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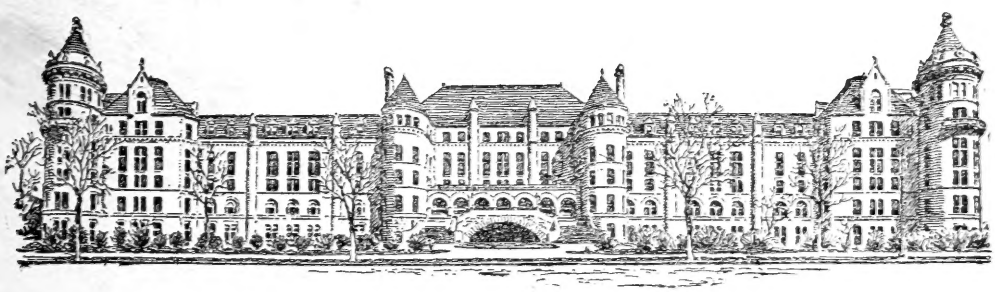
THE AMERICAN MUSEUM JOURNAL



BRONTOSAURUS NUMBER

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American Museum of Natural History

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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
Life Members.....	100	Patrons.....	1000

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 Wednesdays, Thursdays, Fridays, Saturdays and Sundays. Admittance is free to Members every day.

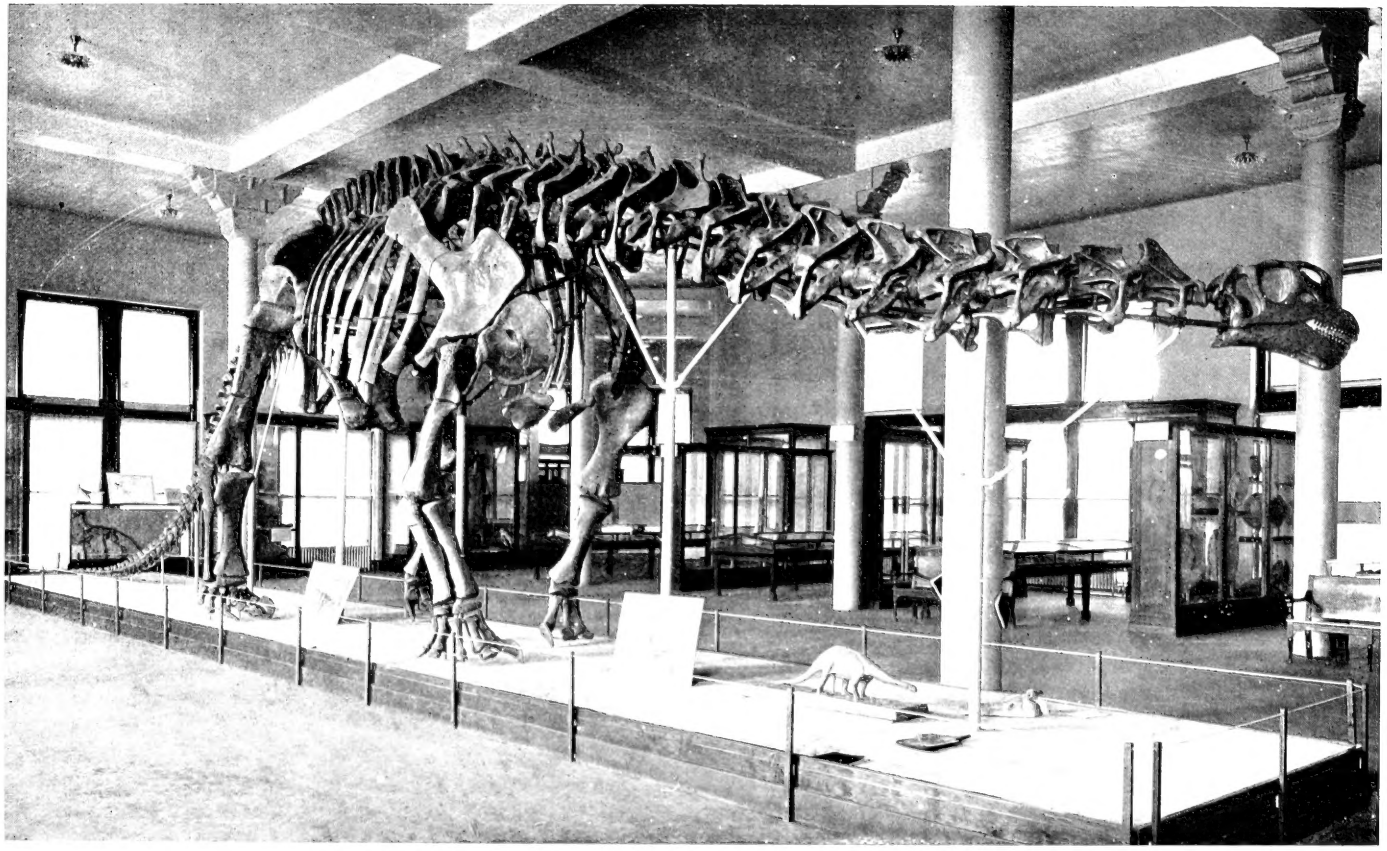


FIG. 1. MOUNTED SKELETON OF BRONTOSAURUS IN THE AMERICAN MUSEUM OF NATURAL HISTORY

The American Museum Journal

VOL. V. APRIL, 1905. No. 2

THE MOUNTED SKELETON OF BRONTOSAURUS.

