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A Trustee of the Museum from 1915 until his death on August 12, 1929

FIELD MUSEUM OF NATURAL HISTORY

FOUNDED BY MARSHALL FIELD, 1893

PUBLICATION 271

REPORT SERIES

VOL. VIII, No. 1

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ANNUAL REPORT OF THE  
DIRECTOR

TO THE  
BOARD OF TRUSTEES

FOR THE YEAR 1929



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January, 1930

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Bequests to Field Museum of Natural History may be made in securities, money, books or collections. They may, if desired, take the form of a memorial to a person or cause, to be named by the giver. For those desirous of making bequests to the Museum, the following form is suggested:

### FORM OF BEQUEST

I do hereby give and bequeath to Field Museum of Natural History of the City of Chicago, State of Illinois, \_\_\_\_\_

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*Cash contributions made within the taxable year to Field Museum of Natural History to an amount not in excess of 15 per cent of the taxpayer's net income are allowable as deductions in computing net income under Article 251 of Regulation 69 relating to the income tax under the Revenue Act of 1926.*

*Endowments may be made to the Museum with the provision that an annuity be paid to the patron during his or her lifetime. These annuities are tax-free and are guaranteed against fluctuation in amount.*

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## ANNUAL REPORT OF THE DIRECTOR

1929

To the Trustees of Field Museum of Natural History:

I have the honor to present a report of the operations of the Museum for the year ending December 31, 1929.

It is most gratifying to be able to report an attendance for the year which breaks all records in the history of the Museum. The total number of visitors during 1929 was 1,168,430. This figure represents an increase of 144,803 over the attendance in 1928, and 122,884 over 1927, the latter year's attendance having been the largest previously attained in the Museum's history. It is worthy of note, too, that the 1929 attendance marks the third successive year in which the number of visitors has exceeded one million. Such impressive and encouraging figures indicate a response on the part of the public to the Museum's activities which makes it certain that the institution is fulfilling its great mission of disseminating knowledge of the natural sciences on a broad scale. Attendance of this size is, further, a tribute to the farsightedness of the Founder of the Museum, and the many others through whose generous benefactions it has been possible to carry on the work on an ever expanding scale.

The highest attendance for any single day in the history of the Museum was also achieved during 1929, on Friday, May 24, when the Museum received 59,843 visitors.

A large part of the increase in the Museum's endowment, and an increasing part of the institution's operating funds, are derived from the many contributions received in the form of memberships. Renewed expressions of gratitude therefore are due to the many persons who have evidenced their interest and good will in this manner. On December 31, 1929, the Museum had on its membership rolls 5,781 names, a number exceeding that of any previous year. As the increased attendance indicates a growing appreciation by the public of what the Museum is doing for it, the increased membership indicates a growing realization of the value and importance of the services rendered the public and a disposition to cooperate in promoting their success. Every membership represents a contribution

which is deeply appreciated by the administrative officials of the Museum. The lack of such support would cause a serious curtailment in the institution's work.

In recognition of the extremely valuable and eminent services rendered the Museum by Mr. Richard T. Crane, Jr., and Mr. Cornelius Crane, the Trustees during 1929 voted to add their names to the list of Benefactors; and this has been done in accordance with the Trustees' order.

In recognition of eminent services rendered to Science, the Board of Trustees elected the following persons as Honorary Members of the Museum: Mr. William V. Kelley, Mr. Frederick H. Rawson, Colonel Theodore Roosevelt, Mr. Kermit Roosevelt, and Mr. C. Suydam Cutting.

In recognition of their eminent services to the Museum, the Trustees elected the following persons as Patrons of the Museum: Mrs. Stanley Field, Mrs. Evelyn Field, Mr. Samuel Insull, Mr. Arthur S. Vernay, Colonel J. C. Faunthorpe, Captain Harold A. White, Mr. Walter A. Strong, and Major John Coats. With regret it is recorded that, shortly after his election, Colonel Faunthorpe died.

