of Parks.

ON the afternoon of Saturday, January 15, Miss Mary Lois Kissell of the Department of Anthropology began a series of talks in the Academy Room upon "Basketry Weavings of Primitive Peoples" illustrated with examples of the different styles selected from the extensive material in the Museum collections. The second lecture of the series was given January 29. The third and last will be delivered February 5, when the "Technic of Basketry" will be considered and a scheme of classification will be presented by means of which the work of various tribes may be recognized.

THE restaurant upon the third floor of the Museum has been discontinued and a new one opened at the foot of the elevator in a series of rooms which have been fitted up expressly for the purpose and which have been built and decorated after the style of the prehistoric edifices of Mitla, Mexico, giving a vivid idea of the interior of those ancient structures in their prime.

LECTURE ANNOUNCEMENTS.**MEMBERS' COURSE.**

The second course of lectures to Members for the season of 1909-1910 will be given in February and March. Special announcements will be sent out later.

PEOPLE'S COURSE.

Given in coöperation with the City Department of Education.

Tuesday evenings at 8:15 o'clock. Doors open at 7:30. Illustrated.

February 1.—“The Grizzly Bear.” By MR. W. H. WRIGHT.

February 8.—“What I Saw in Panama.” By MR. CHARLES L. LEWIS.

February 15.—“Hawaii, the Paradise of the Pacific.” By MR. A. F. GRIFFITHS.

February 22.—“Martinique and the Mt. Pelée Tragedy.” By MR. ROLAND S. DAWSON.

Saturday evenings at 8:15 o'clock. Doors open at 7:30. The last four of a course of eight lectures by PROF. JOHN C. OLSEN on “Pure Foods and their Preparation.”

February 5.—“Sweetening Agents.”

February 12.—“Condimental Foods: Spices, Cocoa, Chocolate, Flavoring Extracts.”

February 19.—“Candies, Aniline Dyes, Coloring Matter.”

February 26.—“Jams, Jellies, Canned Vegetables and Fruits.”

LEGAL HOLIDAY COURSE.

Fully illustrated. Open free to the public. No tickets required. Doors open at 2:45, lectures begin at 3:15 o'clock.

Washington's Birthday, February 22. EDMUND OTIS HOVEY, “Some American Mining Regions.” Particularly those producing Coal, Iron Copper, Gold and Silver.

MEETINGS OF SOCIETIES.

Public meetings of the New York Academy of Sciences and its Affiliated Societies are held at the Museum according to the following schedule:

On Monday evenings, The New York Academy of Sciences:

First Mondays, Section of Geology and Mineralogy;

Second Mondays, Section of Biology;

Third Mondays, Section of Astronomy, Physics and Chemistry;

Fourth Mondays, Section of Anthropology and Psychology.

On Tuesday evenings, as announced:

The Linnean Society of New York;

The New York Entomological Society;

The Torrey Botanical Club.

On Wednesdays, as announced:

The Horticultural Society of New York;

The New York Mineralogical Club.

On Friday evenings, as announced:

The New York Microscopical Society.

The programmes of the meetings of the respective organizations are published in the weekly *Bulletin* of the New York Academy of Sciences and sent to the members of the several societies. Members of the Museum on making request of the Director will be provided with the *Bulletin* as issued.

The American Museum Journal

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THE AMERICAN MUSEUM
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FOR THE PEOPLE
FOR EDUCATION
FOR SCIENCE

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THE AMERICAN MUSEUM OF NATURAL HISTORY was established in 1869 to promote the Natural Sciences and to diffuse a general knowledge of them among the people, and it is in cordial coöperation with all similar institutions throughout the world. The Museum authorities are dependent upon private subscriptions and the dues from members for procuring needed additions to the collections and for carrying on explorations in America and other parts of the world.

The membership fees are,

Annual Members.....	\$ 10	Fellows.....	\$ 500
Sustaining Members (Annual).....	25	Patrons.....	1000
Life Members.....	100	Benefactors (Gift or bequest)	50,000

All money received from membership fees is used for increasing the collections and for developing the educational work of the Museum.

The Museum is open free to the public on every day in the year.



MEMORIAL STATUE OF MORRIS K JESUP

By William Couper, Sculptor

The American Museum Journal

VOL. X

MARCH, 1910

No. 3

COMMEMORATION OF THE FOUNDING OF THE MUSEUM

UNVEILING OF THE STATUE OF MORRIS K. JESUP

ON the afternoon of Wednesday, February 9, 1910, a notable assemblage gathered in the Foyer of the American Museum to witness the unveiling of a statue of the late Morris K. Jesup, who for more than a quarter of a century was the president of the institution, and to listen to an address commemorating the founding of the Museum forty-one years ago. Shortly after Mr. Jesup's death in January, 1908, the Trustees and others of his friends, feeling that a suitable memorial of the late President should be installed in the Museum to which he had devoted so much of his life, subscribed to a fund¹ for the purpose of placing in the Foyer of the building a life-size marble statue of Mr. Jesup. Mr. William Couper, the sculptor of the busts of scientists in the Foyer, was engaged to prepare the statue. The artist, from his own long acquaintance with Mr. Jesup, was inspired with his subject and produced a satisfying portrait showing him in his prime.

The exercises were begun with music, and at four o'clock President Osborn and Honorable Joseph H. Choate entered the Foyer leading the procession of Trustees to the temporary platform which had been erected at the south side of the hall, facing the statue. On the platform were representatives of the National, State and City Governments, besides delegates from great universities, scientific societies and other educational institutions in this city and elsewhere, the full list being as follows: J. A. ALLEN, ALBERT S. BICKMORE, JOHN BIGELOW, GEORGE S. BOWDOIN, NATHANIEL L. BRITTON, HERMON C. BUMPUS, NICHOLAS M.

¹ The subscribers to the Jesup Memorial Fund are MESSRS. HENRY F. OSBORN, J. PIERPONT MORGAN, CLEVELAND H. DODGE, CHARLES LANIER, J. HAMPDEN ROBB, CORNELIUS N. BLISS, ALBERT S. BICKMORE, GEORGE S. BOWDOIN, ANDREW CARNEGIE, JOSEPH H. CHOATE, ANSON W. HARD, JAMES J. HILL, FREDERICK E. HYDE, ADRIAN ISELIN, ARTHUR CURTISS JAMES, A. D. JUILLIARD, JOHN S. KENNEDY, GUSTAV E. KISSEL, SETH LOW, J. PIERPONT MORGAN, JR., HORACE PORTER, PERCY R. PYNE, ARCHIBALD ROGERS, WILLIAM ROCKEFELLER, JACOB H. SCHIFF, CHARLES STUART SMITH, JOHN T. TERRY, JOHN B. TREVOR.

BUTLER, ANDREW CARNEGIE, JOSEPH H. CHOATE, JOHN M. CLARKE, WILLIAM COUPER, THOS. DE WITT CUYLER, CLEVELAND H. DODGE, DANIEL GIRAUD ELLIOT, JOHN H. FINLEY, WILLIAM J. GAYNOR, MADISON GRANT, ARTHUR T. HADLEY, ANSON W. HARD, SAMUEL V. HOFFMAN, WILLIAM T. HORNADAY, FREDERICK E. HYDE, ARTHUR CURTISS JAMES, A. D. JUILLIARD, JAMES F. KEMP, GUSTAV E. KISSEL, H. M. LEIPZIGER, GOODHUE LIVINGSTON, SETH LOW, FREDERICK A. LUCAS, H. M. MACCRACKEN, WILLIAM H. MAXWELL, JOHN P. MITCHELL, J. PIERPONT MORGAN, HENRY F. OSBORN, WILLIAM A. PRENDERGAST, HENRY S. PRITCHETT, PERCY R. PYNE, J. HAMPDEN ROBB, EDWARD ROBINSON, JACOB H. SCHIFF, HUGH M. SMITH, CHARLES B. STOVER, JAMES W. TOUMEY, CHARLES H. TOWNSEND, JOHN B. TREVOR, BRECK TROWBRIDGE, C. D. WALCOTT, WILLIAM R. WILCOX, CLARK WILLIAMS, EGERTON L. WINTHROP, ROBERT S. WOODWARD.

As soon as the invited guests were seated, the addresses that follow were delivered to a most sympathetic audience that filled the Foyer and overflowed into the Northwest Coast Hall behind the statue. At the close of President Osborn's welcoming remarks, the veil was removed from the marble portrait of Mr. Jesup, and the assembly showed its appreciation of the likeness of their former friend. After the close of the addresses, the members of the Museum and guests present were given an opportunity to visit the newly arranged North Pacific Hall, the Jesup Forestry Hall and the Darwin Synoptic Hall.

ADDRESS OF WELCOME

BY HENRY FAIRFIELD OSBORN

PRESIDENT OF THE MUSEUM

Members of the American Museum of Natural History:

We commemorate this afternoon the founding of the Museum in 1869. For their services to our city and country we pay our tribute to the first presidents, John David Wolfe and Robert L. Stuart, and especially to the third president, Morris Ketchum Jesup, distinguished by his long and eventful administration.

As the oldest institution of the kind in the City of New York we welcome



J. PIERPONT MORGAN
A Founder and Trustee

representatives of our twin sister, the Metropolitan Museum of Art, of our younger companions, the Public Library, the Brooklyn Museum, the Zoölogical Park, the Aquarium and the Botanical Garden,—all animated by the same purpose, all under a similar government, and together forming a chain of free educational institutions of which the City may well be proud.

We are honored by the presence of delegates from the President of the United States, from the Governor of this State, from several of the great American universities and from national institutions of scientific research.

We welcome the leading officers of the City government and of the Board of Education. His Honor, the Mayor, the President of the Park Department and the Comptroller are with us as members of our Board. It is significant that these heads of the second great municipality of the world are uniting to play the part of hosts in this celebration, because the City and the Trustees have enjoyed from the first a free and cordial union. From their entire community of purpose there is no reason why they should ever disagree. Through the original application of the Museum for land, this institution is legally under the Department of Parks, but while the relation is amicable and effective, the museums are less a part of public recreation than of the great civic system of education.

A few words may be said as to our future, as to the kind of educational spirit which has been developed under past administrations and will be increasingly developed in the coming years in other branches of science. We believe that we are only on the threshold of the applications of science, or knowledge of the laws of Nature as they bear on human morals, welfare and happiness. If there is one new direction which this Museum shall take, it is in the applications of science to human life. Here people shall have a vision not only of the beauty, the romance, the wonder of Nature, but of man's place in Nature, of laws as inexorable as the moral commands of God handed down by great religious teachers. Over the portals of our new Hall of Public Health we may well place the inscription, "Learn the Natural Commandments of God and Obey Them." If Nature is stern and holds in one hand the penalty for violation of her laws, she is also gentle and beneficent and holds in the other hand the remedy, which it is the duty of science to discover and make known.

What is the part the Museum exhibition halls should play in this education? An ideal museum is a mute school, a speechless university, a voiceless pulpit; its sermons are written in stones, its books in the life of the running books; every specimen, every exhibition, every well-arranged hall speaks for itself. In this sense, in its appeal to the eye, in its journeys for those who cannot travel, the Museum is not the rival but is the ally of all other methods of instruction within its own walls and throughout the great city.

This Museum is a monument of public spirit in New York. We owe the rise of public spirit in this city and country to the war for the Union; that terrible experience brought men and women of all classes together in a closer sympathy, into a new and greater union. Thus Lincoln was our prophet at Gettysburg when he said, "This nation under God shall have a new birth of freedom." As will be fully told by the historian of the day, the inspiration to build a free museum for the people of this city came to us through Albert S. Bickmore. Under his scientific guidance and that of Daniel Giraud Elliot the right direction was taken. Both of these men are happily with us in this hall to-day.

The Founders of 1869, whose names have recently been inscribed on yonder wall, voiced the public spirit of their day. New York was a relatively small and relatively poor city. It was before the era of the great captains of industry, of the single-handed patrons of art, science and education. Nor were there any models on which to draw the lines or to take the scale; there was no British Museum of Natural History, there was no National Museum of the United States. We marvel the more at the audacity of Trustees who conceived a museum so great and who in 1874 approved a general plan larger than that of any building in the world even to the present day, larger than the Escorial of Spain or the National Capitol of Washington.

It crowns this commemoration that four of the originators of the Museum are with us,—two of its scientific advisors, two of its Founders. If I were asked which of the Founders contributed most to administration and development I would say unquestionably Mr. Jesup, Mr. Morgan and Mr. Choate. Of the splendid services of our late President is it not delightful that his colleague for thirty-nine years, Mr. Choate himself, is here to speak?

Our two Founders, *mirabile dictu*, are as young as or younger than they were forty years ago. If youth is measured by energy, by productiveness, by patriotism, these Founders are two of the very youngest men in the City of New York, as each day brings forth fresh, surprising and ever welcome proofs. Who among the so-called younger generation can equal Mr. Morgan, who has quietly and almost unknown to the public sustained the successive administrations of Wolfe, Stuart and Jesup, with his loyalty, his time, his advice, his noble gifts, and who stands behind the present administration with undiminished force and generosity?

Are not our very bones founded in the law? In the early years Mr. Choate rendered incomparable and lasting service, not only to the two museums but also to the City, in laying down our charter relative to that union of public and private responsibility and beneficence which has been the model on which all the other institutions of the kind in this City have been founded. This union has proved by experience to be perfect, for it has



JOSEPH H. CHOATE

A Founder and Trustee

given the city of New York something far superior either to the publicly administered institutions of foreign cities or to the privately owned and privately administered institutions of other great American cities. The essence of this charter and constitution is that from the beginning the city officials as the elective representatives of the people undertake to give the land, the building, the maintenance; the Trustees volunteer to give their best ability and their valuable time to administration, their means and that of others to filling the building with collections.

The agreement has been kept on both sides in the best spirit. To the honor of the City of New York be it said that her rulers have never withheld funds from education, nor have her citizens been lacking in generosity. Owing to this peculiarly American and altogether ideal union of public and private endeavor, we discover that at the end of forty-one years the amount which the people of the city of New York have contributed through their government to this Museum is balanced by an equal amount given by officers, trustees and other friends.

I have therefore great pleasure in introducing as the orator of the day the Honorable Joseph H. Choate, Founder, Trustee and author of the laws of our being.

COMMEMORATION ADDRESS

BY THE HONORABLE JOSEPH H. CHOATE

A FOUNDER AND TRUSTEE OF THE MUSEUM

Mr. President and Ladies and Gentlemen:

Time, like an ever-rolling stream, bears all its sons away, and a lapse of forty years sweeps off a whole generation and more. After their forty years' wandering in the wilderness, when the children of Israel came again to be numbered on the plains of Moab, Caleb and Joshua alone survived of all who had escaped out of the house of bondage in Egypt; and so Mr. Morgan and I alone survive of those who founded this great Museum in 1869. We have accompanied its progress through mazes of doubts and difficulties until it has come at last within sight at least of a land flowing with milk and honey. I am sure that he will heartily join with me in this tribute to our departed associates, that this marvellous growth and development are to be attributed to their fidelity and courage, their public spirit and their unbounded generosity; and when I read their names you will realize how near they come to our hearts and homes, and how much richer and better New York is for their having lived in it:

JOHN DAVID WOLFE
ROBERT COLGATE
BENJAMIN H. FIELD
ROBERT L. STUART
ADRIAN ISELIN
BENJAMIN B. SHERMAN
WILLIAM A. HAINES

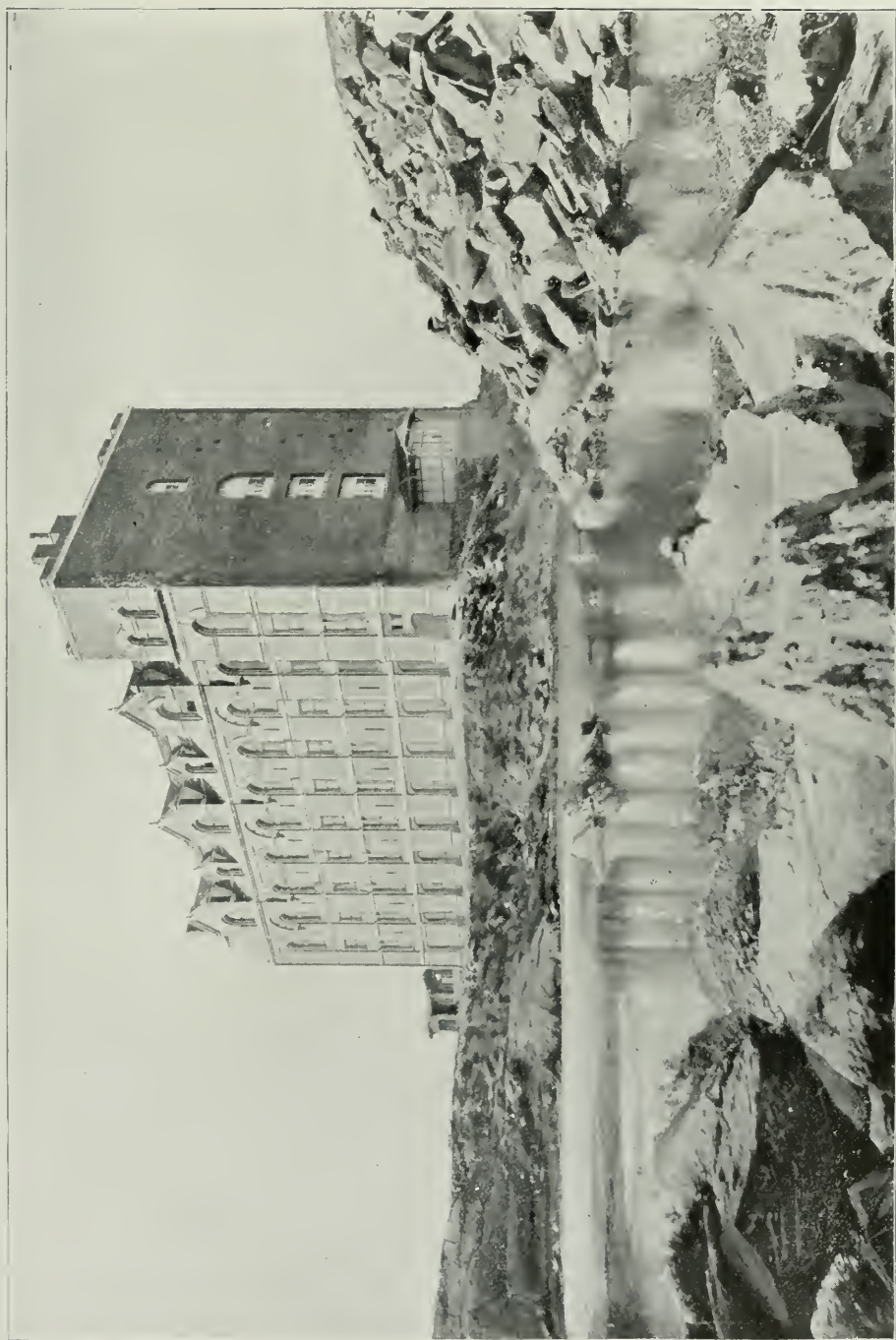
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HOWARD POTTER
WILLIAM T. BLODGETT
MORRIS K. JESUP
D. JACKSON STEWARD
A. G. PHELPS DODGE
CHARLES A. DANA.

It was to their initiative and far-seeing sagacity that the City and the country owe the beginning of this great educational and scientific institution, and, as you all know, there is nothing so hard as a beginning.

New York was sadly behind her sister cities in this interesting development of knowledge and science. Although she had many learned naturalists, and had made spasmodic efforts for the establishment of a museum in which their valuable collections might be gathered, she had allowed Philadelphia and Boston to be far in advance.

The advent of the great naturalist, Professor Louis Agassiz, at Cambridge, a signal event in the history of Harvard, his boundless enthusiasm for science, and the wonderful manner in which he imparted it to his pupils and hearers, gave an impetus to the study of natural history not only at Harvard, but throughout the country which had never been felt before. The truth is that the acquisition of one truly great man by a university does more for the advancement of learning than whole decades of mediocrity; and Harvard and the country awoke from long slumber to a new life of study and inquiry under the light and leading of this famous scholar and naturalist, and almost all the men who afterwards became famous in natural history flocked about him as pupils and gathered inspiration from his lips. The arrival of Professor Arnold Guyot at Princeton soon afterwards was another great incentive, and the formation and rapid increase of museums at the two universities and in Philadelphia were examples of the practical advance in science as a means of education which New York could not fail to imitate.

There were many strong men here interested in the subject; there were ample resources and many interesting and valuable collections within reach, but there was a total lack of organization, an apparent inability to get together, which paralyzed the growing and general desire for the establishment of a museum of natural history which should be worthy of New York as a great intellectual center. In fact, I am not sure that New York was then a great intellectual center. Its intense energies, stimulated by the triumphant close of our great Civil War, were concentrated in commercial channels, and while they were ready to give generous help to any honorable enterprise, our great merchants and men of rapidly growing wealth had hardly time to think of these higher and better things of the mind. They had to be solicited



MUSEUM BUILDING IN 1881.

urgently and intelligently, before they could realize the importance to the city of such things.

Fortunately there came among us at an opportune time a young and intrepid enthusiast who realized keenly the possibilities of the situation and the vast importance to the city of the creation of such a museum. A pupil of Agassiz's, and a man of boundless energy and indomitable persistence, Prof. A. S. Bickmore, was a capital engine driver to propel the train of the growing sentiment, and to him, I think, more than to any other one man is due the credit of initiating the movement which resulted in our foundation. It is pleasant to think that Professor Bickmore is with us to-day to enjoy the ripe fruits of his early labors, as is also Dr. Daniel G. Elliot, an important and influential friend and scientific adviser in the early days, and now a veteran and most distinguished zoölogist, again connected with our institution as an investigator and writer.

The first thing to be done was to obtain from the State a charter of incorporation for the founders, under which the scattered elements which might make a beginning of such an enterprise could be brought to work together. I well remember our visit to Albany to wait upon the magnates of the Legislature, and ask for such a charter. William M. Tweed was then in absolute command of that body, and I will say to his credit, as one white mark against the terrible array of black ones under which his memory has long since been buried, that he received us most courteously, and seemed to recognize the importance of the project which we had in hand, and the charter was quickly obtained and signed by the Governor.

We asked for no other legislative aid, and dared not expect or hope that the money of the people of a great democratic city could be asked or required to be spent to gratify the taste or promote the scientific pursuits of a few men of wealth and culture; nor did the most ardent lover of natural history dare to dream that within a single lifetime this magnificent group of spacious buildings would be erected at the public expense for the housing of our collections, and maintained by a liberal allowance from the city treasury,—so rapid has been the growth of a wholesome popular sentiment in support of what has proved to be one of our most valuable educational establishments, and a scientific institution which holds a leading place among those of the country and of the world.

The museum was organized under the presidency of John David Wolfe, whose administration of three years, from 1869 to 1872, was the formative period of the infant body which was destined by and by to reach such colossal dimensions as we see to-day. Quarters for the storage and display of its first collections were granted by the city in the second and third stories of the old Arsenal Building near the south end of Central Park, and there

they continued to be kept, until in 1877 the first new building in the center of Manhattan Square was completed.

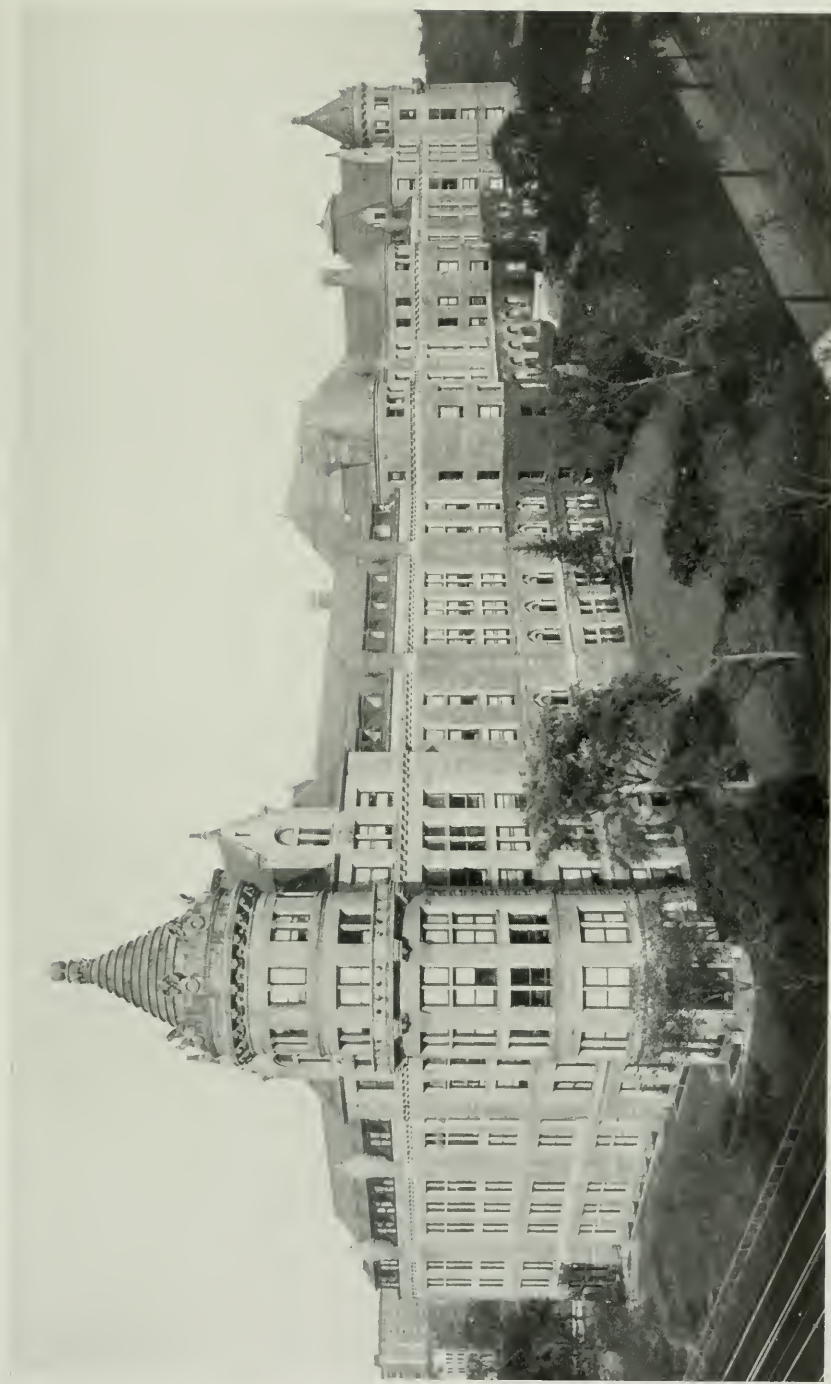
Those earliest days were full of struggle and full of hope, sometimes even against hope itself; and despair sometimes stalked among us as threatening and terrible as if the carnivorous dinosaur had come to life again and showed his terrible teeth; but the fidelity of the president and the never-failing generosity of the more wealthy among the trustees kept the tottering infant alive. Year after year they put their hands in their pockets to make up the inevitable annual deficit, that ever recurring terror and inspiration of all philanthropic institutions. And the boundless enthusiasm of such true lovers of nature and of nature's handiwork as William A. Haines and D. Jackson Steward, constantly breathed new life and spirit into our ambitious purpose to make it a true museum of natural history worthy of the name and of New York.

From the outset we met with the usual fate of all, whether individuals or corporations, who become known as collectors. Miscellaneous collections of every description crowded in upon us much faster than our narrow quarters and limited means could possibly provide for them. Nobody can testify from personal experience more truly than Mr. Morgan of the unhappy predicament of a recognized collector. He does not have to seek collections, but collections seek him from all quarters of the world with voracious appetites and open maw, and would bury even him out of sight, if he had not learned to say No. So it was with our young museum, which would have been bankrupt from the start, if it had not denied itself many tempting offers and learned to say No.

Our first object was to attract public attention and gain public confidence by a well-ordered exhibition of our most attractive collections, while the rest were stored away to await future developments. The trustees and their friends raised forty-four thousand dollars the first year, less than one-tenth of what some of the individual trustees have since given, and five thousand visitors rewarded their efforts as against the million who now throng these spacious halls.

The brief administration of our first president did lay the foundations of the superstructure that was soon to rise. The prestige given to the new enterprise by his high character and his unbounded generosity, followed by that of his daughter, Miss Catherine L. Wolfe, must ever be held in grateful remembrance.

Then came the awful panic of 1873, which threatened to swallow us up as if the earth had opened beneath us. Our hearts melted and our spirits gave way;—but even that calamity was tided over by renewed efforts and redoubled gifts of the richer trustees, by means of which the institution not only held its own, but made steady progress.



MUSEUM BUILDING IN 1908

All the while the trustees and their friends had been besieging the legislature to come to their aid, as every day made it more and more obvious that it was quite impossible to build up by private means alone a great museum which should be worthy to compete with the great museums of Europe, which were supported almost wholly by public monies. To show how modest our aspirations then were, a great petition signed by forty thousand citizens was presented to the Legislature, asking that a single building should be erected at the expense of the city for the joint occupation of the museum of natural history and the museum of art, which at the same time was struggling into being and leading a sickly and precarious existence in private quarters, and sustained largely by the same generous donors.

It was at this period of promising progress and of great struggles under heavy burdens that the ten years' administration of our second president, that generous and public spirited merchant prince, Robert L. Stuart, began, during which the Museum, fostered by public aid and private munificence, grew into a valued and well-recognized educational establishment.

This epoch of steady progress was ushered in by the allotment by the Legislature of the Deer Park on the east side of Central Park for the use of the Museum of Art, and of Manhattan Square, then a remote and almost inaccessible waste land, for the Museum of Natural History, and the appropriation of adequate sums for the erection of a suitable building for each on those respective localities, a most auspicious inauguration of a public policy which provided for the possible growth of each institution in the indefinite future (Manhattan Square alone consisting of eighteen acres) a policy which has already resulted in the expenditure of nearly five millions of dollars by the city under legislative authority in the erection of these magnificent buildings for the housing of our collections, upon which private beneficence has expended an equal amount. And the same may be said of the Museum of Art.

On the second of June, 1874, the corner stone of our first building, designed by Calvert Vaux, as one section of a stupendous plan to cover a large portion — nearly the whole — of the entire square, was laid with imposing ceremonies in the presence of the President of the United States, accompanied by members of his cabinet, the Governor of the State and the Mayor of the City. On the twenty-second of December, 1877, the building was opened with similar ceremonies in the presence of the same august personages. Professor Marsh and President Eliot made admirable addresses, the latter concluding his impressive exhortation to courage and progress by quoting the last words of Moses before he went up on the top of Pisgah to see the promised land which he was not to enter, "The Eternal God is thy refuge, and underneath are the everlasting arms."

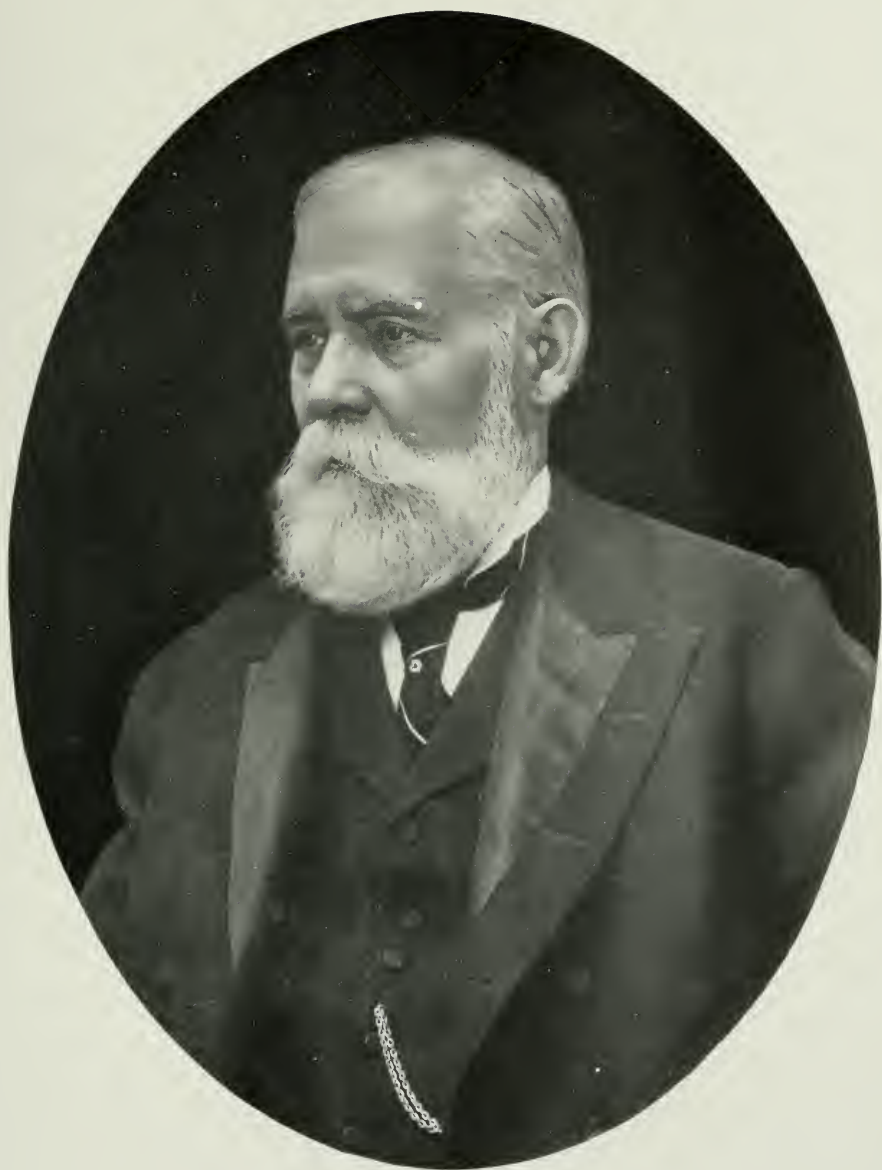
Meanwhile a contract was entered into between the city and the trustees which has subsisted without change for more than thirty-two years, and upon which the contracts of the city with other great institutions like the Museum of Art and the Zoölogical Society have been closely modeled. This contract embodies a mutually generous policy which secures equal advantage to the Museum and the public. It practically provides for a permanent occupation by the Museum of all the buildings erected or to be erected in Manhattan Square, and for a free exhibition to the public of all our collections, under regulations to be mutually agreed upon. The Museum is to continue at all times the absolute and exclusive owner of the collections, and the city the absolute and exclusive owner of the buildings. Under this arrangement the delightful and mutually beneficial relations between the Museum and the people which it inaugurated have steadily grown more close and cordial, to the immense advantage of both.

The administration of Mr. Stuart was one of enormous interest and progress. The Museum was constantly acquiring new and great collections of recognized scientific as well as popular value. A scheme of lectures to public school teachers was instituted under Professor Bickmore, and the Museum began to attract the attention of scientific bodies by the number and variety of its valuable collections. Mr. Stuart's name will be perpetuated as one of our most important benefactors.

I have thus traced the beginnings, but yet only the beginnings, of that truly beneficent institution whose fortieth anniversary we have met to-day to celebrate by the unveiling of this most lifelike statue of the one man who, more than any other — I might almost say, more than all others, for he truly inspired and led all the rest to work in coöperation with him, — has transformed the curiosity shop of miscellaneous and unrelated exhibits which was transferred hither from the old Arsenal in 1877, into this great educational and scientific establishment, this national, this truly American museum of natural history, which is the boast of New York and the admiration of the nation, and may I not say, of the world to-day? If you seek for the monument of Morris K. Jesup, you have not far to go. You have only to wander, with eyes and mind wide open, through these splendid halls, so nobly constructed and fitly equipped, and filled with these collections of wonder and of beauty, among which day unto day uttereth speech, and night unto night showeth knowledge of the works of nature, which are truly the works of God.

I shall attempt no idle words of eulogy of Mr. Jesup, but speak of him only in connection with his work as here accomplished, the crowning glory of a long and honorable life.

To the average observer, the casual layman, untrained by scientific



ALBERT S. BICKMORE
An Originator and Trustee

study, the first impression upon entering the Museum is of its immense utility as a place of popular entertainment, recreation and instruction,—recreation of the most innocent and ennobling kind, for who ever heard of an immoral naturalist, and how could the most casual study of any single thing on exhibition here fail to exalt and elevate the mind and heart? That splendid lecture room, filled to overflowing day after day and night after night with eager teachers and students listening keenly with delight and laying fast hold of instruction, not to let her go;—as the layman enters this vestibule, those wonderful visitors from other worlds, so mysterious and so impressive, excite his imagination and amazement;—as he rises from hall to hall and from floor to floor, does he desire to know the history of his own race, from the days when Adam delved and Eve span up to that considerable civilization which had developed here before Columbus came, every step in the advance from the crudest flint instrument is spread out before him;—would he see something of primitive animal life as recorded in the fossils of many succeeding ages, they are here;—does he incline to study the rocks and minerals and know how and where the most precious stones are found, there is the marvellous Morgan collection of gems, so rich in variety and beauty that the cases containing them are surrounded by hundreds day by day;—is he curious to know how trees grow, there is the splendid Jesup collection of woods from all parts of America;—do the beauties and mysteries of insect life attract him, he is lost in the mazes of entomology;—is he a lover of birds, there they are in their native habitats, all true to life;—would he know what mighty animals roamed the earth before Adam, let him gaze, awe-struck, on the brontosaurus, the mastodon and the dinosaurs in both kinds, and observe how Professor Osborn has learned to put hooks in the jaws of leviathans;—and would he see how woman in all ages has suffered for man, let him visit the copper woman, resting from her labors, immortalized on earth; but his wonder grows as he gazes at her. Will she, who was once all flesh and blood, but long since transmuted into pure copper,—will she wake with the rest of us when the last trump sounds, or has she joined the mineral kingdom forever?

The amusement of the people, however, was only an incident in Mr. Jesup's lofty conception of the true mission of the Museum. He aimed at something far higher and nobler. His lofty purpose was to enlarge and extend the work which had been so well begun, to keep pace with the marvellous growth of the city, and develop the Museum not only into a great educational institution, imparting life and light to the people, but also, which in his mind was the chief object, to make it the home of true science, which should be the center of the scientific activities of the nation, so far as natural history was concerned,—and in all three of these objects his success was most remarkable.

Coming to the presidency in the very prime of manhood, with ample fortune achieved, and the rich experience of a great business life behind him, he bestowed upon the Museum not only generous gifts, constantly repeated, but what was far better, he gave it the best twenty-five years of his life, and all the rich powers of his generous and large-hearted nature. Stimulated by his enthusiasm and his example, the trustees and friends of the institution rallied to its support, and so rapidly did its collections grow, that the Legislature and the City, recognizing its rapidly growing needs, added every four years a new section, a new and noble building to the original edifice, so as to complete already about two fifths of Vaux's original plan, which in 1869 the trustees had had the far-sighted audacity to adopt and approve. I do not hesitate to say that the money spent by the city in the development of this Museum and the Museum of Art is the best investment of public monies ever made by it, whether we consider the direct benefit to the people, or the prestige and character attained by the city as the great metropolitan center of knowledge and culture.

The appetite of the people for what they could learn here grew by what it fed on. The establishment of the Department of Public Instruction, and the erection of a new and complete lecture hall, afforded facilities for education which were largely availed of and widely appreciated. The daily attendance rapidly multiplied, and the people showed their growing love of what they justly regarded as their own free pleasure ground.

Mr. Jesup's generous nature broadened rapidly and constantly with the growth of the work which had come to his hands, not only as to the scope of its objects, but as to the spirit in which it should be administered. This was never better illustrated than in the matter of Sunday opening. At first, and for many years, with the large majority of the trustees, he was utterly opposed to it from early training and prejudice, but as the demand grew, the subject was more carefully considered, and he and those who thought with him yielded, having become satisfied that to look through nature up to nature's God was the best way of spending a portion of the Sabbath, and both he and William E. Dodge, who sympathized with him, and who was one of our most valuable and generous trustees, assured me afterwards that this was the best step forward that the Museum had ever taken.

Mr. Jesup's extraordinary enthusiasm for science and his sympathetic admiration for scientific men, though having little knowledge of science himself, was the most striking feature of his career as President, and wholly unexpected, because he had given up his life before to business and affairs. As he said himself in the report of the trustees for 1886, "It is a difficult task to estimate the money value of what belongs to science and scientific institutions. To their value must be added their ameliorating power, their



DANIEL GIRAUD ELLIOT

educational force, and the scope they afford the higher faculties of man to apprehend the wonderful phenomena of nature, and to master and utilize her great forces." "The highest results of character and life offer something which cannot be weighed in the balances of the merchant, be he ever so wise in his generation." In this view he directed with exhaustless energy and rare intelligence the resources and progress of the Museum.

The establishment of the Department of Woods and Forestry, and his wonderful collection of the woods of America under the direction of Professor Sargent;—the creation of a great Library of Natural History;—alliances with Columbia University and the Board of Education;—the scientific arrangement of the collections in proper departments with a skilled scientific curator at the head of each;—the publications of the Museum, growing more and more valuable to science as the years progress;—the sending out of exploring expeditions to all parts of the world in quest of scientific knowledge and specimens, some of the most prominent of which were at his own expense;—the interchange of specimens and the establishment of mutual and cordial relations with other scientific societies, all testify to this lofty ambition of his to promote here the highest possible objects which he happily lived to see realized. I must not omit his generous and unfailing support of Peary in his repeated and undaunted efforts to reach the North Pole. We had hoped to have that famous discoverer here to-day, but I have the great privilege to read this letter from him, just received.