BY W. D. MATTHEW.

EIGHT years ago the American Museum began a search for fossil reptiles in the Rocky Mountain States. The prime object of the search was to obtain skeletons of the Dinosaurs, those gigantic extinct animals whose fragmentary remains, discovered in that region and studied and described especially by the late Professor Marsh, have excited the greatest interest among men of science. In order to place these marvels of an antique world before the public in tangible form, a Dinosaur Hall was planned, in which should be exhibited mounted skeletons of the principal kinds of Dinosaurs. To obtain these, a series of expeditions into the regions of the arid West, where such fossils are to be found, was inaugurated and carried on under direction of Professor Osborn, and the collections of the late Professor Cope, containing three splendid skeletons of Dinosaurs, were purchased through the liberality of President Jesup.

This programme involved an amount of work hardly to be appreciated by outsiders, and it is as yet far from being complete. Nevertheless, the mounting of the largest skeleton, the Amphibious Dinosaur Brontosaurus, has been finished, the skeleton of a remarkable dwarf Dinosaur, the "Bird-Catcher," has been mounted and placed on exhibition, the preparation and mounting of entire skeletons of three other large and very extraordinary types (the Carnivorous, Duck-billed and Armored Dinosaurs) are well under way, and diligent search is being made for complete and mountable skeletons of other important kinds. Many other more fragmentary specimens have been found, some of which are exhibited in the wall-cases around the hall.

Visitors see here the largest fossil skeleton that has ever been mounted, and may obtain some idea of the variety and the extraordinary character of the animals which populated the earth during the Age of Reptiles, millions of years ago, before the Age of Mammals had begun or the various races of quadrupeds which now inhabit the world had commenced their evolution.

The Brontosaurus skeleton, the principal feature of the hall, is sixty-six feet eight inches in length, and stands fifteen feet two inches high. Its petrified thigh-bone weighs 570 lbs. The weight of the animal when alive is estimated at not less than ninety tons. About one-third of the skeleton, including the skull, is restored in plaster, modeled or cast from other incomplete skeletons. The remaining two-thirds belong to one individual, except for a part of the tail, one shoulder-blade and one hind limb, supplied from another skeleton of the same species.

The skeleton was discovered by Mr. Walter Granger, of the Museum expedition of 1898, about nine miles north of Medicine Bow, Wyoming. It took the whole of the succeeding summer to extract it from the rock, pack it and ship it to the Musuem. Nearly two years were consumed in removing the matrix, piecing together and cementing the brittle and shattered petrified bone, strengthening it so that it would bear handling, and restoring the missing parts of the bones in tinted plaster. The articulation and mounting of the skeleton and modeling of the missing bones took an even longer time, so that it was not until February, 1905, that the Brontosaurus was at last ready for exhibition.

It will appear, therefore, that the collection, preparation and mounting of this gigantic fossil has been a task of extraordinary difficulty. No museum has ever before attempted to mount so large a fossil skeleton, and the great weight and fragile character of the bones made it necessary to devise especial methods to give each bone a rigid and complete support, as otherwise it would soon break in pieces from its own weight. The proper articulating of the bones and the posing of the limbs were equally difficult problems, for the Amphibious Dinosaurs, to which this animal belongs, disappeared from the earth long before the dawn of the Age of Mammals, and their nearest relatives, the living

lizards, crocodiles, etc., are so remote from them in either proportions or habits that they are unsatisfactory guides in determining how the bones were articulated, and are of but little use in posing the limbs and other parts of the body in positions that they must have taken during life. Nor among the higher

FIG. 2. SKELETON OF BRONTOSAURUS IN THE QUARRY

Showing three sections of the backbone partly covered with plaster bandages for transportation to the Museum. The ribs have already been removed from the near side of the backbone. Tools used in the work lie scattered about the quarry.

animals of modern time is there one which has any analogy in appearance or habits of life to those which we have been obliged by the study of the skeleton to ascribe to the Brontosaurus.