The following were elected as Life Members of the Museum: Mr. Max Adler, Mr. Alfred S. Austrian, Miss Florence Dibell Bartlett, Mrs. Jacob Baur, Mr. Edward J. Bermingham, Mr. Chauncey B. Blair, Mr. Rush C. Butler, Mr. Wayne Chatfield-Taylor, Mr. James D. Cunningham, Mr. Charles G. Cushing, Mr. Henry M. Dawes, Mr. Rufus C. Dawes, Mr. Edward J. Doyle, Mr. Louis Eckstein, Mr. George B. Everitt, Mr. Calvin Fentress, Mr. Charles Fernald, Mr. Milton S. Florsheim, Mr. Huntly H. Gilbert, Mr. Charles F. Glore, Mrs. Ernest A. Hamill, Mr. William F. Hayes, Mr. Frank P. Hixon, Mr. James C. Hutchins, Mr. Martin J. Insull, Mr. Theodore E. Joiner, Mr. D. F. Kelly, Mr. William H. Kidston, Mr. Alexander Legge, Mrs. Albert F. Madlener, Mr. Eames MacVeagh, Mr. John E. MacLeish, Mrs. Cyrus McCormick, Jr., Mrs. Robert G. McGann, Mr. Carl Meyer, Mr. Walter P. Murphy, Mr. Stuyvesant Peabody, Mr. Robert H. Ripley, Mr. Charles W. Seabury, Mr. Vaughan C. Spalding, Mr. Eugene M. Stevens, Mr. H. L. Stuart, Mrs. Roger C. Sullivan, Mr. P. C. Ward, and Mr. Philip K. Wrigley.

Mrs. Roger C. Sullivan, it is regretfully recorded, has died since her election.

A list of all classes of Members will be found at the end of this Report.

Vacancies on the Board of Trustees were filled by the election of Mr. Fred W. Sargent, Mr. Samuel Insull, Jr., and Mr. William V. Kelley. Mr. George A. Richardson was elected as a Corporate Member, and at the December meeting of the Board of Trustees he was placed in nomination for a trusteeship, with final action scheduled for the Annual Meeting to be held in January, 1930.

The outstanding addition to the exhibits during the year was the Neanderthal (Mousterian) Man group, installed in Ernest R. Graham Hall of Historical Geology, which was completed and opened to the public on June 8. This life-size group, showing an entire family of Neanderthals and a replica of a cave once actually occupied by these prehistoric people, is the only restoration of its kind in the world. It is a gift to the Museum from Mr. Ernest R. Graham, and is the work of Mr. Frederick Blaschke, sculptor, of Cold Spring-on-Hudson, New York. Research and collecting of material for use in connection with it was performed by the Marshall Field Archaeological Expedition to Western Europe in 1927, under the leadership of Mr. Henry Field, Assistant Curator of Physical Anthropology. The group attracted a tremendous amount of attention, and it is estimated that fully 400,000 Museum visitors have viewed it since it was placed on exhibition. The publicity in connection with it exceeded all precedents, photographs of it and articles about it having appeared in newspapers and magazines all over the world. A complete description of the group will be found in this Report on page 143.

A great many other new exhibits were placed on view during the year. A few of those which are especially interesting are as follows: six additions to the series of large mural paintings of prehistoric animals, presented by Mr. Graham and painted by Mr. Charles R. Knight, bringing the total now on the walls of Graham Hall to sixteen; a habitat group of Indian rhinoceros, the animals being reproduced (by the cellulose-acetate method developed by Taxidermist Leon L. Walters) from specimens obtained by the James Simpson-Roosevelts Asiatic Expedition of 1925-26; a group of Abyssinian dassies composed of specimens obtained by the Field Museum-Chicago Daily News Abyssinian Expedition of 1926-27; a model of an oil well; a 341½-carat aquamarine gem presented by Mr. Richard T. Crane, Jr.; a specimen of the peculiar Guatemalan cow-tree presented by the United Fruit Company as a result of a request from

Professor Samuel A. Record, Research Associate in Wood Technology; a number of antiquities from Kish recently obtained by the Field Museum—Oxford University Joint Expedition to Mesopotamia; a selection of the zoological specimens brought home by the Cornelius Crane Pacific Expedition; and a life-size figure representing a Dyak hunter of Borneo.