NEW YORK, February 9, 1910.

Dear Sir:

It is with the deepest regret that I am obliged to say that an engagement in another city, which cannot be postponed, will make it impossible for me to be present this afternoon on the occasion of the unveiling of the statue of my friend, Morris K. Jesup.

His breadth of mind and character is perhaps in no way indicated more clearly than by the wide range of his interests, as shown by the two projects in which his heart was most deeply centered — the future of the American Museum of Natural History and the discovery of the North Pole.

The fact that such a big, broad, practical mind as his should take up with such deep and steadfast interest the question of North Pole efforts, proved to me conclusively that my own conviction of the value of those efforts was correct.

To Morris K. Jesup more than to any other one man is due the fact that the North Pole is to-day a trophy of this country.

His faith and support carried me past many a dead center of discouragement amounting almost to despair.

Friend of unswerving faith, advisor of keen, long-headed ability, backer of princely generosity, he was first in my thoughts when I reached that goal of the centuries, first in my thoughts on my return, and my ever present regret is and has been that he could not have stayed with us a little longer to see the realization of his faith.

Faithfully,

(Signed) R. E. PEARY, U. S. N.

President HENRY FAIRFIELD OSBORN.

By all these means the Museum did become, in Mr. Jesup's life time, a veritable Mecca for scientific men and societies from all parts of the country, and foreign scientists of distinction were its frequent visitors. He labored in season and out of season with the authorities of the City and State to promote the interests of the Museum, and by the princely bequest of a million dollars doubled our endowment fund, which he had labored strenuously and already contributed generously to create. The debt of gratitude which the Museum and the City owe to him can only be repaid by continuing his work, and carrying it as near to perfection as the ever-growing domain and horizon of science can permit it to go.

We should be false to him and to our own trust if we allowed the work of the Museum to stop where he left it, advanced though that point was. Its relations with the city are fixed and permanent. It has grown with the growth of the city in the past, and it must continue to do so. Judged by its marvelous present development, New York is destined soon to become the greatest of the cities of the world. Shall it be content with riches and luxury and material strength, or shall it lead, as it ought to lead, its sister cities in higher things, in knowledge and culture, in art and science? We and our successors can give it that lead, if we will, by promoting with all our might the higher objects of such institutions as this and the Museum of Art, and the universities, so as to make the higher education and training of men and women the leading feature of our civic life.

I deem it a great privilege in behalf of the donors to present to the Museum this fine statue of our beloved and honored President, Morris Ketchum Jesup, and am glad that his Honor the Mayor, who by virtue of his office is one of our trustees, will accept it on the part of the Board.

RESPONSE

BY THE HONORABLE WILLIAM J. GAYNOR

MAYOR OF THE CITY OF NEW YORK

Gentlemen:

No one can witness this occasion, or go through this great Museum, without a feeling of pride in this great city. It and its citizens are constantly doing something for the moral and intellectual elevation of the community. The good thus done is incalculable. The result is that this is the most intelligent, decent and moral large city in the world. But while many

noble men and women like Mr. Jesup have been doing this work, others in recent years, aided and abetted by a very few newspapers, of which we are all ashamed, have been decrying the city and its people, and spreading throughout the world that they are sunk in vice and sin. I would that they were here this day. They might imbibe some sense of shame. They have also spread throughout the world the wholly false notion that this city is in a doubtful financial condition. The result is that recently our 4 per cent. city bonds sold down to 100.14, while the similar bonds of the comparatively small city of Baltimore sold at the same time for 105.17. It is time that the decent men of this city put an end to this. There is no safer security in the world than the bonds of this city, and yet they have been cried down, until they sell for less than railroad securities which are safe, but not absolutely safe, like the city bonds. The funded debt of this city can never exceed ten per cent. of the assessed value of the real estate on its tax books. It is, for that reason alone, of the same security as a mortgage on real estate, for only one-tenth of its value. But in addition to that, it has back of it the taxing power of the state forever. I hope that those who love this city and work to uplift it and are so worthily represented on this occasion will make their voices heard against all this detraction, and reassert the moral and financial soundness and superiority of this city.

ANNUAL MEETING OF THE TRUSTEES

AT the Annual meeting of the Board of Trustees, which was held on Monday, February 14, 1910, the following elections to the Board were announced:

In the Class of 1912, Mr. T. DeWitt Cuyler, to take the place of Mr. Cornelius C. Cuyler, deceased, and in the Class of 1914, the Hon. George W. Wickersham, in addition to Messrs. J. Pierpont Morgan, Joseph H. Choate, Henry F. Osborn and James Douglas, who were reelected from the Class of 1910.

The following changes in the Scientific Staff were announced: In the Department of Geology and Invertebrate Palaeontology, Prof. R. P. Whitfield, the Curator of the department since 1877, has been made Curator Emeritus, and Dr. E. O. Hovey has been promoted to the Curatorship; in the Department of Anthropology, Dr. Pliny E. Goddard has been appointed Associate Curator, Mr. Harlan I. Smith has been advanced to Associate Curatorship, Dr. Herbert J. Spinden has been

appointed Assistant Curator and Mr. Alanson Skinner has been added to the list as Assistant; a new Department of Public Health has been established with Prof. C. E. A. Winslow as Curator; a new Department of Woods and Forestry has been established, with Miss Mary C. Dickerson in charge.

Announcement was made at the meeting that Mrs. Morris K. Jesup had added to her previous benefactions the gift of a large collection of ethnological material from the Philippine Islands, valued at \$6000, and the contribution of \$10,958.33, being the sum required for the third payment on the Cape York (Peary) meteorites, which are a gift from her to the Museum.

Announcement was likewise made of a gift by Mrs. John B. Trevor of \$5000 to the Permanent Endowment Fund which is to be added to the John B. Trevor Fund; of gifts from Mr. Archer M. Huntington of \$5000 for anthropological work in the Southwest and \$5,000 toward a fund for Antarctic exploration; and of the gift from Mr. Arthur Curtiss James of \$5000 toward the Antarctic exploration fund.

MUSEUM NEWS NOTES.

SINCE our last issue the following persons have been elected to membership in the Museum: Patrons, Mr. THOS. DE WITT CUYLER and HON. GEORGE W. WICKERSHAM; Life Members, MESSRS. A. RADCLYFFE DUGMORE, THEODORE R. HOYT, FREDERIC H. KENNARD, ALFRED H. MULLIKEN, NATHANIEL CUSHING NASH, DE LANCEY NICOLL, R. A. C. SMITH and ALFRED RUTGERS WHITNEY, JR.; Sustaining Member, Mr. J. B. GREENHUT; Annual Members, MESSRS. F. B. ADAMS, W. L. ANDREWS, MISHA E. APPELBAUM, ALEXANDER ARBIB, G. W. E. ATKINS, WM. CHILDS, JR., SAMUEL W. EHRRICH, WM. H. FARRINGTON, L. P. FEUSTMAN, HAROLD H. FRIES, EDWIN GOULD, JR., JOHN ARTHUR GREENE, LOUIS M. GREER, EDWARD GRIFFITH, E. MORGAN GRINNELL, O. J. GUDE, HENRY WILLIAM GUERNSEY, R. A. GUSHEE, A. FILLMORE HYDE and JAMES NESMITH and Misses M. TABER and FLORENCE WATERBURY.

Dr. HERMON C. BUMPUS, Director of the Museum, sailed from New York on February 17 on a tour to Yucatan, Mexico and the southwestern States. In Yucatan, Dr. Bumpus will visit the famous Mayan ruins of

Chichen-Itza, and in Mexico he will spend some time at the great Aztec ruins at Mitla near Oaxaca. These visits are for the purpose of making field studies that will be used in reproducing certain of the prehistoric ruins of North America for structural use in the new hall of Mexican archaeology which is planned for the next addition to the Museum building. On his way back from Mexico, Dr. Bumpus will visit the copper mining regions of New Mexico and Arizona, making studies for use in connection with proposed groups illustrating some famous American copper mines and will make a tour of inspection among the anthropological field parties which the Museum has in the Southwest.

MR. FRANK M. CHAPMAN, Curator of Ornithology, sailed for Mexico on February 17, to make studies and collect specimens and accessories for one of the new series of Habitat Bird Groups. This Mexican group is designed to show the characteristic birds of the American tropics,—parrots, toucans, trogons, motmots and others. The locality represented by the foreground will be in the “tierra caliente,” or tropical portions of the State of Vera Cruz, while the painted background will lead one to the snow crown of Mt. Orizaba, since to explain the significance of perpetual summer and perpetual snow in the same scene will be one of the objects of the group. Mr. Chapman is accompanied by Mr. Louis Agassiz Fuertes, the well-known artist, who will make studies for the background as well as for the birds of the group.

LECTURE ANNOUNCEMENTS

MEMBERS' COURSE

The second course of illustrated lectures for the season 1909-1910 to Members of the Museum and persons holding complimentary tickets given them by Members will be given in March.

Thursday evenings at 8:15 o'clock. Doors open at 7:45.

March 3.—DR. PERCIVAL LOWELL, “The New Canals of Mars.”

These are not simply new canals to us but new on Mars. From the long continued records at the Lowell Observatory, Dr. Lowell, the Director, proves that these canals have originated on Mars within the last few months.

March 10.—PROF. WILLIS L. MOORE, “The Story of the Weather.”

Professor Moore is the Chief of the United States Weather Bureau, and in his lecture will give an account of the work of his Department, a subject of wide-spread interest at the present time.

March 17.—PROF. HENRY E. CRAMPTON, "The Living and Older Volcanoes in the South Pacific."

During the past year Dr. Crampton, curator of Invertebrate Zoölogy, spent several months among the Islands of the South Pacific, visited the active volcanoes of Kilauea in the Hawaiian Islands and Savaii in the Samoan Islands, and obtained an interesting series of photographs of these volcanoes in action.

March 24.—MR. GIFFORD PINCHOT, "The Conservation Movement."

Mr. Pinchot is the President of the National Conservation Association and is perhaps responsible more than any other one individual for the present efforts to conserve the natural resources of our country.

PEOPLE'S COURSE.

Given in coöperation with the City Department of Education.

Tuesday and Saturday evenings at 8:15 o'clock. Doors open at 7:30.

All lectures illustrated with stereopticon views.

MEETINGS OF SOCIETIES.

Public meetings of the New York Academy of Sciences and its Affiliated Societies are held at the Museum according to the following schedule:

On Monday evenings, The New York Academy of Sciences:

First Mondays, Section of Geology and Mineralogy;

Second Mondays, Section of Biology;

Third Mondays, Section of Astronomy, Physics and Chemistry;

Fourth Mondays, Section of Anthropology and Psychology.

On Tuesday evenings, as announced:

The Linnæan Society of New York;

The New York Entomological Society;

The Torrey Botanical Club.

On Wednesdays, as announced:

The Horticultural Society of New York;

The New York Mineralogical Club.

On Friday evenings, as announced:

The New York Microscopical Society.

The programmes of the meetings of the respective organizations are published in the weekly *Bulletin* of the New York Academy of Sciences and sent to the members of the several societies. Members of the Museum on making request of the Director will be provided with the *Bulletin* as issued.

Scientific Staff.

DIRECTOR

HERMON CAREY BUMPUS, Ph.D., Sc.D., LL.D.

DEPARTMENT OF GEOLOGY AND INVERTEBRATE PALEONTOLOGY

Prof. R. P. WHITFIELD, A.M., Curator Emeritus

EDMUND OTIS HOVEY, A.B., Ph.D., Curator

DEPARTMENT OF MINERALOGY

L. P. GRATACAP, Ph.B., A.B., A.M., Curator

GEORGE F. KUNZ, A.M., Ph.D., Honorary Curator of Gems

DEPARTMENT OF INVERTEBRATE ZOÖLOGY

Prof. HENRY E. CRAMPTON, A.B., Ph.D., Curator

ROY W. MINER, A.B., Assistant Curator

FRANK E. LUTZ, A.B., A.M., Ph.D., Assistant Curator

L. P. GRATACAP, Ph.B., A.B., A.M., Curator of Mollusca

WILLIAM BEUTENMÜLLER, Associate Curator of Lepidoptera

Prof. WILLIAM MORTON WHEELER, Ph.D., Honorary Curator of Social Insects

ALEXANDER PETRUNKEVITCH, Ph.D., Honorary Curator of Arachnida

Prof. AARON L. TREADWELL, B.S., M.S., Ph.D., Honorary Curator of Annulata

DEPARTMENT OF ICHTHYOLOGY AND HERPETOLOGY

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HONORABLE JOSEPH H. CHOATE, A FOUNDER AND TRUSTEE

From life-size portrait by PRINCESS LWOFF-PARLAGHY

The American Museum Journal

VOL. X

APRIL, 1910

No. 4

PORTRAIT OF THE HONORABLE JOSEPH H. CHOATE

A FOUNDER AND TRUSTEE

AMONG the founders of the Museum, one who stands out prominently for long-continued and valuable services to the institution is the Honorable Joseph H. Choate. Only on rare occasions, however, can Mr. Choate be found in person within its walls, but from now on visitors may see his genial face and feel the energy of his presence in a life-size portrait painted with unusual power. The portrait is the work of Princess Iwoff-Parlaghy and is presented by her to the Museum through President Osborn.

The artist has painted more royal and princely personages than any other living painter, and although still young, counts some two hundred portraits of well-known persons as her life work. From the time of her childhood at Hajdú-Dorog, Hungary, she has shown marked talent in portraiture and has a strength and ruggedness of style reminding one of Rembrandt and Franz Hals. She studied at Budapest and Munich, having the unique distinction, for a woman, of working under the great von Lenbach, then went to Italy for study of the Italian school. It was while here that she made her first great success in a portrait of Kossuth, the Hungarian patriot, who was living in exile at Turin. The portrait now hangs in the Museum at Budapest. Afterwards she worked in Holland, devoting much time to the Dutch masters.

The most celebrated paintings by the Princess are probably a portrait of Kaiser Wilhelm II and one of von Moltke, the former hanging in the imperial castle at Berlin, the latter in the building of the General Staff of the same city. Others of her pictures are to be found in the museums of Dresden, Leipzig, Heidelberg, Hannover and Vienna. She has received more and higher decorations in the sphere of art than any other woman in the world. Among these medals and decorations may be mentioned the great gold state medal of Germany (the Princess is the only woman in the world who has received this honor), "Hors Concours" and life member of the jury of Berlin, the great gold medal

for art and science on the ribbon of the order of the crown of Wuerttemberg, the order of the Holy Sava of Servia, the large medal for art and science and the great gold medal from His Holiness Pope Leo XIII, the academic laurels and election as "Officier de l'Académie" of France, the gold state medal of Prussia, the gold medal of the Paris Salon and the great Chicago medal of the World's Columbian Exposition.

The present portrait represents Mr. Choate clad in the bright red gown of Oxford University, from which he received the degree of D. C. L. in 1902. He is seated in an arm chair, his right hand on his knee clasping the collegiate cap, but so well has the artist caught the spirit of the man that he seems about to rise in greeting and to be on the point of giving utterance to some of those happy phrases which make him an orator of international reputation. The artist has unusual strength in the individualization of greatness and in this, her latest work, she has been particularly successful in giving expression to the sterling qualities which so endear Mr. Choate to his friends.

LENDERS INDIAN COLLECTION

THE Lenders collection, valued at \$30,000, which has recently been purchased by Mr. J. Pierpont Morgan for the Museum has now been temporarily installed in the South Pacific Hall on the fourth floor. The collection, brought together through many years of travel by Mr. E. W. Lenders, a noted artist of Philadelphia, is rich in material from the Plains Indians, although there are some specimens from the Eastern Woodlands, the North Pacific Coast and the Southwest. The tribes are, in order of the importance of their representation, the Sioux, Cheyenne, Arapaho, Blackfoot, Crow, Nez Percé, Plains Cree, Assiniboine, Apache, Comanche, Kiowa and Shoshone.

A highly interesting part of the material is a series of Sioux costumes. Seven scalp shirts attract immediate attention. The best of them is an old one made of antelope skin decorated with beautiful porcupine-quill work and colored with native dyes. Several women's costumes are noteworthy, and among them are two dresses of more than usual interest. One is very old and is of skin ornamented with elk teeth. It is the second specimen of the kind to come into the possession of the Museum. The

other is a more modern dress made of blanketing, but it is decorated with imitation elk teeth cut by the Indians from elk antler. These are so well carved and polished as to deceive any but the most experienced observer.

In the material obtained from the Blackfoot there is a group of specimens from a noted medicine man known as "Pretty Antelope." This comprises his costume consisting of an ermine headdress with beaded horns, shirt and leggings beautifully beaded and decorated with dozens of ermine skins in the form of a fringe, with belt and moccasins to match, and his tomahawk, lance, tobacco bag, scalp ornaments, rattles, talisman, medicine pipe and all the paraphernalia of a shaman. This makes one of the most complete personal outfits in the Museum.

Among the costumes from other tribes there are several unusual or particularly significant examples. A splendid Comanche suit includes leggings which have enormous flaps trailing on the ground more than twenty inches. Several pairs of Apache leggings have moccasins attached which show the big toe protector. A Pawnee shirt is decorated with porcupine quills in a manner suggesting a more northerly region. The Apache, Comanche and Kiowa objects show the peculiar ideas of dress of these people, such as lack of beads and presence of painted designs in the ornamentation. A magnificent eagle-feather war bonnet has a double trailer which dragged on the ground after the wearer. A very rare wig made of buffalo hair with long tips of horse hair of a lighter color has the hair strands ornamented and held together by daubs of red paint at intervals of about an inch.

The art work of the Indians is represented by moccasins, vests, charms, awl cases, bags, saddle blankets and game bags, carriers and parts of horse accoutrements and pipe and fire bags decorated in beads and quills. Smokers will be interested in the collection of catlinite pipes. The stone for the bowls of these pipes was obtained at the famous quarry at Pipestone, Minnesota, which is still in the possession of the Indians, who have kept, with the sanction of the Government, the exclusive right of quarrying this peculiar stone. The pipes in the collection, many of them with decorated stems and bowls, represent the handiwork of practically all the larger Plains tribes and some of those of the Eastern Woodlands.

The Indians of the Southwest have contributed to the collection many curiously wrought objects in silver and other metals, such as

bracelets, wrist protectors, belts and necklaces. Particularly remarkable is a necklace of turquoise and silver beads with a pendant of hammered silver. Seven medals dating from 1829 to 1857 represent tokens given to noted Indian chiefs by Presidents Andrew Jackson, John Tyler, Zachary Taylor, Millard Fillmore, Franklin Pierce and James Buchanan. The custom of giving medals bearing an embossed portrait of the President is still in vogue, but it is almost impossible to obtain them from the Indians who have been honored.

Basketry and pottery are not as well represented, since Mr. Lenders, from the character of his work as an artist, took more interest in collecting costumes and the utensils and weapons of the material culture of the tribes. There are, however, a few splendid old baskets including two of the feathered Pomo variety and three of the pitch-covered water baskets of the Southwest. There are some interesting specimens of pottery from the Pueblo region and buffalo and mountain sheep horn spoons from the Plains. The most valuable spoon, however, does not come from the Plains region but is a large one of beautiful translucent horn from the Haida of the Northwest Coast of America.

In regard to weapons and war pieces, there are quivers and bows and arrows, buffalo lances, tomahawks and stone clubs of various sizes and shapes. Two clubs, the stone heads of which are covered with beads, are known as "coup sticks." In former times, the most notable achievement of an Indian was the taking of a scalp, but with the introduction of rifles the killing of a man became so easy and there were usually so many scalps taken after a battle that this trophy began to lose its importance. The Indians considered it a much braver act to touch the body of a fallen foe with a coup stick under fire of the enemy. There are two buffalo hide shields, one of which is worthy of special mention. It is from the Osage tribe and has a buckskin cover with symbolical paintings. From this cover there formerly depended eagle feathers, the shafts of which were decorated with dyed hair woven in various patterns. A bullet hole through cover and shield and what seem to be blotches of blood suggest the fate of its original owner.

Besides all these, the collection includes series of baby carriers, Indian dolls, wampum peace belts, Navajo blankets, necklaces of deer's hoofs and bears' claws, ghost dance clubs, scalp dance wands and medicine otters.

A special feature of the collection is the extensive series of articles

of painted buffalo hide, Mr. Lenders having made a special study of the buffalo. Among the objects, besides the two shields mentioned, is a small Shoshone medicine tipi painted with realistic designs. There are also several saddle bags, a Winnebago drum with a painting of the Thunder Bird on one side, together with many rattles and other articles.

The objects from the Indians of the Southern Plains were much needed in the Museum collections, which still are weak in material from the Southern Plains region and the Southeast in general, though rich in that from the Northern Plains.

THE MUSEUM RESTAURANT

REPRODUCTION OF TEMPLE RUINS AT MITLA, MEXICO

THE Museum has a new restaurant — a very novel one. Taking the elevator to the east basement, we find ourselves within the three rooms that comprise this new restaurant, but strange to say we have passed through the low, broad doorway of an ancient Mexican temple and are surrounded by its mosaic-ornamented walls.

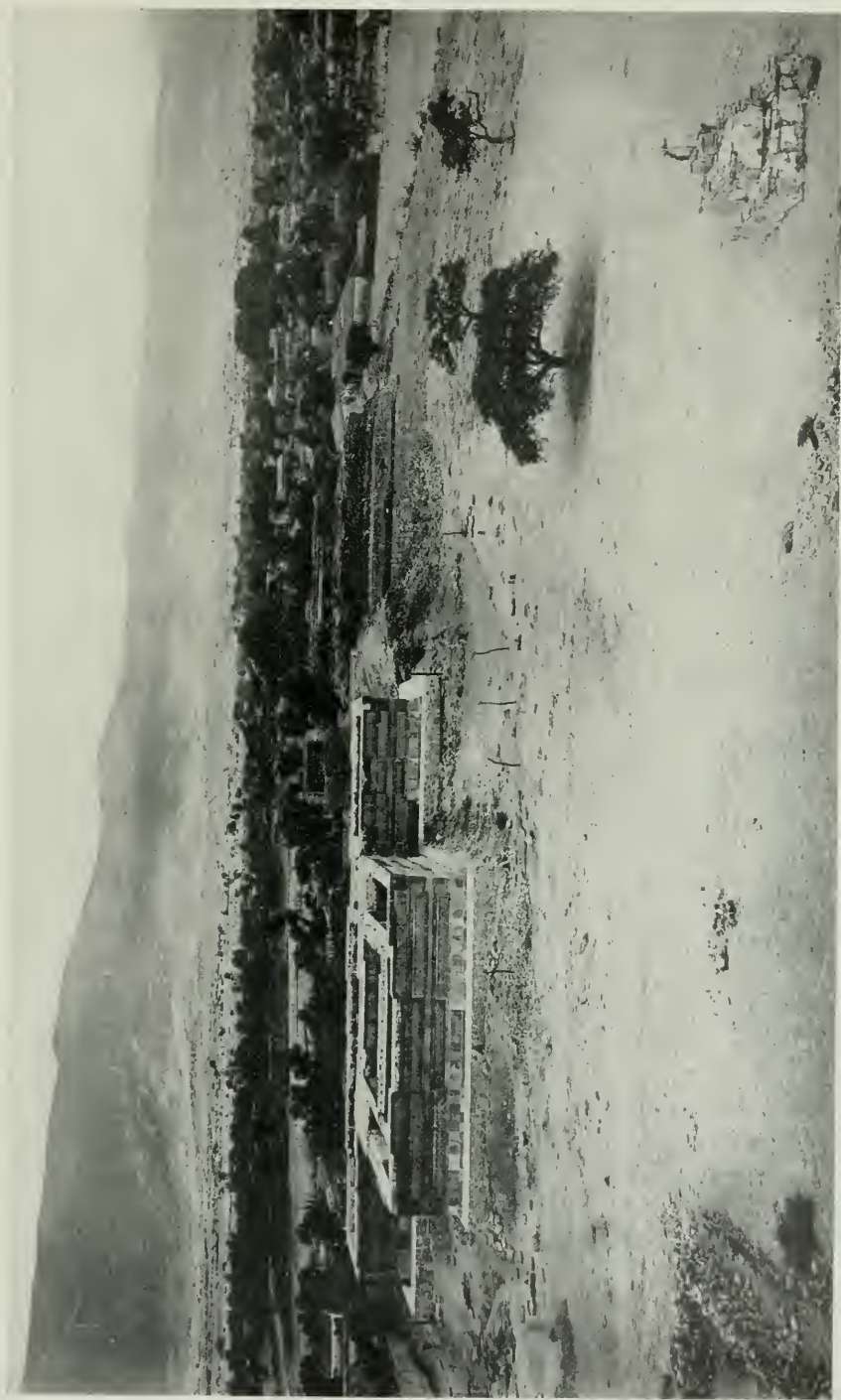
To see the original in its prime, we must have lived centuries before the Spanish conquest and have known a race which even before the times of the Toltecs had developed a culture, at least a temple building art, far exceeding that usually ascribed to the native races of this hemisphere. To look upon the ruins of this original to-day we should need to travel to southern Mexico. There, thirty miles by stage from the large city of Oaxaca, we should come to the town of Mitla, a modern little place with thatched houses and cactus fences, lying in a great amphitheater-like valley surrounded by mountains. The stage ride leads through broad green valleys dotted with farms and villages and set here and there with signs of occupation at some time far past. As we approach Mitla, the surrounding hills show much of the gray and greenish colors of trachyte, an ancient volcanic rock. When we reach the town, we find the market place and some of the public buildings constructed of this trachyte, which probably was taken from its abiding place in the cliffs more than a thousand years ago and used in successive building operations by the predecessors of the homely Zapotecan race now living here.

Mitla has long been known as the site of some of the best preserved

and most remarkable ruins in all Mexico. Who the people were that erected the buildings and whether the structures were intended for palaces or temples is unknown, but the architects and builders were wonderful for skill and boldness in design and execution, and they were not averse to work. They brought the trachyte from the hills, a stone that is soft and easily broken into great blocks, but yet is tough and durable; they obtained adobe from the immediate vicinity to be used in the foundations in setting the stone; they transported lime, probably from some outcrop in the valley, and mixed it with gravel to make cement or concrete for the laying of floors and pavements; they procured paints, mainly by mixing whitish earth and iron oxides, the colors preferred being white and several shades of red, and they cut great trees to get logs for long spans in ceilings and roofs. Because of the limit set by the length of a single roof beam, they built most of their chambers long and narrow, though they sometimes set stone columns through the middle of a chamber to double the span.

In raising the walls they cut the margins of the stone blocks so accurately that the joints required little or no mortar. The wonderful fact is that they did little simple stone laying, but instead prepared every block to fit into a particular place, so that each additional layer in the walls differed from its neighbors above and below in width, angle or projection. Most remarkable of all is the manner in which these builders ornamented their structures with geometric designs made out of innumerable little pieces of stone, each of which was cut and shaped to fit into the formal pattern of the mosaic. It is estimated that about 15,000 pieces of hewn stone were used for the inside walls of one of the small chambers of the Quadrangle of the Grecques.

To appreciate the new restaurant fully, we must know the plan on which the Mitla temples that furnished its inspiration were built. There are traceable in the ruins five groups of structures. Throughout these the ground plan is a formal quadrangle, presenting a series of central courts each surrounded by four chambers. The best preserved of the structures is the so-called Group of the Columns, particularly interesting because its great central court (about 150 feet square, probably once holding a shrine at its center) was supposedly bounded by four wide halls, each of which gave entrance into a smaller quadrangle of four rooms around a less spacious court. The best preserved of these wide halls is that on the north, the so-called Hall of the Six Columns. It is





MAIN ROOM OF THE MUSEUM RESTAURANT

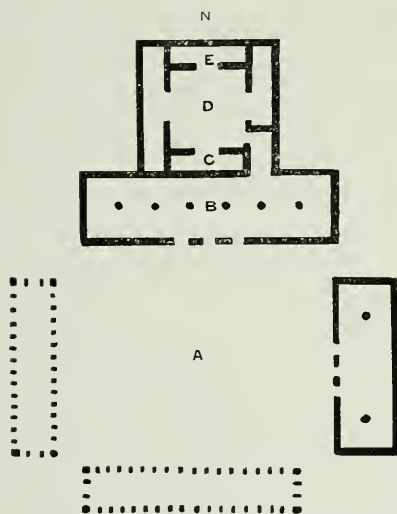
Reproduction of the Court of the Quadrangle of the Greeks, Mitla. (D of the plan on page 99)

the quadrangle entered from this hall, the Quadrangle of the Grecques, that the Museum has in part reproduced, including the court, 30 feet square, with its north and south chambers, the east and west rooms being omitted on account of the limited space available.

The reproduction was undertaken upon data given by Professor Marshall H. Saville who has made extensive studies of the ruins. While many desirable measurements were lacking, those supplied were suffi-

cient—augmented by good photographs—to secure accurate scales which were employed throughout the construction. The materials employed were selected with the object of avoiding the possibility of fire and at the same time of reducing to a minimum the danger of damage through use as a dining hall. The parts representing heavy masonry, to a height of about five feet, consist of stones cast in Keen's cement, backed with reinforced concrete, which insures both strength and hardness. Above this, where there is little danger of damage, the material used for panels and grecques is plaster strengthened with burlap.

Having obtained the measurements of each piece of stone or panel of mosaic, wooden forms were made, then modeled over with clay to gain the effect of the



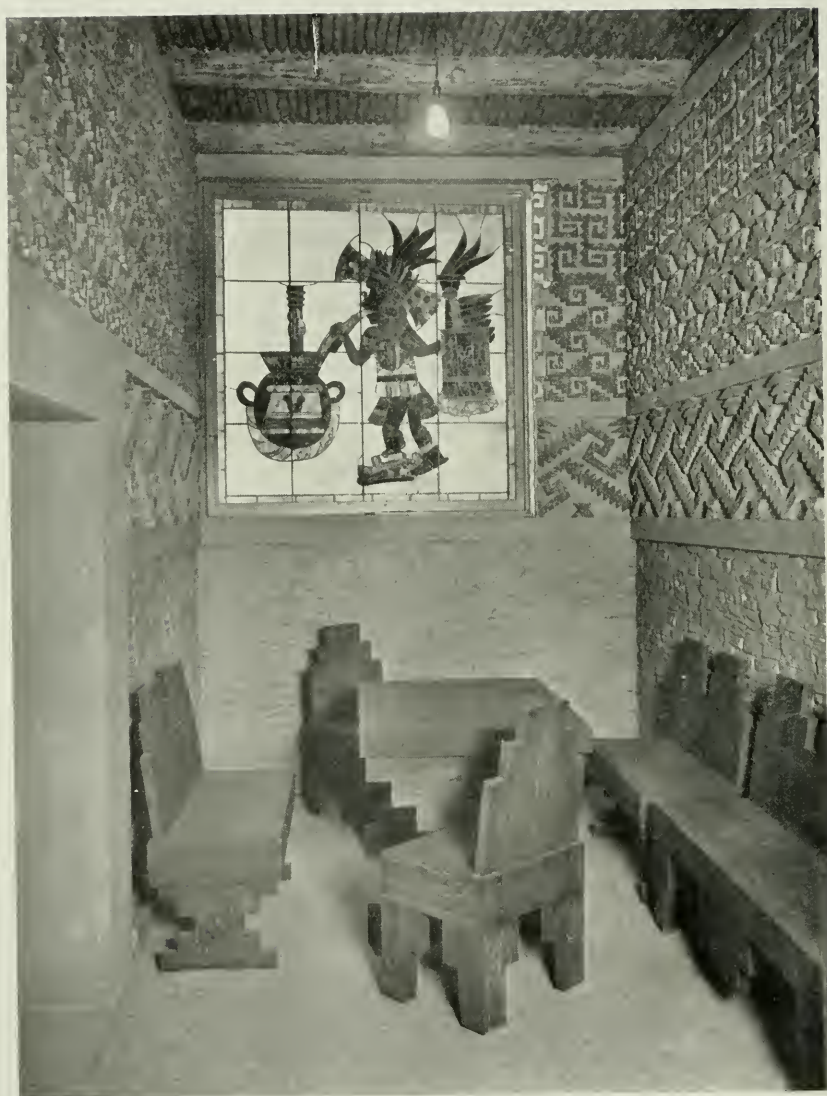
GROUND PLAN OF THE "GROUP OF THE COLUMNS," MITLA.

A. Court of the Quadrangle of the Columns. B. Hall of the Six Columns. C. South Chamber of the Grecques. D. Court of the Quadrangle of the Grecques. E. North Chamber of the Grecques.

The Museum restaurant reproduces rooms C, D and E.

stone surface as shown in many samples from the Mitla ruins in the possession of the Museum. From these models, plaster or glue moulds were made and cement or plaster casts run off as they were needed in construction. All parts were cast hollow, and by cementing each to its neighbor and anchoring all securely to the walls, the structure became both rigid and durable with a minimum of weight.

Thus visitors to the Museum may see an old Mitla temple as it used



REPRODUCTION OF THE NORTH CHAMBER OF THE GRECQUES

Stained glass windows in the north and south rooms represent pre-Columbian mythological figures taken from an ancient codex

to look,— the same low doorways of simple structure at the centers of the walls between court and rooms, the same court walls covered with horizontal panels of mosaic, and those of the chambers, except for a dado of masonry, made up completely of grecque patterns. The rooms off the court have been provided with stained glass windows made by the artist, Mr. Will S. Taylor. They represent mythological designs taken from the Codex Magliabechiano XIII, 3. Similar mythological figures have been painted on the backs of the chairs by the same artist. That the new restaurant is of unusual interest as an exhibition hall arises not only from the fact that it sets down in the heart of New York an exact reproduction of an ancient temple of Mexico, but also because the Mitla structures themselves in many features of construction as well as in the system of ornamentation stand alone not only in the general region represented but even in the small province to which they belong.

TWO NEW BIRD GROUPS

TWO new habitat bird groups have recently been opened for exhibition, and there are now but few breaks in the circuit of the gallery that these groups occupy. The one first completed, "Cuthbert Rookery," on the west side of the hall, is among the largest of the series, and represents a portion of a Florida Heron rookery, the sort of Florida bird gathering best known to the world because of the economic interest attached to aigrette-bearing herons. The foreground shows these herons — six different species and several individuals of each species — nesting among thick-growing mangroves, while the background, painted by Mr. Bruce Horsfal, pictures the whole islet of the rookery as it appears at sundown. Hundreds of birds are settling among the mangrove branches that literally roof over the islet with green. Gray Louisiana and Little Blue Herons make up a colony by themselves at the left. Roseate Spoonbills, conspicuous because of their color, approach and occupy a portion of the islet at the right; and everywhere, except in these preempted spots, are the representatives of the other three species, American Egrets, Snowy Egrets and Ibises. At the time the studies were made for the group, March 29, 1908, it was estimated that this rookery was the home of about 3,000 birds, 2,000 being Louisiana

Heron and 350 American Egrets, while only 15 were Snowy Egrets and 35, Roseate Spoonbills.

The rookery from which this group was copied is the only one remaining of the many that existed twenty-five years ago. All the others have given way to the slaughter wrought by egret hunters, this one escaping because of its inaccessibility. Cuthbert Rookery is in the heart of the mangrove swamp that borders the Everglades at the extreme southern part of the State. The large boat which carried the Museum expedition could approach only within seven miles, because of the shallowness of the water, and small boats had to be laboriously pulled and pushed through the brackish brown water of the remaining distance.

This is the rookery where Warden Guy Bradley was shot in the summer of 1905, while on duty guarding this last stronghold of the herons. The island to-day is unprotected and the birds, rare now, are liable to meet extermination in the near future. If the visitor to the Museum has previously read either Mr. Chapman's experiences at Cuthbert Rookery as given in "Camps and Cruises of an Ornithologist" or those of Mr. H. K. Job as set forth in his book "Wild Wings," he will see the Cuthbert Rookery Habitat Group with greatly enhanced interest.

The second of the two groups, the Turkey Buzzard or Turkey Vulture, that on the east side of the hall, presents a sharp contrast to the Cuthbert Rookery group in that it shows but one bird with its young, instead of a vast gathering of birds and many nests. Notwithstanding this, the Turkey Buzzard group is one of the most satisfactory of the whole twenty-five now completed.

The series of habitat groups of North American birds was designed not only to show the haunts and habits of the birds, but also to include in the painted backgrounds representations of the land types of American scenery. Until the Turkey Buzzard group was completed, the series did not show the wooded shores of an Atlantic slope river. The locality selected to fill this gap is on the Potomac, ten miles above Washington, where the river flows through heavy deciduous forests.

The success of the new group, however, does not lie only in depicting in a strong, simple way the home life of this bird, rare in the North, not only in setting forth an added sort of American landscape, but also and strikingly in the effect of the whole as a work of art. As we stand before the group, the scene is very real, quite as though we had climbed the rocky





TURKEY BUZZARD HABITAT GROUP

Studies for this group were made on the Potomac River, ten miles above Washington

cliffs and, from the height, surrounded by all the details of the life there, were looking up the river and to the opposite shore. The picture spread out before us has atmosphere, an achievement due both to the work on the painted background and to the conception carried out in the foreground. A haze rests over the green wooded hills that slope down to the Potomac and are imperfectly reflected in its muddy, slow-moving water. Close at hand, the gray lichen-spotted rocks that make up the cliffs of the near shore are here and there covered with poison ivy and Virginia creeper. Fern and hepatica, growing among dead leaves fallen from an overhanging chestnut oak, fill the crannies of the rocks.

In one of the larger of the crevices of these rocks two white down-covered birds stretch up their heads and spread their wings in supplication to a parent bird that has just alighted on a rock above them. We realize in looking at these young birds the wisdom of the instinct which makes them "lie low" in the nest, for we feel, almost with a sense of dizziness, so realistic is the group, how precipitous are the walls that extend from the nest to the water far below. The Turkey Buzzard has a longer period of family life than many birds. The time of incubation for the two heavily-spotted eggs is about thirty days, and the young must know for fully two months a world limited to the rock and dead leaves of the niche in which they first opened their eyes, although as their vision is perfected, they see the dome of the sky and the wooded heights of the river.

The Turkey Buzzard is an abundant and well-known bird at the South, where it does good service as a scavenger and is protected both by law and public sentiment. The studies for the group were made by Mr. Frank M. Chapman and Mr. J. D. Figgins in May, 1909, at Plummer's Island. The background was painted by Mr. Hobart Nichols from his own sketches, made on the ground. Plummer's Island is locally interesting as the home of the Washington Field Naturalists' Club, to which organization the Museum is indebted for many courtesies extended.

For these two groups the Museum expresses gratitude to the same Members whose generous contributions have made possible the whole series: Mr. John L. Cadwalader, Mrs. Morris K. Jesup, Mrs. Philip Schuyler, Mrs. John B. Trevor, Mrs. Robert Winthrop, Mr. F. Augustus Schermerhorn, Mr. H. B. Hollins, Mr. Henry Clay Pierce, Mr. Henry W. Poor and Mr. Courtenay Brandreth.

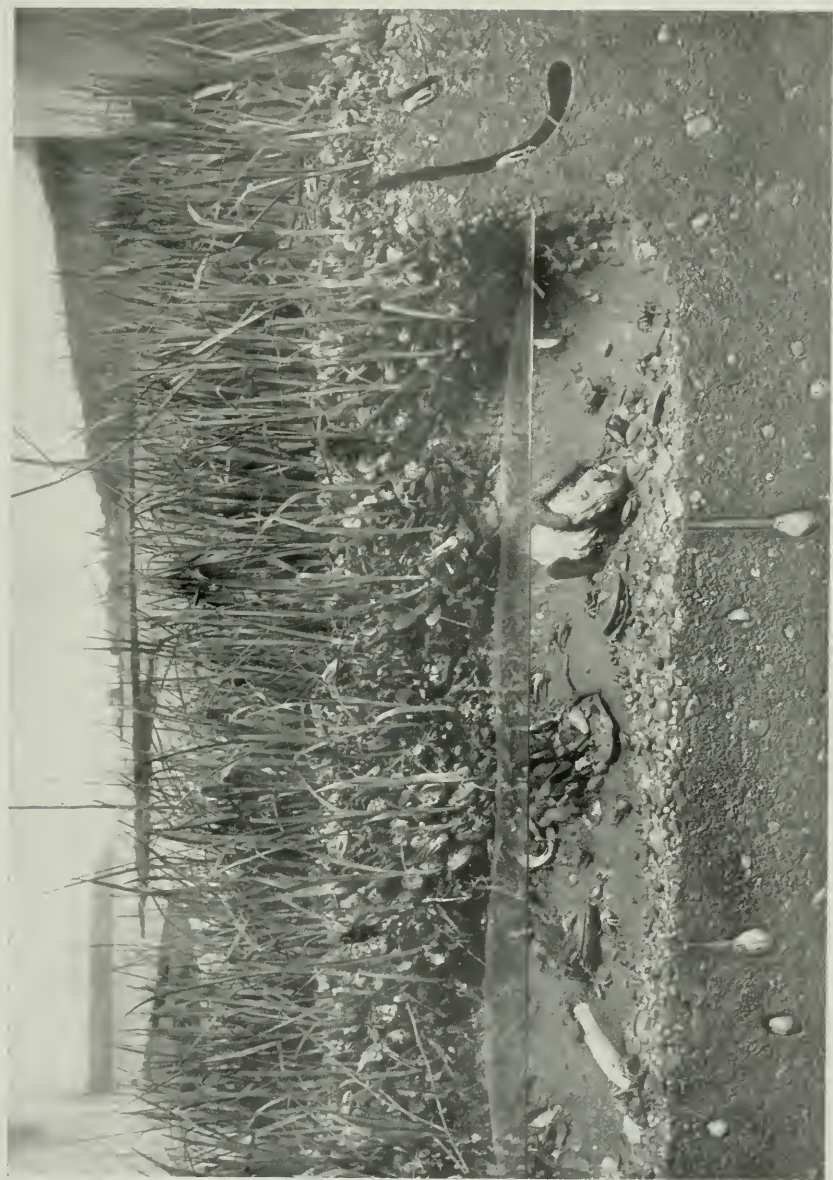
COLD SPRING HARBOR GROUP

THE group shown in the photograph on page 107 is being installed in the Darwin Hall of Invertebrate Zoölogy and represents a typical association of animal life, such as may be seen between tides on the Long Island shore. The scene is laid at Cold Spring Harbor, and the studies were made during the month of April.