As far as the backbone and ribs were concerned, the articulating surfaces of the bones were a sufficient guide to enable us to pose this part of the skeleton properly. The limb-joints, however, are so imperfect, that we could not in this way make sure of having the bones in a correct position. The following method, therefore, was adopted:

A dissection and thorough study was made by the writer, with the assistance of Mr. Granger, of the limbs of alligators and

other reptiles, and the position, size and action of the principal muscles were carefully worked out. Then the corresponding bones of the Brontosaurus were studied and the position and size of the attachments of the corresponding muscles were marked out, so far as they could be recognized from the scars and processes preserved on the bone. The Brontosaurus limbs were then provisionally articulated and posed, and the position and size of each muscle were represented by a broad strip of paper extending from its origin to its insertion. The action and play of the muscles on the limb of the Brontosaurus could then be studied, and the bones adjusted until a proper and mechanically correct pose was reached. The limbs were then permanently mounted in these poses, and the skeleton as it stands is believed to represent, as nearly as study of the fossil enables us to know, a characteristic position that the animal actually assumed during life.

The Brontosaurus was one of the largest of the Amphibious Dinosaurs or Sauropoda, a race of gigantic reptiles which flourished during the Jurassic or Middle Period of the Age of Reptiles, —some eight millions of years ago by a moderate estimate of geological time. These Amphibious Dinosaurs are more ancient than any of the extinct mammals in the adjoining hall (No. 406), except for a few tiny jaws in the Small Mammal Alcove. They were the largest animals that ever lived, excepting some of the whales, and certainly were the largest animals that ever walked on four legs.

In proportions and appearance the Brontosaurus was quite unlike any living animal. It had a long thick tail like the lizards and crocodiles, a long flexible neck like an ostrich, a thick, short, slab-sided body and straight, massive, post-like limbs suggesting the elephant, and a remarkably small head for the size of the beast. The ribs, limb-bones and tail-bones are exceptionally solid and heavy; the vertebræ of the back and neck, and the skull, on the contrary, are constructed so as to combine the minimum of weight with the large surface necessary for attachment of the huge muscles, the largest possible articulating surfaces, and the necessary strength at all points of strain. For this purpose they are constructed with an elaborate system of

braces and buttresses of thin bony plates connecting the broad articulating surfaces and muscular attachments, all the bone between these thin plates being hollowed into a complicated

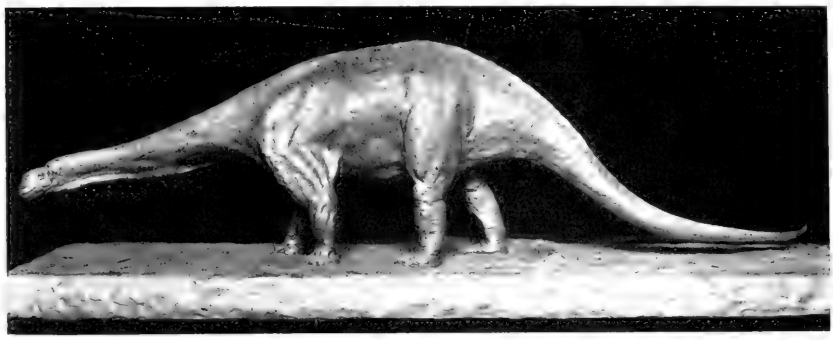


FIG. 3. MODEL OF BRONTOSAURUS. BY CHARLES R. KNIGHT, 1905
Executed from the mounted skeleton, under direction of Professor H. F. Osborn

system of air-cavities. This remarkable construction can be best seen in the unmounted skeleton of Camarasaurus, another Amphibious Dinosaur.

The teeth of the Brontosaurus indicate that it was an herbivorous animal feeding on soft vegetable food. Three opinions as to the habitat of Amphibious Dinosaurs have been held by scientific authorities. The first, advocated by Professor Owen, who described the first specimens found forty years ago, and supported especially by Professor Cope, has been most generally adopted. This regards the animals as spending their lives entirely in shallow water, partly immersed, wading about on the bottom or, perhaps, occasionally swimming, but unable to emerge entirely upon dry land. More recently Professor Osborn has advocated the view that they resorted occasionally to the land for egg-laying or other purposes, and still more recently the view has been taken by Mr. Riggs and the late Mr. Hatcher that they were chiefly terrestrial animals. The writer inclines to the view of Owen and Cope, whose unequaled knowledge of comparative anatomy renders their opinion on this doubtful question especially authoritative.

The contrast between the massive structure of the limb-bones, ribs and tail, and the light construction of the backbone, neck

and skull, suggests that the animal was amphibious, living chiefly in shallow water, where it could wade about on the bottom, feeding on the abundant vegetation of the coastal swamps and marshes, and pretty much out of reach of the powerful and active Carnivorous Dinosaurs which were its principal enemies.

FIG. 4. RESTORATION OF BRONTOSAURUS. BY CHARLES R. KNIGHT
This restoration represents Professor Osborn's view of the habits of the animal

The water would buoy up the massive body and prevent its weight from pressing too heavily on the imperfect joints of the limb- and foot-bones, which were covered during life with thick cartilage, like the joints of whales, seals and other aquatic animals. If the full weight of the animal came on these imperfect joints, the cartilage would yield and the ends of the bones would grind against each other, thus preventing the limb from moving without tearing the joint to pieces. The massive, solid limb- and foot-bones weighted the limbs while immersed in water, and served the same purpose as the lead in a diver's shoes, enabling the Brontosaurus to walk about firmly and securely under water. On the other hand, the joints of the neck and back are exceptionally broad, well-fitting and covered with a much thinner

surface of cartilage. The pressure was thus much better distributed over the joint, and the full weight of the part of the animal above water (reduced as it was by the cellular construction of the bones) might be borne on these joints without the cartilage giving away.

Looking at the mounted skeleton we may see that if a line be drawn from the hip-joint to the shoulder-blade, all the bones below this are massive, all above (including neck and head) are lightly constructed. This line then may be taken to indicate the average water-line, so to speak, of this Leviathan of the Shallows. The long neck, however, would enable the animal to wade to a considerable depth, and it might forage for food either in the branches or the tops of trees or, more probably, among the soft succulent water-plants of the bottom. The row of short, spoon-shaped, stubby teeth around the front of the mouth would serve to bite or pull off soft leaves and water-plants, but the animal evidently could not masticate its food, and must have swallowed it without chewing, as do modern reptiles and birds.

The brain-case occupies only a small part of the back of the skull, so that the brain must have been small even for a reptile, and its organization (as inferred from the form of the brain-cast) indicates a very low grade of intelligence. Much larger than the brain proper was the spinal cord, especially in the region of the sacrum, controlling most of the reflex and involuntary actions of the huge organism. Hence we can best regard the Brontosaurus as a great, slow-moving animal-automaton, a vast storehouse of organized matter directed chiefly or solely by instinct and to a very limited degree, if at all, by conscious intelligence. Its huge size and its imperfect organization, as compared with the great quadrupeds of to-day, rendered its movements slow and clumsy; its small and low brain shows that it must have been automatic, instinctive and unintelligent.

COMPOSITION OF THIS SKELETON.

The principal specimen, No. 460, is from the Nine Mile Crossing of the Little Medicine Bow River, Wyoming. It consists of the 5th, 6th and 8th to 13th cervical vertebræ, 1st to 9th dorsal and 3d to 10th caudal vertebræ, all the ribs, both coracoids, parts of sacrum and ilia, both ischia and pubes, left femur

and astragalus and part of left fibula. The backbone and most of the neck of this specimen were found articulated together in the quarry, the ribs of one side in position, the remainder of the bones scattered around them, and some of the tail-bones weathered out on the surface.

From No. 222, found at Como Bluffs, Wyo., were supplied the right scapula, 10th dorsal vertebra, and right femur and tibia.

No. 339, from Bone Cabin Quarry, Wyo., supplied the 20th to 40th caudal vertebræ; No. 592, from the same locality, the metatarsals of the right hind foot, and a few toe-bones are supplied from other specimens.

The remainder of the skeleton is modeled in plaster, the scapula, humerus, radius and ulna from the skeleton in the Yale Museum, the rest principally from specimens in our own collections. The modeling of the skull is based in part upon a smaller incomplete skull in the Yale Museum, but principally upon the complete skull of *Morosaurus* shown in Case 42.

Mounted by A. Hermann; completed Feb. 10, 1905.

TWO NEW BIRD GROUPS.