A crowded mussel bed (*Modiolus plicatula*), rather thinly covered with sprouting "spartina" grass, is overrun by fiddler crabs of two species (*Uca pugillator* and *Uca pugnax*). At the extreme right of the group are two sections of fiddler-crab burrows, occupied by their tenants. The water is shown at half-ebb tide, while underneath its surface are clusters of the edible mussel (*Mytilus edulis*) and of the common oyster (*Ostrea virginica*). Upon one of the oysters is its arch enemy, a starfish (*Asterias forbesii*). With arms extended over the shell of the oyster and with innumerable tube feet firmly attached and in a state of tension, the starfish is steadily straining to pull apart the valves of its gradually weakening victim. Scattered about on the sea bottom are those scavengers of shallow water, the sea snail (*Nassa obsoleta*) and the hermit crab (*Eupagurus longicarpus*). Two of the crabs are fighting over a dead fish, while lurking here and there may be seen the mud crab (*Panopeus herbstii*). In the center, adhering to an oyster shell, are several specimens of the tube worm (*Hydroides dianthus*) with expanded gill circlets of brilliant color. At the lowest part of the group in the foreground, the mud of the sea bottom is cut in vertical section to show the long or soft clam (*Mya arenaria*) upright in its burrow, its protruded siphon reaching upward to the water.

The background of the group gives a good effect of distance produced by an arrangement of colored photographic transparencies showing an actual view of the harbor. The materials were collected and the field studies made by Dr. F. E. Lutz. The group was mounted by Mr. Ignaz Matausch, with the assistance of Mr. Dwight Franklin and under the direction of the Department of Invertebrate Zoölogy.

ROY W. MINER.



THE STEFÁNSSON - ANDERSON ARCTIC EXPEDITION

ON February 18 letters were received at the Museum from Mr. V. Stefánsson and Dr. R. M. Anderson, who are now spending their second winter on the Arctic coast of North America. Their experiences are best related in their own words, although their letters give only a hint at their lives. Mr. Stefánsson writes as follows:

HERSCHEL ISLAND, August 18, 1909.

I arrived here this morning to find that there is opportunity to send out mails this evening, with no sure opportunity after that till December. * * * * My last report to you was from Barrow in May. * * * * A day or two after the date of it I left Point Barrow, going east with two dog teams of five animals each, and three Eskimo. On one sled was the skin umiak, which we later found capable of carrying 3500 lbs. in smooth waters, on the other our camp gear and some ammunition purchased from Mr. Brower for use in the event of our supplies not arriving. When we reached Smith Bay we found that Dr. Anderson, with one team and two Eskimo, had commenced hauling eastward what stuff there was left in our cache at Smith Bay. For three days we worked together carrying our outfit forward, but on May 28 I detached three Eskimo with one sled to proceed as fast as possible to our other cache at Barter Island to take care of it during the spring thaws. * * * * On June 12 sledding operations were stopped some fifteen miles west of Colville by water on the ice,—travel resumed June 23 by umiak in open water. June 26 to July 8 was spent on Colville River, much of time in camp with Colville Eskimo, some of whom I had not seen before. * * * *

East of the Colville we were delayed an aggregate of five days by ice, strong head winds and some annoying, if not serious minor misfortunes. Arrived at and departed from Flaxman Island August 5, but were delayed two miles east of there two days; here were met by our whaleboat and Eskimo from Barter Island and journey now proceeded more smoothly. August 18, myself and the umiak were picked up about twenty miles west of Herschel Island yesterday by Capt. C. T. Pedersen, schooner "Challenge," and brought here to-day, while Anderson and whaleboat could not be taken on and therefore follow. Capt. Pedersen expected to stay here two days, giving me ample time to write letters, but reports of whales take him out again to-night.

The main energies of the summer have been taken up with getting eastward; we still have hopes of getting as far as Cape Parry, which will put us

in striking distance of the Coppermine by sled (about 300 miles). Some ethnological information has been gathered here and there incidentally, Dr. Anderson has a number of sets of eggs and bird skins. * * * *

I leave a good many things unconsidered and turn to the future. If we fail to reach the Coppermine or Victorialand districts I shall not accept the verdict as final. * * * * I shall make the winter as useful as I can among the Cape Bathurst natives, if we are forced to winter there. They are almost as unknown scientifically as any Eskimo, although not as "unspoilt" perhaps.

HERSCHEL ISLAND, August 19, 1909.

* * * Shortly after finishing yesterday's letter, and as Capt. Pedersen was about to sail, the "Karluk," Capt. Cottle, came in from Barrow. He had sighted the "Hermann" (supposedly carrying my freight) but had had no communication with her; believes neither the "Hermann" nor any other ship will come in this year; and intends himself to winter in the Arctic, but cannot say where. It is therefore clear we shall receive none of the supplies sent by you. * * * *

Capt. Cottle will take me and the two Eskimo I have with me as far east as he can and land us. There we shall fish and hunt against the winter. I leave instructions for Anderson to follow in the whaleboat, and if he is frozen in west of where Capt. Cottle lands us, say, Cape Parry, he can sled east to find us. It seems to me now the chance is fair of our getting to the Coppermine after all. * * * *

Dr. R. M. Anderson, the biologist of the expedition, writes more briefly, being greatly pressed for time, as follows:

HERSCHEL ISLAND, August 22, 1909.

I arrived here to-day from the west with the whaleboat, having been stormbound for three days within sight of the Island. Mr. Stefánsson's boat had preceded us by a few hours, while our party was looking for a lost dog. Mr. Stefánsson sailed yesterday on board the steamer "Karluk." * * * * I shall follow at once through the Mackenzie delta in the whaleboat. If frozen in before reaching Cape Parry, we shall proceed by sled to join Mr. Stefánsson. * * * * Capt. Pedersen's schooner is to sail at once for Point Barrow, so that my official report of operations since Oct. 20th, 1908, will have to go out via Dawson the coming winter. My specimens including seven skins with heads of *Ovis dalli*, and fifteen Caribou, mainly from Colville region, will have to remain here until another ship comes in or the "Karluk" goes out.

DARIUS OGDEN MILLS

AT the annual meeting of the Board of Trustees the following resolutions were passed with reference to Mr. D. O. Mills, who died January 3, 1910:

This Board records with sorrow its tribute to the late

DARIUS OGDEN MILLS

for twenty-eight years one of its number.

Mr. Mills was elected a Trustee February thirteenth, eighteen hundred eighty-two, and a year later was made a member of the Finance Committee, on which he continued to serve until his death. He was one of the four members of the committee appointed in eighteen hundred ninety-two to consider arrangements for educational coöperation. He also served on the Nominating Committee and was its Chairman for over fifteen years.

The Museum is indebted to Mr. Mills for many generous gifts.

Since the foundation of the Museum forty-odd years ago many prominent and distinguished men have served on the Board of Trustees, but none whose presence was more welcome than that of Mr. Mills. Quiet and gentle in his manner, sound in judgment and wise in counsel, modest and simple but full of good sense, just and true in every dealing, he was loved and appreciated by all who knew him. His death on January third leaves his fellow Trustees of this Board with a feeling of profound sense of loss and with the greatest admiration for his fine and lovable qualities of character.

REPORT FROM THE FABBRI YACHT

THE yacht "Tekla" which has been cruising in the waters of southern Florida, under command of her owner Mr. Alessandro Fabbri, in behalf of the Department of Fishes has succeeded in obtaining many interesting forms which are new to the Museum's collections, and the Messrs. Fabbri are carrying on the work with great energy and enthusiasm and expect to take plaster moulds from fishes which can be captured a little later in the season. By invitation of the Messrs. Fabbri the writer had the privilege of accompanying the yacht as the Museum's representative.

The most effective apparatus for getting specimens proved to be a large seine. This was especially useful on smooth sand bars sloping down into water of moderate depth. At times a strong current and the mud at a river's mouth would make the seine almost too heavy to draw, or some huge snag would anchor it to the bottom temporarily, but the results obtained fully compensate for the trials and labor of its operation. A small hand seine yielded good results where the large one could not be used, and variously improvised dip-nets turned up rare things from the tide-pools and shallows. Off shore specially constructed beam-trawls were used without great success, owing to the treacherous nature of the bottom. Yet the beam-trawl turned up several forms of life not obtained in any other way.

Collecting off shore from a small boat was highly profitable, when, on fine warm days, light airs from the south and east wafted Gulf Stream conditions into the very harbor of Key West, driving in the colored, bubble-like floats of the Portuguese-man-of-war (*Physalia*), the little violet snail (*Ianthina*) and masses of gulf weed (*Sargassum*). A fine series of *Nomeus gronovii* was obtained. These little fishes swim about under the float of the Portuguese-man-of-war, receiving protection through the powerful sting of its host's long tentacles. It is easy to dip up *Physalia* and fishes together in a net and carefully disentangle and throw back the *Physalia* without getting stung. The small fishes are very beautiful, but their black, blue and silver colors do not keep well in preserved specimens. Swimming among the Portuguese-man-of-war were also the very young of the amber jack, pretty little banded fishes scarcely an inch long, as well as small schools of scad, *Trachurus trachurus*. This latter fish, abundant and an important food fish in Europe, is considered rare on our coast. The young are probably common enough here where the Gulf Stream washes the shore of Florida.

Many of the fishes collected about Key West range southward among the West Indies. At Cape Sable, where much collecting was done, there is a predominance of forms that range along the South Atlantic coast, from about Cape Hatteras, or even Cape Cod, to Texas, but it was a surprise to find the blow-fish (*Spheroïdes*) obtained there identical with the one so common about New York in summer, whereas a quite different species was found common at Miami and a third form was abundant at Key West.

Unquestionably the most interesting region visited was the edge of the Everglades. The "Tekla" anchored several miles up Shark River, among the mangroves, and shallower waters still farther up stream were explored with a launch and row boats. In the weed-choked shallows various interesting small fishes characteristic of the region and new to the Museum's collections were very abundant. These forms are preyed upon by larger fishes, of which the leathery spotted gar (*Lepisosteus*) was most in evidence. It was here that some unusually small specimens of the great tarpon were obtained with rod and reel.

Common, though seldom seen, a rather large gray shark (*Carcharhinus lamnia*) with broad, blunt head and a formidable array of saw-edged teeth, prowls about the wharves and shipping in the harbor of Key West. Several of these sharks were caught. From the number a fine specimen eight or nine feet long was selected, and plaster moulds for a cast were made from it. When placed on exhibition in the Museum, the cast will doubtless attract no little attention, as will also the cast of a jew-fish, a huge bass of the sea, weighing some hundreds of pounds. The moulds taken from this latter fish have already been safely received at the Museum.

JOHN T. NICHOLS.

MUSEUM NEWS NOTES

THE bequest of Miss Phebe Anna Thorne to which reference was made in the January number of the JOURNAL has been paid over to the Museum and has been applied as an endowment to the Museum's room for the blind. Messrs. Samuel and Jonathan Thorne, the executors of the will, feeling that this use of the legacy was so thoroughly in accord with their sister's interest and desires have increased the amount from ten thousand to twenty-five thousand dollars, out of the residue estate, thus insuring a permanent income for the development of this new and extremely useful and promising branch of the Museum's work. The Trustees have established a committee on the Museum for the Blind consisting of Hon. Seth Low, Mr. A. D. Jouillard, Dr. H. C. Bumpus and Professor Henry F. Osborn.

THE Museum has received and added to its permanent endowment fund the sum of one hundred thousand dollars which was bequeathed to it by the late Mr. Darius O. Mills.

Since our last issue the following persons have been elected to membership in the Museum: Patron, HON. GEORGE W. WICKERSHAM; Life Member, MR. FREDERICK A. LUCAS; Sustaining Members, MESSRS. FRITZ ACHELIS and ALFRED E. MARLING; Annual Members, MESSRS. M. W. AMBERG, CHARLES EBERHART, B. TAPPEN FAIRCHILD, H. C. FLEITMANN, JAMES GUTMANN, E. G. LOVE, BRADLEY MARTIN, JR., HOWARD NOTMAN, FRANKLIN SIMON and AUGUST ZINSSER, JR., REV. PERCY STICKNEY GRANT, DR. E. LYELL EARLE, MMES. CADWALADER JONES and HENRY D. WHITFIELD and MISSES LEÓNIE M. GALLOT STAMM and CATHERINE A. STEVENS.

MR. FREDERICK A. LUCAS, Curator in Chief of the Brooklyn Museum, has been elected a life member of the American Museum on account of the practical assistance which he has rendered the latter institution and because of his contributions to science.

THE magnificent elephant head which was collected by Mr. Richard Tjäder in German East Africa in 1906 and which has been on exhibition at the Museum for the past two years as a loan from Mr. Samuel Thorne has been transferred to the Heads and Horns collection at the Zoölogical Park in Bronx Park.

ADVICES received late in February from Mr. Roy C. Andrews, who has been cruising for the past six months on the steamer Albatross of the United States Bureau of Fisheries, gave an account of an interesting and profitable journey among the Philippine Islands, the Moluccas, the Celebes and along the coast of Borneo. Many valuable photographs of natives have been obtained, including moving picture films of dancing "Dyaks" at Amboyna, Moluccas. Ethnological material, too, was obtained from several islands, part of which was generously presented by His Excellency, Baron Quarles de Quarles, Governor of the Celebes.

News from Messrs. Lang and Chapin, of the Museum's Congo expedition, has come in the form of letters and post cards which were ten weeks or more on their journey from the heart of Africa. Mr. Lang's

official report is stated to be on its way to New York, but it has not arrived yet. When the letters were despatched, late in November, 1909, the Museum expedition was making its headquarters at Avakubi, twenty-six days' march up the Congo River from Stanleyville. Most of this march was through the dense tropical forest and was extremely trying, not only to the white men but also to their native porters; nevertheless, all are in excellent health. Avakubi is an important rubber station, about twenty tons per month being received in payment of taxes from the natives, who also bring in many fine elephant tusks. The expedition has been successful in collecting hundreds of perfect skins and skeletons of mammals and birds, besides photographs and other data for use in preparing habitat groups.

On the evening of Friday, March 11, Commander Robert E. Peary, U. S. N., presented to the members of the Museum a thrilling account of his discovery of the North Pole, illustrating his address with many excellent photographs made by him while on the expedition. On account of the great popular interest in Commander Peary's work it was necessary to restrict admission to those holding Members' tickets. Even under these conditions six hundred persons were turned away from the auditorium.

From Wednesday to Friday, March 16 to 18, inclusive, the Horticultural Society of New York held its spring exhibition in the Columbus Avenue wing of the Museum. The event was made more noteworthy even than usual through the coöperation of the American Rose Society, which held its annual convention and exhibition here at the same time.

THE National Association of Audubon Societies held its annual meeting at the Museum on March 17. The convention was signalized by the principal address, which was by Mr. Donald B. McMillan upon "The Bird Life of the Arctic." Mr. McMillan will be remembered as one of the scientific staff that accompanied Commander Robert E. Peary on his successful North Polar expedition last summer.

THE HONORABLE GIFFORD PINCHOT unfortunately was unable to fill his engagement to address the Members of the Museum on March 24, but his place was filled by Dr. W. J. McGee, Secretary of the Inland Waterways Commission and member of the National Conservation Commission, who spoke upon "The Conservation Movement," which was the subject originally assigned for the evening.

LECTURE ANNOUNCEMENTS

PEOPLE'S COURSE

Given in coöperation with the City Department of Education.

Tuesday evenings at 8:15 o'clock. Doors open at 7:30. Lectures illustrated with stereopticon views.

March 1.—MR. LOUIS F. BERRY, "Spain."

March 8.—DR. JOHN C. BOWKER, "Portugal, a Cluster of Grapes."

March 15.—MR. C. J. BLANCHARD, "Winning the West."

March 22.—MR. FRANK A. GALLUP, "Greece as It is To-day."

March 29.—MR. FRANK A. GALLUP, "Italy and the Italians."

April 5.—DR. GEORGE R. VAN DE WATER, "To the Heart of the Dolomite Region."

April 12.—DR. GEORGE R. VAN DE WATER, "From Cortina to Botzen, over Pordoi Joch Pass."

April 19.—DR. GEORGE R. VAN DE WATER, "The Stelvio Pass."

April 26.—MR. ALFRED J. TALLEY, "The Passion Play."

Saturday evenings at 8:15 o'clock. Doors open at 7:30. Lectures illustrated with stereopticon views.

March 5.—MR. A. EMERSON PALMER, "Development of Public Education in New York City."

March 12.—MR. H. SNOWDEN WARD, "The Humor and the Pathos of Charles Dickens."

March 19.—HON. JOHN J. MURPHY, "The Tenement House Department."

March 26.—HON. CHARLES N. CHADWICK, "Our New Water Supply."

April 2.—HON. CHARLES B. STOVER, "The Park Department."

April 9.—HON. LAWSON PURDY, "The New York Tax Department."

April 16.—HON. MILO R. MALTBY, "The Public Service Commission."

April 23.—Subject and lecturer to be announced.

April 30.—Subject and lecturer to be announced.

Children are not admitted to the lectures of the People's Course, except on presentation of a Museum Member's Card.

MEETINGS OF SOCIETIES.

Public meetings of the New York Academy of Sciences and its Affiliated Societies are held at the Museum according to the following schedule:

On Monday evenings, The New York Academy of Sciences:

- First Mondays, Section of Geology and Mineralogy;
- Second Mondays, Section of Biology;
- Third Mondays, Section of Astronomy, Physics and Chemistry;
- Fourth Mondays, Section of Anthropology and Psychology.

On Tuesday evenings, as announced:

- The Linnaean Society of New York;
- The New York Entomological Society;
- The Torrey Botanical Club.

On Wednesdays, as announced:

- The Horticultural Society of New York;
- The New York Mineralogical Club.

On Friday evenings, as announced:

- The New York Microscopical Society.

The programmes of the meetings of the respective organizations are published in the weekly *Bulletin* of the New York Academy of Sciences and sent to the members of the several societies. Members of the Museum on making request of the Director will be provided with the *Bulletin* as issued.

The American Museum Journal

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MARY CYNTHIA DICKERSON, *Associate Editor*.

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THE AMERICAN MUSEUM OF NATURAL HISTORY was established in 1869 to promote the Natural Sciences and to diffuse a general knowledge of them among the people, and it is in cordial coöperation with all similar institutions throughout the world. The Museum authorities are dependent upon private subscriptions and the dues from members for procuring needed additions to the collections and for carrying on explorations in America and other parts of the world.

The membership fees are,

Annual Members.....	\$ 10	Fellows.....	\$ 500
Sustaining Members (Annual) ..	25	Patrons.....	1000
Life Members.....	100	Benefactors (Gift or bequest)	50,000

All money received from membership fees is used for increasing the collections and for developing the educational work of the Museum.

The Museum is open free to the public on every day in the year.



ROBERT PARR WHITFIELD

Curator of Geology and Invertebrate Palaeontology, 1877-1909

The American Museum Journal

VOL. X

MAY, 1910

NO. 5

ROBERT PARR WHITFIELD

ROBERT PARR WHITFIELD, Curator Emeritus of Geology and Invertebrate Palaeontology, died on April 6 after a long illness. Coming to the Museum while still in the prime of life, he rendered most faithful service to the institution for thirty-three years and did his full share in placing it in its commanding position in the scientific world.

He was born at New Hartford, Oneida County, New York, May 27, 1828, and therefore came from a region which has furnished several of the most famous geologists and palaeontologists of America. At the age of nine, the boy began work in a cotton mill, later entering the shop of his father, who was a spindle maker. When he was twenty, his father gave young Whitfield his time, and he was employed by Samuel Chubbock, a well-known manufacturer of philosophical instruments at Utica. His spare moments were spent in collecting the fossils for which the region around that city is famous and in preparing, mounting and studying them, his interest in natural history having been aroused and fostered in very early life by an English nurse who was in the family. School education did not fall to his lot; in fact, as he has stated in conversation with the writer, his entire school training amounted to less than three months of time in all, and he never saw the inside of a school house as a student after he was twelve years old. Hence Professor Whitfield's career as a scientist is even more remarkable than it would have been, if he had had the advantage in early life of the scholastic and other training that has fallen to the lot of the majority of men who have attained eminence in science.

In the early fifties, Professor James Hall heard of young Whitfield's collection, visited him and saw the scientific promise in the young mechanic. When, therefore, poor health obliged him to give up his work in the shop in 1856, Professor Hall was glad to get his assistance on the Natural History Survey of the State, and Mr. Whitfield removed to Albany, where he remained as an assistant in palaeontology and geology

for more than twenty years. When the great James Hall Collection of fossils was purchased for the American Museum, the services of Professor Whitfield were secured for its care, and he entered upon his duties as Curator of Geology in January, 1877, being the only curator that the institution then had. His first year was devoted to arranging the geological and palaeontological material in the exhibition hall assigned to it in the new building of the Museum, and when this building, which is now known as the North Wing, was opened to the public, December 22, 1877, the collections in his charge were by far the most important from a scientific standpoint among all the possessions of the Museum.

Throughout his whole career, the mechanical skill developed in the tool and instrument shops stood Professor Whitfield in good stead, and it was of material assistance to him in the development of his talents as a draftsman. His first efforts at making drawings for publication were in the delineation for the State Survey of the correct relations of the complicated remains of fossil crinoids, or sea lilies. He soon surpassed the other draftsmen in the accuracy of his observations and in the skill and brilliancy with which he used his pencil in representing fossil forms, and it was not long before he became the head draftsman of the Survey. In this capacity he executed several thousands of drawings before the termination of his connection with the organization. This training as a draftsman was of material assistance to Professor Whitfield in all his studies. His recognition of old and new features amounted almost to an instinct, and there is little question that for nearly half a century he had no superior in this country in the identification of fragmentary invertebrate fossils.

In addition to his work for the State of New York and this Museum, he studied and described the fossils which were gathered by the Clarence King Geological Survey of the Fortieth Parallel, Jenney's and Ludlow's expeditions to the Black Hills of South Dakota and much of the material gathered for the geological surveys of Ohio, Indiana, Wisconsin and New Jersey.

Soon after he came to the Museum, he began to urge the establishment of a medium for the publication of the results of the scientific work done in the Museum. This led to the institution, in 1881, by President Morris K. Jesup, of the Museum "Bulletin," the first five articles of which, comprising all that was issued during the first year of its existence,

were prepared by Professor Whitfield. In the succeeding years, he contributed many articles to the pages of the "Bulletin," and the last piece of work that he did in connection with his department was the preparation, during the latter half of last year, of the text and drawings of the descriptions of several new species of fossil shells from the Mt. Lebanon district of Syria. The drawings, to be sure, show the effects of advancing age and infirmity, but nevertheless they indicate clearly the master hand that prepared so many thousands of antecedent figures.

Although never a man of strong physique, Professor Whitfield usually enjoyed good health and was able to accomplish an immense amount of work. The Hall Collection of fossils was his idol, and its care and interests were constantly on his mind. Naturally methodical and systematic himself, the arrangement of the collection reflected these characteristics of the man and was the joy of the visiting scientist who desired to inspect a particular species with or without the assistance of the curator. Almost punctilious in his attention to duty and to his ideas of Museum work, he was always to be found either in the exhibition hall or in the laboratory, never going away on collecting expeditions except within the limits of his usual brief vacations. Remaining actively engaged in his department to within so short a period of his demise, his removal means much to the Museum and his familiar figure and his counsel will be greatly missed.

EDMUND OTIS HOVEY.

THE DODGE EXPEDITION TO MISSISSIPPI

THE Museum collection of fishes is poor in "ganoids"—sturgeon, gar-pikes, amia, shovel-noses and spoon-billed catfish or paddlefish—and it has seemed desirable that this ancient group should be exhibited adequately in the Hall of Fishes. One reason for the interest in "ganoids" is that they are known to be the race of fishes from which all the modern types such as perch, cod and salmon are descended. Accordingly, thanks to the aid of the Dodge Fund, an expedition was sent in March to spend several weeks in a region which is peculiarly rich in these rare forms for the purpose of obtaining material to show their structure and development. In the northwestern corner

of the state of Mississippi there is an extensive fishery of the paddlefish (*Polyodon folium*) which is in charge of Mr. J. E. McGehee, a friend of the Museum, who put at its service his launches, fishermen and nets. There was thus offered an unusual opportunity for securing the desired collection, which was further improved by the fact that during the present spring a lake, Moon Lake, was to be fished, which had not been netted before. The collecting party consisted of Dr. L. Hussakof and Mr. Dwight Franklin. They report excellent success in collecting specimens and in obtaining casts and color studies which will ultimately be used in the preparation of habitat groups.

A FOURTH JOURNEY TO THE SOUTH SEAS

DURING the years 1906 to 1908, inclusive, I made three voyages to Tahiti and the other islands of the Society group, under the auspices of the American Museum and of the Carnegie Institution of Washington. The purpose was the investigation of the land-snails of these islands, and each year the results proved so unexpectedly satisfactory that further explorations were found desirable and were accordingly planned and carried out. My fourth journey, that of 1909, extended over about 15,000 miles of the Pacific Ocean and involved travels in seven groups of islands (the Society, Cook, New Zealand, Tongan, Samoan, Fijian and Hawaiian) while some of the Paumotus were seen in passing. My route is shown in the chart on page 125. The investigation of the land-snails of the Polynesian region was undertaken on account of the unusually favorable conditions for the study of certain evolutionary results and processes. Every biologist is familiar with Gulick's famous writings of the last quarter of the nineteenth century, in which he demonstrates that the Achatinellid land-snails of the Hawaiian Islands vary from valley to valley and from island to island of the group. As descendants of a common ancestral stock the different valley colonies and island types are the products of divergent evolution in correlation with their greater or lesser degrees of isolation. The efficiency of differing environmental conditions as actual factors in the process of species differentiation has been variously estimated by writers like Romanes, Jordan, Allen, Wallace and others, who have dealt with



PAPEETE AND THE NORTHWESTERN PART OF TAHITI



LOOKING SOUTH IN OPUNOHU BAY MOOREA SOCIETY ISLANDS

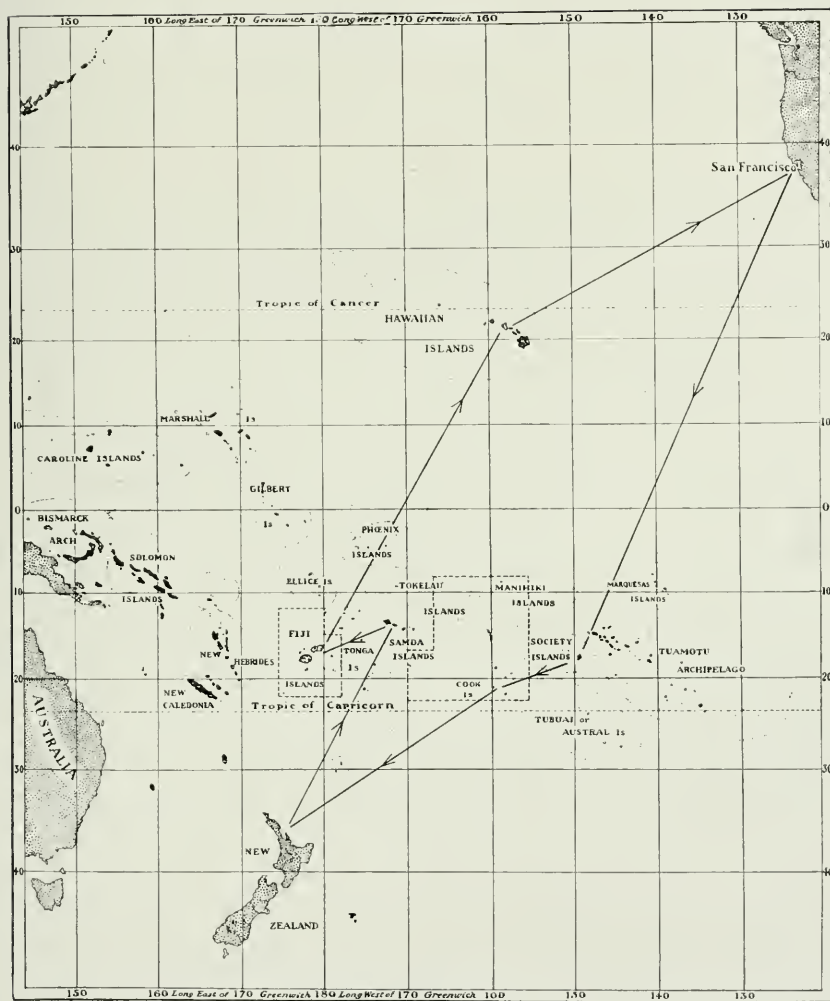
The impressive and strangely sculptured peaks are part of an ancient crater wall

similar phenomena displayed by other groups of organisms. Dr. A. G. Mayer made an initial biological study of the Tahiti land-snails belonging to the genus *Partula* and found remarkable differences between the valley colonies of this island. Advised by him to carry investigation further, I undertook the journeys mentioned, and the present brief account of the last one will give some of the general results of studies in the field and laboratory.

The first landing place as in previous voyages was the island of Tahiti, the largest and best known member of the Society Islands. Papeete is its main town, situated on the northwest coast, and like Suva in the Fiji group and Honolulu in the Hawaiian group, it is the governmental and commercial centre of the surrounding region of the South Seas. Its great prominence has been gained from Captain Cook's famous voyages in the eighteenth century and from the establishment here of the earliest missionary settlements in southeastern Polynesia. The town now has over 3,000 inhabitants, about three fourths of whom are natives. Cook's estimate of the population of the entire island made in 1768 was 240,000 whereas now there are less than 10,000 natives. Even if we allow for considerable exaggeration in his estimate there has obviously been a frightful mortality, resulting from their contact with white races and from the almost total destruction of their primitive scheme of life.

On approaching Tahiti, the island reveals itself as a magnificent double cone of ancient volcanic rock; the larger cone is twenty-five miles in diameter and rises to a height of nearly 8000 feet; it is joined by a low narrow isthmus to the smaller cone which is fifteen miles across. The view of the island near Papeete (page 123) shows also the characteristic mountain ridges whose central heights are covered by clouds from soon after sunrise to sunset. These ridges radiate with remarkable regularity from the interior to the sea, and the valleys between them are sometimes a half-mile in width, with dense tropical vegetation along the more level ground on either side of the streams. Sometimes the valleys are deep, narrow gorges with high, steep walls, bare of everything except low shrubs and grass. It is in the moist jungles of the valley bottoms that the *Partulas* live, and the higher and drier slopes form boundaries that restrain the snails from crossing to another valley, except during the wettest months of the rainy season.

More than two hundred valleys of smaller and larger size have been



ROUTE OF PROFESSOR CRAMPTON'S JOURNEY OF 1909

explored during my four journeys around and about the Society Islands. Over 100,000 specimens of snails have been obtained from Tahiti and the other five islands of the group — Moorea (see page 123), Raiatea, Tahaa, Huahine and Borabora. It was necessary to make a complete survey, in order that there might be no unknown gaps. On account of the high and rugged ridges which separate the valleys, it is very rarely possible to cross inland from one valley to another. It was my habit, therefore, to travel with my group of native assistants



TEVAITOA IN RAIATEA, ONE OF THE LEEWARD ISLANDS

A primitive village of the Society Islands

around the coast by canoe or whaleboat, or sometimes by carriage and on horseback, and to live literally among the natives in their primitive and interesting villages like the one shown on this page. Naturally it was possible to learn much of these people, their customs, their every day life and also their occasional ceremonies that the casual visitor to Paapeete and similar large towns misses. A photograph is given on page 127 of one of their rare village fishing parties, undertaken in this case by the men of the entire district of Opoa in the Island of Raiatea.

The abundant collections in hand give a perfect demonstration of

the principles of geographical distribution. Each island possesses its own species, while its different valleys have forms that are usually markedly different. For instance, in the valley of Tipaerui of Tahiti the examples belonging to the species *Partula otaheitana* are almost all twisted to the right, and all of them are rather small, brown and streaked. Their relatives in the magnificent valley of Fautaua, a half mile distant, are larger, yellower and redder, but the fact of greater interest is that the shells of a large proportion of them twist to the left. In Hamuta



FISHING SCENE IN RAIATEA, SOCIETY ISLANDS

Distributing the fish caught for a district feast

Valley, just beyond Fautaua, the right-handed and left-handed members of the species are about equal in numbers, while in Pirai Valley beyond they are all left-handed. This last valley is the home of a small form, *Partula filosa*, that grows nowhere else in this island, in the group of islands or in the world.

When the collections are sorted out according to species and varieties and according to their geographical source, they give ample evidence to

prove that the divergent types of neighboring or distant valleys have arisen from common ancestors and that they have changed little by little, in one place and another, so as to become the distinct and characteristic types of their own neighborhoods. The evidence proves also that the snails have evolved primarily by "sporting," or mutation in the de Vries sense, and that the internal or constitutional factors are the potent ones, for the geological, climatic and general biological conditions are more uniform in these islands than anywhere else in the world. The



MANGAIA, ONE OF THE COOK ISLANDS

An uplifted coral limestone island

assignment of a secondary importance to environment is one of the principal results of my investigation.

A second result of equal importance is even more interesting. It is that the evolution of new types is taking place at the present time, as the evidence amply demonstrates in several instances discovered in different islands. My investigations give long-desired proof that the differentiation of species is going on under surroundings that are entirely natural

and not only under the artificial conditions of the laboratory and experiment station.

In June, July and the early part of August a final survey was made of certain baffling portions of Tahiti, Moorea, Raiatea and Huahine. I then passed on to the Cook Islands by a steamer which stopped long enough at Mangaia, Moki, Aitutaki and Rarotonga for a survey to be made of each place. With the exception of the last named, which is a "high" island like Tahiti, the Cook Islands are uplifted coral atolls



PAGOPAGO HARBOR, TUTUILA, SAMOAN ISLANDS

Showing part of the surrounding amphitheater of mountains

composed entirely of limestone. Mangaia, illustrated on page 128, is a typical example of such islands, which are relatively infrequent in the South Seas. These were originally low coral atolls scarcely rising above the surface of the ocean, and they were subsequently lifted by some geological power which raised the bottom of the ocean at this place, so that what were formerly the lagoons in the center became basin-like valleys. Earlier voyagers like Garrett and Cuming had reported certain species

of *Partula* from some of these islands, a remarkable fact in view of their low character and peculiar geological formation. Moki, however, had not been visited before. At both Moki and Mangaia, I found a species of *Partula* living in banana, orange and screw-pine (pandanus) groves of the coral plateau.

My voyage was then continued to New Zealand, which does not possess any species of *Partula*; but it is a region of great interest geologically on account of its volcanoes and geysers, and also in ethno-



VITI-LEVU, THE LARGEST OF THE FIJI ISLANDS

A characteristic jungle scene

logical respects because its natives, the Maoris, are the offspring of the same stock which peopled the Society, Cook, Samoan, Hawaiian and certain other groups of Polynesia. My route then proceeded through the Tonga group, which includes many beautiful examples of all three kinds of South Pacific islands. At the end of September headquarters were established in Apia, the main town of Upolu in the Samoan group, and explorations were made in this and neighboring islands. Peculiar species of *Partula* live here, and they, like the Society Island forms, are

restricted to particular islands. The climatic and other conditions were so adverse that a complete exploration was impossible in Samoa at this time of the year. In Tutuila, however, which is the largest island of American Samoa, a practically complete survey was made, and much interesting material was secured. The high mountain slopes covered with dense vegetation are pictured on page 129. They are like those of the Society Islands, but the intervening valleys are not as rigidly isolated as in the latter region, so that the species of different parts of the islands resemble one another quite closely. Our interest here centers in the comparison of Samoan species with those of other groups.

The Fiji Islands, next in order, belong ethnologically and geologically to Melanesia, a quite distinct region of the South Pacific. Ovalau and Viti-Levu were visited, but no species of *Partula* were found in them; the single form from this group that is known to science occurs in more remote islands. It seems strange to one familiar with southeastern Polynesia that the *Partulas* should be lacking, for the thick, moist jungle (page 130) and the topography seem to be in every way the same as in the eastern islands. Going next to the Hawaiian Islands, I spent considerable time in studying the famous collections in the Bishop Museum which were made by Andrew Garrett during decades of research in the islands of the Pacific. Most of the original forms had been discovered during Garrett's explorations, and so his collections with his own identifications must always have great value for the student of the present day. Through the kindness and courtesy of Dr. C. M. Cooke of the Bishop Museum, excursions were made into the field in the island of Oahu, in order to observe personally how the *Achatinellid* land-snails resemble and differ from the *Partulas* in biological relations. The remarkable fact resulting from this comparison is that the former snails are restricted to isolated trees or clumps of trees on the sides of the valleys, while the drier and more open valley-bottom forms the barriers, instead of the ridges as in the case of the *Partulas*. The essential principles of distribution, however, are the same.

The zoölogist who travels more or less extensively in the South Seas soon becomes an ardent student of the native inhabitants. His interests would be aroused by the primitive daily occupations and culture of the people who, nevertheless, have developed remarkable intellectual powers; but the feature of greater significance to the investigator of the principles of geographical distribution is the fact that precisely similar phenomena

are displayed by the various Polynesian island-races and lower forms like the snails already described. The Polynesians from the Paumotu westward to Tonga and New Zealand and from Hawaii southward to the Austral Islands possess the same general physical and intellectual characteristics, while their culture is practically uniform throughout this vast region. These resemblances indicate a common ancestry of the several races, and the native traditions confirm the conclusion which may be based solely upon observations of the present day. The islanders of each group have certain more or less unique qualities, especially in the matter of language. Subservient, like other living things to the control of evolution, the natives as well as the snails have come to differ more or less widely in correlation with their greater or lesser isolation in geographical respects.

HENRY E. CRAMPTON.

ANTHROPOLOGICAL WORK IN THE SOUTHWEST

DURING the past few months the Museum has been carrying on important anthropological work in the Southwest through Dr. Pliny E. Goddard and Dr. H. J. Spinden of the Department of Anthropology. A glimpse at what is being accomplished is given in a recent report from Curator Clark Wissler, who has been making a tour of inspection. Extracts from Dr. Wissler's report are as follows:

SANTA FÉ, NEW MEXICO,
March 30, 1910.