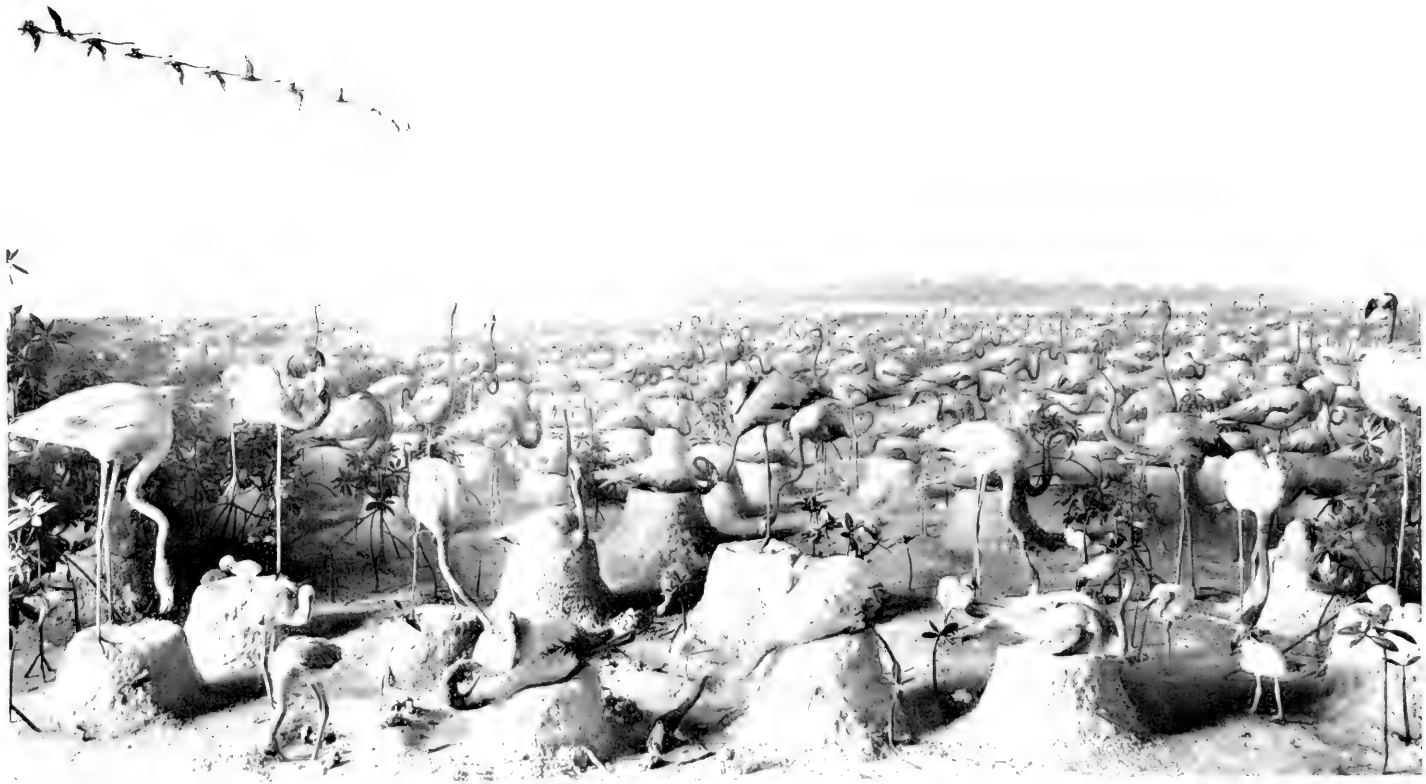
THE recently completed group of Flamingos and of the summer bird-life of the San Joaquin Valley of California, photographs of which are reproduced on pages 71 and 77, more closely approach the Museum's ideal of an exhibit illustrating the haunts and nesting-habits of birds than any which have heretofore been prepared.

Both are based upon careful field studies, by artist as well as by ornithologist, and both accurately portray not only the home-life of the species they represent, but also, through the use of a painted background, the character of the region in which the birds live.

Aside from their beauty, which renders them attractive to the most casual observer as well as to the ornithologist, these groups possess much scientific value. This is particularly true of the Flamingo group, in which the nesting-habits of this bird are for the first time properly shown.

These two groups make important additions to the series already prepared through the generosity of several friends of the Museum, who have contributed to a fund designed for this purpose.

By no means the least important feature of the Museum's expedition to the Bahamas in search of material for the Flamingo



THE FLAMINGO GROUP

Background painted by Charles J. Hittell (landscape) and Louis Agassiz Fuertes (birds). Birds mounted by Herbert Lang

group is the influence exerted by the Museum toward the enactment of a law which has just gone into effect establishing a close season on the Flamingo and other birds which formerly were without legal protection in the colony, and prohibiting the killing of song and insectivorous birds at any season.

MUSEUM NEWS NOTES.

A LARGE part of the Philippine exhibit of the St. Louis Exposition has been acquired by the Museum, subject only to a gift of certain duplicate material to the Smithsonian Institution and to the Commercial Museum of Philadelphia. When packed, ready for shipment, the material thus acquired filled twenty freight cars. All visitors to the exposition will realize that this acquisition is a matter of the highest importance not only to the Museum and to the city, but to the country at large, and that it places here the most comprehensive single collection representing the life and industries of any of the groups of Pacific islands.

The material has arrived at the Museum and a small portion of it has been arranged for temporary exhibition in the North and West Wings of the second floor of the building, but there is material enough to fill an entire wing of the building without duplicating exhibits. The present temporary installation enables the visitor to gain a very good summary idea of the culture of the important tribes inhabiting the islands. Clothing and textile fabrics, household utensils, agricultural implements, fish and game traps, arms, houses, boats and other means of transportation and articles of manufacture, all find their place here in ample illustration. The Museum, furthermore, is exhibiting part of the original material at the Lewis and Clark Centennial Exposition at Portland, Oregon. The Portland exhibit will come to the Museum at the close of the exposition.

J. Pierpont Morgan, Esq., has lately added to the gem collection material representing forty-one mineral species used or available for use as gems. Among the cut stones are some

remarkable rubellites and other California tourmalines, and some choice beryls and topazes. Two superb kunzites, one of 224 karats and the other of 118 karats, add brilliancy to the display of that peculiar new gem. Some new gold specimens are worthy of special mention. The installation of the gem collection has been entirely remodeled, greatly to the improvement of its effectiveness. The floor space of the whole corridor is now devoted to the gems and gem material, each species having a special pedestal case devoted to its proper display. The change in the installation of the gems has necessitated the temporary removal and storage of some of the finest exhibition portions of the mineral cabinet, but they will be displayed again as soon as room can be made for them.

Mr. Morgan has also presented to the Museum the George F. Kunz collection of meteorites, which has been on exhibition for some years as a loan. The collection comprises some rare specimens, including two which are unique and have never been described, and the largest mass (1038 pounds) of Cañon Diablo which has been found.

The mineral cabinet has been enriched by the acquisition of several rarities from the noted Binnenthal locality in the Tyrolean Alps Among the species and varieties received may be mentioned bementite, hutchinsonite, smithite, trechmannite and lengenbachite. A remarkable antique jade labret is one of the recent additions to the collection.

The appearance and usefulness of the local collection of the New York Mineralogical Club have been greatly enhanced by the substitution of neat printed labels for the previous typewritten cards.

The Department of Conchology has received from Mr. F. A. Constable a gift of the last installment of the celebrated Hirase collection of the land shells of Japan, and the series is now on its way to the Museum. This installment comprises about 1000 specimens of shells belonging to 220 species, bringing the total of the Hirase collection in the possession of the Museum up to

about 4000 specimens of 800 species. The series is fully representative of the land molluscan fauna of Japan, and while the specimens are not strikingly beautiful, they are of high scientific interest.

A LARGE proportion of the radium exhibit gotten together for the St. Louis Exposition by the United States Geological Survey has been presented to the Museum and has been temporarily installed in the Hall of North American Mammals (No. 206). The exhibit consists of minerals containing uranium, polonium, radium, actinium and other radio-active minerals; compounds and apparatus illustrating the various steps in the process of manufacture, and photographs and literature bearing upon radio-activity. The principal source of radium is pitchblende from Joachimsthal, Bohemia, but it has also been derived from carnotite, a Colorado mineral, and it occurs widespread in minute quantities. This exhibit attracted great attention at the exposition and is the object of much study by visitors to the Museum.

ANOTHER of the exhibits from the St. Louis Exposition which have been received at the Museum is the material that was sent out by the New York City schools. This exhibit has been temporarily arranged in the East Hall of the second floor (No. 207) and has been visited by thousands of school children and their parents.

A MODEL representing a village of the Koryak tribe of eastern Siberia has been completed by the Department of Ethnology and placed on exhibition in the West Hall of the ground floor. The model represents not only the half-underground houses with their strange hopper-shaped superstructures, but also the industries of the people and the preparation of their store of food for the long winter. The season represented in the group is the autumn.

THROUGH the courtesy of the Oregon Historical Society of Portland, the Museum has had the opportunity of studying, photographing and making casts of an important series of

archæological specimens, mostly from the region between The Dalles and the mouth of the Willamette River. There were fifty-six specimens, comprising implements and other objects in carved stone of several kinds. Such sculptures are rare so far north in America, while several of them are quite unique and are new to archæologists. This loan has enabled the Museum practically to complete its data regarding known specimens from this archæological province.

On February 17 the new Dinosaur Hall of the Department of Vertebrate Palæontology was opened to the public. The principal object in this hall is the great skeleton of Brontosaurus, an enormous herbivorous animal distantly related to the lizards. A detailed description of this specimen, the only exhibit of its kind in the world, is given in another part of the present issue of the JOURNAL. The other great families of dinosaurs (the Carnivorous, the Horned, the Armored and the Spoon-billed) will all be represented in this hall. On the south side of the room have been installed several magnificent specimens of fossil turtles and tortoises from the Cretaceous beds of the West. The specimens for the Dinosaur Hall have been derived from the collections made by the Museum field expeditions from 1897–1904, which have been presented by the Trustees, and the E. D. Cope Collection of Reptiles, Amphibians and Fishes, which was presented to the Museum in 1902 by President Jesup.

The Tower Room has been set aside for the reception of the collection of fossil fishes which is now in process of installation. The principal portions of this collection are the famous Newberry Collection deposited with the Museum by Columbia University; the Cope Collection presented by President Jesup, and an extensive series from Syria.

Over the arch leading into the Morgan Hall of Mineralogy, the Department of Vertebrate Palæontology has installed the giant fish known as *Portheus* from the American Mediterranean Sea of the Cretaceous period.

THERE has recently been placed on exhibition in the Hall of Fossil Mammals a representative series of the remarkably rich

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THE SAN JOAQUIN VALLEY GROUP

Background painted by Charles J. Hittell (landscape) and Louis Agassiz Fuertes (birds). Birds mounted by H. S. Denslow

extinct fauna collected in caves in Arkansas by Messrs. Walter Granger and Barnum Brown in 1903 and 1904, on expeditions sent into the region by the Museum.