* * * * I am able to make a brief report on our work in the Southwest. In general, I find the results in collections beyond what I dared hope at the outset, while in the research side of the work my expectations have almost become realities. As you will recall, we planned work on a programme that would this year give us fair collections from the pueblo and non-pueblo dwelling Indians of New Mexico and Arizona, excepting the Zuñi and some divisions of the Yuma stock. To date we have collections from the four divisions of Apache peoples, two divisions of the Pima stock and the various Rio Grande Pueblo. Collecting among the Navajo is now under way, and I expect to try some of the Yuma groups soon. Thus, we shall have brought together in less than a year's time, from actual field-work, collections representing six tribal divisions and as many villages of Pueblo

Indians, as a whole constituting two general types of culture, occupying an area comprising the territories of New Mexico and Arizona. * * * *

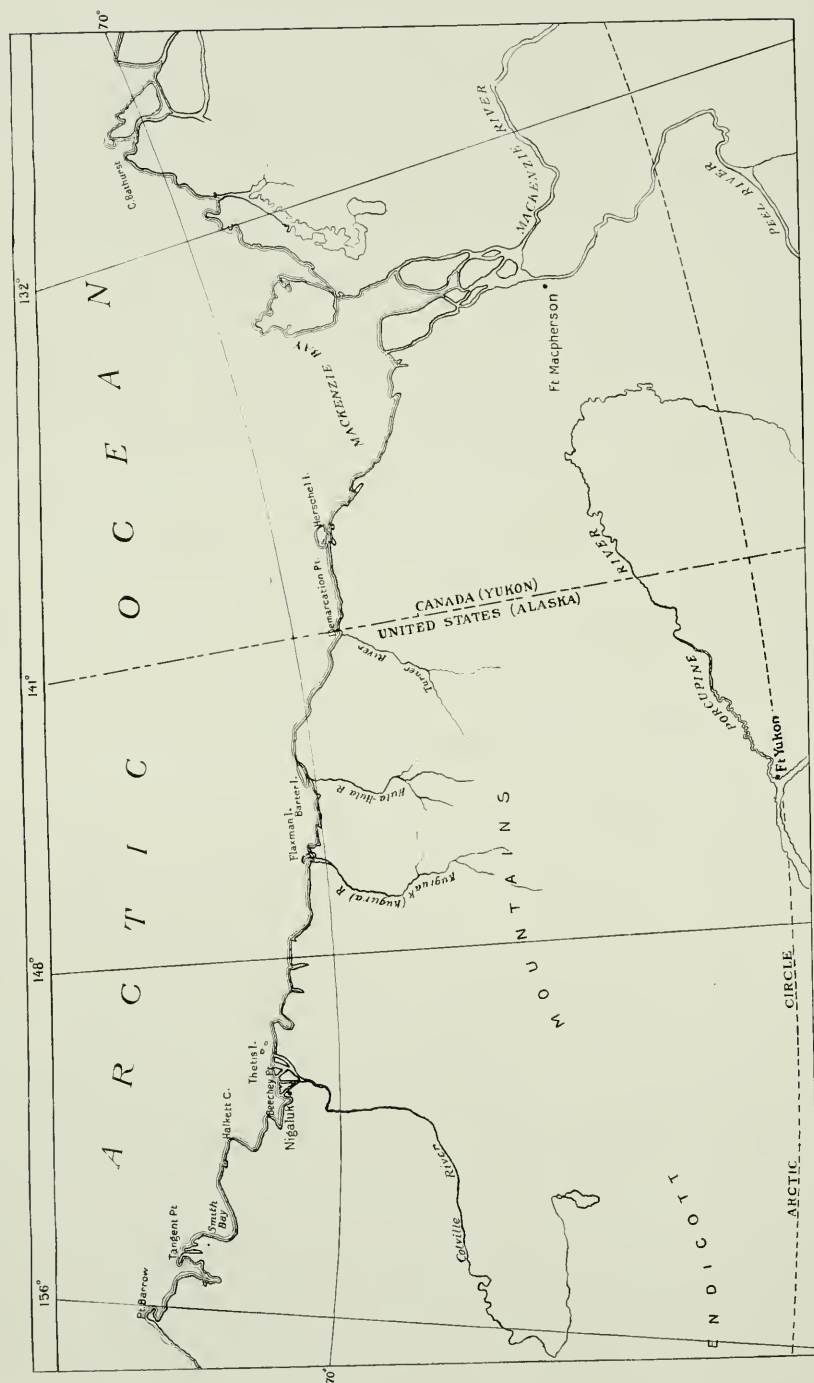
From the research point of view our important pieces of work are on the Apache and the Rio Grande Pueblo. The former resolve themselves into several groups each of which has a culture modified largely by environment and contact with their neighbors, the determination of these sub-types and their origins being the important problem. While the Apache hold a prominent place in the general literature of the South-west, their culture has not hitherto been made the subject of systematic investigation by anthropologists. * * * * The Rio Grande Pueblo constitute by far the largest body of their class, but they have not been systematically studied in contrast with the Zuñi and Hopi groups. While our collection is far from representative of the villages taken severally, as a whole it covers their general culture fairly well and contains some very good things. There are pieces of pottery made fifty years ago which in connection with that of recent make certainly give us the modern type, making our collection a standard. In several other classes of objects we fare almost as well.

STEFÁNSSON-ANDERSON ARCTIC EXPEDITION

SINCE the last issue of the JOURNAL more extensive reports than we have had heretofore have come in from Dr. Rudolph M. Anderson, the biologist of the Museum's expedition to the Arctic coast of North America east and west of the mouths of the Mackenzie River. For many months nothing was heard from him, but no news was considered to be good news, for bad news travels rapidly among the Eskimo, and no anxiety was felt regarding his welfare. Letters from both Mr. Stefánsson and Dr. Anderson were published in the April number of the JOURNAL, and we now have the privilege of publishing extracts from the narrative of the latter's experiences during the preceding months. He writes as follows:

HERSCHEL ISLAND, August 22, 1909.

* * * * Mr. Stefánsson and I left Flaxman Island October 20, 1908, going in opposite directions. I started east with one sled and eight dogs, four Eskimo, our employee Havinerk, his wife Mamayouk, their little girl, and an 18 year old boy named Kiðya. The latter had no place to stay for the winter and wished to accompany us as a "volunteer." He proved to be



MAP OF ARCTIC ALASKA, SHOWING REGION COVERED BY THE STEFANSSON-ANDERSON EXPEDITION

Richard Island is the large island just east of Mackenzie Bay. Toker Point is on the mainland east of Richard Island. The Eskimo Lakes parallel the coast line east of Toker Point. Baillie Island is southeast of Cape Bathurst. Cape Parry is the most easterly point shown on this map.

a good sheep hunter and a useful companion. We followed the coast line, in general, to the mouth of the Hula-hula River, about six miles west of Barter Island. Here we picked up a toboggan, very useful in the mountains, and fixed up our whaleboat cache. We took only three 50 lb. sacks of flour, two slabs of bacon, a few pounds of beans, and some tea and tobacco with us from Flaxman Island. We cached half a sack of flour here for our return trip, but it was eaten by wandering natives before we returned. There is plenty of driftwood along the coast for camping purposes, but inland, between the coast and the mountains, there is little to burn, only a few willow twigs and snags along the river bars. We found two families of natives living on the Hula-hula, and hunted with them during November, the entire party killing fifteen sheep (*Ovis dalli*). One mountain hunter, named Kunagnana, with his wife and three small children had been living on sheep for months. He had over thirty sheepskins on hand, besides having clad the whole family from head to foot in sheepskins. His shirt, coat, pants, stockings, boots, mittens, snow-shoe lacings, and even the little tent he lived in, were made entirely of mountain sheepskins.

Our flour and other "civilized rations," except tea and tobacco, were gone early in November, and for the next month we lived on mountain sheep "straight," with a few messes of ptarmigan thrown in. Willow ptarmigan were very common and rock ptarmigan rare in the creek valleys. On the north side of the mountains, it required very little effort to bag ten or fifteen ptarmigan in a couple of hours. Later in November, we joined forces with a party of five Eskimo whom we had met at Herschel Island the summer before — Auktelek and his wife Tulak, their grown son Akorak, and another young hunter named Pikalo, and the latter's father Kunasilek. Auktelek told me that several years before his brother Umegluk with two companions had crossed the "divide" from the head of the Hula-hula River and hunted on a river flowing south (I believe the middle or east branch of the Chandlar), a northern tributary of the Yukon, and had found plenty of tük-tū (caribou). There is an immense territory south of the Endicott Mountains and north of the Yukon which the white prospectors have not yet reached except in a few places. The Rampart House and Fort Yukon Indians do not range so far north except in summer, and the Eskimo seldom cross the mountains. To the knowledge of the natives, no white man had ever crossed the mountains in this region.

We decided to cross this mountainous divide. We hauled a load of meat and a little wood within a quarter mile of the summit and camped one night (December 3) above the willow line. We took the sleds over safely by putting ten dogs in harness, and with the help of six men boosting and pulling. Descending a rocky creek gorge, we reached large willows before night of

December 4. The second day devoted to hunting brought in one sheep out of a flock of eleven seen. The third day's travel brought us to green spruce trees. Ptarmigan were scarce, also hard to find as the river valley was wild. We were on pretty short rations before we struck the caribou herds in the high foothills on December 18. The snow was deep and soft on the south side of the divide, our sleds were soon stalled, and we were delayed for days cutting trees, hewing out boards and making toboggans. A trail had to be snow-shoed ahead, and travel was slow, all hands "slugging" in harness with the dogs. Two porcupine and a great gray owl proved welcome additions to our larder. Canada jays were observed a few miles north of the limit spruce trees, and ravens were often in sight. During the latter part of December we saw many caribou, at one time over a thousand within rifle range at one time,—a magnificent spectacle. We lived in tents until December 23, when we built a hut of poles covered with blocks of moss, living there until late in January, occasionally seeing caribou. They were continually moving eastward, and we were finally compelled to cross a low chain of hills to another large creek valley about twenty miles farther east. When we were down to our last day's food, we fortunately killed sixteen caribou, January 31, and one moose, February 4. This gave us meat enough to attempt the return journey. * * * * The return journey was easier than the descent, as the river was covered with ice. We often had difficulty in crossing places where the whole river half a mile wide was overflowed with several inches of water which perhaps had a very thin crust of ice over it—this at -50° Fahrenheit. Lowest temperature observed was -54° F. We recrossed the "divide" February 28 and reached Flaxman Island March 7, having been on a "straight meat" ration for four months,—two months without salt. All the party, however, were in fine health and condition. * * * * The usual procedure before moving camp is to pound up every bone and boil the fragments to extract the grease—as a result of which few bones are left on the mountains for future palaeontologists to ponder over.

I made another trip to the Hula-hula River from Flaxman Island to bring out the balance of my skins and skulls, returning April 14, and met Mr. Stefánsson, whom I had not seen since October 20. After finishing the preparation of my specimens I started west from Flaxman Island, and sledged as far as Smith Bay. Here I found a note from Mr. Stefánsson who had preceded me, stating that advices had been received at Point Barrow to the effect that no whalers were coming into the Arctic Ocean this summer, and we were left to our own resources to get our belongings east.

We at once started hauling goods and supplies east from our cache at Smith Bay, and by strenuous effort with two sleds succeeded in getting five

sled loads of gear, and a thirty-three-and-one-half foot skin "umiak" within a few miles of the Colville delta before water overflowing the sea ice put an end to sled travel on June 14. Launched this boat on June 23 and have spent the time since then moving eastward, paddling, sailing or tracking. I have spent all available time in collecting, and have taken a fair series of eggs and nests, including whistling swan, black brant, black-billed and American golden plovers, turnstone sp., red-backed pectoral, Hutchins goose and semipalmated sandpipers, northern and red phalarope, snowflake, Lapland longspur, parasitic jaeger, red-throated loon, willow ptarmigan and others, all from the vicinity of Colville delta. * * * * Near Flaxman Island, we found several Herschel Island boats at the trading rendezvous to meet the Cape Smythe traders, and Ningakshuk, owner of a small sloop, kindly brought me, with several dogs and several hundred pounds of specimens, as far as Herschel Island. * * * *

CAMP NEAR TOKER POINT,
Arctic Coast, October 16, 1909.

* * * * Since my last letter, dated Herschel Island, we have progressed thus far eastward. My party sailed from Herschel Island at 3:30 A. M., August 25, with two whaleboats and one sloop — one boat belonging to us, the other to a young native named Pikalo, who, with his father, had agreed to come with our party and assist us, on consideration of being free to trap on his own account during the winter. The sloop belonged to Ningakshuk, who wished to go some distance eastward, as an independent venture. He aided us materially by carrying seven dogs and several hundred pounds of baggage through the Mackenzie delta.

We were often delayed by bad weather and head winds. It was necessary to stop for several days east of Shingle Point, as it is unsafe to cross the shoals on the western side of the delta, unless the wind is light and fairly S. W. Just east of Tent Island we were stopped again by head winds and foggy weather; then we cruised through a network of channels south of Langley Island, and after several days of tedious tacking and grounding, reached the mainland opposite the south end of Richard Island (Tūnūñók). At this point, our friend Ningakshuk decided that he dare not risk his sloop outside of the river, fearing heavy September gales in the shoal water outside.

We were consequently compelled to transfer our baggage from the sloop to the two whaleboats. This loaded them down heavily, without the seven people and eleven dogs which we were carrying. The channel east of Richard Island is very wide, but is shoal in many places, and a N. or N. E. wind raises a rough sea quickly. Entered the harbor at Kittigarynit September 26. Several Eskimo families were camped here, and were revelling

n abundance of fish, and "killahua" (white whale or beluga) meat and blubber. The natives are said to have killed about two hundred beluga near here during the summer, and every family has large caches of meat and plenty of oil — enough for the winter. * * * * This region has evidently supported a comparatively dense population in the past, as the beach is lined with old houses and every hill-top is strewn with graves.

On September 22, we reached a harbor in a little lagoon, known as Tūtōroktok, a few miles S. W. of Toker Point, just as a N. W. gale began to blow. The storm lasted three days, and on the morning of the 26th "young ice" had formed half way across the lagoon, while a heavy snow-fall had filled the sea with slush ice. With some difficulty, we moved the boats out to another and better harbor about half a mile away, and as there was no prospect of advancing farther by boat, we hauled the boats up on dry land for the winter.

As long as there was any open water, we caught fair hauls of fish in our nets every night, and after that have had fair success fishing through the ice. We have been getting our dogs into good condition for a long sled trip and have now all the frozen fish we can carry, as well as a cache of about 200 lbs. to leave here for the coming spring.

We are starting to-day with three sleds for the eastward to join Stefánsson, expecting to find him somewhere between Baillie Island and Cape Parry. Sled travel is not good even now. There has been no very cold weather, and the sea ice is not solid. The bays froze over earlier than usual at such temperatures, as the water was clogged by falling snow. Heavy snow-falls later prevented the ice from getting thick, and the salt ice is still wet and slushy under deep snow. Our intention is to follow the coast a little farther east than Warren Point, make a portage of "our sloop" across to the Eskimo Lakes, follow the lakes northeastward, then portage again, to strike the foot of Liverpool Bay, near Nicholson Island. From Nicholson Island we shall follow the east side of Liverpool Bay to Baillie Island. If Mr. Stefánsson is not at Baillie Island to make other arrangements, we shall proceed down the west coast of Franklin Bay around to Cape Parry and as much farther as circumstances will permit during the winter. * * * * The prospects are favorable for a successful season.

MUSEUM NEWS NOTES

EARLY in April, President Osborn returned from a journey in Arizona, Mexico and California partly in the interests of the Museum. Two of the great copper mines of Arizona and Mexico were visited, and with the aid of Dr. James Douglas, one of our Trustees, questions relating to the future exhibition of the geology and economics of copper were studied. In California, arrangements were made with the Mt. Wilson Observatory through Director George Ellery Hale to secure for the Museum copies of the most recent solar photographs. Dr. Hale has also consented to take the chairmanship of an appointive committee on astronomy. A visit to the palaeontological collections of the University of California led to concluding important arrangements for future collecting on the Pacific coast with the cordially promised coöperation of Prof. J. C. Merriam of the University. An interesting trip was made to the famous bone beds of the Rancho La Brea.

THROUGH the generosity of Mr. Anson W. Hard, the Museum is fortunate in having secured an extensive series of old and valuable serapes and other blankets made by the Saltillo and other Indian tribes of Mexico and several of the tribes of our own Southwest.

SINCE our last issue the following persons have been elected to membership in the Museum: Sustaining Members, MESSRS. JOHN G. MILBURN and D. SCHNAKENBERG; Annual Members, MESSRS. PAUL B. HAVILAND, COLIN I. MACDONALD, WINTHROP PARKER and WARBURTON PIKE, DR. ALEXANDER LAMBERT, HON. FRANCIS M. SCOTT, MRS. J. B. DUER and Miss MABEL SATTERLEE.

MR. FRANK M. CHAPMAN writes that the party collecting material for the zonal group representing the fauna and flora of the eastern edge of the Mexican plateau is in good health and is rapidly attaining its objects. Mr. Chapman and Mr. Fuertes have made their studies from near Cordova to a point above timber line on Mount Orizaba, and the former's letter is, in part, as follows:

“Cordoba, 28 March, 1910.

“We got back from our mountain trip last night. The first two days on the mountain we had constant fog or rain, then it cleared and the weather was superb. We camped at 8,500, 9,500, 10,500 and 12,000 feet. At the highest camp the mercury fell to 12° F. The mountain has never been ascended from the side we were on and is said to be there unscalable. It looked so! I went only to timber line at 13,000 feet and then found permanent ice 100 feet higher. Here life ceased and further ascent would have served no purpose that I had in view, had it been possible.

“The temperate zone has been materially changed by man, and there is no first growth left, even in this unfrequented part of Mexico. The limit of human habitation is approximately marked by the limit of corn growing, or about 9,000 feet. Here we found magnificent forests of pine and spruce, with oaks six feet in diameter and over 100 feet high. Timber line is marked by the abrupt cessation of tree-growth, the last trees being 30 to 40 feet in height. We got an essentially complete list of Alpine birds and other data of value, including a large series of photographs.”

MR. ROY C. ANDREWS, of the Department of Mammalogy, is visiting the whaling stations of southern Japan, where the opportunities for the study of several species of cetaceans are particularly good.

DR. LOUIS LIVINGSTON SEAMAN delivered a lecture at the Museum on Thursday evening, April 7, 1910, entitled “African Explorations and Adventures.” Dr. Seaman has visited Africa on several occasions. His lecture was illustrated by stereopticon views of the territory of Uganda, the shores of Albert Nyanza and other regions, and he dealt particularly with his studies upon the tsetse-fly and sleeping sickness and incidentally with the ethnological and geographical features of his expeditions.

ON Friday, April 15, from four till six and from eight till ten o'clock, there was held a private exhibition of the collection of African game made in 1909 by Messrs. E. Hubert Litchfield, Bayard Dominick, Jr., and Henry Sampson, Jr. The collection includes more than three hundred heads and illustrates admirably the range of variation in size and color of the animals that have made East Africa famous. During the afternoon and evening a large series of photographs illustrating the capture

of the animals, the physical aspect of the country through which the expedition passed and the primitive inhabitants, was thrown upon the stereopticon screen. The newly arranged African Hall is now open to the public.

THE collection of meteorites in the Foyer has been enriched by the recently acquired siderite or iron meteorite to be known as Knowles, the name of the post office in Oklahoma nearest to where it was found. The find has not yet been described, but a full account with illustrations will soon be published. The mass weighs about 355 pounds. There has also been placed on exhibition here the second largest known mass of the siderolite form of the Brenham (Kansas) meteorite. This weighs 218 pounds and replaces the two smaller masses of the same fall that have heretofore been on exhibition.

Monday, May 16, 8:15 p. m.

In coöperation with the

NEW YORK ACADEMY OF SCIENCES

In the large Auditorium of the Museum

Illustrated Lecture

“The Return of Halley’s Comet”

By

PROFESSOR S. A. MITCHELL

Of Columbia University

No tickets required

Members of the Museum and their friends are cordially invited to attend

MEETINGS OF SOCIETIES

Public meetings of the New York Academy of Sciences and its Affiliated Societies are held at the Museum according to the following schedule:

On Monday evenings, The New York Academy of Sciences:

- First Mondays, Section of Geology and Mineralogy;
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CARAVAN OF THE MUSEUM'S CONGO EXPEDITION

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MOBALI WOMAN CARRYING WATER

The Congo natives (Bantus) are sharply cut off from the other five African races by their language, which, soft, flexible, built on a systematic, philosophical basis, would seem to argue degradation from some superior race

The American Museum Journal

VOL. X

OCTOBER, 1910

No. 6

IN THE HEART OF AFRICA

THE FIRST PUBLISHED ACCOUNT OF THE MUSEUM'S CONGO EXPEDITION

Photographs by Herbert Lang

TWO members of the Museum staff, Messrs. Herbert Lang and James Chapin, are in the Upper Congo region, that great steaming land of equatorial Africa shrouded in jungle. They have slowly sailed up the Congo River, one of the three largest rivers of the world, and least well-known; they have travelled on foot through dense tropical forests proceeding for hours through swamps until, as described by one of them, they were dripping and picturesque like the mighty jungle trees with innumerable hangings and decorations. They have seen strange places and stranger primitive peoples, of whom it is time that the world obtain complete scientific record in view of the rapid advance that civilization must make in the Congo in the immediate future. The photographs that they have sent tell a small part of the story of their progress into this heart of Africa, giving, however, a realization of the inadequacy of cold gray pictures to make vivid a tropical country, the splendid color, the sounds, the life — and the heat. It was in regard to the last that Mr. Lang wrote the following advice to a friend: "While looking at the pictures get into a Turkish bath. You will appreciate the country better."

The Congo is probably one of the most promising unexplored fields for zoölogical work in the world. There has been every reason to prevent investigation of the region previously. Civilization has ignored the west coast of Africa. The world knows the north, east and south coasts, but mystery has been attached to the whole six thousand miles of the coast on the west where surf continually thunders.

The Congo, inland, is cut off from communication with the north by the desert of Sahara, from the east and the valley of the Nile by high mountain ranges, from the south by trackless jungle and misty swamp. It lies in the heat of the equator, inaccessible and inhospitable, a country of nearly one million square miles, larger than Europe leaving out



EMERGING FROM THE FOREST NEAR AVAKUBI

In Central Africa, more than 8000 miles from New York. A caravan of more than 200 people was necessary to transport the expedition's equipment from Stanleyville to Avakubi

There are great difficulties in photographic work at the Congo camp, partly because of the intense heat; developing is done at night



MR. HERBERT LANG LEADER OF THE
CONGO EXPEDITION

Mr. Lang, an expert in zoölogical survey and modern taxidermy, has had previous experience in Africa, having gone in from Mombasa on the East Coast in 1906

four centuries after the discovery of the river was it charted, that is, by Stanley in 1877.

Latterly, conditions have wholly changed. There is now a lure for all nations in ivory, gold and rubber. The Arabs have been driven away and the slave trade abolished. Where formerly there was no way of transferring objects from

Spain and Russia. It has been given over to fever and sleeping sickness, to raiding Arabs, and to various negro tribes victims of slavery, and more or less cannibalistic in habit. It has neither sent out invitation nor given cordial greeting to the white man, who up to 1871 had not been more than one hundred and fifty miles from the coast. At that time no one knew whether the head waters of the Congo belonged to the Niger or to the Congo. Not till

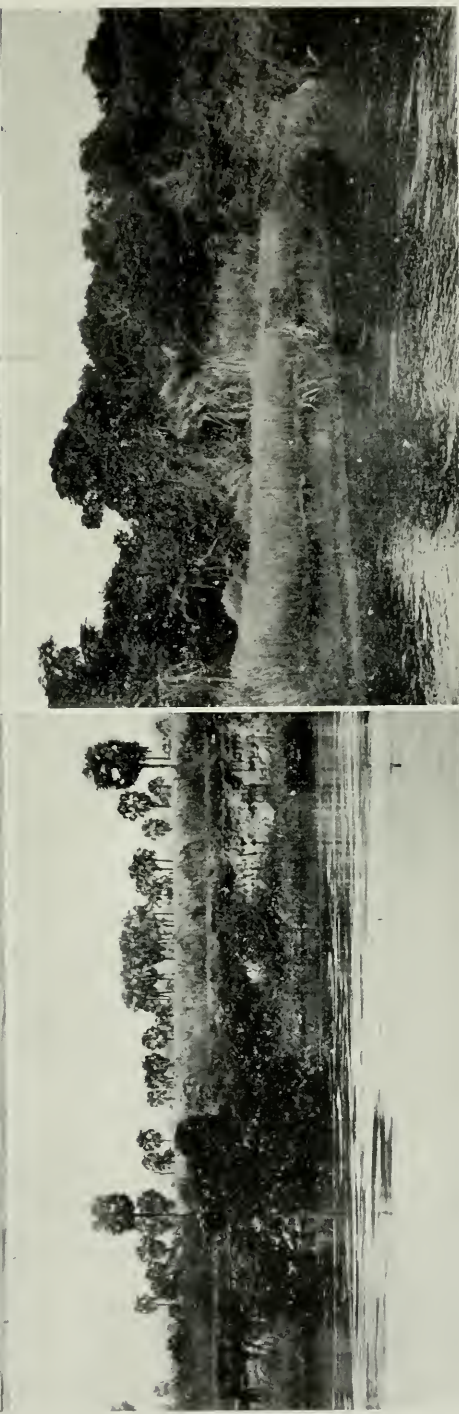
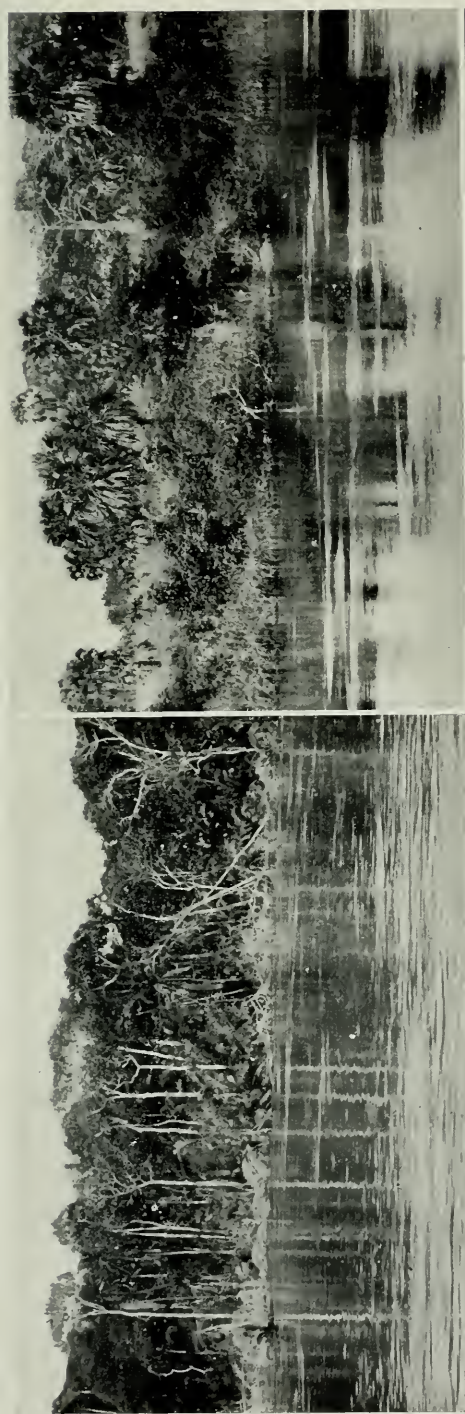


MR. JAMES CHAPIN, ASSISTANT

the coast except on the heads of negroes, now ocean steamers discharge cargoes at a railway pier one hundred miles up the river, a railroad continues to Leopoldville, 320 miles from the coast, connecting there with steamers for points still farther inland.

The Congo River between the coast, or more properly between Boma, one hundred miles from the coast, and Leopoldville, is a cataract region, a stretch of two hundred miles through which there is a rise of land from 700 feet above sea level to 2500 feet; or considering it in the other direction, down the river instead of up, there is a drop of 1800 feet through which the vast volume of water passes in a series of plunges from Leopoldville to Boma. It is this impassable cataract region that kept secret for so long the great highway of the Congo. Pass these two hundred miles and the Upper Congo stretches on through 1100 miles of smooth river, making with its tributaries one of the greatest systems of natural canals on the globe.

For many years, the late President Jesup held the hope that an expedition from the American Museum might be sent to the Congo. Even early in 1907, preliminary plans had been discussed with the Honorable Mr. Liebrechts, Secretary General of the Department of the Interior of the Congo, the negotiations being carried on through the Honorable James Gustavus Whiteley of Baltimore, *Consulat Général de L'État du Congo*, and the Honorable Pierre Mali of New York, Belgian Consul and an intimate personal friend of President Jesup. In May, 1907, the plans were so far advanced that Hermon Carey Bumpus, Director of the Museum, went to Brussels to confer with the Belgian officials. As a result of these negotiations the patronage of King Leopold was obtained for the project, a patronage which he evidenced at once by presenting large collections of ethnological material, a nucleus for the Museum's African halls. With Director Bumpus, the hope for an expedition to the Congo became one of the most cherished among his many plans for the rapid advancement of the institution along lines coördinate with the world's progress. His interest, with that of Mr. Whiteley, accrued also by that of Mr. John B. Trevor of the Executive Committee of the Board of Trustees, finally crystallized in a Congo Expedition Committee appointed late in the fall of 1908 by Henry Fairfield Osborn, President of the Board of Trustees, and consisting of these three men, Mr. Trevor acting as chairman, and of Messrs. Robert W. Goelet, Herbert L. Bridgman and Frank M. Chapman as added



SHORES OF THE LOWER CONGO PHOTOGRAPHED FROM THE STEAMSHIP LEOPOLDVILLE



PIER AT BOMA

The Congo Expedition reached Boma, Capital of the Congo Free State, June 23, 1909



WOODPOST AT BARUMBU

The river boats burn wood, stopping frequently for a supply at "woodposts," usually mere clearings cut out of the jungle

associates. The organization of this committee gave definite form and impetus to the negotiations which finally brought about the sanction of the authorities in Belgium to the Museum's exploration of the Congo, and which so controlled circumstance at home that the project dreamed of became a reality.

The history of the following months, in fact, till May 8, 1909, when Messrs. Lang and Chapin sailed on the "Zeeland" of the Red Star Line for Antwerp, is a fascinating chapter of work preparatory to the launching of a great expedition.

The matter of financing the expedition was taken in hand by a group of the Museum's members and friends, to whom the institution is deeply indebted and to whom the world in the future will be indebted because of the large scientific value of the expedition. They are Messrs. John B. Trevor, Charles Lanier, Cleveland H. Dodge, J. P. Morgan, Jr., William K. Vanderbilt, A. D. Juilliard, Robert W. Goellet and William Rockefeller.

Plans were outlined for the scientific end of the work: to push at once into the central part of Africa so that headquarters might be located eight hundred or more miles from the coast in a region formerly unexplored zoologically; to make the aim of the expedition a zoological survey of the basin of the Congo, collecting heavy game but also directing energies along other lines of investigation, so as to make collections for all departments of the Museum. While awaiting the final arrangements with the Belgian government, coöperation and enthusiasm among those concerned pushed the undertaking to a wonderful success in its preliminary stages, assuring an aim and scope to rank the expedition as perhaps the greatest the Museum ever sent out.



MOBALI WOMAN CARRYING FIREWOOD

Finally there came a day of good news, April 2, 1909, marked by the receipt of letters from His Excellency Baron Moncheur of the Legation de Belgique at Washington and from the Honorable Mr. Whiteley at Baltimore announcing that there had been secured not only the support and necessary good will of the Belgian Government but also an appropriation of 6800 francs (\$1329.23) toward the expense of transportation in the Congo. The compact agreed upon provided that in return the expedition should give to the Tervueren Museum, Belgium, certain suggested zoölogical specimens lacking there. The coöperation is expressed by the following words quoted from the reply of Director Bumpus to Baron Moncheur: "The American Museum of Natural History will consider it a privilege to be permitted to share the scientific results of this expedition to the Congo with the Musée du Congo in Belgium. We are confident that the combined efforts of the Colonial Administration of the Kingdom of Belgium and the American Museum of Natural History will result in the general promotion of Science and thus redound to the benefit of all people."

Practical work could now be pushed rapidly. Passports were obtained from the Secretary of State at Washington, steamship tickets were purchased, permits for freight obtained, money cabled to the Banque du Congo, Belge, Brussels, to be held at the disposal of the expedition. Through the courtesy of Mr. H. L. Bridgman, a member of the Congo Committee, letters of introduction were obtained to persons in Brussels, in particular to His Excellency, the Honorable Mr. Lane Wilson of the United States Embassy; and in each case the new allies proved their personal interest by writing to officials in the

Congo. On April 16, at a dinner given by President Osborn to the Congo Committee and other friends of the undertaking, a farewell was extended to the explorers and the last word was said in anticipation of unprecedented success for the work.

Thus the expedition



A RIVER BOAT ON THE WAY TO STANLEYVILLE



In August great flocks of plover-like birds, *Glaucola*, sit on the sand bars and stone ledges of the Upper Congo



Arrangements have been made with the natives so that the expedition, on its return, will camp at the famous fisheries at Stanleyville till adequate fish collections can be made

was launched. Messrs. Lang and Chapin reached Antwerp and proceeding to Brussels were cordially received. A letter from the Honorable Mr. Lane Wilson to His Royal Highness Prince Albert de Ligne brought invaluable services in securing concessions for the expedition: all articles for scientific purposes, except rifles, to be duty free; the collecting to extend not only to all ordinary specimens throughout the year, but also to the rare white rhinoceros of the Lado district, the elephant in Ituri, the white gorilla recently found in the Kivu region, and the okapi, that recently discovered relative of the giraffe.

In Brussels and London the equipment was completed, an equipment which throughout was based upon such sound considerations that the expedition is having unusual strength in the field. Special consideration was given to the medicine chest and to the tents. Through the courtesy of the Secretary General, Mr. H. Droogmans, it was most fortunate that the Chief of the Medical Service was met, Dr. Emile Van Campenhout. With ten years experience in the Upper Congo and many years of investigation of Congo diseases, especially of the sleeping sickness, he could advise preëminently well. He inspected the expedition's tents and pronounced them ideal for the region, recommending for night the partly closed rather than the all-round open tent used by the British in tropical work — for daytime use, however, recommending the all-round ventilating type.

Finally in the first week of June the start was made for Africa on the steamship *Leopoldville* and after twenty days' sail Boma was reached, one hundred miles from the coast, the capital of the Congo Free State for the past twenty-eight years. Here a warm greeting was received from the Honorable Mr. Handley, the American Consul General.

It was well that the expedition had planned to push immediately inland, because of the extravagant prices as well as the dearth of life in the region of Boma and Matadi, the latter a town built on ledges of rock a few miles above Boma. Mr. Lang writes:

You should see the relative poverty of the fauna around Boma and Matadi. This of course goes hand in hand with the general monotony of the country, nothing but hills, one as barren as the other, though occasionally the grass, usually four or five feet high, is replaced in the valleys by a few bushes. The scarcity of bird life is most striking as one enters the Congo River from the sea. The stream is seven miles wide at its mouth, with low shores, reeds, sedges, papyrus, mangroves and, in some places, cocoanut palms. Farther up, false *Borassus* [palms] and Baobabs become more abundant; yet there are few birds except of the very common kinds, some terns, swallows and a few vultures.



ITINERARY OF THE CONGO EXPEDITION

Sailing from Brussels on the steamship Leopoldville, the expedition reached Boma June 23, 1909, proceeded from Matadi by rail to Leopoldville, up the Congo by river boat to Stanleyville, from there through the "dense forest" on foot to Avakubi. The latest report, June 30, 1910, came from Medje

The expedition left Matadi by rail reaching Leopoldville July 1, beyond the cataracts and 320 miles from the coast. From there it proceeded by boat to Stanleyville, hoping to find this place suitable for a permanent base of operations. Stanleyville is 720 miles inland, twenty-two days' journey from Leopoldville, although the return trip requires only thirteen or fourteen days owing to the swiftness of the current. Most of the steamers on the Congo are stern-wheelers, of very shallow draught because there are so many sand bars. The expedition, however, did not utilize one of these steamers but took a barge, propelled by a twin screw tug alongside. Wherever the boat stopped to take on firewood, the men went ashore, collected whatever was possible, and on coming back had the advantage of the large deck of the barge for work.

Of the voyage up stream Mr. Lang writes:

The lack of any congregation of large birds must be a surprise to anyone, especially on such a mighty stream interrupted by so many forested or grass-covered islands. One kind of vulture is the most common large bird, but to see more than twenty in a day is unusual. There are some white-headed eagles. In Stanley Pool kites are common, sitting on the sand bars, in the neighborhood of which some solitary pelicans may be seen preening themselves or swimming. On shore there are ibis and geese. A few egrets emerge silently from the bushes on the swampy islands. Water turkeys, mostly single, but sometimes in pairs disappear at once in the water or reeds, or very often take wing to establish another lookout on some branch farther off. To see a few large herons is an occasion, but it may become an exciting event if one discovers, on some distant sand bar, a few marabouts. Small shore birds or pigeons may often enliven the edge of shores and sand banks; but the only large aggregations of any bird on the Congo during this season are composed of a species of *Glaucopis*, of which several large flocks have been observed. Even the birds that cross the river from time to time show no great variety; flocks of screaming gray parrots are common in the morning and evening, a few hornbills in very elegant swoops, plantain eaters, single or in pairs, more seldom, ducks, heron and ibis. We distinguished five different kinds of kingfishers as they darted out from the branches or hovered over the water.

On land it is quite different. Above Kwamouth, not only are larger birds more common, but indeed small birds are fairly abundant, especially weaver birds, sun-birds, bee eaters, wagtails, sandpipers, goatsuckers, swifts, swallows, pigeons, rollers and starlings. We were disappointed in our desire to see mammals from the boat on the journey up stream. There were occasional bands of monkeys sitting in trees near the shore, but no elephants trespassing or bathing in herds, and no buffaloes. In fact, the few places where elephants have been seen six or more years back are pointed out to you, like historic places. Even the hippos seem to resent the bullets that are invariably sent in their direction by the passengers of any passing boat. It is true that we saw some, but it took good looking and a strong field glass. If it happens that a young innocent hippo shows himself full size on a sand bar, the ever hungry negroes on board talk only of something to eat and proceed to shoot him.



BARTERING WITH PASSENGERS ON THE RIVER BOAT

Congo natives are great traders, using for currency such objects as beads and brass rods



VILLAGE ON THE CONGO RIVER

The dots on the palm leaves are nests of the weaver birds. Flat and bare land shows where the river has eaten into and overflowed the shore



THE FALLS OF STANLEYVILLE IN THE DISTANCE

Showing the natives with their dugouts, and also the bar that stretches out into the river. It is at Stanley Falls that the famous native fisheries are located



AT THE ENTRANCE OF THE DENSE FOREST"

The mightiest primeval woods known to man. A cold gray picture is wholly inadequate to make vivid a tropical country, the splendid color, the sounds, the life — and the heat

Finding after all that Stanleyville was impossible as a base for operations, because of high prices and because too far distant from the most interesting zoölogical regions, decision was made to push on still farther east with a part of the supplies, to Avakubi in the Haut Ituri.

Certain bits of local color from Avakubi are in the following quotations from letters sent to friends and not intended for public reading:

You laugh about the quinine, but I do not take quite ten grains a day. Every other day I take six grains and have become so accustomed to it that I do not notice any bad effects. Our medicine chest is quite a formidable affair, but seems to be mostly used for treating our black boys and porters, who are always having little illnesses, for which they want "dawa" (medicine).

Just now we are having the pleasure of inhabiting a house, built of bricks laid in mud, as they all are here, and roofed with palm leaves. . . . How you would laugh to see us catching bats in the evening with a butterfly net.

Avakubi is a great rubber station, about twenty tons a month being received from the natives as taxes. Some elephant tusks are also received from the same source. There is a mission here with two priests who often shoot birds for us. They have added a number of good specimens to our collection. It has taken us an almost incredible time to get out to this place, and will take almost as long to get back. Such an isolated spot can hardly exist anywhere else in the world. A lieutenant who gets his newspapers by way of East Africa, and consequently much more quickly than if they came up the Congo, has lately informed us that Cook claims to have discovered the North Pole. This is about the only news from the rest of the world we have heard. [November 12.]

That the place is isolated was well proved to the friends of the explorers when after August 14, 1909, the months passed by and no word came. Anxiety increased, notwithstanding the knowledge that the expedition had gone far into the Haut Ituri district where it was difficult to get out mail. In late April, however, a sixty-six page report, dated November 29, relieved all fear. They were putting in every hour from the first beam of light in the morning till nightfall, and often till midnight when the work required it, and that in a humid atmosphere of about one hundred degrees, but heroically said that all was so fascinating they were not thinking of discomfort. The report, which was rather bulky, had come by parcel post and had been nearly five months on the way.

The comparative isolation of the Congo is well illustrated in the matter of cablegrams. For instance, a cablegram from New York to a point five hundred miles inland in British East Africa will be answered in about eighteen hours, while one from New York to Boma



IVORY CARAVAN

A caravan with 97 tusks from the Haut Ituri. The largest weighs 106 lbs. and is 9 ft. long. Trade in the Congo is now in the hands of several nationalities



"WIRELESS" STATION AT STANLEYVILLE

By an intricate system of beating the tom-tom — a log hollowed out through a narrow slit — news is "telegraphed" at night. The sounds repeated over and over carry six or seven miles

or Matadi only one hundred miles from the coast will not even reach its destination for from ten to fifteen days. In fact, the delay is said to be sometimes so great that a letter may be received before the cablegram.

The report of November 29 shows remarkable industry. It reveals work astonishing in amount and careful and systematic to a degree. Mr. Lang is evidently living up to his reputation for speed and skill in the work of zoölogical survey and expert taxidermy; and not only this, but also such system is being used in labelling the material that the collection will have in-



"TELEGRAPH" OPERATOR

Sounds produced by beating at different points on the tom-tom are combined into a syllabic alphabet, so that any message, however complicated, can be sent



NATIVES OF STANLEYVILLE PLAYING A GAME

They spin fruit stones like tops. The trick is to spin two on the banana leaf so that one will not bounce the other off

dubitable scientific value. It was the wish of the Museum that all specimens, large and small, should be individually tagged so that if at any time they had to be abandoned but did ultimately reach the Museum, there would be more chance of their scientific value having remained unimpaired. It scarcely seems possi-



A RESTHOUSE AT BAFWASIKULE

Erected for the agents of the colony. The courtesy of these resthouses has everywhere been granted to the expedition



MUSEUM CARAVAN CROSSING A RIVER

The raft is attached to lianas stretched across the stream

ble that two men in the short space of two months after reaching their base of operations should have been able to prepare such a list of specimens, 291 mammals and 472 birds, besides more than 2000 specimens of the smaller fauna. A later report sent out January 5, little more than three months after reaching Avakubi, shows a record of 510 mammals and 762 birds, with more than 4000 of the smaller fauna, and this collection covered by 400 pages of descriptive matter.

That so much has been done is due not only to speed and skill, but also to the foresight of the leaders in planning and to that force of personality which can get enthusiastic work from subordinates. Three assistants (Loangos, a tribe from the French Congo, known as very intelligent) were hired before leaving Leopoldville. These fellows were taught during the voyage up the river. Afterward, just before leaving Stanleyville, the last place where natives can be engaged by contract, fifteen assistants were hired — for a monthly payment of three dollars in addition to food.

We have done our utmost [writes Mr. Lang] in training these natives and look forward with great pleasure to the results. Six of them can prepare small mammals, four can prepare birds, several of them can do the work on larger mammals, though all of them can take active part in it. Besides, two are successful hunters, and all know how to set traps for small mammals and to catch reptiles and batrachians. Several are very keen in catching invertebrates, and one is remarkable for finding different species of ants. Others are fishermen; they know how to weave native fish traps and they handle canoes with skill. As a whole they are a remarkable lot of natives, and I sincerely hope that the results will show what can be achieved by native assistance.

In addition to these trained assistants the expedition has forty porters for the work of ordinary occasions. The porters are not hired for a long period but are paid and discharged at the end of every trip, fresh ones being engaged in each new locality through the assistance of government officials. The porters of the Upper Congo cannot carry as heavy loads as those of British East Africa; fifty-five pounds (English) is taken as a maximum load. This results not only from their inferior physical constitution, for there are many strong and well-built porters, but it is, of course, more weakening, even for natives, to carry loads in the hot moist atmosphere of the forest than on the generally healthy plains of British East Africa. A very large caravan was necessary for the travel through the dense forest from Stanleyville to Avakubi; one hundred and sixty porters were hired at Stanleyville and to get along

quickly and safely twenty more were engaged from village to village. It is interesting to know that after twenty-two days' march under all the difficulties of making way through a wet tropical forest, this large caravan was brought to a safe arrival at Avakubi, having lost neither man nor load and with everything of the equipment in perfect condition.

To read the following quoted from Stanley's description of the Congo jungle brings a fuller appreciation of this march:

Lean but your hand on a tree, measure but your length on the ground, seat yourself on a fallen branch, and you will then understand what venom and activity breathe around you. Open your notebook, the page attracts a dozen butterflies, a honey-bee hovers over your hand; other forms of bees dash for your eyes; a wasp buzzes in your ear, a huge hornet menaces your face, an army of ants come march-

ing to your feet. Some are already crawling up, and will presently be digging their scissor-like mandibles into your neck Imagine the whole of France and the Iberian peninsula closely packed with trees whose crowns of foliage interlace and prevent any view of sky and sun. . . . Then from tree to tree run cables from two inches to fifteen inches in diameter, up and down in loops and festoons and W's and badly-formed M's; fold them round the trees in great tight coils, until they have run up the entire height, like endless anacondas; let them flower and leaf luxuriantly, and mix up above with the foliage of the trees to hide the sun, then from the highest branches let fall the ends of the cables reaching near to the ground by hundreds. . . . Work others through and through these as confusedly as possible . . . on every horizontal branch plant cabbage-like lichens of the largest kind, and broad spear-leaved plants. . . . and orchids and . . . a drapery of delicate ferns. Now cover tree, branch, twig, and creeper with a thick moss like a green fur. . . . To complete the mental picture of this ruthless



CHIEF OF A RENOWNED CANNIBAL TRIBE

The cap of leopard skin and red parrot feathers gives him wisdom; the chain of leopard canines confers the leopard's stealth and cunning. Instead of the ivory disk usually gracing the upper lip of the Congo native, he wears a polished leopard incisor



Congo anteater
or Pangolin

forest, the ground should be strewn thickly with half formed humus of rotting twigs, leaves, branches; every few yards there should be a prostrate giant . . . half veiled with masses of vines . . . and every mile or so there should be muddy streams, stagnant creeks, and shallow pools, green with duckweed, leaves of lotus and lilies, and a greasy green scum. . . .



In addition to the government assistance in the matter of porters, which has been due largely to the personal influence of Mr. Jules Renkin, Minister of Colonies, courtesies have been extended to the expedition in two other directions. It has been granted storage free of charge in every magazine of the Province Orientale, and has been allowed to get goods from the government storehouses. This latter privilege is of unusual importance as no money of any kind is used among the natives of the Upper Congo and the various kinds of articles, brass rods and accordeons, for instance, prized and accepted in trade among these tribes are so



Striped Squirrel
of the Congo



Congo
Horned Viper



REVISING THE LOADS. TWO HOURS FROM AVAKUBI

The 200 porters and native assistants of the Congo Expedition after marching through the dense forest for 22 days



CONGO EXPEDITION ENTERING AVAKUBI STATION

Congo natives cannot walk long distances, and admire greatly the white man of strength and endurance

unusual in a white man's eyes that no adequate preparation could be made.

When the report of January 5 was sent, the active work on heavy game had not commenced. The expedition was on the point of engaging experienced native hunters and the very keenest pygmies to be found. It was in the district of large game where the trumpeting of elephants could be heard from the camp, and elephants' trails — deep round footprints "as if someone for amusement had gone about sinking a bucket into the mud and pulling it out again" — were common along the river and in the banana plantations. For the most part heavy game in Central Africa is protected by law and is relatively abundant, not near extinction as in South Africa. The square-mouthed or so-called white rhinoceros, however, is not common anywhere in Africa. It is practically extinct in South Africa, is rare in the narrow strip of country west of the Nile — the Lado of Central Africa — and is wholly unknown in all other parts of the continent. The square-mouthed rhinoceros is on the average larger than the common African rhinoceros, has a double hump in the region of the neck and a head that differs wholly in shape from that of the common form, one striking point of difference being a square upper lip instead of a pointed overhanging one.

Also, the expedition was in the land of the *okapi*, with the hope of getting specimens for a group in the Museum. Less than ten years ago the world was stirred by the discovery of a new animal in the northern part of the Congo forest, *okapi*, the natives called it. Stanley had gained from the dwarfs some hint of it. He thought it related to the horse, in spite of the anomaly of a grass-eating animal living in forests. When actually seen, the *okapi* was found very wonderful: a shy animal, standing as high as a stag, and feeding on the leaves and twigs of trees,



MAMBUTI PYGMY, AVAKUBI

Congo pygmies, having the height of ten-year-old children, are shy, vindictive when angered, keen in hunting. Many photographs and 24 measurements of this pygmy have been taken, besides a plaster cast of his face

its sleek, glossy coat even brown above while zebra-like on the legs and posterior part of the body. Its foot has two hoofs but no vestige of the two small false hoofs characteristic of the deer. In fact, the okapi proves itself closely allied to a fossil animal, *Helladotherium*, of Greece and Asia Minor, its nearest living relative being the giraffe.

The hunting trips for large game will facilitate the work along anthropological lines since pygmies will be a part of the company. Besides, villages will be visited, having two or three hundred pygmies attached to them. Some successful casts have already been made of the faces of three pygmies, but dwarfs are so shy that they are reluctant to submit to the procedure. They were won over by having their hands cast first. After they had seen how simple a matter it is, they were induced to allow the plaster to be put on their faces.

A letter sent to friends in early January tells of the personal welfare and good cheer of the explorers:

On Christmas we dined especially well and on New Year's day opened a canned plum pudding (!) that had been given to us in Stanleyville. Good food is not at all scarce here. Yesterday we looked over our stock and found we had seven live chickens, ten pineapples, three large bunches of bananas and various fresh vegetables and fruits. Sweet potatoes, whiter and not so tasty as those at home, grow like weeds on all sides. In fact, we scarcely need to draw upon our European provisions at all except for butter and sugar.

From the first of December till two days after Christmas we stayed at N'Gayu, three days to the north of Avakubi, collecting mammals and other specimens which have been sent back to Avakubi. Our Christmas present was an old male chimpanzee captured on Christmas Eve.

A final word just received from the expedition, started June 30 from the Congo camp at Medje, north of Avakubi. With the introductory words, "There is only good news to be reported, all is well," there follows a triumphant record: 1200 mammals and 1500 birds are in the collections; a unique ethnological collection of 700 numbers has been gained from the Mangbetu; best of all, the okapi group is assured, not only in the possession of male and female specimens and young, but also, in that materials from the animal's haunt have been preserved and crated ready to ship, so that there promises to be reproduced in the near future in the American Museum of Natural History, New York, a small part of the mighty Congo forest with its strange life.

MARY CYNTHIA DICKERSON

TWO ACTIVE VOLCANOES OF THE SOUTH SEAS

WE were camped at the base of the volcano Savaii of the Samoan Islands and had climbed from our camp to the summit over the broken lava fields to see the fire of the volcano at night. Standing upon the extreme edge of the crater and looking down, the immense lake of lava four hundred feet below glowed almost as a continuous incandescent mass. Its light was reflected upon the clouds above, making a beacon that we had often seen from a distance of forty miles and which was said to have been visible at a distance of seventy miles during the period of the volcano's greatest activity about two years previous. Looking seaward, rosy vapors outlined the course of the lava down to the shore of the island where the fire of final lava cascades gave color to two huge clouds of steam. The fires illumined the scene so as to give light to guide a way over the broken lava, which is at best a precarious ground, and again and again through the night we climbed from our camp at the base of the cone to look down upon the fascinating but awful marvel.

Even when we saw it in the daytime, it was hard to realize the scene actual and not an imaginary panorama of Dantesque infernal regions. The yawning cavity of the crater extended a full half mile in length, and its width was more than four hundred yards. Almost perpendicular and sometimes undercut, the crater walls dropped hundreds of feet to the lake of molten lava, which was in such violent commotion that it seemed to be liquid flame rather than a mass of fused and fiery rock. At certain places it boiled with unusual activity, sending huge jets and fountains high into the air. Its waves moved hither and thither at different times, but now and then they would surge heavily and dash against the wall where the lava made its final way to the ocean. And always from this surface, thin steam-like vapor charged with acid gases swirled upward in the draught caused by the strongly-blowing trade winds, making it unpleasant to look over the edge even from the windward side.

We had begun the ascent of the volcano early in the afternoon in order to reach the crater before dusk. Proceeding through the undestroyed woods of a neighboring valley we entered upon the lava field at a point some miles from the coast, thus obviating the necessity of traversing its whole extent from sea to crater. Our natives, bearing food and water, now



SAVAII VIEWED FROM THE SEA

Volcano, and portion of the north coast of the island. The clouds of steam are caused by molten lava pouring into the ocean



WESTERN LIMIT OF THE LAVA FIELD ALONG THE SHORE

Continually more territory has been devastated as wave after wave of fluid lava has swept downward from the crater of Savaii



THE CONE OF SAVAII

The cone is 400 ft. from base to crest. The margin of the crater shows above at the left

tied the husks of cocoanuts to their naked feet for protection in walking over the broken lava, and after a final pause for rest, we left the shade and tempered heat of the tropical forest for the open glare of the volcano's slope. Viewed from afar, this slope seems even and smooth, but in reality it is like a tempestuous ocean suddenly arrested in its movements and turned into stone. Here and there wide sheets of lava with corrugated rippling surfaces formed still rivers between massive banks of cinders through which their molten substance had earlier ploughed its way; larger and smaller tables of crust, like broken floes of the Arctic Ocean, were tilted up and piled in strange heaps. And so vitreous was the material of this sea of black broken rock that the light was reflected from millions of crystal surfaces and facets as from so many fragments of ice or glass.

Progress over this field was necessarily slow, but by following the general trend of the less broken lava streams, we gradually worked upward and toward the main axis of the whole lava mass, indicated by vents which gave egress to steam and gases discharged by fluid lava running through tunnels beneath the surface.

The great crater we found a perfectly typical cone of cinders and lava, with a height from base to summit of four hundred feet as measured by the aneroid barometer. On three sides it is composed mainly of ashes and pumice, but toward the sea its surface displays smoother areas of rock where the lava formerly welled over the edge before the tunnels were formed by which the discharge now takes place. Large bombs, rounded masses of lava hurled from the crater during some explosive eruption, occur on the slopes, sometimes covered as by a sheet of tar with a later-extruded layer of lava.

It was in the course of my fourth journey among the islands of the Pacific that I made the ascent of this remarkably active volcano formed about five years ago on the island of Savaii, the largest member of the Samoan group. It happened that my investigations of the distribution of the land snails of Polynesia demanded for comparative data a thorough exploration of volcanic islands of great age, islands that for many centuries have been sculptured by the elements till they present alternating ridges and valleys radiating from their high central peaks. Tahiti is perhaps the most beautiful example of such an island. In many cases the several islands in the Pacific groups are of different geological ages, and consequently display different degrees of weathering. They thus form a series of stages to show how ancient rugged islands like Tahiti and Moorea may have been derived from the newly formed volcanic mountains like those of the Hawaiian and other groups which possess relatively even sides with lava fields unfurrowed by erosion.



CRATER MARGIN, SAVAII, FROM THE SEAWARD SIDE

Savaii holds supreme rank among volcanoes of to-day for rapidity of development



SEA WALL NEAR THE CASCADES OF MOLTEN LAVA

Cinders and lava, layer upon layer, between volcanic field and sea



RUINS OF STONE HOUSES

Trees were not consumed because of rapid cooling of the lava



MAUNA LOA, HAWAII. VIEWED FROM THE SEA

The even slopes, bearing secondary cones, rise slowly and grandly to a high summit



"HALEMAUMAU", HOUSE OF PERPETUAL FIRE

Floor of the main crater basin of Kilauea, the jet of vapor marking the fire-pit of incandescent lava. Kilauea has been active continually for more than a hundred years

It is true that I was interested in these Pacific islands also for reasons less closely connected with my work. For instance, the various islands give evidences of great changes in the level of the ocean bed and also explain the rôle played by corals in the construction of many types of islands. With few exceptions the islands occur in groups or chains suggesting the conclusion that they are the peaks of a range of mountains formerly connected by lowlands but now separated as the result of a subsidence of the ocean's floor. Every one is familiar with the theory that a coral atoll, consisting of a living reef bearing a more or less extensive series of coral islets, is built upon such a volcanic peak, which, according to Darwin and Dana, has been withdrawn below the water's level and overgrown by coral as it slowly subsided. It may be, as Agassiz contends, that a coral atoll is built upon a submarine volcanic mountain upheaved from the ocean's floor; but in either case the relation between coral reefs and volcanic peaks is one that possesses a real importance for the zoölogist.

The two volcanoes of Savaii and Kilauea occur in island groups that are in every way typical of the so-called "high" islands of the Pacific Ocean. The Samoan Islands, containing Savaii, lie almost on a straight line running nearly east and west. Upon examination they prove to be of various ages, for the westernmost, Savaii, bears the volcano that is active and has other indications that it is more recent in origin than its neighbor, Upolu; this island, in its turn, is younger than the more rugged Tutuila and Manua to the east. The Hawaiian Islands, containing Kilauea, also range with some regularity along a line, which in this case runs west-northwest and east-southeast; but one very interesting difference consists in the fact that the newest island, Hawaii, lies at the eastern end of the group, while the relative geological ages of the other islands correspond with their serial geographical order westward to Kauai, the oldest and most sharply sculptured member of the group. In all other essential respects, the Samoan and Hawaiian Islands are closely similar.

The new volcano on the island of Savaii is assuredly very impressive. Its total mass is great, but this feature is not so striking as its remarkably rapid development in the short period of five years; this development and the continual flow of fiery lava from its vast crater entitle it to supreme place in the array of volcanoes now in activity. It lies about eleven miles back from the coast nearly opposite the middle of the north shore of Savaii, which is roughly rhomboidal in outline and forty miles long. Approaching this part of the island by day, the most striking features of the panorama are the two vast clouds of steam that rise from the places where molten lava pours in cascades into the ocean. Upon the glistening black slopes beyond, jets of vapor mark the vents in the roofs of the tunnels through

which the fluid lava runs upon its seaward journey from the crater; and from the crater itself, two thousand feet above sea level, rises a similar fountain of thin steam that quickly merges with the dense clouds above.

When one looks upon the enormous mass of this new mountain, it seems impossible that five years could be sufficient for its formation, yet this is actually the case. The first crater appeared in August, 1905, upon the floor of a beautiful green valley. As cinders and lava were sent out, they gradually built up a larger dome and spread out to form the first strata of the great volcanic field. The flow followed the valley to the ocean, but as wave after wave of fluid lava or steam-charged ash swept downward, more and more territory was devastated, while the lava, already cooled to form ridges and hillocks, diverted the later lava rivers into irregular and wider-spreading channels. Reaching the ocean, the molten rock poured into the depths of the sea over the coral reef, building ever outward, at the same time that it followed the reef and shore so as to spread over a section of the island represented by a five-mile arc of shore. Naturally the seaward wall of the whole lava field is highest near its midline where it measures eighty or ninety feet. This wall displays a regular series of strata of prismatic blocks or tables, formed by the cooling of successive sheets of flowing lava. These strata sometimes lie between masses of cinders, showing how the eruptive output varied in character during succeeding weeks and months. Toward either side, the whole field gradually thins out, and at its western edge ends in a series of rough rocky billows, seared and broken by their contraction in cooling. Yet their materials reached this point as red-hot fluid lava, having journeyed a route that must have been nearly fifteen miles in length.

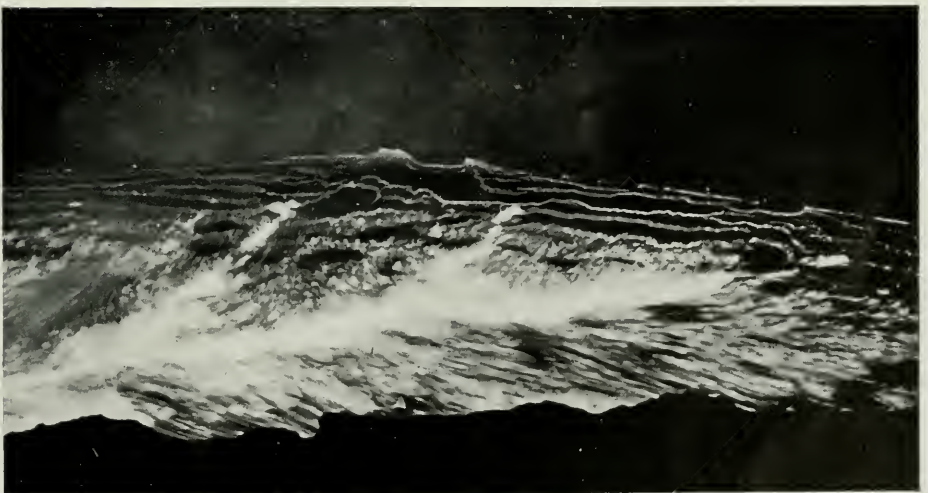
As the molten lava first swept down the valley and along the strand, we can see that its destructive affects were rapid and complete. It was only where there were walls of coral limestone, like those of the churches and traders' warehouses that anything could withstand the flood of rock; the wooden huts of the seaside villages were entirely consumed. Yet so quickly did the surface of the plastic mass become cool, that the coconut and other trees, felled by the burning through of their bases, were rarely consumed.

Turning to the volcano Kilauea of the Hawaiian Islands, we find it in many respects quite different from Savaii of the Samoan group. It is an accessory outlet upon the side of the giant volcanic mountain of Mauna Loa, whose main crater at the summit, more than thirteen thousand feet above the sea, is active only at very long intervals. There is a journey of two hundred miles from Honolulu to the island of Hawaii on which Mauna Loa occurs; viewed from the ocean on approach, the even slopes of the mountain rise slowly and grandly to the high summit, bearing numerous secondary or "parasitic" cones which have been formed by sporadic local eruptions.



THE "LAKE OF FIRE" OF KILAUEA

Jets of molten lava are thrown up along lines of greatest activity



THE "LAKE OF FIRE" OF KILAUEA AT NIGHT

The photographic film was exposed four seconds

The first view of Kilauea itself is somewhat disappointing to one who has recently witnessed the grandeur of the eruption at Savaii, but closer acquaintance reveals many features of great interest. Kilauea lies about four thousand feet above the level of the sea, and is about twenty miles back from the coast. In general structure it is a wide shallow basin over three miles in diameter, depressed below the general level of the slopes of Mauna Loa. At quite a little distance from the geometric center of the lava field which forms the floor of this basin is the active fire-pit, marked during the day, as at Savaii, by a cloud of vapor, and at night by a marvelous pillar of fire.

The well-beaten trail to this center of activity leads down along the terraced wall of one side to the almost level floor of the main basin. In the strongest contrast to Savaii, Kilauea's lava field is remarkably even; indeed the best areas of the former are far more broken than the most irregular parts of the latter. The surface undulates more or less, it is true, while here and there broken masses form hillocks and ridges, but the active vent has given forth the molten lava with comparatively little disturbance. Since the middle of the nineteenth century enough rock has poured out into this wide basin to reduce the height of its vertical walls from more than eight hundred feet to about four hundred.

In December last, Kilauea was unusually active after a period of relative quiet. The fire pit is nearly circular in outline and its walls fall in two terraces to the small pool of molten lava, about two hundred feet below the natural level of the whole basin. Its general structure has varied more or less in past decades, as well as its degree of violence, but it has been a permanent center of eruptive activity for more than a hundred years, well deserving the native name of "Halemaumau," the House of Perpetual Fire.

Here as at Savaii the surface of the pool is in constant commotion, but the areas of incandescence are much restricted and run in parallel or forking lines. Cakes of congealed lava float between these lines, and when in their movements they reach the neighboring areas of greater activity, they are redissolved and their fragments are thrown into the air together with jets of more fluid lava. Photographs taken at night exhibit with great distinctness the primary and minor areas of greater activity that form a network upon the surface of the pool.

HENRY E. CRAMPTON

A NEW SWORDFISH MODEL

GR^{EAT} interest prevailed in the Department of Preparation one hot Saturday forenoon in late July when a swordfish, a very perfect 130-pound representative of its race, was brought there as a gift from one of the Museum's members, Mr. George McKesson Brown. The fish was in fine condition for casting; it had been put, as soon as captured, into a specially constructed zinc-lined tank filled with ice, then after a hurried sail to New York, had been removed from the yacht's deck to the Museum, still in its ice-filled tank.

The staff of the Department dropped other work and under the direction of Dr. Louis Hussakof and the donor set out to pose the fish, ready for the manipulation of clay and plaster about it. The body was made to curve slightly as if in motion. The tail fin was placed stiffly in the position in which it cuts the water as it moves rigidly from side to side. This rigid widely-forked tail fin, contrasting with the curving flexible tail fin of a shark, announces the identity of the swordfish to the fisherman watching with harpoon ready at the prow of his boat. The "sword" was posed straight out in front, more than three feet in length, slender and rapier-like, a weapon made by consolidation of the upper jaw bones. It is this sharp-edged instrument that is said to prove so deadly to a school of fish. The swordfish rises fully into air above the prey, turns on its side and drops — a long, slender form glistening in air momentarily. Then the many small fish sharply cut in two by the descending weapon are followed and picked up as they settle to the bottom. The men in the taxidermy shop continued to work throughout the day but as a result, at night, there lay beside the fish a two-piece mold, perfect imprints of the two sides of the fish.

The adaptation of a swordfish to endure high pressure is said to be remarkable. A diver who can stand a greater pressure than sixty or seventy feet is difficult to find, to stand one hundred feet is most unusual, although there are extreme cases in which the record is higher than this. It is said that the usual sub-marine boat can endure little more than one hundred and fifty feet depth, its standard power being to maintain a depth of seventy-five feet; yet a swordfish, according to Mr. Brown, will reach a depth of twelve hundred feet. When harpooned and given freedom, fastened only to a floating keg, it may carry a two hundred fathom line straight down till taut. If the line is too short to reach the bottom, the keg will be dragged under, staves and hoops will rise to the surface, resulting in the loss of the fish to the pursuing boat.

This specimen, the cast of which will be put on exhibition soon, measured nine feet in length and was caught about forty-five miles off Block Island, a region the fish reaches in July, appearing off No Man's Land a little later, and as far north as Bar Harbor in August. The swordfish is the only species of its kind. It belongs to the mackerel type with body greatly narrowed just in front of the tail fin, the rapid motion of the slender posterior end of the body and of the tail fin sending the fish at high velocity through open seas. It is reported to be a creature radiantly beautiful in sun-lighted water, as with grace of form and motion, clothed in the iridescent colors of feldspar, it now shimmers in contrast with the hues of the sea, now blends with them. The swordfish has strength even great enough to penetrate ships and, as is proved by many authentic reports, has often had the inclination to use this strength. The species, although widely distributed through the seas of the world, has recently become more rare. Fishermen fear that in a very short period of years it will be extinct along the Atlantic coast.

A NOTE FROM THE FORESTRY HALL

THE Honorable Mr. Karl Petraschek of Vienna, who is in America to study forestry conditions, stopped in New York this summer on his way to Washington and the West and spent several days studying the collection of North American trees in the Museum's Forestry Hall. Mr. Petraschek has been Chief Forester of Bosnia and Herzegovina for more than twenty years. In addition to this practical work in Austria, which includes the famous reclamation of the Karst, a 600,000-acre tract of barrens, he has studied the forests of other countries also, namely, Germany, France with Algeria and Tunis, Norway, Sweden, Denmark, Roumania and Servia, this last country through having been called there as expert for the reorganization of Servia's system of forest management. Mr. Petraschek's pleasure in the Jesup Collection was great; he declared it to be, quoting his words, "a sample for the world, in its complete display of the wood itself, in arrangement and 'groupment,' as made now for a great part of the hall, in the models of leaves, flowers and fruits, which are so like nature that they give a better idea than a good picture, and also in the labels, especially those with small maps, indicating graphically the dispersal." America can learn much from Europe in all forestry matters. As proof stand the four months of study spent last winter in Germany by forty-five Americans, sons of lumbermen and forest owners and students of the Biltmore Forest School. It is therefore gratifying to realize that

in the opinion of expert European authority, President Jesup's inception of the American Museum Wood Collection with its complete representation of distribution maps and the recent work which has added flower and fruit models and arranged the trees in natural groups, have produced an exhibition unsurpassed in excellence.

THE ANNUAL SCOURGE OF FLIES AND MOSQUITOES

Exhibition Hall labels must necessarily be brief. For those who are especially interested in some given subject, much must be left for explanation by other means. These notes on household insects have been prepared to supplement the exhibits which are being arranged in the Hall of Local Insects, since inquiries pertinent to the subject come both from members of the Museum and others almost daily by letter, telephone and word of mouth.

THE old method of prolonging life through the quest for an elixir of life has fortunately been replaced by the modern method of gaining control of the preventable causes of premature death. Of these causes to-day nothing is to be compared in disastrous results with the infectious or germ disease. One of the greatest discoveries made in the work of getting control of germ diseases has been the relation between their dissemination and common insects, insects so accepted by the world as necessary evils that there has been great difficulty for public opinion to grasp the far-reaching force of the discoveries and the tragic meaning of past years of ignorance. That where there are no mosquitoes, there will be no malaria and no yellow fever, is a fact now proved beyond dispute. That Africa has so often been the "white man's grave" has not been the fault of Africa so much as of the white man's lack of knowledge of the relations between the sleeping sickness and other fevers prevalent there and insects, especially of flies and mosquitoes.

The Typhoid-Fly, as the United States Entomologist has suggested that the common house-fly, *Musca domestica*, be called, is the most abundant insect of this vicinity. It carries the germs of typhoid and many other diseases, especially of those intestinal in character, on the sticky pads of its feet, on its proboscis and in its digestive apparatus. Its eggs are laid in foul matter where the larvæ feed and change to pupæ. Upon emerging from the pupal cases, the flies wing themselves perhaps to other foul places, perhaps to the nearest kitchen or dining-room, to sick-chambers, to the children in the streets, always returning to accumulations of foul matter for the purpose of depositing eggs. It is unnecessary to say more. These facts prove the need of an active campaign, increasing in force with the

return of each summer, especially when combined with the fact that of the 23,087 flies collected by Dr. L. O. Howard from dining-rooms in different parts of the United States, 22,808 were of this typhoid species.

To screen our windows is but a partial remedy against the scourge, for shops from which food comes may remain unscreened. To rid ourselves of the fly we must do away with its breeding places; there is no other way. This means work for the Board of Health in every city, and coöperation of all members of communities everywhere, but it is the one road toward protection from fly-born sickness and death.

The Malaria Mosquito, *Anopheles maculipennis*, is likely to insert the germs of malaria when it pierces the skin, and that it is only the females that "bite," is no consolation since their number is legion. There are 15,000 deaths annually from malarial fevers in the United States, yet this disease can be spread only through the agency of this insect. All mosquitoes, unless it be the striped-legged form of the seashore, should be looked upon with suspicion, for the points of difference between the malarial and non-malarial forms are too minute to be of general help in distinguishing them. The ravages of the malaria mosquito can be checked, just as can those of the typhoid fly, by getting rid of its breeding places. This work also must be communal, the method varying with the conditions. Swamps and pools should be drained whenever possible. Where draining is not practicable, they can be kept free from mosquito larvæ by covering the water with a film of oil. The larvæ coming to the surface to breathe cannot break through the film and so suffocate; however, as the oil evaporates rapidly, it must be renewed every week or two. Ponds, brooks and fountains may be kept relatively free by introducing goldfish or top minnows, if the banks have been cleared of weeds so that the fish can patrol the entire surface. Rain barrels and water tanks should be screened or stocked with fish; even tin cans and bottles which fill with water during rains may prove ruinous to the health of a community and should be buried or disposed of in some safe way. Much work has already been done in eliminating mosquitoes from infested regions, but — and this is the rock on which many mosquito campaigns have been wrecked — the action must be communal and compulsory, one ignorant or obstinate landowner easily making of no avail the work of a hundred.

FRANK E. LUTZ



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THE COMMON HOUSE-FLY OR TYPHOID-FLY

House-flies may carry living germs of typhoid fever on the sticky pads of their feet.
For structure of Malaria Mosquito, see enlarged model in the Museum, Darwin Hall

ADVENTURE WITH AN AFRICAN ELEPHANT

IT is fortunate indeed that Mr. Carl E. Akeley is recovering from the rather serious injuries received while elephant hunting in Africa this past summer. He came upon a herd unexpectedly and before he could take aim at the giant fellow nearest, the huge tusks were immediately upon him. Mr. Akeley swung himself between the tusks, grasping one with each hand, but was borne to the ground under the elephant's trunk and body. In a letter of July 20 to Director Hermon C. Bumpus, he writes:

Four weeks ago, while in quest of a spot to make studies for the elephant group, I ran on to the trail of several bulls. The trail was old, but I followed it and came up with the herd the next day quite unexpectedly in dense jungle. One of them saw me first, used me for a "prayer rug" and got off scot-free. I can walk a little now, and have reason to hope that in another month I may be able to return to the forest, though it may be much longer before I can undertake the work of caring for an elephant's skin. I should like to meet once more the elephant who drew first on me.

Mr. Akeley, the noted collector of big African game, has had much previous experience in elephant hunting. He is responsible for the elephants as well as for the taxidermy work in connection with the group in the central foyer of the Field Columbian Museum, a group masterly in its action and in its portrayal of animal character. But the risk in elephant hunting is always great even to the experienced. As Colonel Roosevelt says: "...there are few careers more adventurous, or fraught with more peril, or which make heavier demands upon the daring, the endurance, and the physical hardihood of those who follow them."

Mr. Akeley left New York in the summer of 1908 for British East Africa to make collections for the American Museum, especially to insure an elephant group for the African Hall. His aim has been, therefore, not only to get elephants but also studies and materials for the reproduction of their habitat. It was this that took him to Mount Kenia, the place from which his last letter was sent; on this mountain he reports elephants living at an elevation of 1400 feet. His work of getting possession of the elephants has been slow of achievement because most of the great tuskers have fallen before the continual raids for the ivory trade. Quoting again from his letter:

Since January, I have inspected well over one thousand elephants here and in Uganda, but have not been fortunate in finding the desired perfect specimens. I am determined that the old bull shall be as near right as possible even if it takes another year. Uganda is undoubtedly the place to get big elephants, but they are becoming rare. They are hounded incessantly by sportsmen, poachers, traders and

natives. The wonder is that there is a good one left. One that we shot in Uganda carried tusks of seventy to eighty pounds weight, but owing to the huge bulk of the animal, they appeared small. This elephant was of size sufficient to carry two-hundred-pound tusks gracefully.

Mr. Akeley tells of an interesting discovery he made at Mount Kenia owing to his habit, offensive to his followers, as he says, of "pounding" across country by compass regardless of well-known trails. He found the shelter where a baby elephant had been born and was spending the early days of its existence while the mother fed about in the neighborhood. It was on the extreme point of a ridge, well off the elephant trails and feeding grounds. He was first attracted to the spot by the remarkable appearance of a tree which, hung with an enormous mass of aerial roots, made a canopy for the shelter.

MUSEUM NEWS NOTES

AMONG the recent gifts to the Museum are the Lender's collection of costumes of the Plains Indians, presented by Mr. J. Pierpont Morgan; a valuable collection of Navajo blankets presented by Mrs. Russell Sage; and two specimens of the African elephant as well as two of the square-mouthed or white rhinoceros, collected and presented by the Honorable Theodore Roosevelt.

A memorial tablet to the late Jonathan Thorne has been placed in the Museum's room for the blind, recently endowed by the bequest of his daughter, the late Phebe Anna Thorne. The tablet is a bronze bas-relief of Mr. Thorne and was designed and executed by Chester Beach of New York.

SINCE our last issue the following persons have been elected to membership in the Museum: Patrons, MESSRS. OGDEN MILLS and FELIX M. WARBURG, HER SERENE HIGHNESS, PRINCESS VILMA LWOFF-PARLAGHY and MMES. RUSSELL SAGE and JOHN B. TREVOR; Life Members, MESSRS. F. LOTHROP AMES, C. FORSTER COOPER and STANTON D. KIRKHAM and MISS ELIZABETH BILLINGS; Sustaining Members, MR. CHARLES DE RHAM and MRS. C. M. PRATT; Annual Members, MESSRS. J. ADAMS BROWN, CLARENCE L. FABRÉ, EMIL FRENKEL, WILLIAM HAGUE, ROWLAND G. HAZARD, JAMES HENRY, LOUIS A. HILDEBRAND, STANLEY D. MCGRAW, S. K. REED and GEORGE M. THORNTON and MMES. CHARLES A. POST, J. CLIFFORD RICHARDSON and CHARLES B. ROWLAND.

PRESIDENT OSBORN left August 5 for a journey in the West, returning to the Museum September 19. He visited the Big Horn Basin of Northern Wyoming, where a field party under Mr. Walter Granger is carrying on explorations for the earliest known ancestors of the horse and of other mammals in America, the especial object of the work being to secure the complete history of the life of this section of the country in lower Eocene times. President Osborn also visited the new Glacial National Park of Northern Montana, which since the last session of Congress has been added to the system of National Parks. This park is a superb region, embracing the wildest and finest mountain scenery in the United States. It contains no less than sixty glaciers and includes the summit of the Rocky Mountain System, lying about forty miles immediately south of the Canadian boundary.

BEFORE his departure for the West, President Osborn sent to the press his volume on the "Age of Mammals." This book is to be published by the Macmillan Company in October and will be the first popular summary of the results of the paleontological explorations of the Museum during the past twenty years. It is illustrated largely from the Hall of Fossil Mammals and from photographs collected by the Museum's field expeditions.

DR. JAMES DOUGLAS is having prepared for the Museum at his expense, a large model of the Copper Queen Mines, the property of the Copper Queen Mining Company, Bixby, Arizona. This model, showing the construction of tunnels and the various processes of extracting and treating the ore, is the first step in Museum representation of the industrial side of geology. Dr. E. O. Hovey has charge of the field studies preparatory to the construction of the model. He left for Arizona early in August, accompanied by Messrs. A. Breismeister, William Peters and Thomas Lunt. They will return to the Museum about the first of October.

DR. CHARLES H. TOWNSEND of the New York Aquarium is serving the Museum as Acting Director during a six-months' leave of absence of Director Hermon C. Bumpus.

PROFESSOR HENRY FAIRFIELD OSBORN has been appointed Honorary Curator of the Department of Vertebrate Paleontology and Dr. W. D. Matthew has been promoted to the position of Acting Curator.

DR. C. H. TOWNSEND has recently presented to the Museum fourteen specimens of Hawaiian Island birds from the collection of the late Edward Hitchcock of Hilo. Not one of the eight species represented was previously contained in the Museum's collection of birds, which is deplorably deficient in Hawaiian material.

A recent addition to the Dinosaur Hall is a skeleton of *Cryptocleidus oxoniensis*, a Plesiosaur from the Oxford Clays of Peterborough, England, dating from the Upper Jurassic. This specimen was obtained by exchange from the British Museum and is unusually complete, the principal restored parts, carefully modelled from other well-preserved skeletons, being the head and the outer ends of the paddles.

PROFESSOR C. E. A. WINSLOW, Curator of the Department of Public Health, delivered a paper, "Waste of Life Capital in American Industries," at the summer conference of Mayors, Schenectady, convened to discuss municipal health problems.

PROFESSOR HENRY E. CRAMPTON sailed from Naples September 9 after a summer spent in touring through Europe. During his travels he visited the principal European museums, noting methods of exhibition, and studying the collections of terrestrial snails. In August he attended the session of the International Congress at Gratz, reading there a paper covering his investigations on land snails made in four journeys to the islands of the South Pacific.

SINCE March of the present year, Mr. Roy C. Andrews of the Museum staff has been studying and collecting the Cetaceans taken at the whaling stations on the west coast of Japan. To date he has secured skeletons of whales according to the following list: finback more than 69 feet long, humpback 47 feet long, sperm 60 feet long, sulphurbottom 78 feet long, and two kill whales 22 and 28 feet respectively. In addition, he has procured a number of skeletons of several species of porpoises. These skeletons, four of which have already made the long journey to the Museum, were presented to the Museum by the Oriental Whaling Company of Japan. At the various stations Mr. Andrews has been received with the utmost courtesy by the Japanese and every facility has been extended to him for carrying on the work. A detailed report of his work will appear in a later number of the Journal.

MR. ALANSON SKINNER of the Department of Anthropology has made two field excursions this summer. The first was to the Menomini Indians residing on their reservation in northern Wisconsin. From these people, Mr. Skinner obtained an exhaustive collection. He was especially successful in being able to secure some very important religious objects including five medicine bundles. The second expedition was to the Seminole Indians dwelling in the Big Cypress and the Everglades of Florida. On this trip also, a large collection was made, and will shortly be placed on exhibition in the Museum.

MR. ROY W. MINER, Assistant Curator in the Department of Invertebrate Zoölogy, spent the month of July at Woods Hole, Mass., making ecological studies and gathering material for Museum groups to illustrate typical associations of marine life, especially the fascinating fauna of wharf piles. During August, he studied rock tide-pools, first at Nahant, Mass., and later at South Harpswell, Maine. He was assisted in the work by I. Matausch and H. Müller, preparateurs, S. Shimotori, artist, and Thomas Lunt, photographer.

DR. ALEXANDER PETRUNKEVITCH, Honorary Curator of Arachnida, has accepted a position in the Department of Zoölogy at Yale and will assume his new duties at the beginning of the current university year.

MR. J. D. FIGGINS, Chief of the Museum's Department of Preparation, has gone to Denver to assume the Directorship of the Colorado Museum of Natural History.

JUST as the JOURNAL goes to press, a letter dated Cape Parry, Arctic Ocean, March 13, comes from Mr. V. Stefánsson, and one written from Baillie Island from Dr. Rudolph M. Anderson. These letters give the adventures of the Museum's Arctic Expedition and the results of work during the months from September 1, 1909 to March 6, 1910. Unusual difficulties have been experienced in the matter of getting a living from the frozen country. Sometimes the men have been without food for days or have been reduced to forcing down their throats what seems impossible food, such as rubbery, raw sealskin, or ptarmigan feathers and long-haired deer-skin soaked in clear seal oil. In fact, at one time starvation reduced them to use as food and sacrifice to the minimum the skins that served them for clothes and bedding. A full report with extracts from their letters will be given later.

AFTER several months spent among the Crow Indians of Montana, Dr. Robert H. Lowie is at present at work among the Hidatsa of the Fort Berthold Reservation, North Dakota.

DRS. GODDARD AND SPINDEN of the Department of Anthropology are attending the Congress of Americanists in Mexico City after which Dr. Spinden will again take up his work among the Rio Grande Pueblo of New Mexico.

THE AMERICAN FISHERIES SOCIETY, which held its fortieth anniversary in New York City, September 27-29, met at the American Museum of Natural History September 28, at which time the members of the Society were the guests of the Museum at luncheon.

MR. FRANK M. CHAPMAN, Curator of Ornithology, addressed the National Conservation Congress at St. Paul, September 7, on "Practical Bird Conservation." Before demonstrating with the aid of lantern slides and motion pictures practical methods and results in the conservation of birds, Mr. Chapman explained why protection is essential and called attention to the relation between birds, insects and forests, giving statistics in regard to the depredations of insects injurious to trees and also data showing to what extent birds feed upon these insects.

LECTURE ANNOUNCEMENTS

MEMBERS' COURSE

The first course of lectures for the season 1910-1911 to Members of the Museum and persons holding complimentary tickets given them by Members will open in November.

PUPILS' COURSE.

The lectures to Public School children will be resumed in October.

PEOPLE'S COURSE.

Given in coöperation with the City Department of Education.

Tuesday evenings at 8:15 o'clock. Doors open at 7:30. The first four of a course of seven lectures by MR. ARTHUR STANLEY RIGGS on "Historic Italy from Sea to Sea." Illustrated by stereopticon views.

October 4.— "Down the Riviera: The French and Italian Shores of the North."

October 11.— "Florence: The City of Art Transcendent."

October 18.— "Pisa — Genoa — Venice: 'They Who Go Down to the Sea in Ships.'"

October 25.— "Rome: The Quick and the Dead — A New View."

Saturday evenings at 8:15 o'clock. Doors open at 7:30. The first four of a course of six lectures on "Evolution" by PROFESSOR SAMUEL C. SCHMUCKER. Lectures of October 15, 22 and 29 illustrated with stereopticon.

October 8.— "Charles Darwin,— a Master Mind."

October 15.— "Natural Selection,— a Master Idea."

October 22.— "Fossil Evidences for Evolution."

October 29.— "What a Chicken Can Teach Us."