Early in March, Mr. Frank M. Chapman, Associate Curator of Ornithology, went into the swamps of Florida for the purpose of studying the life history of the Brown Pelican and of obtaining additional material for the group illustrating this remarkable bird. He reports exceptional success in attaining the objects of the expedition. He has also obtained data, photographs and specimens with which to represent the nesting-habits of Ward's Heron, the Water Turkey and other birds, greatly enriching our Museum and study collections.

In commemoration of Audubon's one hundred and twenty-fifth birthday, the Museum has placed on exhibition in Hall No. 308, a collection of Audubon relics. Among the objects is the portfolio in which Audubon carried specimen plates while securing subscribers to his great work in this country and abroad, together with sketches and finished plates. Here are also his gun and hunting coat, and the dog harness used in Labrador, mementoes of the journey to the then Far West.

Dr. E. O. Hovey, Associate Curator of Geology, went to Mexico early in February on a geological expedition through the practically unknown Sierra Madre mountain region of western Chihuahua. He reports visiting a wonderful series of cañons, from 2000 to 6000 feet in depth and from 5 to 11 miles in width, which have been carved by the rivers out of the elevated plateaus forming the major portion of the state. Dr. Hovey has also visited the great copper mines at Bisbee, Arizona, and Nacozari and Cananea, Sonora, Mexico. The specimens collected from these mines, as well as from the region traversed in the main expedition, will form valuable additions to our series illustrating economic and mining geology. Hundreds of negatives form an important part of the results of the expedition. Professor Robert T. Hill, formerly of the United States Geological Survey, is the leader of the party.

LECTURES.

MEMBERS' COURSE.

THE second course of lectures to members of the American Museum of Natural History by officers of the scientific staff of the Museum was given according to the following programme:

Thursday evenings at 8.15 o'clock.

February 2.—PROF. A. F. BANDELIER, "The Traveling Indian Medicine Men of Bolivia."

February 9.—PROF. LIVINGSTON FARRAND, "Religious and Ceremonial Life of the North American Indians."

February 16.—PROF. MARSHALL H. SAVILLE, "Ruins of Mayan Cities in Central America."

February 23.—MR. GEORGE H. PEPPER, "Explorations in the Southwest and in Mexico during 1904."

March 2.—MR. GEORGE H. SHERWOOD, "The Game and Food Fishes of Our Atlantic Coast."

March 9.—PROF. WILLIAM MORTON WHEELER, "The Habits of Ants."

March 16.—PROF. ALBERT S. BICKMORE, "Northern Germany—Bremen, Hamburg and Lübeck."

March 23.—PROF. ALBERT S. BICKMORE, "Southern Germany—Stuttgart, Nuremberg and Rothenburg."

PUPILS' COURSE.

DURING the spring and summer terms of the public schools the lectures at the Museum to the pupils have been continued according to the schedule which follows. These lectures, which are intended to supplement the regular grade work in geography are so popular with teachers and classes that it is necessary to use the Auditorium for the whole course. The lecturers are Messrs. L. P. Gratacap, R. W. Tower, W. M. Wheeler, E. O. Hovey, H. I. Smith, G. H. Sherwood, G. H. Pepper and Barnum Brown of the scientific staff of the Museum.

	Mar.	Apr.	May.	
Mon.	6	3	8	"Russia and Japan."
Wed.	8	5	10	"The Capitals of Europe."
Fri.	10	7	12	"The Industries of the United States."
Mon.	13	10	15	"The American Indian."
Wed.	15	12	17	"In Polar Regions."
Fri.	17	14	19	"Spanish America."

	Mar.	Apr.	May.	
Mon.	20	24	22	"The Physical Divisions of the United States."
Wed.	22	26	24	"Egypt and her Neighbors."
Fri.	24	28	26	"Our Island Possessions."
		May		
Mon.	27	1	29	"Methods of Transportation—Past and Present."
Wed.	29	3	31	"The Work of Water."
			June	
Fri.	31	5	2	"New York City—Past and Present."

COLUMBIA UNIVERSITY—MUSEUM COURSE.

During February, Prof. Henry Fairfield Osborn, Curator of Vertebrate Palæontology in the Museum and Da Costa Professor of Zoölogy in Columbia University, delivered a course of six illustrated lectures on "The Evolution of the Horse," in co-operation between the Museum and Columbia University. The programme of the lectures was as follows:

Wednesday, February 1.—"The Horse as an Animal Mechanism."

Adaptation of the teeth, skull, skeleton, musculature and internal anatomy to the special functions of grazing and of speed.

Monday, February 6.—"The Horse in Relation to the Idea of Evolution."