Children are not admitted to these lectures, except on presentation of a Museum Member's Card.

MEETINGS OF SOCIETIES

Public meetings of the New York Academy of Sciences and Affiliated Societies will be held at the Museum according to the following schedule:

On Monday evenings, The New York Academy of Sciences:

First Mondays, Section of Geology and Mineralogy;

Second Mondays, Section of Biology;

Third Mondays, Section of Astronomy, Physics and Chemistry;

Fourth Mondays, Section of Anthropology and Psychology.

On Tuesday evenings, as announced:

The Linnean Society of New York;

The New York Entomological Society;

The Torrey Botanical Club.

On Wednesdays, as announced:

The Horticultural Society of New York;

The New York Mineralogical Club.

On Friday evenings, as announced:

The New York Microscopical Society.

The programmes of the meetings of the respective organizations are published in the weekly *Bulletin* of the New York Academy of Sciences and sent to the members of the several societies. Members of the Museum on making request of the Director will be provided with the *Bulletin* as issued.

The American Museum Journal

MARY CYNTHIA DICKERSON, *Editor*.

FRANK M. CHAPMAN,
LOUIS P. GRATACAP,
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The membership fees are,

Annual Members.....	\$ 10	Fellows.....	\$ 500
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All money received from membership fees is used for increasing the collections and for developing the educational work of the Museum.

The Museum is open free to the public on every day in the year.



A DETAIL OF THE FLAMINGO GROUP

Protective coloration evidently plays no part in the lives of adult flamingoes. They are protected by the nature of their haunt and by excessive wildness

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PROTECTIVE COLORATION IN THE HABITAT GROUPS OF BIRDS

WHILE the habitat groups of birds make their strongest appeal to most Museum visitors through the universal love of the beautiful, it must not be forgotten that mounted specimens placed in a natural setting permit study of the animal in relation to its environment. The origin of the name "snake-bird," for example, as applied to the Anhinga is at once obvious when one sees in the group representing this species the bird swimming with the body submerged and only the slender sinuous snake-like neck and head exposed. The wading stilt, betraying the function of the exceptionally long legs, and the feeding flamingo, with upturned bill pressed into the mud, also illustrate the importance of natural surroundings for exhibition specimens.

The necessity of seeing the bird in its natural habitat is particularly evident when one attempts to explain the relation between the color of an animal and its immediate environment. Nearly every one of the habitat groups of birds will present some evidence in support of this fact. Let us look, for example, at the first group to the right as we enter the hall. It is based on studies made on Cobb's Island, Virginia, and contains, among other birds, numerous black skimmers with their newly hatched young. Several of the latter, mounted directly from photographs from life, are shown in the pose they assume at the command of the parent in the presence of danger, and are so flattened out against the sand that they seem almost to fuse with it; even in the group they are remarkably inconspicuous, while in life they are almost invisible.

The inquiring visitor noting this fact will doubtless ask, how then is the correspondingly conspicuous black plumage of the adult bird to be explained; assuredly it is not protective, and a reply to the question is that the adult skimmer avoids observation by excessive wariness. Up to the time the studies for this group were made, no naturalist appears to have seen a skimmer on its nest, and it was currently believed that the bird sat upon its eggs only during the night. Observations and photographs made from a blind showed that the skimmer returned to the little hollow in the sand in which its eggs were laid, just as soon as it felt that it was not under



WHITE-TAILED PTARMIGAN IN SUMMER PLUMAGE

A portion of the Arctic-Alpine group. The female ptarmigan is protectively colored; she will allow herself to be touched before deserting the nest

in the cinnamon teal and ruddy duck. When molting, these birds, in common with grebes, murres and other diving birds, lose all their wing quills simultaneously and are consequently flightless until new ones are acquired. Apparently, therefore, to aid in their concealment during this comparatively helpless period, the males shed the more striking portions of their distinctive plumage which is replaced by a dull, neutral-tinted plumage like that of the female. This is worn only until they reacquire

observation. Indeed a thermometer would doubtless have proved the necessity of the bird's presence if its eggs were not to be cooked by the noon-day rays of a July sun.

Passing by the groups arranged along the side of the hall, each one of which has a biologic story of its own, we journey from the Atlantic to the Pacific and find the case of the skimmer practically repeated by the black-necked stilt in the San Joaquin Valley group. Here again is a conspicuous black and white parent, while the downy young wear an admirably disguising costume, which persists even to the plumage of flight worn by the half-grown stilt which is squatting in the vegetation at the water side. Note also in this group how effectively the color of the downy black tern in the foreground blends its wearer with the details of its nest.

This San Joaquin group contains a further illustration of protective coloration



A SMALL PORTION OF THE SNAKE-BIRD HABITAT GROUP

The origin of the name appears when one sees the bird swimming with only the head and the slender sinuous neck exposed

the power of flight when their full male costume is regained. The disguise, as it were, known as the "eclipse plumage" is well shown indeed by the cinnamon teal and ruddy duck in the San Joaquin group.

At the same end of this hall, but on the west side, is situated the really startling flamingo group. Protective coloration evidently plays no part in the lives of adult flamingoes, whatever it may do for their young, and these flaming creatures, which, as the birds in the background show, can be seen at a great distance, are protected by the nature of their haunts which permit them to see as well as be seen long before an enemy could reach them, in connection with a wildness which makes it impossible to approach near them without the exercise of the utmost caution, and that under favoring conditions. Furthermore, these brilliant birds are most abundant only on islets uninhabited by predatory mammals and where they find in abundance the small shells on which they mainly subsist.

Only one additional instance will be cited to illustrate further the value of these groups in connection with a study of the colors of birds. It will be found in the Arctic-Alpine group from the summit of the Canadian Rockies where white-tailed ptarmigan in summer plumage can scarcely be seen amid the heather and the lichen-covered rocks. A seasonal group at the entrance to the main bird hall below shows clearly how the plumage of this bird, keeping pace in its changes with the variations in its surroundings, prevents its wearer from ever becoming a shining mark for the numerous foes to whose attacks it is subject, but the group in question shows only the summer home and summer plumage of the birds, and it is especially significant to know that the female, found sitting on the nest here shown, actually permitted herself to be touched before deserting her eggs. Compare her actions with those of the skimmer, which avoids even being seen on its nest, and we have a convincing demonstration by the birds themselves of what constitutes a protective and what a non-protective plumage.

FRANK M. CHAPMAN

A NEW FIELD FOR MUSEUM WORK

THAT the Museum has created a Department of Public Health emphasizes its aim to develop scientific work along practical lines directly beneficial to the masses of the people. That it has placed at the head of this department a man whose previous work and interest have centered largely in problems of city water supply and sewage disposal comes with peculiar fitness at just this moment when for the past two months the water supplies in and about New York have been deficient in quantity and questionable in quality. Professor Winslow plans to build

up the new department along two somewhat distinct lines, bacteriology and municipal sanitation.

There is at present no comprehensive collection of bacteria in this country and workers who desire authentic cultures must send to Prag for them unless a neighboring laboratory happens to have the particular organism desired. In the bacteriological laboratory now being equipped at the Museum, the new Department will install and keep under cultivation a complete collection of bacteria, securing material from colleges and board of health laboratories in this country and in Europe. The Museum will thus be in a position to act as a central bureau for the distribution of bacteria, supplying the needs of corresponding laboratories and of schools and other institutions which may occasionally desire cultures. Such a bacteriological collection when established will furnish also an exceptional opportunity for studies of the systematic relationships of this group in which a better biological classification is greatly needed.

The public exhibits of the Department will deal chiefly with phases of municipal sanitation. The central idea will be to set forth some of the conditions which affect the life of the human animal in that form of commensalism which we call a city. Temporary exhibits will be prepared to illustrate the history and development of the more important phases of city life. For example, the first of these exhibits will deal with the problem of water supply sanitation, illustrating by models and specimens as well as by photographs and charts, the sources of water, its collection for public use, the danger of infection, the development of microscopic algae and protozoa in reservoirs, methods adopted for purification and resulting effects upon the public health. The history and development of the present and future sources of water supply of New York — an engineering undertaking second only in magnitude to that of the Panama Canal — will be graphically represented. The chief features of these temporary exhibits will be preserved for a permanent exhibit of Public Health, such as several German cities now possess, but of which there is no example in the United States.

Professor Winslow comes to the Museum from ten years of service in the Massachusetts Institute of Technology, where since 1905, he has been Assistant Professor of Sanitary Biology. In 1903, he was appointed Biologist-in-charge of the Sanitary Research Laboratory and Experimental Station, founded by the Institute at that time for the study and dissemination of knowledge with regard to sanitary questions. Professor Winslow was also Assistant Health Officer in Montclair, New Jersey, during the summer of 1898 and did special work in the Engineer's Office of the Massachusetts State Board of Health during the summers of 1899-1902. He has

been an extensive contributor to the medical, technical and scientific press on the subjects of bacteriology of water, ice and air, the purification of sewage and the causation of typhoid fever. His investigations on the purification of Boston sewage, carried on at the Sanitary Research Laboratory, have led to important practical applications at many of the plants in this country and in Canada.

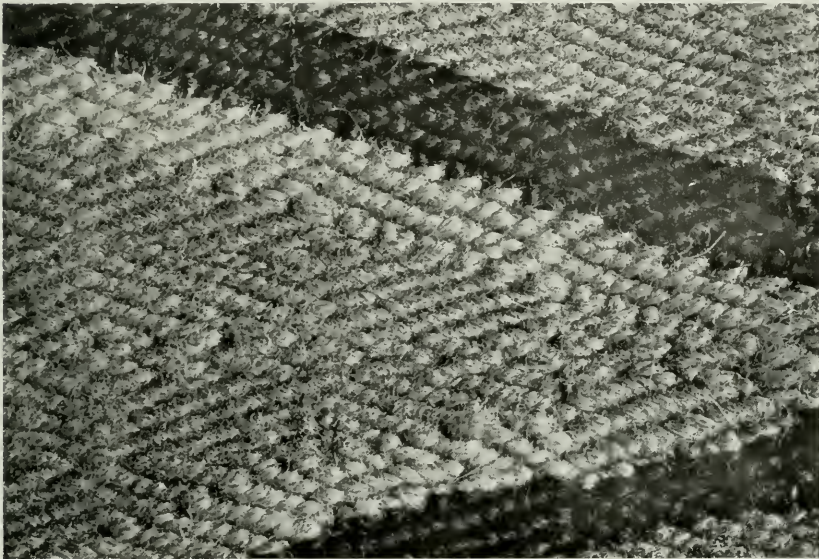
Professor Winslow has been more or less actively associated with socio-



PROFESSOR C-E. A. WINSLOW OF THE DEPARTMENT OF PUBLIC HEALTH

He will build up an exhibit dealing with the problems of New York's water supply and with other sanitary aspects of city life

logical interests in Boston, particularly in relation to movements for better factory conditions and improvements in the milk supply. It was mainly through his efforts that the system of factory inspection in Massachusetts was remodelled two years ago by the creation of district medical inspectors, acting under the Board of Health and having supervision of all questions of factory inspection. In our own section he is already known for his expert services extended in connection with lawsuits relating to the water supply of New Jersey.



SECTION OF A SADDLE BLANKET, LENDERS' COLLECTION

It shows the diagonal or twilled weave conforming to the color design, a white and black diamond on a rose ground

NAVAJO BLANKETS

THE Navajo, the Indian blanket-makers of the Southwest, occupy a large portion of northern Arizona and New Mexico. In language, they are of the Athapascan stock and therefore are connected with the various Apache tribes to the east and south with whom, in fact, they are able with difficulty to carry on conversation. The Hopi, a Pueblo people, have their homes on the mesas to the west.

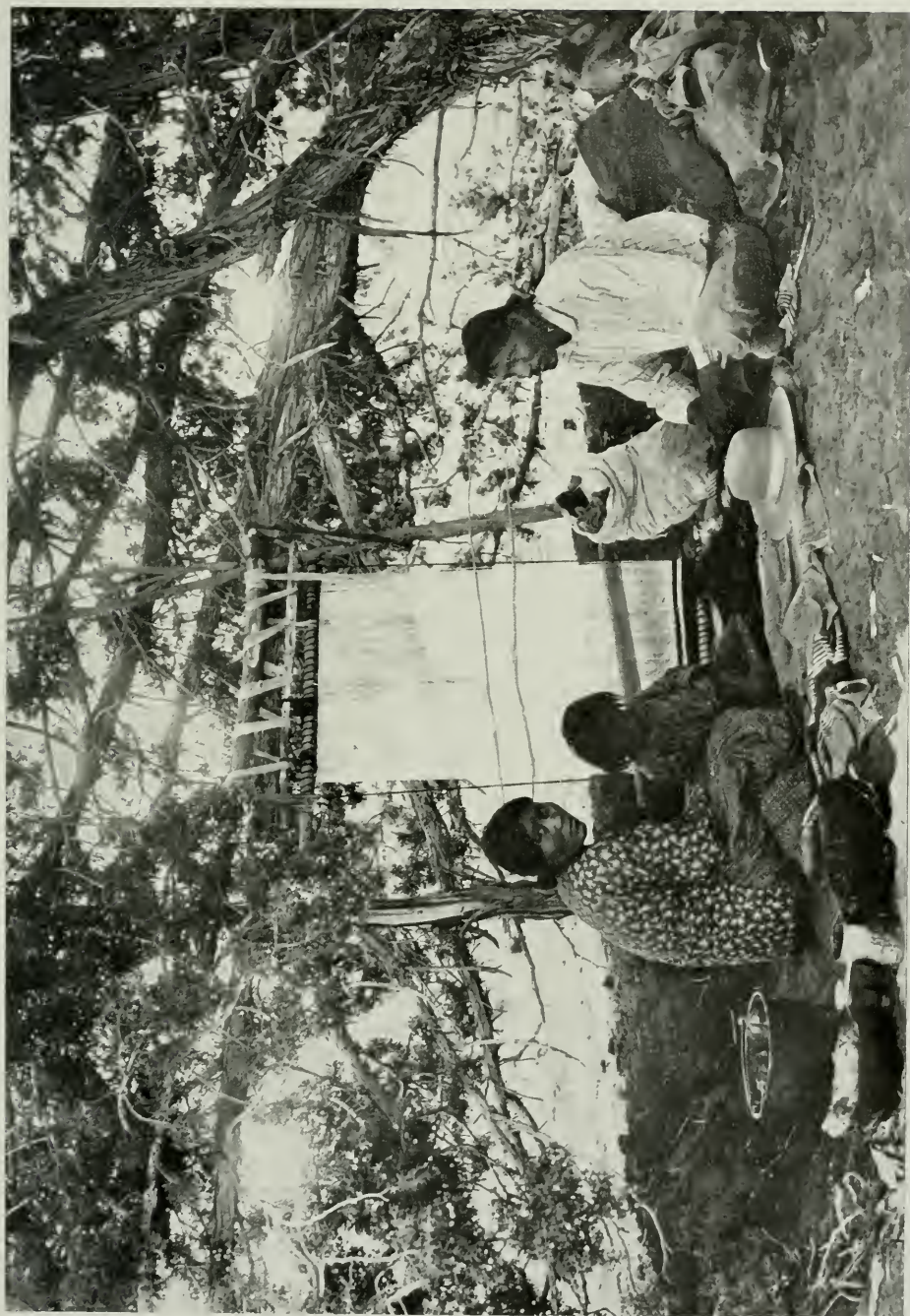
The Navajo are the only natives of North America who have become a

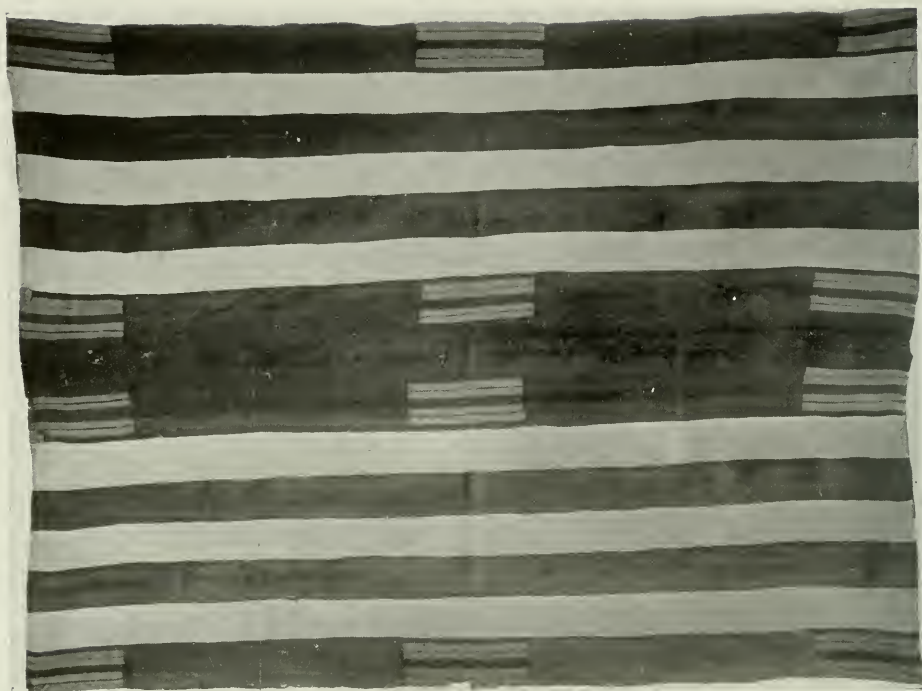
pastoral people. When first visited by the Spanish explorers in 1540, they were already agriculturalists. During the seventeenth, eighteenth and early part of the nineteenth century, the Navajo were given to raiding their Mexican neighbors much after the manner of the Apache. It is probable that at first the mules, burros, cattle and sheep procured on these raids were killed and consumed immediately, but that later they were retained and allowed to breed. The combination of a pastoral and an agricultural life in a semi-arid region requires not only a vast acreage but much traveling. The corn is grown along the stream beds, the crop being matured, if the gods are good, by showers in late summer. The sheep must be moved from range to range as the seasons change. The herding of the flocks usually falls to the children who are assisted in times of difficulty by the older members of the family. Only during the winter is a house really necessary; at other seasons, the family lives under the shelter of a tree or rock. The Navajo have become a wealthy people with their half million of sheep, doubly so since much of the wool, by the skill, industry and unlimited patience of the women, is woven into blankets.

Blanket-making is now the chief art of the Navajo. It seems probable that formerly they made a variety of baskets and that methods of dyeing and the designs were transferred to the blankets as the art of basket-making declined. Many of the men are expert silversmiths showing not only skill but excellent taste. The Navajo are not the unpoetic, unimaginative people they appear, for they have a great wealth of ceremony with songs, prayers, and complicated graphic art.

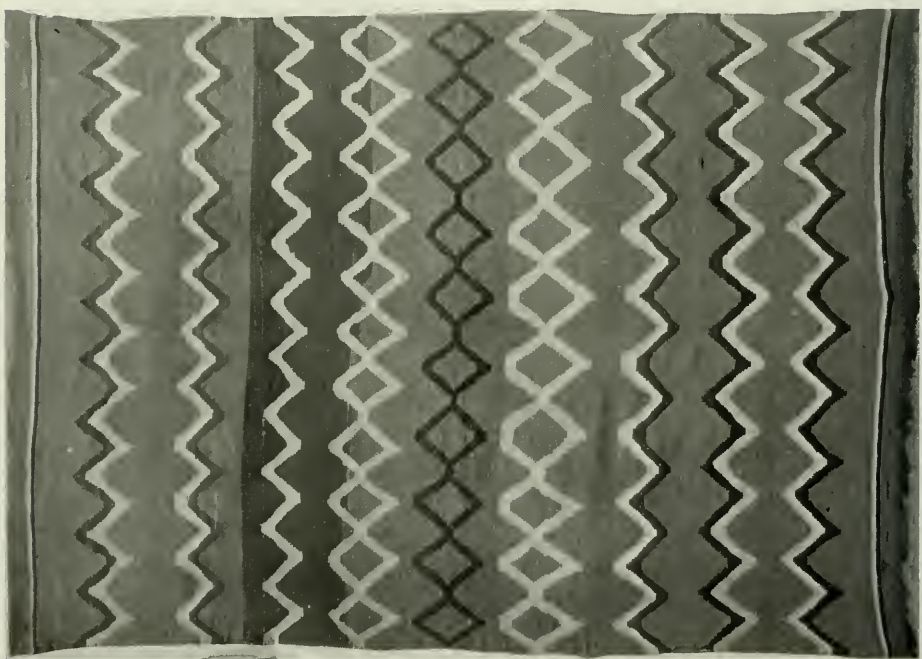
BEGINNINGS IN NAVAJO WEAVING

The history of the Navajo shows the adaptability of a race to meet and take advantage of new conditions and to imitate and develop the customs of neighboring races. It is especially interesting to look at this history in connection with weaving, since the beginning of the manufacture of cloth by any race is always a milestone in development, clothes giving a more emphatic impression of the status of a people than any other one item in their culture. There was considerable weaving done in North America before 1492, the date of the landing of Columbus. From the cliff-dwelling Pueblo area of New Mexico and Arizona southward to Peru, cotton was cultivated, spun and woven into cloth. Specimens recovered from the extremes of this territory indicate that a high state of perfection had been reached. Also in another area, the Northwest, the Chilcat and other tribes made blankets from the hair of the mountain goat, where, however, the





CHIEF'S BLANKET OF THE LENDERS' COLLECTION



THE GEM OF THE LENDERS' COLLECTION

Indigo blue and white design on a body of bayeta red, the bayeta ravelled from five different pieces of cloth

most simple form of loom was used, the work being done entirely by hand as in basketry. Again, in the eastern portion of North America, belts and other small articles were woven from Indian hemp and from buffalo, bear and moose hair. The Navajo, however, in early times, seem not to have raised cotton nor to have woven blankets, although their Indian neighbors, the Hopi, are known to have done so.

METHOD OF WEAVING

The spindles and looms used by the Navajo are so similar to those employed by the Indians of this region and farther south one is justified in supposing that in some respects the art was borrowed, but certainly not from Europeans since the differences are too great to be reconciled with any direct teaching by the Spanish. Judging from the general character of the product and the designs employed, one must believe that to a very great extent, the Navajo have developed for themselves their unsurpassed art.

The wool is sorted, spread out on a sloping stone and then washed by pouring hot water containing an extract of the yucca root over it. The carding is done with a pair of ordinary European hand cards and there is no evidence of a primitive means ever having been employed. The spindle, however, is the same as that found in cliff ruins. It consists of a small stick at the base of which is a wooden disk to give momentum and facilitate the winding of the yarn.

The loom is a simple frame in which the warp is placed vertically. The weaving is done beginning at the bottom, the



NAVAJO WOMAN SPINNING WOOL

The spindle is very like those found in the prehistoric cliff-dwellings in the Southwest



WEAVING A NAVAJO BLANKET

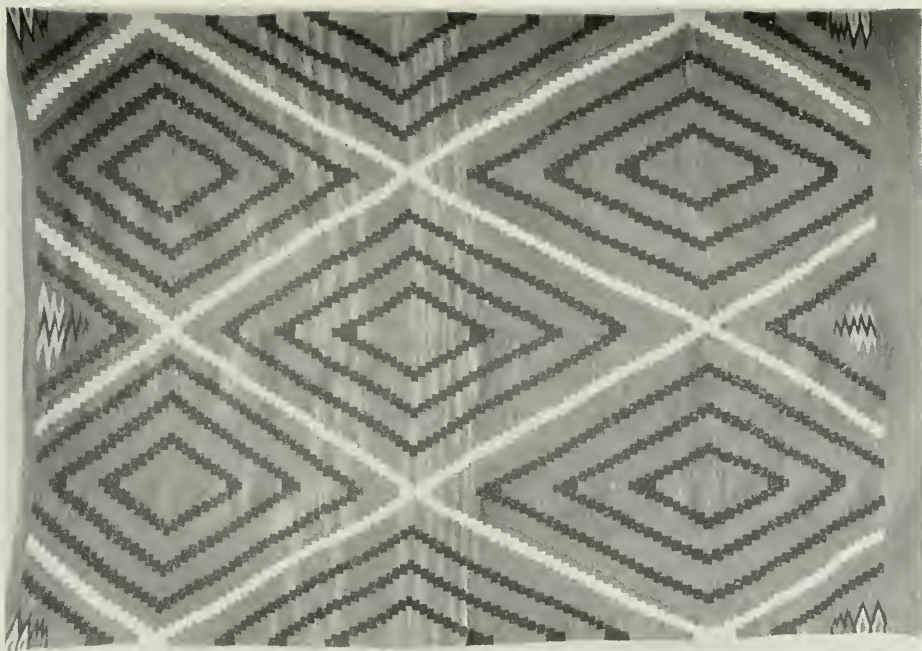
Insuring a close weave by beating down the woof with a batten. Both implement and method are characteristic of the Southwest

various native and commercial dyes. Some of these were almost certainly employed by the Navajo in basket-making. Black they produced by combining a concoction of sumac (*Rhus aromatica*), roasted ocher and piñon gum. Dull red was obtained by placing the yarn in a liquid made by boiling in water the bark of alder and mountain mahogany. Lemon yellow was secured by the use of the yellow flowers of the shrubby *Bigelovia gracilescens* and a native alum. Old gold resulted from rubbing into the wool a paste made of sorrel roots and crude alum ground together. In rather early days indigo blue was obtained from the Mexicans and displaced native blue. A bright scarlet and a rose color were obtained in the early history of blanket-making by ravelling woolen cloth obtained from Europeans. Blankets containing such material are called "bayeta" from the Spanish name of

blanket being lowered as the work progresses. No shuttle is used, the yarn is inserted with the fingers or by the aid of a small stick. The woof is forced down by pressure with a fork or by the blow of a batten stick. The weaving of North America is peculiar in that the woof strands of a particular color are not carried entirely across the blanket, but only as far as that color is required for the design. It is then dropped and another color taken up.

COLORS OF NAVAJO BLANKETS

The colors employed are the natural white and brown of the well-washed wool, a gray which results from the mingling of these, and



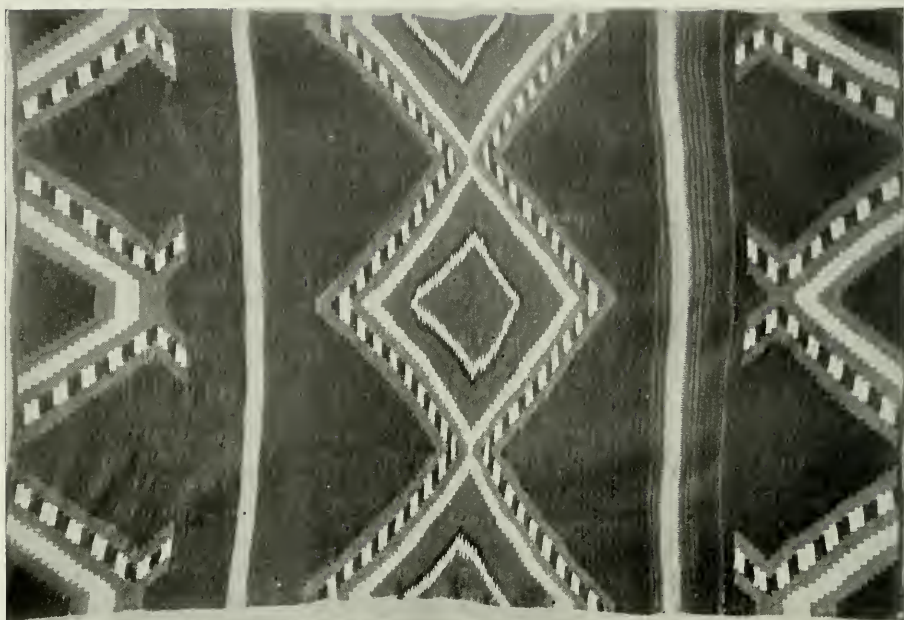
AN ATTRACTIVE BLANKET IN THE SAGE COLLECTION

Background of red, broken in the middle by irregular stripes of lighter color; diamond pattern in dark blue and white



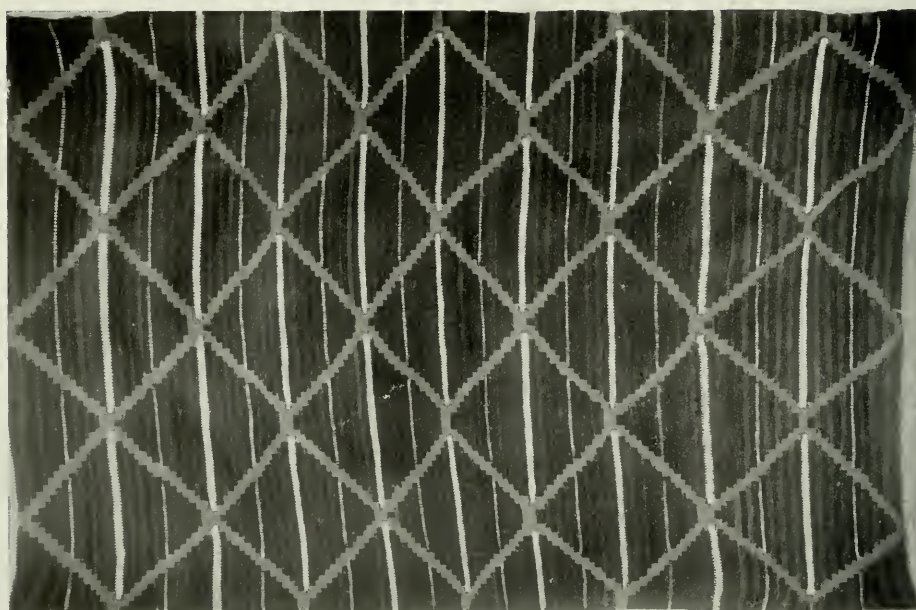
NAVAJO WOMAN'S DRESS

A blanket of black and bayeta red. Sage Collection



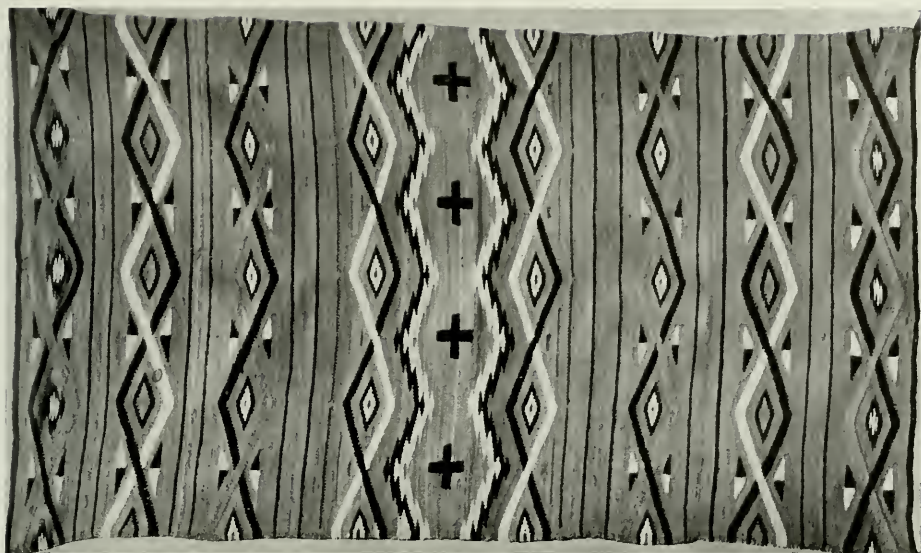
NAVAJO BLANKET OF THE SAGE COLLECTION

Background of blue and black; a diamond in red as a central design; rose colored bands between middle and end figures



A VALUABLE BLANKET, SAGE COLLECTION

A design of red and white on a background made up of narrow blue and black stripes



A BEAUTIFUL SADDLE BLANKET FROM THE SAGE COLLECTION

The background is red, the complicated design dark blue, yellow and white. This blanket is unusually fine in weave



A VALUABLE OLD NAVAJO BLANKET

Designs in white and indigo blue on a background of red. Sage Collection

flannel used in the soldiers' uniforms. It is to be regretted that in recent years aniline dyes have superseded native ones. At the present time an effort is being made by the traders in the Navajo country to secure the use of native dyes again or of more permanent commercial dyes.

NAVAJO DESIGNS

Since blanket weaving is of comparatively recent origin among the Navajo, the source of designs is a matter of considerable interest. It is yet to be determined how far these patterns are a natural growth coördinate with the development of Navajo weaving, in how far they have been taken over from Navajo basketry, and to what extent they have been influenced by Pueblo and Spanish neighbors. The earlier examples of Navajo weaving often have broad stripes, closely resembling the blankets made by the Hopi. Later many geometrical figures appear, standing alone, or combined with horizontal and vertical stripes or with each other. The general arrangement is usually symmetrical, but both the completed pattern and the individual designs lack the exactness of machine work.

The more common designs are squares, parallelograms, diamonds and triangles. Diamonds are often formed by intersecting diagonal lines which run across the blanket, half diamonds resulting at the sides. The outlines of the figures in many cases are broken with right angles, that is, made to consist of a series of steps. These designs have Navajo names descriptive of them, such as "sling" for the elongated diamond, "three points" for the triangle. The ordinary diamond is called "star large," by which the morning star is meant. This and the zigzag line representing lightning and triangular masses called clouds have more or less religious connotation and may be symbolic in their intention. The swastika, a primitive cross-like form, which is now often seen on blankets has recently been introduced in response to the commercial demand for it.

KINDS OF NAVAJO BLANKETS

The Navajo wove at first to secure clothing and blankets for their own use. The women's garment consisted of two rectangular pieces of cloth partly sewed together on the sides and one end, openings being left for the neck and arms. The fashion required that the middle portion of each piece be black with a broad band of red at each end relieved by narrow stripes and small designs in black or blue. This red is in many cases bayeta because the women's dress has not been much worn since the use of bayeta has been superseded by Germantown and commercial dyes. A single large rectangular blanket was used to wrap around the body. These

are called "Chief's blankets" and are distinguished by a peculiar arrangement of designs. The body of the blanket is made in broad stripes. On this as a background, a rectangular design is woven in the center with one half of the same design midway on each side and one quarter of it in each corner. These blankets are valuable because they were woven with care from finely spun yarn and because they usually date from the period of bayeta and the better dyes. The Navajo now prefer to wear the trader's blanket since it is lighter in weight and more gorgeous in colors and designs.

From the collector's and blanket lover's standpoint, there are four groups into which Navajo blankets fall. The most valued are those containing bayeta which have not been made since about 1875. Next stand those which consist entirely of wool in the natural color or dyed only with native dyes. Thirdly, many blankets of excellent workmanship and pleasing designs have been woven from Germantown yarn, ready spun and dyed; and finally, the common modern product too often the result of aniline and other commercial dyes.

NAVAJO BLANKETS RECENTLY ACQUIRED

In the Lenders' collection presented to the Museum by Mr. J. Pierpont Morgan, there are twenty-five Navajo blankets, eleven of which contain bayeta yarn, five of the eleven being also chief's blankets. The gem of this collection is about two yards long and a yard and a half wide and has the body of bayeta red, material ravelled from five different pieces of cloth.

Mrs. Russell Sage during a recent visit to the Southwest and California purchased two collections of blankets. One of these belonged to A. C. Vroman of Pasadena, California, and had been made by him with rare taste and judgment. It is mostly composed of the very best examples of earlier Navajo weaving. Thirteen blankets of this collection were given to this Museum, others to the Metropolitan Museum of Art. The second collection was obtained from Fred Harvey, well-known through his connection with the Santa Fé railroad system. It consists of six Navajo blankets in addition to specimens of Hopi, Chimayo and Saltillo weaving. This collection as a whole has been presented to the Museum.

A few months ago the Museum had no blankets worthy of mention and the situation was a discouraging one, for good blankets are obtained only by bountiful means and by the exercise of a critical judgment acquired through years of experience. These three collections brought into the possession of the Museum through the generosity of Mrs. Russell Sage and Mr. J. Pierpont Morgan have already supplied the need hardest to meet, that of the oldest and best blankets.

PLINY E. GODDARD

"TURNING KOGMOLLIK" FOR SCIENCE

EXPERIENCES OF THE MUSEUM'S ARCTIC EXPEDITION

THERE could be no more simply told story of hardship, of high hopes made futile by storm and illness than that recorded in the latest letters from the Museum's Arctic Expedition. The past winter will long be remembered as the "hard times" winter by the two expedition leaders, Messrs. V. Stefánsson and R. M. Anderson, "turned Kogmollik" in the cause of science — "to turn Kogmollik" meaning to join forces with the Kogmollik Eskimos of the Mackenzie delta and eastward, dressing as they do and wandering with them to get a living from the country.

Any man who goes into the Arctics expects the possibility of having to face starvation, unless he takes a ship. It is impossible to carry with dog team or small boat enough to serve for more than a short journey; and if at the end of the journey, game proves scarce or wandering bands of Eskimos cannot be located, retreat from the difficult situation becomes problematic. In such straits Eskimos sometimes have to sacrifice their dogs; but unless worst comes to worst, they take such an adventure as a matter for joking and with whetted courage push on, perhaps in the face of a blizzard and through deep snows. The explanation of the Eskimo's cheerful view of the matter lies largely in his trust in the hospitality of his fellow Eskimos. For in Eskimo character there has evolved great unselfishness and in Eskimo tribal life a rare communism, passing strange and contradictory as it may seem that this should have taken place in a land of cold and privation, opposed to the selfishness and cruelty of most peoples of southern countries where there are physical comfort and plenty. A chief in the Arctics is not appointed or chosen, nor does he inherit his title. He attains it from a reputation for hospitality.

The Stefánsson-Anderson Expedition differs essentially from ordinary Arctic ventures in that whereas it is usual to carry along everything that the party is expected to need during its stay in the field, in this instance, little in the way of food, clothing or house materials was taken. This was the original plan, since the primary aim of the expedition is ethnological. How can a white man become familiar with the real life of primitive peoples, with their language, folk lore and songs, customs, beliefs and ambitions, except by living with them in their houses and as they do? Therefore, the leaders of the Arctic Expedition dress in Eskimo clothes, which weigh no more than a spring suit yet "allow one to sit comfortably on a block of snow, with back to the wind, fishing through a hole in the ice, the tem-

perature being -50° Farenheit, and to feel the cold nowhere but on the face." They eat Eskimo food also, a great acquirement for a white man, and report that since the first month's difficulties they relish all,—raw frozen fish, eaten as one would eat corn from the cob, boiled fish without salt, taken with the fingers, even the Eskimo delicacy of boiled fish heads, and, of course, seal oil, whale blubber and deer meat.

The necessity of existing on such food seems a bad enough state of affairs to one surrounded by the comforts of civilization, but in reading the letters of the expedition's experiences the past winter the imagination is sated with the recounting of one impossible food after another:

A little Eskimo boy with us was fortunate enough to find the carcass of a caribou which had been killed by wolves. They had eaten only part of the back meat, leaving us enough for three or four good meals. . . . After that was gone we had "whitefish" blubber straight, with the addition of about two spoonfuls apiece of caribou stomach mixed with oil at each meal. Our caribou had carried a peck of well masticated moss and grass in its stomach. Perhaps the stuff did not have much nutritive value for man, but it served as a vehicle for the assimilation of a much greater quantity of oil than we could take straight. I asked the Eskimos to tell me the name of this camping place, as nearly every little creek, hill or promontory has a local name. Nobody knew, but "Jimmy" sardonically suggested that we call it *Kak'-wī-ā-tuk* (the place of no food).

Ivitkuna killed a fox, which afforded a taste of meat. We also singed the hair off a piece of sealskin, slightly scorching the skin. This made the skin brittle and "chewable" and as a little fat was still adhering it was quite palatable, much better than the scraps of rubbery, raw sealskin we had often forced down our throats before. . . . This diet kept us from experiencing actual hunger, but we felt lazy, and weaker every day. Frequent halts were necessary, perhaps fifteen minutes every hour, and we usually fell asleep sitting on the sled at every halt. Everybody was getting pretty thin, but had not been sick at all. I had lost fully twenty pounds in nine days, although still fairly strong.

The expedition took small equipment in supplies, it is true. Yet scan the list of purchases made at Point Barrow on the Alaskan coast. At first blush the perusal is amusing, later enlightening. Of course, there is ammunition; also, bespeaking the needs of the climate there are deerskin coats and various articles such as snow goggles. Lanterns and cases of coal oil anticipate the Arctic winter when the sun does not rise for nearly three months. Naturally the list itemizes dogs: 4 dogs at \$15 each, 1 dog \$19, 3 dogs \$45. But besides all these there are certain frequently recurring items that arouse interest because of the large amounts: 50 lbs. of tea at 35 cents a lb., 20 lbs. of tea at 20 cents a lb., 40 lbs. of tea at 35 cents, and so on; 4 tins of matches \$8, 3 tins of matches \$6, 2 tins of matches \$4, and so on; 100 lbs. black tobacco \$50, 8 boxes chewing tobacco \$38, 50 lbs. Uncle Ned tobacco \$20, and so on and on. The fact develops that

these astounding quantities of matches and tobacco and of tea are not for the members of the expedition, but are to pass slowly into the hands of the Eskimos, being the staple trading medium of the country.

The Arctic Expedition left New York in May, 1908, financed for its work by the American Museum of Natural History and in part by the Geological Survey of the Canadian Government. It proceeded overland to Edmonton, the world's greatest fur market, then two thousand miles northward by the Mackenzie River route to the coast. The final good-bye was sent back from Athabasca landing which was the jumping-off place as regarded communication with the Museum. The main object of the expedition is to make a scientific study of little-known Eskimos, especially those tribes east of the Mackenzie River, and to obtain, of course, as much material as possible to illustrate Eskimo life and customs. Secondly, it is to carry on a zoological survey, procuring collections of mammals, birds and fish, this work being in the hands of Dr. Anderson.