The chief facts in the evolution and geographical distribution and the special relation of horses to their environment.

Wednesday, February 8.—"The Fossil History of the Horse, especially in North America."

Supposed ancestors of the horse in the Cretaceous and Basal Eocene Periods. The first appearance of true horses in the Lower Eocene.

Monday, February 13.—"The Fossil History of the Horse," Continued.

Reasons for believing that the evolution of the true horses has taken place in this country. Causes of the extinction of all the native horses in North and South America.

Wednesday, February 15.—"Existing Races of Horses, Asses and Zebras."

Discussion of the question as to which of these types inhabited North America and the causes of their present distribution in Asia and Africa.

Monday, February 20.—"Probable Origin of the Domesticated Breeds of Horses."

Are domestic breeds of multiple origin? Semi-wild or feral race of horses in different parts of the world. Modes of distribution and intermingling of these breeds. The horse as a factor in civilization.

PEOPLE'S COURSE.

The programme of public lectures given Tuesday and Saturday evenings in co-operation with the Department of Education of the City of New York for the third course of the season 1904–1905 has been as follows:

Tuesdays, a course on European geography:

March 7.—Mr. Gerhardt C. Mars, "Venice of the Golden Ring."

March 14.—Prof. H. E. Northrop, "Vesuvius and the Bay of Naples."

March 21.—Dr. Clarence H. Young, "Travels in Greece."

March 28.—Mr. Henry H. Parry, "Wales and Her People."

April 4.—Mr. Peter MacQueen, "Scotland."

April 11,—Prof. Sutton Fletcher, "Castles and Palace Homes of England."

April 18.—Prof. Sutton Fletcher, "The Cathedrals and Abbeys of Britain."

April 25.—Mr. Roland S. Dawson, "The St. Louis Expedition."

Saturdays, a course of lectures on sound and music by Prof. E. R. Van Nardroff:

March 4.—"Nature of Sound."

March 11.—"Musical Tone and Stringed Instruments."

March 18.—"Sympathetic Tone and Musical Timbre."

March 25.—"Simple Wind Instruments."

April 1.—"Reed Wind Instruments."

April 8.—"Miscellaneous Musical Instruments."

April 15.—"Sound Waves and Musical Harmony."

April 22.—"Telephone and Phonograph."

MEETINGS OF SOCIETIES.

The meetings of the various societies that make the Museum their home have been continued throughout the quarter. Papers on technical and general scientific subjects are read before these societies. The papers and discussions are often of popular character and are always of considerable general interest. The public is invited to attend the meetings, and members of the Museum, on making request of the Director, will be provided with programmes of the meetings as they are published.

The New York Academy of Sciences holds its meetings as follows, at 8:15 P.M.:

First Mondays.—Business meeting and 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 on varying dates meetings are held by the New York Linnæan Society, the New York Mineralogical Club and the New York Entomological Society.

These meetings will continue throughout the month of May and then recess will be taken until October.

As illustrating the wide scope of the work of these societies and the general character of the papers presented at the meetings, we quote the following titles from the monthly bulletins of the Scientific Alliance of New York.

HOFRATH PROF. DR. ALBRECHT PENCK of the Imperial University, Vienna, on "The Glacial Surface Features of the Alps." Illustrated.

PROF. HENRY FAIRFIELD OSBORN on "Recent Discoveries of Extinct Animals in the Rocky Mountain Region and their Bearings on the Present Problems of Evolution." Illustrated.

PROF. J. J. STEVENSON on "Recent Advances in our Knowledge of the Composition of Coal."

PROF. JAMES F. KEMP on "New Sources of Supply of Iron Ore."

PROF. W. M. WHEELER on "Ants that Raise Mushrooms." Illustrated.

DR. F. A. LUCAS on "Whales and Whaling on the Coast of Newfoundland." Illustrated.

PROF. JAMES F. KEMP on "The Physiography of the Adirondacks." Illustrated.

PROF. F. E. LLOYD on "Botanical Research at the Desert Laboratory in Arizona." Illustrated.

MR. B. S. BOWDISH on "Photography in Nature Study." Illustrated.

MR. FRANK M. CHAPMAN on "Florida Bird Life." Illustrated.

MR. C. G. ABBOTT on "A Bird-lover in the Scottish Highlands."

MR. C. WILLIAM BEEBE on "A Naturalist's Camping Trip in Old Mexico."

MR. JONATHAN DEWIGHT, JR., on "Some of the Rare Birds of New York."

PROF. J. J. STEVENSON on "A Visit to the Coal Fields of the Island of Spitzbergen."

DR. GEORGE F. KUNZ on "The Jagersfontein Diamond, the Largest Diamond ever Cut." Illustrated with models and photographs.

DR. EDMUND OTIS HOVEY on "St. Vincent, British West Indies. The Eruptions of 1902 and their Immediate Results." Illustrated.

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