In the ethnological work there were plans to investigate two fields, one west of the Mackenzie River, the other east. The "Nunatama," an inland tribe of the Colville are probably least known scientifically among the Eskimos of Alaska because they never trade directly with the white man, getting goods from the Point Barrow Eskimos, who in their turn trade with the Arctic whaling vessels. The greatest interest of the expedition, however, centers in the tribes east of the Mackenzie at Coronation Gulf with its Coppermine River and on Victoria Land north of this. It is known that here are opportunities to study tribes wholly uninfluenced by the white race.

Although the desire was to go directly to these eastern Eskimo tribes, the final arrangements sent the expedition west to the Colville with the idea of returning eastward by whaling ship. The latter plan ingloriously miscarried owing to the fact that no whaling vessel visited the region during the whole season, the first time such a thing had occurred during the forty years since ships began to visit there regularly. Thus the expedition was forced to winter in the lower Colville region.

Now it happens that the Colville, which is very poor in game, is not the place one would choose in which to spend a winter. The year before both dogs and Eskimos had starved to death there and many families had moved out. This winter the cold came early, ponds were frozen over in August. The failure of the whaling vessels meant not only inability to get eastward from the Colville but also that the winter must be passed there without sufficient supplies, for only part of the equipment had been taken by way of the Mackenzie, dependence being placed on whaling vessels from San Francisco to get the remainder to the northern camp. The Museum made



MAP TO SHOW THE REGION VISITED BY THE MUSEUM'S ARCTIC EXPEDITION

The expedition spent its first winter, 1908-9, on the Colville west of the Mackenzie, its second in the region of Cape Parry and Langton Bay, east of the Mackenzie. Its important work with Eskimo tribes uninfluenced by the white race is still farther east, on the Coppermine River. Mr. Stefánsson's party started for the Coppermine in April, 1910

repeated and emphatic efforts to get north these supplies. The Museum files show copies of many letters written by Director Hermon C. Bumpus to steam whaling companies, owners of private whalers, captains of freight schooners and of United States revenue cutters, and with these letters courteous responses bearing negative results. Strange chance it seemed that there was no vessel of any sort going to the Far North in the summer of 1909. The negotiations for shipment of supplies went on between the Museum and the West through the winter and early spring. At last it transpired that one steamship whaling company of San Francisco, Messrs. H. Liebes and Company, would send the freight steamer "Herman" to Herschel Island and would carry supplies. That the supplies left San Francisco April 24, 1909, however, did not insure their reaching the expedition, and if the truth must be told, revealing much in regard to Arctic navigation, these same supplies, most of which left New York in the fall of 1908, and all of which left San Francisco in April, 1909, have not yet reached the Museum's expedition or at least had not done so in late spring of 1910 when the last letters were sent out.

The winter on the Colville proved less difficult than had been feared; spring came and the main energies of the summer of 1909 were spent in getting eastward, with much time lost waiting for whalers which never came. Finally Mr. Stefánsson succeeded in getting as far east as Cape Parry, near enough to the Coppermine for a dash there at the opening of the spring of 1910 — if the intervening winter could be successfully passed. It is this winter in the Cape Parry district that has proved the "hard times" winter for the expedition, set forth in the narrative of recent letters.

We landed, Nat-ku-tji-ak, his wife Pan-ni-gáb-luk and I, August 31, by the stranded wreck of the steam whaler "Alexander," lost here in the summer of 1906, ten miles east of Cape Parry. Our first object was to find deer, as we were insufficiently clothed for the winter and had on hand provisions for about two months only. After hunting inland in vain two days, we decided to store most of our stuff in an old house built by some Eskimos who pillaged the "Alexander", and then proceed to Langton Bay to look for deer. We had to transport the things, a little more than a boatload, from where they had been landed on the beach to the house, and while we were loading the second time a southwest wind suddenly blew up. We made a vigorous effort to get to the house, but the beach was rocky there and the surf made a landing impossible. We had to run into shelter in a deep fjord cutting southeast into the land. The southwester continued and we could not get back to the "Alexander," although many articles which we needed badly were there and others a handicap to carry were with us in the boat.

As soon as possible we began edging southwest along the coast, but it was slow work. Paddling a big umiak is slow work under any conditions for three people. A few days of southwest gales would be separated from a few more days of southwest gales by perhaps a half day of calm, but never a breath of fair or land wind. Unfortunately for us we happened to have with us a map of the coast. When on

September 7 we came to a bight in the shoreline which corresponds excellently with one on the map into which the map makers show that a large river empties, we concluded we had reached this river, R. la Roncière. The formation of the coast simulated well the mouth of a large river. We all agreed that the river must have trees, or at least large willows, as all good-sized rivers do, which would mean game, and it seemed advisable to ascend it. The beach was covered with small spruce drift trees which promised well. I made an entry in my diary to the effect that "R. la Roncière" differed from most Arctic rivers in that the Lord had put it in the same place as had pleased the map makers.

We ascended and found, sure enough, a river — small, it is true, but we took it for one of the numerous delta channels of a large stream. We went for about five miles farther and came to a small lake. We know now that "R. la Roncière" does not exist. It took us two days of fair weather to get back to the open sea again, and we finally reached Langton Bay September 13.

At Langton Bay, Mr. Stefánsson and the Eskimos hunted with little success. This was unfortunate because all were short of deerskins. Each person in the Arctics needs at least six deerskins for clothes and three for bedding; in fact a total of nine skins is rather short allowance. By the end of October, considerable anxiety began to be felt concerning the whereabouts of Dr. Anderson who in August had started east in a small boat along the coast, leaving at Herschel Island, boxed and ready for shipment, all specimens collected up to that date. Eventually Mr. Stefánsson and his Eskimo started out to find him, first building a log house with an open fireplace where the Eskimo woman could stay to protect a cache of twenty-two deer. Travelling was difficult but they reached the coast fifty miles west from Langton Bay by November 18. Here they found on the beach an old whale carcass, probably four years old, and spent a day getting a sled-load of blubber before proceeding. They had gone on only a day's journey when they were rejoiced to meet Dr. Anderson with his six Eskimo assistants. The whole party returned to the beach where the frozen whale was and spent the day getting another load of blubber and in talking over the situation.

Dr. Anderson had been traveling under unusual difficulties because having a large party of assistants to make possible the transportation of supplies and collecting equipment. He says respecting this, "Turning Kogmollik has its disadvantages as well as its advantages. Alone I could shoot more game than I drew out of the pot and still have much leisure time for other work. There was certain work to be done, however, which I could not handle alone and diplomatic reasons compelled me to become a communist out and out. This meant a hand to mouth existence for a time with so many to be fed, some worry, and much hard work, but brought my boat and goods to the place where they had to be."

The matter of assistants in the Arctics is a large problem. To hire an

Eskimo means that his family also must be fed and carried along with the expedition. Captain Roald Amundsen is of the opinion that outside of the scientific staff of an expedition Eskimos should best be depended on for all work, his chief reason being not the greater resistance of the Eskimo physically to northern hardships, although that is true also, but that the Eskimo does not get homesick and is not continually down-hearted. The Eskimo's disposition is such that whether he be cold, hungry or in danger he seldom becomes dispirited or sulky. Commander Peary has always spoken in favor of Eskimo assistants and has always shown his personal preference in being accompanied by them on his dashes for the Pole. Mr. Stefánsson who had previously spent a year with the uncivilized Eskimo agreed with this opinion in favor of the Eskimo and the Museum's Arctic Expedition was planned accordingly. He reports, however, a wonderful change in the Eskimos as regards pay for services since he was at the Mackenzie delta in 1906. "Then they knew little about money and one could hardly pay for anything. He might make gifts, but pay was never asked and if offered needed explaining by the statement that white men always pay for food and work in their own country. So great is the change that now an Eskimo seldom remains permanently satisfied with the most liberal pay for services."

While the reunited divisions of the expedition worked getting a store of blubber, the leaders reviewed the past and carefully studied the future. One thing was certain, they must have the traps and ammunition that had been left perforce in the old house beside the wrecked "Alexander." Black and silver fox had recently been seen, black fox with a value from six hundred to a thousand dollars per skin. Besides there could be no more opportune time to get the things necessary for the Coppermine trip which would begin in the spring as soon as the sun came back. It was, therefore, decided that Dr. Anderson with two Eskimos and ten dogs should go at once to the "Alexander." The day they separated was one of the worst of the year,—35° with a southwest blizzard. Going east with the storm, Dr. Anderson could proceed; going toward the west and so in the face of the gale, Mr. Stefánsson's dogs refused to work, and waiting was necessary till the storm abated. At last they started, six people with two days' provisions, and after fifteen days of struggle they got back to the log house where they had left the Eskimo woman in charge of the cache. Nothing could be more graphic than Mr. Stefánsson's description of these fifteen days:

On the whole trip we killed five ptarmigan and not a single rabbit, though one of us hunted each bank all the way up. The sun was gone and so the daylight was meagre, besides it blew a blizzard every day. The whale tongue was very bad eating,

it had little to it but dry fibres and was strongly impregnated with sea salts (other than NaCl). When we had finished this we were really better off for the stuff seemed to make us sick. We then ate sealskin, some deerskin we had along for sole leather and our snowshoe lashings, in fact every edible thing except clothes. Fortunately we had seal oil. With about a cupful of oil a day one does not feel in the least hungry but lazy, sleepy and weak. All of us found it a little difficult to take the oil straight. We soaked it up in tea leaves, deerskin with long hair on it and ptarmigan feathers.

Before they reached the end of these fifteen days some of the Eskimos were taken sick, and did not recover for weeks. These were indeed most discouraging times. Mr. Stefánsson was not able to go far from the camp because of the sick Eskimos, there were seven people and six dogs to feed, meaning a consumption of rather more than a deer per day, while there was no light but dim twilight for hunting, and every southeast wind brought fog, every southwest wind, a blizzard. To add to other causes for depression all were feeding wholly on lean meat in Arctic cold where health and spirits depend on the presence of fat in the food. Also it was at this time that the oil for lights gave out:

At this time we had left only about a quart of oil, which was soon gone and we were without lamplight all the time the sun was away. This was especially inconvenient for the women, as sewing in the dark is difficult. There was more than once a whole week, too, when I made no entry in my diary because I could not see. One could write for about two hours at noon, but I was usually hunting at that time, always starting out before daybreak.

In addition, we were getting badly worried over the non-arrival of Anderson and his party. They should have been home by Christmas. We were especially afraid that on the very day they left us in the blizzard they might have ventured too far off shore on the ice and have been carried with it to sea. The sick Eskimos were growing despondent. I used to see deer almost every clear day (there was fog or blizzard two days out of three) but on the clear days it was so absolutely breathlessly calm that deer could hear you and you could hear them from a quarter to a half mile away. I therefore never got a shot at them. An Eskimo always looks upon such protracted ill luck as caused supernaturally. Taboos had been violated. They knew I had eaten deermeat the day I killed a wolf, but worse than that they knew of more than one case of my breaking the Sabbath. They were therefore certain they should never be able to get any deer. One day, however, I shot a fawn. This seemed to break the spell to the notion of the Eskimos.

In early January lack of food made some sort of a venture necessary, so a start was made for Langton Bay. Here they found the cache of blubber broken into by a wolverine which had eaten a hole through a two-inch plank. Small consolation was gained by the fact that they caught the wolverine, although it was excellent eating after its high living on deer meat and bear meat. Disappointed here, there was nothing to do but keep on to the "Alexander"; reaching the old house by the wreck they

were astounded to find Dr. Anderson and one of his Eskimos there, recovering from pneumonia. Fortunately flour had been among the supplies left at the house or the men never could have lived through. Fortunately too, polar bears have no appetite for flour. When Dr. Anderson arrived at the house he found that bears had broken in and devoured four boxes (500 lbs.) of whale blubber, two slabs of bacon, spilled a ten-gallon can of alcohol and "knocked things about generally"; but the flour they had not disturbed.

The letters report that in March all were "in fit condition, showing no serious after-effects," and that Mr. Stefánsson was expecting to start with his party during the first week in April for the Coppermine.

The expedition is planning to come out of the field soon, and great interest at the Museum attaches to the time when the full results of the work will be known. Making a zoölogical survey in the Arctics is a peculiarly difficult task due largely to problems of transportation of outfit and accumulating specimens; and the collections with duplicate series which the expedition reports will be of great scientific value. With the close of this expedition, Mr. Stefánsson will have five years' knowledge of the Eskimo. He has accomplished much in getting records of songs and short tales, working to ascertain definitely the presence and variations of certain folk tales throughout the tribes. He has complete lists of words used by the Shamans in ceremonials; and he has a large series of head measurements and many photographs. All results of the expedition will possess unusual value, representing as they do, work accomplished in spite of the almost insuperable obstacles set by the Arctic winter and by the necessity of "turning Kogmollik."

MUSEUM NEWS NOTES

THE near future promises rapid development in the Museum's instruction for the blind owing to the Jonathan Thorne Memorial Fund. The work is under the supervision of the Department of Public Education which has long had an interest in Museum instruction for the blind, but outside of its regular lecture courses could do little because all permanent exhibits are of necessity within glass cases. It is hoped that future plans will allow close coöperation with the teachers of the blind throughout the city and that the unusual advantages which the Museum can give in the free handling of duplicate specimens from its store-rooms will be found valuable training for blind children. It is desired even that the Museum

shall extend the work beyond its own doors, sending out to the blind study collections well labeled in both New York Point and American Braille, following here the plan of small travelling museums employed in coöperation with the city schools where 900,000 children were reached during the past year.

AN expedition under Mr. Walter Granger of the Department of Vertebrate Palæontology in searching for fossil remains in the Big Horn Valley, Wyoming, has discovered in the Lower Eocene a complete skeleton of the ancestral horse, a small four-toed species. The skeleton has been taken up in a block of sandstone, and after the block arrives at the Museum, chipping the rock away from about the bones will proceed at once. The great fact is that this skeleton was found in the Lower Eocene, being the first record for this formation, which is older than any that has before yielded a complete horse skeleton. The specimen must, therefore, carry evolutionary history farther into the past than skeletons previously obtained, and when fully exposed, is likely to be found approximating more nearly a hypothetical five-toed ancestor of all horses.

A TEACHERS' DAY has been planned by the Museum authorities. Delegates from all the schools have been invited to be present on Saturday, November 5, from two to five-thirty o'clock. Special guides will be on hand to conduct the teachers through the exhibition halls and especially through the laboratories and workrooms which are not open to the public. The program includes ten-minute illustrated talks by the Curators of the Museum and a general meeting at which brief addresses will be made by Professor Henry Fairfield Osborn, President of the Board of Trustees, Dr. William H. Maxwell, Superintendent of the Public Schools, and other educators. A reception will follow these addresses.

THE HORTICULTURAL SOCIETY OF NEW YORK will hold its fall exhibition in the Museum from November 9 to 13. The exhibition will be open especially for the members of the Society and for Museum and affiliated organizations on Wednesday evening from 7 to 10 o'clock. It will be open to the general public on Thursday, Friday and Saturday from 9 A. M. to 5 P. M. and from 7 to 10 P. M., also on Sunday from 1 to 5 P. M.

MISS MARY LOIS KISSELL of the Department of Anthropology left New York October 28 for an extended period of field observation among some of the Indian tribes of the Southwest. Miss Kissell will devote her time to a study of the basket work and textiles of these tribes paying especial attention to the origin and significance of designs.

DR. R. BROOM, the leading authority on the Permian vertebrates of South Africa and collecting there for this Museum, has recently announced the discovery of a fossil skeleton of *Delphinognathus*, a large and aberrantly specialized extinct reptile, related to the group of Theriodonts. These latter forms are believed to stand rather near the borderland between reptiles and mammals. The accession is important because there is very little South African material in the Museum.

THE SEVENTEENTH CONGRESS OF AMERICANISTS in accordance with an adjournment taken in Buenos Aires in May reassembled in Mexico City, September 7 and continued its sessions until September 14. These congresses meet biennially, alternating between Europe and America. This meeting of the Congress in reality formed a part of the Mexican centennial which continued throughout the month of September. The papers presented dealt for the most part with various subjects concerning Mexican archaeology and ethnology and were read by leading anthropologists. Europe was represented by Dr. Edward Seler, Berlin, the president of the Congress; Dr. Francois Heger, Vienna; Professor Capitan, Paris; and Professor Moguel, Madrid. From the United States there were in attendance, Drs. Dixon and Tozzer of Harvard, Dr. MacCurdy of Yale, Dr. Boas of Columbia, Dr. Gordon of Philadelphia, Dr. Hrdlicka of Washington, Professor Starr of Chicago and Mr. Stansbury Hagar of New York. Drs. Goddard and Spinden were delegates from the American Museum.

PUBLIC meetings of the New York Academy of Sciences and its Affiliated Societies will be held at the Museum according to the usual schedule. Programmes of meetings are published in the weekly *Bulletin* of the Academy.

LECTURE ANNOUNCEMENTS

MEMBERS' COURSE

The first course of illustrated lectures for the season 1910-1911 to Members of the Museum and to persons holding complimentary tickets presented to them by Members will be given in November and December.

Thursday evenings at 8:15 o'clock. Doors open at 7:45.

November 17 — PROF. CHARLES-EDWARD AMORY WINSLOW, "Insect-Carriers of Disease."

Professor Winslow has been engaged for some years in the study of problems of water supply, sewage disposal and other phases of municipal sanitation. His lecture

will deal with the important discoveries made during the last decade in connection with the spread of typhoid fever, malaria and yellow fever through the agency of flies and mosquitoes and with the recent achievements of sanitation in controlling these diseases.

December 1 — MR. FRANK M. CHAPMAN, "From Sea-level to Snow-line in Vera Cruz, Mexico: A Study of the Distribution of Bird-life as it is Controlled by Altitude."

Mr. Chapman worked on Mt. Orizaba from the coastal lagoons (where moving pictures were secured of the rare roseate spoonbill) and the luxuriant forests of the lowlands upward to the magnificent pine and spruce forests with their snowbirds and crossbills, characteristic of the Canadian zone.

December 8 — MR. JAMES L. CLARK, "Snap Shots from British East Africa."

Mr. Clark, a successful sculptor and taxidermist, has returned recently from a fourteen months' stay in British East Africa. While there he obtained a splendid series of pictures of the big game of the country, as well as of the picturesque natives, and besides had some most unusual adventures, for example, at one time he was treed by a herd of two hundred elephants.

December 15 — DR. PLINY E. GODDARD, "Nomadics of the Southwest."

Through the generosity of Mr. Archer M. Huntington, the Museum for the past two years has been maintaining expeditions in the Southwest for the purpose of making an exhaustive study of the Indian tribes there and of their relationships. Dr. Goddard has spent several months among these Indians, and will give an account of his experiences and observations.

December 22 — MR. ROY C. ANDREWS. Subject to be announced.

Mr. Andrews of the Museum staff has recently spent six months at the whaling stations on the eastern coast of Japan and has secured a number of large whale skeletons for the Museum. Many of his photographs are remarkable.

PUPILS' COURSE

These lectures are open to the pupils of the public schools when accompanied by their teachers and to the children of Members of the Museum on presentation of Membership tickets. Lectures begin at 4 P. M.

Oct. Nov.

Monday, 24 14 — "New York City: Past and Present." By MR. ROY W. MINER.

Wednesday, 26 16 — "Insects and Health." By PROF. C-E. A. WINSLOW.

Friday, 28 18 — "Forests and their Uses." By MRS. A. L. ROESLER.

Monday, 31 21 — "Scenes in Peru, Bolivia and Brazil." By DR. LOUIS HUSSAKOF.

Nov.

Wednesday, 2 30 — "Alaska and its Indians." By MR. HARLAN I. SMITH.

Dec.

Friday, 4 2 — "Children of all Nations." By MRS. A. L. ROESLER.

Monday, 7 5 — "Transportation: Past and Present." By MR. WALTER GRANGER.

Wednesday, 9 7 — "A Trip to Europe." By DR. LOUIS HUSSAKOF.

Friday, 11 9 — "Life on the Plains." By MR. BARNUM BROWN.

PEOPLES' COURSE

Given in coöperation with the City Department of Education.

Tuesday evenings at 8 : 15 o'clock. Doors open at 7 : 30. Illustrated.

November 1 — "Naples: Its Environs and Vesuvius." By MR. ARTHUR STANLEY RIGGS.

November 8 — "Southeastern Italy: The Sorrentine Peninsula and its Place in History." By MR. ARTHUR STANLEY RIGGS.

November 15 — "Twentieth Century Sicily: The Modern Garden of Eden." By MR. ARTHUR STANLEY RIGGS.

November 22 — Subject and lecturer to be announced.

November 29 — "Holland's War with the Sea." By JAMES H. GORE, LL. D.

Saturday evenings at 8 : 15 o'clock. Doors open at 7 : 30. Illustrated.

November 5 — "The Humming Bird's History." PROF. S. C. SCHMUCKER.

November 12 — "The Mind of the Apes." PROF. S. C. SCHMUCKER.

November 19 — "The Living and the Non-living." By MR. BENJAMIN C. GRUENBERG.

November 26 — "Life Aggressive: Utilizing the Environment." By MR. BENJAMIN C. GRUENBERG.

The American Museum JournalMARY CYNTHIA DICKERSON, *Editor*.

FRANK M. CHAPMAN,	} <i>Advisory Board.</i>
LOUIS P. GRATACAP,	
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THE AMERICAN MUSEUM
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FOR THE PEOPLE
FOR EDVCATION
FOR S C I E N C E

VOL. X

DECEMBER 1910

NO 8



THE CHIEF DIRECTS THE CEREMONY FROM THE STERN OF THE CANOE

Every article of dress and regalia from the smallest ivory ornament to the largest ceremonial robe is reproduced in durable materials and with fidelity to nature

—“Work on the Ceremonial Canoe,” page 238

The American Museum Journal

VOL. X

DECEMBER, 1910

No. 8

HERCULEAN TASK IN MUSEUM EXHIBITION

FOREWORD REGARDING THE CEREMONIAL CANOE SCENE IN THE NORTH PACIFIC HALL

Photographs from the North Pacific Coast by Lieutenant George T. Emmons,
Museum photographs by Thomas Lunt

AN unusually large task in exhibition entered upon by the Museum is that of filling a Ceremonial Haida Canoe sixty-four and a half feet long with Indian figures, about forty in all, representative in physique, garb and action of the tribes of the North Pacific Coast. The conception is that of Director Hermon C. Bumpus, supervision of scientific details is under Lieutenant George T. Emmons, and the technical work is being carried out by the sculptor, Sigurd Neandross.

Lieutenant Emmons has spent some thirty years among the Indians of the Northwest Coast, working with deep interest along the lines covering their culture and is abundantly equipped in knowledge. The Museum will always be in his debt for invaluable service. Sigurd Neandross is an American sculptor of Norwegian parentage who has been honored at home and abroad. Notable among his works are a monument in the public square in Copenhagen — an imaginative figure of a nymph singing the song of the Vikings, a bust of a mother and child shown at the Berlin International in 1897 and now in the Kaiser Wilhelm Museum at Krefeld, Germany, and in this country a bronze statue of an officer of volunteers in the public square at Pottsville, Pennsylvania. Mr. Neandross has at present several large idealistic figures and groups in progress.

The Ceremonial Haida Canoe was made many years ago on the Skeena River near Port Essington on the Alaskan Coast and formed a part of the Powell collection secured by the Museum in 1883. The monstrous boat hung for many years from the ceiling of the hall, taking its present place in 1908. In this year decision was made to convert it into a great open exhibition case in which to set forth the primitive culture of the Northwest Coast Indians, and the idea advanced by Lieutenant Emmons was accepted that the exact expression of the exhibition should take the form of an institution known as the "potlatch," a ceremonial allowing attractive use of the rich Northwest Coast materials in the possession of the Museum.



SKETCH MODEL IN CLAY

Work was begun in the summer of 1908. The time represented by the scene is somewhat over a century ago when these Indians first came in contact with Europeans. The canoe is supposed to have reached the surf of the beach, being kept in position there by the paddlers holding water and the bow and stern men operating the poles while ceremonial speeches and dances are rehearsed. The result of the positions chosen for paddlers and polemen is not only an artistic one but gives opportunity for mechanically bracing the boat so that there can be no vibration of the exhibit, the poles being anchored in the floor and the paddles riveted in the cement base supporting the canoe.

Mr. Neandross has taken hold of the Museum's problem with unusual insight into the needs of the case, designing an immense composition with sweep and balance in the grouping, yet each figure an accurate study of tribe, suited in dress and action to its particular part in the meaning of the whole. The ideal of exhibition in a people's museum must be accuracy and completeness of truth in such combination with beauty, life and action that there is produced a resultant of human interest and educational force. Mr. Neandross has proved in his work as a sculptor before the world that he is on the way to mastery of a combination in art unusual and difficult, that is of realism and idealism. It is this power of the sculptor which is in considerable part bringing success to the Museum's giant task.

M. C. D.

The actual story of the great canoe's journey to New York is as follows: It was paddled by Haida Indians to Victoria; carried by schooner to Port Townsend, Puget Sound; by steamer to San Francisco; by Pacific mail steamer to Panama; across the Isthmus on the Panama Railroad from Panama to Colón, whence it was shipped on the deck of a Pacific mail steamer to New York. In crossing the Isthmus, to avoid injury during sharp turns, the canoe was adjusted on two platform cars, being fastened securely on the forward car and swinging loosely on greased guys on the rear car. Free transportation from San Francisco to New York was contributed by the President of the Pacific Mail Steamship Company.



A SUGGESTION OF THE PLAN

THE POTLATCH OF THE NORTH PACIFIC COAST

By Lieutenant George T. Emmons

THE potlatch is the distinctive feature of aboriginal life along the North Pacific Coast from the Strait of Fuca to the vicinity of Mt. St. Elias. It is the great giving ceremony when individ-

uals and families gladly impoverish themselves that the dead may be honored, the emblem of the clan exalted and social standing recognized or increased.

What was probably a simple feast for the dead in primitive days, in the progress of time has become a most complex observance which however is regulated by the strictest laws of etiquette and though varying somewhat in minor details among different tribes is recognized in the main by all.



OF THE TLINGIT RACE

Underlying the potlatch as a social function is a deep religious fervor in the worship of ancestry and the communion with the dead

The social organization of the Tlingit is founded upon matriarchy and consists of a number of clans or totemic families grouped under two exogamous phratries which intermarry and supplement each other upon all occasions of ceremony. In the building of the home, the erection of the heraldic or mortuary column (totem pole), the preparation and cremation of the dead, and the mutilations of the body, the service is invariably performed by those of the opposite party, and the potlatch is given in payment for these acts; but underlying the more social function is a deep religious fervor in the worship of ancestry and the communion with the dead. The food and tobacco that are cast into the fire become a spiritual administration to those who are ever present though invisible, and with each offering there is called the name of one departed who receives honor in proportion the gift.

The peculiar food and climatic conditions throughout this area have not only rendered this wholesale giving possible but also have encouraged its practice and development to an enormous degree. Here life is comparatively easy. The wonderful annual run of salmon, trout, herring and eulichon, the steady supply of halibut, cod, whale, seal and shell fish, the generous yield of berries, roots and green things, as well as the great forests of cedar, spruce and hemlock, and pure water ever at hand, combine to offer the greatest advantages with the least exertion. Along this Pacific coast there are but two seasons. During the milder and pleasanter period from April until October the food supply is procured, and the remainder of the year, not extreme in temperature but wet and stormy, becomes a time of leisure. These leisure months from October till May are devoted to social pleasures and ceremonies among which the potlatch holds the first place.

Preparations for the function may occupy much of a lifetime in the accumulation of material to be given away, and the invitations are personally delivered months or a year in advance. The guests, including generally two tribes or village clans, if living at a distance get ready as soon as they return from the summer camps. The canoes are repainted and decorated, dancing paraphernalia is unpacked and gone over, a sufficient food supply for the travel is put aside, and a programme of dances and songs with which to honor their host is arranged. Households embark together in the largest canoes and as in war parties they are under the direct supervision of their chief. They travel and camp together and practice their dances and songs en route. From time to time the host receives notification of their progress and when they are within one camp of their destination, he sends out envoys and food to them. The final day when they embark, the canoes are assigned their places with the chief leading. The men and women



IN THE LAND OF THE POTLATCH



TLINGIT CHILDREN



Sitka is now connected by an all-American cable with Seattle. This is but one indication of the rapid advances civilization is making on the North Pacific Coast and of the changes that are taking place in the culture of the Indian tribes there



SIGURD NEANDROSS, SCULPTOR

have put on their ceremonial dress, the face has been painted and the hair dressed with red ocher and birds' down. With drum, rattle and dance staff they take their places in the sterns of the canoes which now follow each other in column until near the village of their host when they form in line abreast and holding gunwale to gunwale stand in slowly to the shore, the occupants singing and dancing to the accompaniment of the drum. When nearing the beach those paddling hold water, the bow and stern men get out the poles and the line of boats is kept in position, while speeches are exchanged through several hours. With the signal to land the canoes are backed around stern first and beached, the villagers rush into the water to greet their friends and carry the party's belongings to the house which has been prepared for reception and all is confusion and bustle.

In early days the Tlingits had many slaves who paddled the war canoes besides performing all work for their masters. They were not permitted to take part in the ceremonies and were often sacrificed upon the occasion of the potlatch. The group which Mr. Neandross is so skillfully executing represents a Chilcat chief and his followers in ceremonial dress in the war canoe just before landing to attend a potlatch. The dress and materials represented on the figures are all from the North Pacific Coast and in the possession of the American Museum.



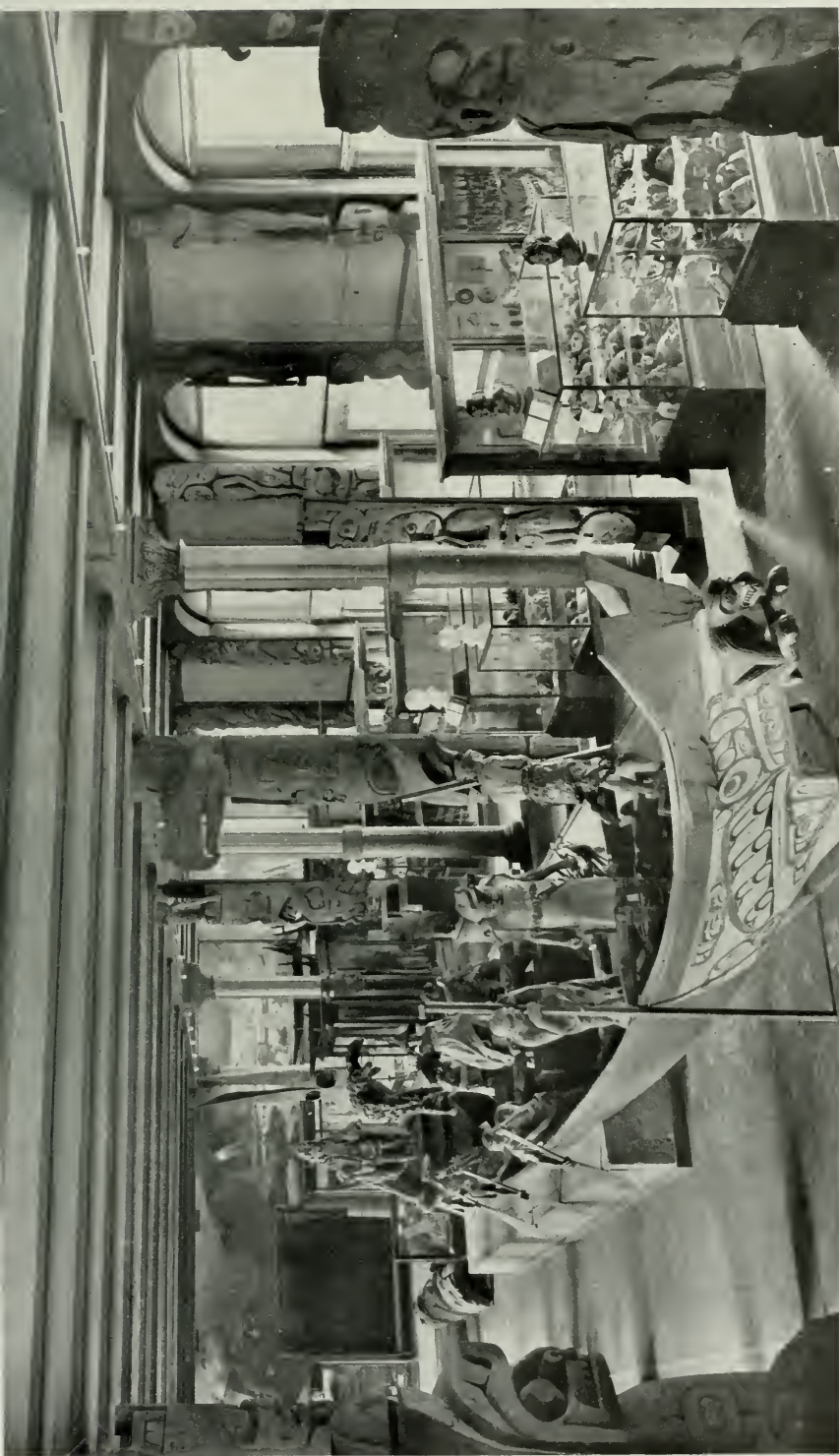
SUCH IS THE COUNTRY OF THE TLINGIT INDIANS



A POLEMAN IN THE CEREMONIAL CANOE, SHOWING THE SCULPTOR'S
SKILL IN MAKING CASTS OF FIGURES IN ACTION



THE NORTH PACIFIC HALL IN NOVEMBER, 1908
The Haida Canoe is more than sixty-four feet long. It came into the possession of the Museum in 1883



The general plan and the decorative features are the conception of Director Hermon C. Bumpus; Stokes Eskimo paintings on the wall at the far end, mural canvases of North Pacific Indians in preparation by Will S. Taylor to take position in the spaces between the windows at right and left, totem poles set to form sections representative of the various tribes, the great ceremonial canoe in the center. The arrangement of the technical exhibits in the cases is the work of Harlan I. Smith, Associate Curator in the Department of Anthropology.

THE WORK ON THE CEREMONIAL CANOE

A MODIFIED METHOD OF MAKING PLASTER CASTS FROM LIFE

By Sigurd Neandross

THE Museum is continually carrying on experiments to find methods for reproducing objects which cannot in themselves, because of the very nature of the case, be exhibited, and when the work was started upon the Ceremonial Canoe Scene of the Chilcat Indians it was found that the earlier methods of cast taking were not entirely satisfactory.

The work as a whole brings an unusually large number of technical problems, for here must be reproduced some forty figures for exhibition without the protection of glass cases in the center of the North Pacific Coast Hall. The lack of protection means that not even the garments, the furs, the masks and regalia can be used, for a few years of such exposure would mean great deterioration in value of some of the richest possessions of the Museum. Therefore everything from the smallest ivory ornament to the largest ceremonial robe has to be reproduced and that in durable materials. The work presents unusual difficulties also, because in addition to its artistic scope, it has to be given great scientific value as a record of individual types of these Indian tribes, requiring at every step work most accurate of form and lifelike in coloring.

In the figure work a new method has been developed to a most successful working so that perfect life casts can be made. A paraffin spraying machine, the idea of which was obtained by Director Bumpus in Europe, has been utilized to cover the model with a coat of wax preliminary to the application of the plaster. Some time after the work was begun, however, a simple brush method of applying the paraffin was substituted for the machine. This yields equally good results and has the advantage of making the method possible for a man working alone in the studio or in the field. The method makes the process less disagreeable for the model than is the case in making the ordinary plaster mold. It is also possible to make larger casts in this manner than by the usual method, such as the full head and shoulders as in a portrait bust, even half the body or in fact the whole if the pose permits. One principal gain in plaster casts taken from molds in which the paraffin process is used is the advantage of accuracy of form whereas in the old method the weight of the plaster compresses and distorts all the softer parts of the body. The threads used to cut the mold being first laid over the model in the usual way, warm paraffin heated in a



SHAMAN'S RATTLE

One is the original, the other a reproduction in plaster. The half-tone shows only in part the striking similarity of the two because of lack of color



SHAMAN'S CEREMONIAL MASK

Lack of color and unequal lighting prevent the apparent identity that exists when the masks are taken in the hand. That on the right is the original



UNFINISHED FIGURE IN PLACE IN CANOE

Each figure is begun in the studio and put into the canoe incomplete to get perfect adjustment of pose and action in the particular spot to be occupied





double boiler is painted over the model with a soft brush. The work is started at the lowest parts; each stroke of the brush leaves a film which immediately becomes hard; the painting or splashing of the paraffin is continued until about one-fourth of an inch is covered over the model. A coat of this thickness will resist any pressure from the plaster which at this stage is applied over the paraffin and in such thickness as to insure the safe handling of the mold. Before the plaster becomes entirely hard the threads are drawn to cut the mold into manageable parts as in the ordinary "piece mold."

In the matter of dressing the figures it was soon found that plaster alone was too brittle and that for clothing or objects of regalia each specimen must have a different treatment. Woven cloth and skins are copied in burlap or caracas cloth which, dipped in a warm solution of glue water, is hung upon the plaster figure and allowed to stiffen there after adjustment in a natural arrangement of folds corresponding to pose and action. This garment can then be covered with a mixture of plaster and glue, and almost any texture imitated by applying the sticky composition with a modeling tool or

brush. The substance adheres to the fibres of the cloth, becomes tough and quite hard, suitable to take a coat of varnish and the color, and is remarkably well fitted for the work as it can be kept in plastic condition for three or four days. As to the color work on both garments and figures, it has proved better to put on a priming color in a higher key than nature after which a thin wash of shellac over the thoroughly dried color forms a backing for a stippling of transparent colors to accentuate the desired effect, eliminating opaque colors in this finishing work. Finally the oily finish of the new paint may be removed and a lifelike texture given to the surface by rubbing over lightly with pumice stone and turpentine.

Results essential to the representation of life as well as the work of suiting the subject, pose and dress to artistic uses must always remain to the skill of the artist working. The method is valuable in museum work and presents a possibility for a new level of accomplishment.

CANOES OF THE NORTH PACIFIC COAST INDIANS

By Harlan I. Smith

Photographs by the Author

A LONG the Pacific Coast from Puget Sound in Washington past British Columbia to Mt. McKinley in Alaska live seven great groups of sea-faring Indians and canoes make one of their most valuable possessions. Their canoes for use on the ocean differ from those for river navigation and those of the south differ from those of the north. Certain tribes have a characteristic type, but the Indians travel great distances and have traded their canoes from tribe to tribe, so that a given type may be used throughout the entire region.

The Haida of the islands of northern British Columbia and southern Alaska make an ocean-going canoe with a breakwater at the prow and both ends curving upward. Canoes of this type are sometimes only large enough for two or three people, while others, especially those formerly made for warfare, will hold as many as forty. In 1909 two of these canoes more than sixty feet long and with prows and sterns extending higher than a tall man's head were seen on the beach of the Kwakiutl village at Alert Bay. This Haida type is one of the most important and seaworthy of all canoes of the coast. The Tlingit Indians, who occupy the coast of Alaska from the Haida country to that of the Eskimo, own many Haida canoes although they make several kinds of their own.



A Grave Monument probably signifying that the deceased "potlatched" many canoe loads of property

The Chinook is another seaworthy and extensively used type. The Nootka of Cape Flattery and western Vancouver Island use it for whale hunting and launch it skillfully through the tremendous breakers constantly washing their coastline. They use a racing canoe also, somewhat similar in shape but long and narrow.

A river type rather smaller than the Chinook sea-going canoe is used by the Salish of Puget Sound and vicinity and also by the southern tribes of the Kwakiutl of northern Vancouver Island and the adjacent mainland. The prow which extends horizontally over the water has a deep notch in the end and meets the main part of the prow to form almost a right angle. A river canoe with spoon-shaped ends is found among the Bella Coola of the inlets of the northern Kwakiutl country, who are very skillful in navigating the swift rivers fed by melting glaciers. Such a canoe is usually poled, one man standing in the prow, another in the stern and poling on opposite sides. This type of river canoe is also used by the adjacent Kwakiutl tribes. The Salish Indians of the west coast of Washington have a canoe very much like it for river navigation but the prow and stern are like those of a scow.

Decoration of the canoes with carved and painted animal figures characteristic of this general region is common, especially among those of the Haida and Chinook types, and the canoes are always cared for as valuable property. Paths are cleared in the rocks on the beach so that the canoes may be drawn up without injury, and sometimes skidways are formed of cross poles

weighted at the ends with stones. A canoe party was observed to improvise such a skidway when landing at a strange beach. The men jumped

into the shallow water and carried their women ashore, then returned to the canoe, flung the dogs into the sea to swim ashore by themselves and next carried arm loads of small slabs to the women. These slabs the women placed crosswise on the beach and as the men pushed the canoe on to the improvised skidway, the women gathered up the slabs as fast as the canoe passed over them and ran ahead to repeat the operation.

Curiously enough a canoe sometimes has a width greater than the diameter of the cedar tree from which it was dug out. To effect this result, the dug out canoe is filled with water, then hot stones are added, and after the wood is somewhat softened, the sides of the canoe are

pressed outward and fastened in place by means of thwarts which are tied in with spruce or cedar rootlets. When the canoe is nearly finished great care is taken in adzing it down, measures being used to get it to the proper thickness throughout. The surface of the canoe is usually charred, which not only serves to give it a good black color but tends to prevent it from decaying.

There is some doubt as to whether sails were used on any of the canoes before the Indians first saw white navigators, but it is certain that they were used before canvas was a commodity in the country, strips of cedar bark being woven together for the purpose as in some of the mats of to-day.



Chinook canoe. Note overhanging prow and vertical stern. Seaworthy and outside of the Haida the most extensively used



River canoes owned by Kwakiutl. Semi-circular in cross section, spoon-shaped at the ends. Poled by two men, one in the prow, one in the stern

THE NEW PLESIOSAUR

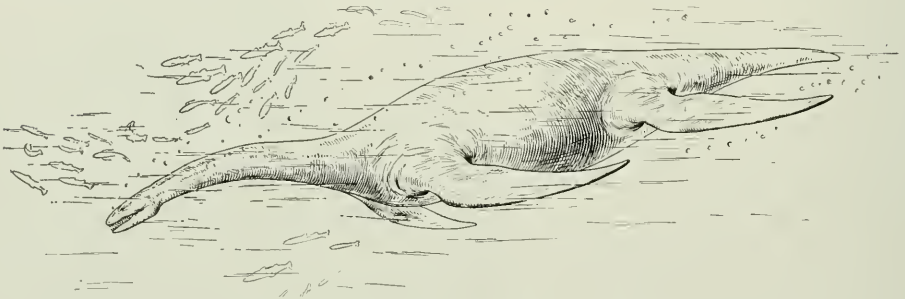
A GREAT MARINE REPTILE OF THE ANCIENT WORLD. IN APPEARANCE
COMPARABLE TO "A SNAKE THREADED THROUGH THE BODY OF A
TURTLE." THE FOSSIL SKELETON IS NOW ON EXHIBITION ON
THE FOURTH FLOOR OF THE MUSEUM

By W. D. Matthew

THE latest addition to the fossil skeletons on exhibition is a great marine reptile, eleven feet long, six feet and seven inches across from tip to tip of the paddles. It belongs to a group long since extinct and is very obviously unlike any living animal. The long flippers, broad compact body and short tail suggest a huge sea turtle; but there the resemblance ends, for the creature had no bony carapace or "shell" and the long stiff neck and small flattened head with sharp teeth flaring out from the jaws are very unlike those of any turtles.

This skeleton was found in an unusually complete condition and moreover, the bones were not distorted by crushing, which made it possible to articulate the skeleton in its true proportions and form, and mount it in a characteristic pose. Generally speaking skeletons as ancient as this one are found flattened in the rock, so that while they make a good bas-relief when the rock is chiseled away, they do not show the real form of the animal as when alive.

Plesiosaurs were both numerous and varied in the Age of Reptiles, and their remains have been found in marine formations of this era in all parts of the world. In the United States they occur in many localities from California to New Jersey, but the best specimens are from the Cretaceous formations of the Great Plains. The remains have been mostly fragmentary,



Sketch Restoration of the *Cryptoclidus*, by Edwin Christman. Note the small head, stiff neck and the turtle-like paddles. Based on the mounted skeleton in the American Museum

AMERICAN PLESIOSAUR *Elasmosaurus*

Restoration by Mr. Charles R. Knight. The long neck which was very likely much less flexible than here depicted, probably allowed this reptile to come up stealthily on prey from underneath while swimming near the bottom in shallow seas

though a few more or less complete skeletons are preserved in this and other museums in America.

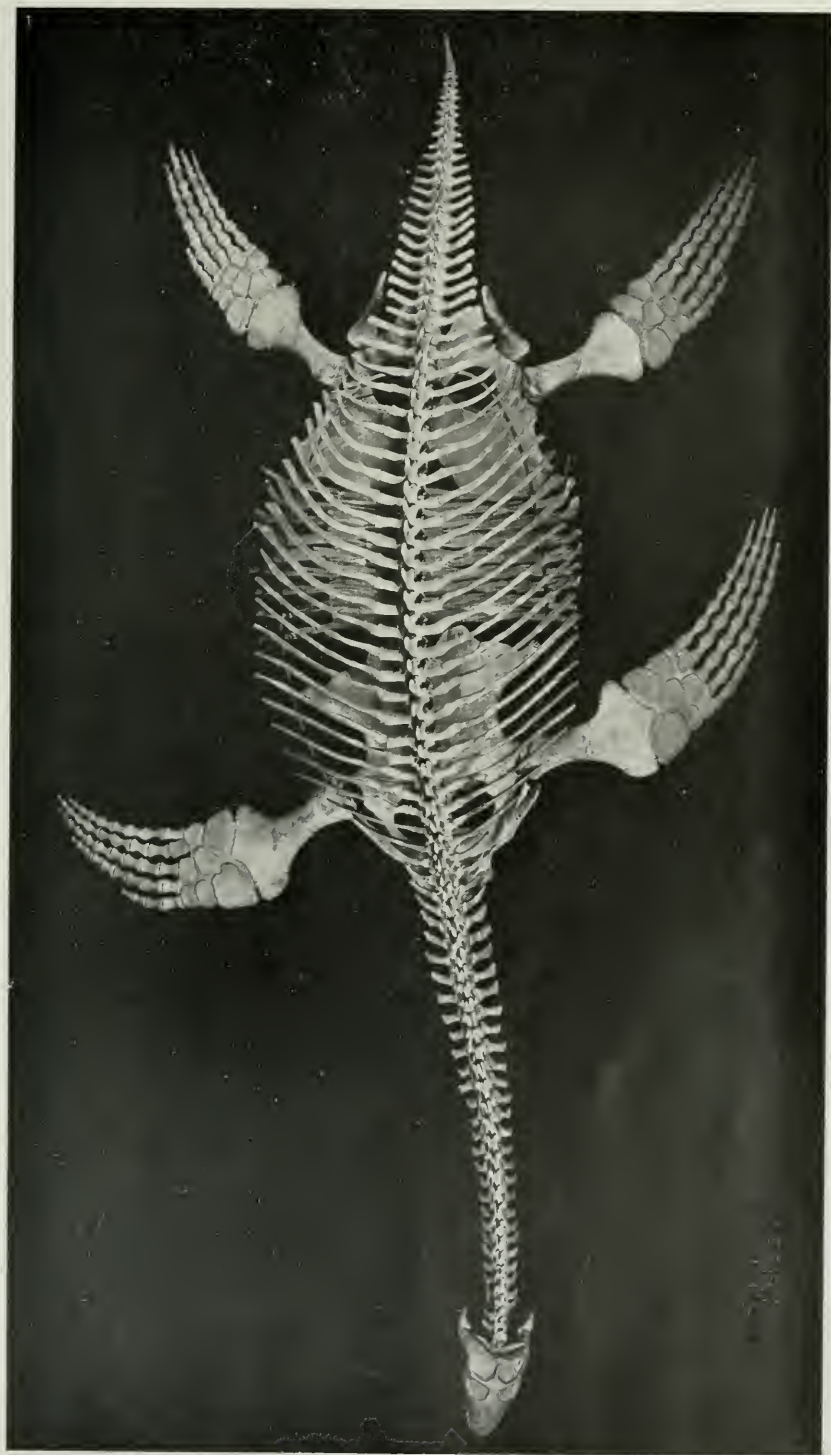
Many skeletons, crushed and flattened but splendidly preserved, have been obtained from the cliffs of Lyme Regis and Whitby in England and from the great slate quarries of Holzmaden in Württemberg, and are preserved in various museums in Europe and America. The clay pits near Peterborough, England, have yielded a large series of Plesiosaur skeletons, most of which are in the British Museum. Fragmentary remains have also been described from India, South America, Australia and New Zealand.

Some of the Plesiosaurs were of gigantic size, thirty to forty feet in length, but more commonly they were smaller, from six to fifteen feet. The length of neck and relative size of the head varied widely in different genera. The American *Elasmosaurus* was forty feet long with a small head and a neck twenty-two feet in length. The other extreme was *Pliosaurus*, equally huge in bulk but with the skull nearly five feet long and the neck only a foot and a half. The smaller Plesiosaurs were intermediate between these two extremes, but most of them had small heads.

The restoration of *Elasmosaurus*, made by Mr. Charles R. Knight under the direction of the late Professor Cope, is based upon a nearly complete skeleton in the Cope collection now in the American Museum. Studies by



Cryptoclidus oroniensis of the Jurassic Period from the Oxford Clays near Peterborough, England. The mounting is by Mr. Charles Lang, under the scientific guidance of Mr. Barnum Brown, Assistant Curator, the pose being selected from careful studies of the skeleton and also of the movements of living sea turtles at the New York Aquarium



Professor Dames of Berlin show, however, that the neck was by no means as flexible as indicated by this restoration. This is proved by the character of the joints of the neck vertebrae, which are nearly flat instead of being ball-and-socket joints as in the neck of mammals and of most modern reptiles, or saddle-shaped joints as in birds. These flat joints, like those in the back of mammals, allow but a limited amount of motion at each joint, which must have been only partially offset by the great number of vertebrae in the neck of the Plesiosaurs.

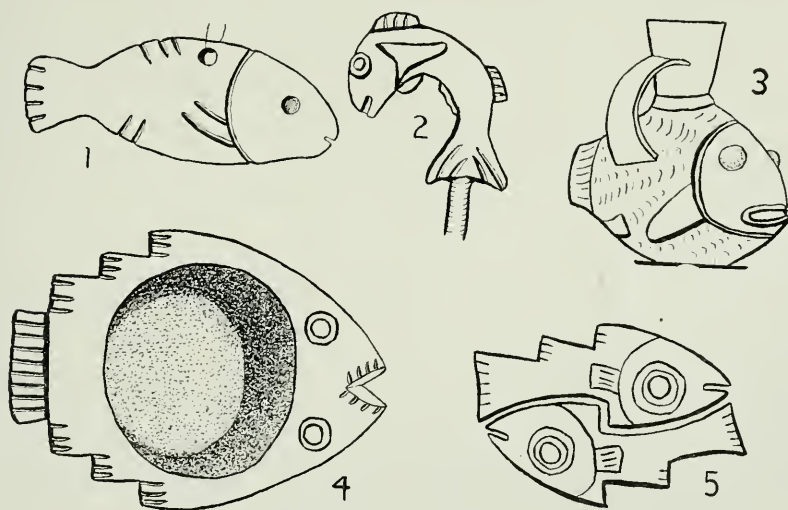
The name Plesio-saur or "near-lizard," given to these animals about a century ago, indicates that they are more like the modern reptiles than are the "fish-lizards" or Ichthyosaurs found in the same geologic formations. But they are not related to lizards any more than to snakes, crocodiles or turtles, and the name of "Great Sea Lizards" which was given to them in the popular natural history works of fifty years ago is an unfortunate one, because there was in the Reptilian Era a third group of great marine reptiles, the Mosasaurs, which were in fact relatives of the lizards and resembled them in many respects, although like Plesiosaurs and Ichthyosaurs, they were provided with swimming paddles instead of feet. Skeletons and restorations of Mosasaurs and Ichthyosaurs are exhibited on the walls of the east corridor near the elevator, and show the differences between these three types of great marine reptiles.

We must suppose that Plesiosaurs were carnivorous, the sharp-pointed flaring teeth being adapted to seize a quick-moving prey rather than to feed upon slow-moving shellfish or upon seaweeds. But from the proportions of the body and the analogy with turtles we may suppose that they swam slowly and usually near the bottom, coming up on their prey stealthily from underneath instead of pursuing it through the water like the swift Ichthyosaurs or the modern sharks and dolphins which these reptiles resembled. The long neck was too stiff for very quick movements, but would nevertheless be of great assistance both in capturing prey and in reaching the surface to breathe, a necessity for all reptiles. It is common to find with Plesiosaur skeletons a considerable number of pebbles enclosed within the body cavity. Sometimes a peck of these pebbles are found—hard, round, with polished surfaces, and varying in size from a hen's egg to a baseball. It is probable that these pebbles assisted digestion, as is the case in many birds, the pebbles seeming to crush and grind the hard parts of the food in the gizzard. If so we must suppose that the prey of the Plesiosaurs contained hard parts for which this kind of crushing was necessary. It has been suggested that they preyed in part upon the squid-like baculites and belemnites whose remains are exceedingly abundant in the same formations.

THE FISH DESIGN ON PERUVIAN MUMMY CLOTHS

AN EXPLANATION OF CERTAIN COMPLEX PATTERNS

OUR largest sources of knowledge of prehistoric Peruvian peoples are records from their graves, not written documents however, for these people of Peru had no written language, but records far more difficult to read with correctness, namely, vessels of clay, wood and brass, or fabrics wrapped about their mummies. In the coastal region of Peru, the people worshipped the sea and the fish as a symbol of the sea, differing in this respect, of course, from inland races. In this coastal region there-

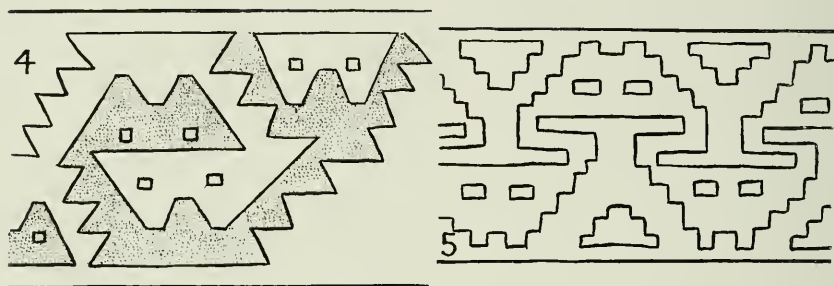
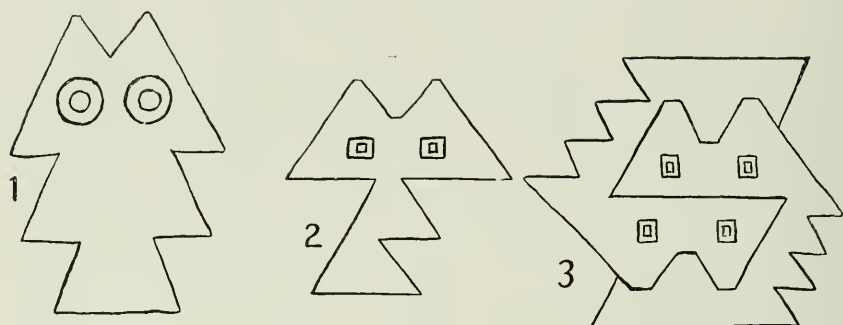


REALISTIC FISH DESIGNS FROM PREHISTORIC PERU

1 — Pendant cut from shell. 2 — Head of bronze implement. 3 — Clay vessel. 4 — Vessel of wood. 5 — Interlocked fish design from pottery

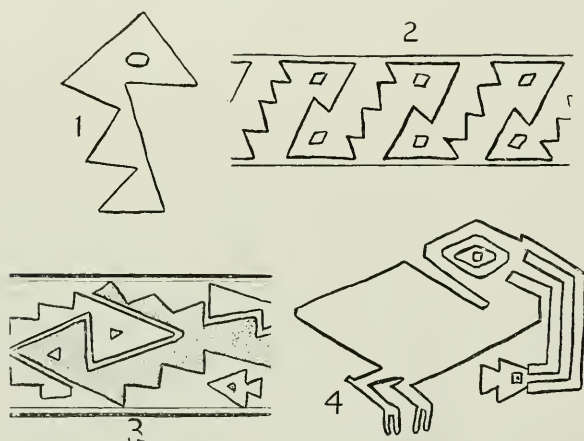
fore, as would be expected, the fish proves a favorite design in decorative art. Pottery, vessels of wood and metal, as well as large coarse pieces of cloth used to wrap about mummy bundles show fish forms with considerable fidelity to nature. Woven fabrics, on the other hand, are decorated more often with conventional designs, designs of much greater simplicity of outline, owing possibly in part to the difficulties in the way of technique in weaving.

Mr. Charles W. Mead of the Depart. of Anthropology has set forth in the Anniversary Volume of Essays presented to Professor Frederic Ward Putnam



CONVENTIONALIZED FISH DESIGNS ON PERUVIAN MUMMY CLOTHS

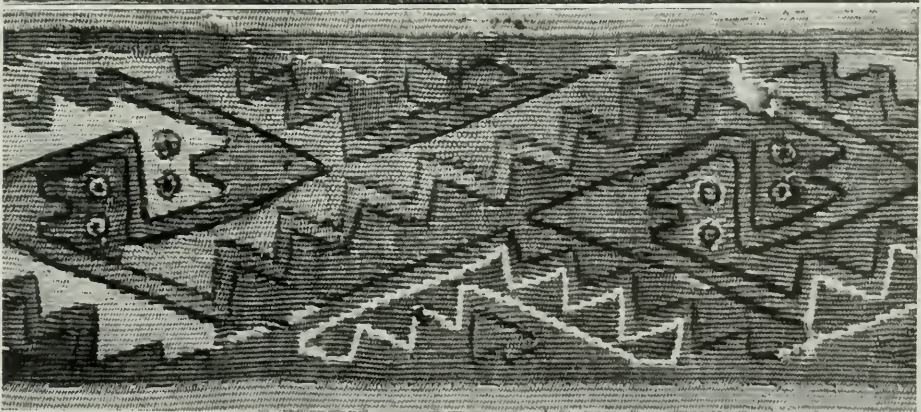
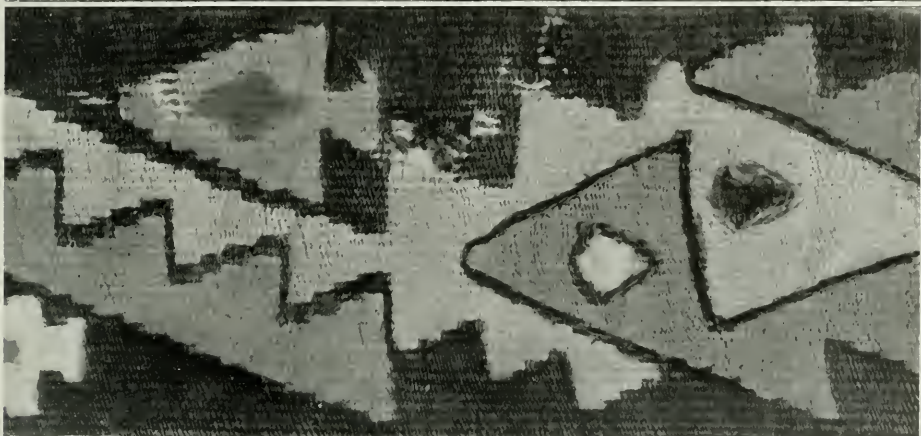
1 — Only the eyes and general form of the fish are preserved. Compare with (4), p. 251. 2 — Still more conventionalized, a key to many complex patterns as in (3), (4) and (5). Compare with (5), p. 251



OTHER CONVENTIONALIZED FISH DESIGNS

The first can be accepted after comparison with (2) above and with (5), p. 251. As a result the second and third also are revealed as fish designs. The fourth represents a pelican-like bird with a fish in its beak; compare with (3)

a very interesting explanation of certain of these complex designs on mummy cloths. He begins with examples in which the fish form is not to be doubted, and traces the design through others less simple to the most complex conventionalized patterns which in no way suggest the fish form, thus showing conclusively that many designs



PORTIONS OF PERUVIAN MUMMY CLOTHS

Chosen to show various highly conventionalized patterns of the interlocked fish design. The softened coloring of these fabrics is wonderfully beautiful

hitherto described as animal figures or designs derived from animal figures are in fact conventionalized fish forms.

The theory underlying the explanation is really that of art progression by degeneration, first promulgated in 1879 by Professor Putnam, who said:

"In the course of time, as art attained increased power of expression, it progressed beyond mere realism and led to the representation of an object by certain conventional characters without that close adherence to nature which was at first necessary to a clear understanding of the idea intended to be conveyed. Thus conventionalism began. Side by side with this conventional representation of objects are found realistic forms; conservatism which is such a strong characteristic of primitive peoples leading to both methods of expression at the same time."

Mr. Mead is the first to make the application of the theory to the evolution of mummy cloth designs; and he makes his point very clear. He has had unusual opportunity for study in the Museum. He has held under his charge for many years the Peruvian mummy cloths, which, if we except those of Berlin, form the world's largest collection. The collection is not wholly known, in fact, because many mummy bundles have never been opened, but still hold secret their fabrics of softened color and symbolic design.

AN INDIAN WHO HELPED THE MUSEUM

By Clark Wissler

NOT so very long ago there came to us the simple message that one of our Indian friends had set out from his tipi expecting to take a brief journey and had taken the long one that ended in the Beyond, the Sand Hills of his people. But a few days before there had arrived at the Museum marked as a gift to the writer a package containing a few specimens and carefully wrapped to themselves a few ordinary trinkets. The contrast between this token and those usually received, for there had been many, might have warned us had not our senses been deadened to the signs of his people. So his last message remains unanswered. It seems fitting, however, that some formal acknowledgment of his services to this Museum should be made. It was chiefly through him that the important medicine bundles in the Plains Indian collections were received, objects no white man should handle, much less own, and certainly not expose to public view. This collection, then, in so far as it represents the Blackfoot Indians is a memorial to him.

He was a priest, a medicine man of the old type, almost the last his race holds. He was born some eighty years ago into the Piegan division

of his people. At the proper age he put himself under the care of a famous medicine man and finally inherited the rituals and formula long used by his teacher. His face was rather feminine and commonplace, except the eyes. No one seeing him in a ceremony when the "spirit was with him" would ever forget the eyes that seemed to light up his whole face. Sharp, the well-known painter, has caught them fast on his canvas. His names, as with the Indian, changed at various periods of life. To us he wished to be known as "The Bear-One."

We first saw The-Bear-One in one of his ceremonies. He wore a robe having blue emblems upon a yellow ground, a simple head-dress of running fisher skins and carried a small feather wand. Through the open front of the robe his body appeared painted an even yellow with star and moon signs on the breast. This robe and its accessories may be seen in the Plains Hall. Not long after, we called upon him. The interview was uneventful and confined to a discussion of our purpose to record faithfully certain facts of Indian life and to preserve certain objects pertaining thereto. While he was respectfully attentive, he seemed not particularly interested. On leaving we remarked that his robe would be a fitting object for our collection. He made no reply, but a burst of laughter from his woman indicated the absurdity of the request. We went our way and the man and his robe were forgotten for a time. One day we received an unexpected call from him, the woman trudging at his heels. He stated that we had asked the robe of him, that such was quite unusual, but that our purpose was creditable; that we were sincere in our efforts to learn the ways of his people, that the memory of them be not lost. Hence, we could have the robe under certain conditions. If he gave the robe to an Indian, he would lose the right to its ceremonial use and the protection of the powers of nature associated therewith; but that he would part with it to us at the cost of making another if we would follow out certain instructions as to its care at our hands and would agree to leave behind the full right to the ceremony. The restrictions as to the care of the robe were necessarily discussed fully, we feeling that no agreement should be made that could not be kept. At one stage of this he became indignant and rose to his feet with the remark, "You came to me with a request, I have come to you with that which you requested and now you receive me as a mere bargainer." A frank apology on our part saved the day and at last common ground was found. At a sign the woman took from under her shawl the old buffalo-hide case containing the robe and placed it in my hands. The-Bear-One urged me to open it and see that all was correct. It was. Without further comment the pair went their way.

We went about our work and waited. The important things were yet to be done. Unless we could get the ritual of that robe, the significance of

its use and its many symbols, we should fail to do what our profession considers most important. By and by we were invited to call on The-Bear-One. This time we got the head-dress and wand upon similar terms. Then followed much visiting between us, but nothing seemed to open the way to the information we desired. He always got away from any discussion that pointed that way. However, he gave us much important data about the ordinary affairs of life. One day he turned to us with, "Let us make an agreement: you always do as I say, I always do as you say." It is useless to try to describe the reaction to this remark. We stood facing each other with long unflinching gaze, each searching the other to the depths. On our part prudence, caution, reason all shouted, "No, never!" Yet — so far we had failed to get a single important medicine bundle, nothing except these few things of his, information concerning them not at all; such a compact would get them all; but the price! At last we ventured, "To such requests as are reasonable to the minds of the asked." Something like reproach and pain flashed across his face, but he clasped my hand and departed. On reflection the rashness of even this impressed us and we resolved not to call upon him for aid except in last resort. In late years he often spoke among his people of this compact as a bond that had never been broken. During the years he made three formal requests of us and we on our part two. One we turned down as impracticable, but made a fair return of another sort.

In association with his robe and head-dress the visitor will see other objects, such as a drum, a whistle of human bone, and the skin of an albino magpie, in short his complete outfit as a medicine man. The information we secured in time: the dreams and visions he experienced, his fasting, how he learned his powers. This we cannot enter upon here. Suffice it to say that the spirit of the sun, the moon, the various stars, the earth, the water and much that pertains to each have some place in the formula of which the objects were, even to him, but crude symbols. He once charged me that if these objects should be rudely handled there would follow an annoying storm of rain and wind. Strangely enough, our workmen in the Museum have twice shifted these objects and in each case the city was swept by a severe storm within two days. Each time we notified our friend of the coincidence; happenings of which he frequently spoke with a pleasure that comes from a faith confirmed.

He believed that he had the knowledge to control the weather and other of nature's works. For many years he had been the leading one to keep the days fair during the annual sun dance ceremonies. One season a young medicine man talked about among his people that he would show his power at the sun dance and bring the rain in spite of our friend. When the day came the horizon was banked with clouds and mist hung upon the hillsides.

The young aspirant appeared in the open among the tipis with a small pipe, dancing, shouting and holding the pipe toward the heavy clouds. Our friend was not idle, but after his way sat modestly in his tipi with his drum — the one in the case — tapping it softly and mumbling his songs and formula. All day long the clouds lowered and rose, of mist there was much, but of rain scarcely a drop. It was an unusual day. Even the prudent old weather prophet would have advised umbrellas and mackintoshes. At intervals the young braggart danced in public, our friend kept to his tipi. After two days of this uncertain weather, the sun came forth bold and clear. Then our friend laid his drum aside and the braggart sought solace in heavy wagers at the wheel games.

At another time our friend accepted a challenge as to which could make it rain more heavily. His rival worked his formula and there was a pour. Then our friend took up his drum and began. Soon there were torrents. The waters rose in all the tipis save his own, but he continued tapping his drum heedless of his fleeing neighbors. What matter if his tipi had been set on a small knoll, thanks to his keen-eyed woman?

The little drum in the case could doubtless tell us many other tales, but they are lost forever. Remember that our friend was but an old unwashed, blanket-covered Indian addicted to the prejudice and folly of his kind, and not the ideal these lines may entice you to imagine. Once he was heard to say that he had lived to know deeply two white men, one daubed in color, one otherwise; that he himself dabbled in medicine, but that each after his way attained his ends. Yes, each has his method — art, science, the medicine formula of the Indian.

There are other objects in the hall that stand as silent memorials to this crude Indian and his time, each object bearing its own unwritten lore and none the less important in science if occasionally the cause of sentiment.

ETHNOLOGICAL COLLECTION FROM CHILI

THE Museum has recently received from Dr. F. D. Aller of Gatico, Chili, a valuable ethnological collection of one hundred and fifty specimens, some of which belong to prehistoric times, others to the sixteenth century. These specimens are much like those in the Museum's collection from Arica, Antofagasta and Chuquicamata, Chili. Of unusual interest are the objects taken from a woman's grave, in particular a work basket of the same form as those found all over the Peruvian coast. In the basket are feather plumes, bone charms and bone awls for basket work, spindles wound with thread, spindle whorls and a finely netted bag used probably for carrying coca.

TEACHERS' DAY

QUOTATION FROM THE TALK OF GEORGE H. SHERWOOD, CURATOR OF THE DEPARTMENT OF EDUCATION

The Teachers' Day exercises were attended and appreciated in a way gratifying to the Museum, which on its part made every effort to set forth in detail both the institution's desire and its wealth of equipment for coöperation with the City in educational work along lines of natural science.—Editor.

ONE of the purposes of the Founders of this Museum was to establish an institution which would encourage and develop a study of natural science. I believe that they had in mind an intimate relation between the Museum and the public schools, and our Trustees have faithfully carried out this idea of the Founders. The work of the Department of Education in this connection falls under two heads: first, what we are prepared to do for the teachers in the building, and second, what we are prepared to do in the schools.

Considering first the work in the building.—We give every fall and spring to school children a series of lectures prepared with the idea of supplementing the work in your class rooms. Topics are chosen for the most part by the teachers and are fully illustrated. Most of you, I know, are sending your pupils to these. In addition to this, largely through the generosity of Dr. A. S. Bickmore, who was founder and first curator of our Department of Education, we have a large series of lantern slides, between thirty and forty thousand. Any teacher may come to our building, select slides, make an appointment, bring her class to the building and there give a lecture on the subject she has chosen. The Museum furnishes lecture room, slides and operator and if the teacher does not care to do the talking will provide also a person to do the talking.

We have started in a small way a room for the children. In this room are modelling tools and drawing instruments and animals of interest to the children. The purpose is recreative, but a competent instructor is always there to direct the play and recreation. And more recently we have opened a room for the blind. In that room are objects which can be handled and which, through the coöperation of the Library for the Blind, have been labelled in raised type.

Second, the work done in the schools.—I refer to the circulating collections sent out to the public schools. When the Department of Education of New York City placed in your hands its first syllabus of nature study, it made no provision to supply you with material. As a result we had numer-

ous applications for assistance. Director Bumpus felt that here was an opportunity to carry out the idea of the Founders and prepared ten small cases of birds. These were sent to the schools. From that beginning has grown the work of to-day, but instead of ten cases there are more than four hundred cases and we are supplying monthly nearly four hundred schools of the city. You are better able than I to judge of the practical use of these collections. We have felt encouraged by a letter that came from a little girl in one of the East side schools. The teacher had evidently used a collection of our birds for a lesson in language which had taken the form of a letter to the Director of the Museum: "My dear Director Bumpus, I am very glad that you sent the birds to us. We have enjoyed them very much. I think they are all beautiful, but of all the birds I have studied the one I like the best is the English sparrow because it is the only one I have ever seen."

NEWS FROM THE ARCTIC EXPEDITION

SINCE the last issue of the JOURNAL, letters have been received from the Stefánsson-Anderson Expedition. That from Mr. Stefánsson was written April 25 at a place fifty miles on the way to the Coppermine and holds out bright prospects for the journey, in part because he had fortunately been able to purchase fifty pounds of pemmican from a sailor at Cape Parry. The expedition was about to start on the remaining three hundred miles but with only three Eskimo assistants, great difficulty having been experienced in getting any Eskimos to go because of fear of violence from the Coronation Gulf people. Of these three he writes that Natkutjiak is the sort who will go anywhere, Tannaumirk will follow anywhere and Pannigabluk, the woman, is used to starving, having been near death from hunger half a dozen times. The country through which they will pass has many lakes and rivers unknown to geographers. Mr. Stefánsson is supplied with charts of the region made by Dr. Richardson in 1846 and he considers them authoritative, saying, "They omit many things, but do not put down things not here. For the huge non-existent R. la Roncière, Dr. Richardson is not to blame. His charts are innocent of it, though all our newer maps have it."

The letter from Dr. Anderson was written August 13. It announces that at last he has in hand the supplies sent by the Museum in 1908 and 1909. He had not yet heard from Mr. Stefánsson, who, however, had told him not to worry if he did not hear until Christmas.

THE NEW LOON GROUP

THE loon's penetrating call, reported to sound like demoniac laughter, is well known to people visiting northern lakes. Few see the bird, however. If they do catch a brief glimpse of it, they decide that its neat tailor-like appearance, with head black, breast clear white, back closely polka-dotted with white, belies the weirdness of its call. Loons are noted for skill in diving and swimming, being able to proceed rapidly under



A PORTION OF THE NEW HABITAT BIRD GROUP

several fathoms of water. It is said that they have been caught with hooks set for trout eighty feet below the surface in New York lakes. It is known that many loons winter at sea fifty miles or more from land.

Two loons are shown in the new habitat bird group which is reproduced from studies made in June, 1909, on the New Hampshire shore of Lake

Umbagog. One bird is standing erect over its two large eggs in a nest of leaves on the ground; the other just coming up from the water is half hidden by a ridge of moss. That it is June is proclaimed in the foreground of the group by a clump of blossoming viburnum, by tall purple rhodora and on the ground waxen flowers of hunchberry. Rocks at the edge of the lake make gradual the transition to the painted background where the artist, Mr. Hobart Nichols, has portrayed a portion of the lake, its irregular evergreen-covered projections of land and its still reaches of water leading to a farther shore and mountains in the distance.

This group is the last in the series of habitat bird groups installed under the supervision of Mr. Frank M. Chapman, the habitat being the work of Mr. J. D. Figgins and Mr. A. E. Butler. That the loon group has been made possible is due to the generosity of the benefactors to whom the Museum is indebted for the whole series.

WOMEN NOT CONSERVATIONISTS

From an Address by Frank M. Chapman

INSECTS cost a loss to our forests of \$100,000,000 a year. The Biological Survey of the United States has shown that the stomach of a single cedar bird contained 100 canker worms, that of a cuckoo 250 tent caterpillars, of a chickadee 454 plant lice, of a flicker 1,000 chinch bugs, and of a scarlet tanager 630 gypsy moth caterpillars. A tanager eats moth caterpillars at the rate of 2,100 an hour. A Maryland yellow-throat ate 3,500 plant lice in forty minutes.

Yet chief among the enemies of the birds and therefore of the forests is woman. In shopping districts where I have made ornithological studies on women's hats, I found woodpeckers, flycatchers, orioles, bobolinks, meadow larks, tree and white-throated sparrows, snow buntings, waxwings, swallows, tanagers, warblers, thrashers, robins and bluebirds by scores and hundreds. The destructive power of fashion is shown in the case of the ptarmigan grouse. In winter it is snowy white and its plumage may be dyed any color. The flesh of the birds is good food, but the food demand did not drain the supply. When the feathers became fashionable, however, 2,000,000 were killed in four years; one shipment contained ten tons of wings. Twenty thousand paradise birds are shipped annually. Of the thousands of herons which glorified our marshes only a few remain since the egret plumes became the fashion. In one year Venezuela exported 1,538,000 plumes of herons, and these figures do not take into account possibly double that number of young herons which starved in their nests for lack of care.

MUSEUM NEWS NOTES

THE following have been elected recently to membership in the Museum: Life Members, MESSRS. BENJAMIN WALWORTH ARNOLD, DICKSON Q. BROWN, CHARLES W. HARKNESS, D. P. KINGSLEY and T. B. PARKER, CAPTAIN JOHN J. PHELPS and COLONEL ROBERT M. THOMPSON; Sustaining Member, MR. RALPH WURTS-DUNDAS; and Annual Members, HIS EXCELLENCY WILLIAM H. TAFT, MESSRS. WILLIAM A. ADRIANCE, MARSHAL CHANDLER BACON, F. O. BEZNER, L. F. BRAINE, W. B. COGSWELL, FRANK R. CORDLEY, JULIEN T. DAVIES, J. BENJAMIN DIMMICK, F. N. DOUBLEDAY, H. C. DRAYTON, WILLIAM SEYMOUR EDWARDS, THOMAS W. FARNAM, WILLIAM T. FLOYD, J. R. GLADDING, HENRY J. S. HALL, PHILIP W. HENRY, A. F. HOLDEN, L. E. HOLDEN, JOHN H. ISELIN, EDWARD H. KIDDER, OTTO R. KOECHL, TOWNSEND LAWRENCE, ARTHUR LEHMAN, ARTHUR LINCOLN, LUCIUS N. LITTAUER, R. S. LOVETT, ALFRED BISHOP MASON, STEPHEN O. METCALF, ROBERT GRIER MONROE, J. SEAVER PAGE, EDWARD C. PERKINS, GEORGE E. PERKINS, LEWIS A. PLATT, GEORGE E. SCHANCK, ALFRED L. SELIGMAN, GEORGE ST. JOHN SHEFFIELD, LOUIS MORRIS STARR, SAMUEL THORNE, JR., THOMAS G. WASHBURN, ALEXANDER M. WHITE, LUCIUS WILMERDING, ORME WILSON, JR., and JOHN YARD; REV. DR. GEORGE C. YEISLEY, DRS. CHARLES L. DANA and JOHN E. WILSON, GENERAL CHARLES F. ROE and MMES. CHARLES OTIS KIMBALL, JOHN MURRAY MITCHELL, and E. L. BREESE NORRIE.

THE following members of the Board of Trustees contributed toward the expense of Teachers' Day: Messrs. Cleveland H. Dodge, J. Pierpont Morgan, Adrien Iselin, Jr., Seth Low, J. Hampden Robb and Henry F. Osborn.

At the Quarterly Meeting of the Board of Trustees of the Museum held on November 14 the following changes were made in the scientific staff: Dr. Louis HUSSAKOF was appointed Associate Curator of Fossil Fishes; Mr. John T. NICHOLS, Assistant Curator of Recent Fishes; and Dr. William K. GREGORY, Assistant in the Department of Vertebrate Palaeontology.

THREE members of the Scientific Staff, Dr. J. A. ALLEN, Curator of the Department of Mammalogy, Mr. Frank M. CHAPMAN, Curator and Mr. W. DeW. MILLER, Assistant in the Department of Ornithology, attended the 28th annual meeting of the American Ornithologists' Union in Washington, November 15-17. Dr. ALLEN was the first President of the Union, serving for seven years (1883-1891); Mr. CHAPMAN is now first Vice-President.

MR. BARNUM BROWN of the Department of Vertebrate Paleontology has recently returned from an expedition to Montana which completes the work on the Laramie formation begun in 1902 and carried on continuously since that time except during the year 1907. The most important specimen obtained was an unusually complete skeleton of *Trachodon*. As a result of the work in Montana the Museum will be able to restore and mount all of the chief representatives of dinosaur life during the Laramie Cretaceous period which marked the close of dinosaur life in the United States.

THE NATIONAL ASSOCIATION OF AUDUBON SOCIETIES met at the Museum October 25. Besides other business a resolution was passed expressing to Mrs. Dutcher the gloom cast upon the meeting by the illness of William Dutcher, the Association's President. The lecture in the evening was given by Professor John B. Watson of Johns Hopkins University on the "Facilities for the Study of Animal Behavior on the Dry Tortugas Bird Reservation."

MR. W. DEW. MILLER acted recently as expert ornithologist to pass on the legality of sale of about one hundred species of birds submitted by milliners of the State. Mr. Miller identified the skins and reported that under the ruling of the Shea bill passed by the last Legislature, forty-three among them could not be used on women's hats. Among these were Bohemian waxwing, snow bunting, swift, magpie, sooty and white terns, green heron and white heron, screech owl, condor, jay and skylark.

THE MUSEUM LIBRARY lacks for its files volumes II to VIII inclusive of the JOURNAL. The librarian would be grateful if Members who have any of these numbers and do not care to keep them would send them to the Museum.

LECTURE ANNOUNCEMENTS

MEMBER'S COURSE

The following illustrated lectures of the course remain to be given to Members of the Museum and persons holding complimentary tickets given them by Members.

Thursday evenings at 8:15 o'clock. Doors open at 7:45.

December 1 — MR. FRANK M. CHAPMAN, "From Sea-level to Snow-line in Vera Cruz, Mexico."

December 8 — MR. JAMES L. CLARK, "Snap Shots from British East Africa."

December 15 — DR. PLINY E. GODDARD, "Nomadics of the Southwest."

December 22 — MR. ROY C. ANDREWS. Subject to be announced.

PUPIL'S COURSE

These lectures are open to the pupils of the public schools when accompanied by their teachers and to the children of Members of the Museum on presentation of Membership tickets.

Lectures begin at 4 o'clock.

December 2 — MRS. AGNES L. ROESLER, "Children of All Nations."

December 5 — MR. WALTER GRANGER, "Transportation: Past and Present."

December 7 — DR. LOUIS HUSSAKOF, "A Trip to Europe."

December 9 — MR. BARNUM BROWN, "Life on the Plains."

PEOPLE'S COURSE

Given in coöperation with the City Department of Education.

Saturday evenings at 8:15 o'clock. Doors open at 7:30.

The last three of a course of five lectures on "Biology" by MR. BENJAMIN C. GRUENBERG. Illustrated by stereopticon views.

December 3 — "Life Defensive: Resisting the Environment."

December 10 — "Life Victorious: Mastering the Environment."

December 17 — "Heredity."

Tuesday evenings at 8:15 o'clock. Doors open at 7:30. Illustrated.

December 6 — MR. CHARLES T. HILL, "The Post-Roads of the High Alps."

December 13 — DR. JOHN C. BOWKER, "The Passion Play."

LEGAL HOLIDAY COURSE

Fully illustrated. Open free to the public. Tickets not required.

Lectures begin at 3:15 P. M. Doors open at 2:45 P. M.

December 26 — DR. LOUIS HUSSAKOF, "The Fish and Fisheries of the Southern States."

January 2 — MR. ROY W. MINER, "Corals and Coral Islands."

February 22 — PROF. C-E. A. WINSLOW, "Insect-Carriers of Disease."

Public meetings of the New York Academy of Sciences and its Affiliated Societies will be held at the Museum according to the usual schedule. Programmes of meetings are published in the weekly *Bulletin* of the Academy.

The American Museum Journal

MARY CYNTHIA DICKERSON, *Editor*.

FRANK M. CHAPMAN,	} <i>Advisory Board.</i>
LOUIS P. GRATACAP,	
WILLIAM K. GREGORY.	

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