In addition to the above, four new groups for the Hall of American Mammal Habitat Groups were completed, to be opened to the public early in January, 1930. These consist of a group of polar bear, the specimens for which were presented by Mr. Frederick H. Rawson; a group of Alaska brown bear composed of specimens obtained in 1927 by the John Borden—Field Museum Alaska—Arctic Expedition and the Alexander H. Revell—Field Museum Alaska Expedition; a group of American bison composed of specimens presented by the late Arthur B. Jones, and a group of musk-ox of the Hudson Bay variety (see page 151). The other new exhibits mentioned in the preceding paragraph are all described in detail in the section of this Report devoted to INSTALLATIONS AND REARRANGEMENTS, beginning on page 128.

Much progress was made with reinstallations and improvements in many of the exhibition halls of the Museum, and with relabeling. Especially notable in this respect are the improvements made in Hall J (Egyptian archaeology), Hall 5 (Indians of the Great Plains), Hall D (African ethnology), the Madagascar collection in Hall E, the Arthur B. Jones Malaysian Collection in Hall G, Carl E. Akeley Memorial Hall (African mammals), Hall 21 (systematic bird collections), Hall 25 (plant economics), Charles F. Millspaugh Hall (North American woods), Hall 34 (minerals, crystals, meteorites, physical geology), Clarence Buckingham Hall (physical geology, rocks, relief maps), and Hall 36 (petroleum, coal, clays, sands).

Including parties engaged in domestic field work, the Museum had seventeen expeditions operating during 1929, and an eighteenth expedition got under way just as the year closed. Thirteen expeditions were at work in overseas territory or foreign waters; four were engaged in work in North America. Full details concerning the personnel, and the work performed, of all the expeditions will be found in the section of this Report under the heading EXPEDITIONS AND RESEARCH, beginning on page 47. The following is a brief summary:

The William V. Kelley—Roosevelts Expedition to Eastern Asia for Field Museum completed its work of more than a year's dura-

tion with the return of the last member in December. The expedition was eminently successful, bringing the Museum a total of 15,397 zoological specimens, 2,400 sheets of botanical specimens, and a few ethnological items. Most remarkable was the success of Colonel Theodore Roosevelt and Mr. Kermit Roosevelt in obtaining near the Tibetan border a complete specimen, including skin, skull and skeleton, of the rare giant panda, the first such specimen ever brought out of Asia. The animal fell before the joint fire of their rifles, and is the first, so far as known, ever shot by a white man. Of the total specimens collected a large proportion was obtained by the second division which worked in French Indo-China under the leadership of Mr. Harold Coolidge, Jr., of Boston. Valuable assistance, which was most helpful and is highly appreciated, was rendered to the expedition by Mr. Jean Theodore Delacour of Seine-Inférieure, France; by His Royal Majesty, the King of Luang-Pro-bang; and by various military and civil officials of the government of French Indo-China.

Likewise eminently successful was the Cornelius Crane Pacific Expedition of Field Museum, the members of which returned in September after nearly ten months of cruising and collecting among the islands of the South Pacific, aboard Mr. Crane's yacht, the *Illyria*. This expedition brought back approximately 18,000 zoological specimens, and also a few ethnological and geological specimens. A new species of rodent was discovered in the Galapagos Islands by this expedition. Mr. Karl P. Schmidt, Assistant Curator of Reptiles, was leader of the scientific party.

The Frederick H. Rawson-Field Museum Ethnological Expedition to West Africa completed its work in Angola (Portuguese West Africa) where extensive and valuable collections were made, and proceeded to Nigeria (British West Africa) where work was to be continued in the early part of 1930. Reports from the leader of the expedition, Mr. W. D. Hambly, Assistant Curator of African Ethnology, indicate that intensive studies were made of many tribes encountered during more than 10,000 miles of travel in Africa. More than 1,200 artifacts were collected in Angola alone; and valuable data, still and motion pictures, and dictaphone records were obtained for ethnological research purposes.

The Chancellor-Stuart-Field Museum Expedition to the South Pacific obtained rare zoological specimens, among them two of the giant lizard of Komodo, Dutch East Indies, and two of the reticulated python of Borneo, largest reptile known to science. The

expedition, sponsored and led by Mr. Philip M. Chancellor of Santa Barbara, California, is concluding its work and is expected home early in 1930. Mr. Norton Stuart, also of Santa Barbara, is co-leader. The Museum is greatly indebted to Mr. Chancellor for the interest in its work which led him to organize this expedition, which was entirely financed by him, and has resulted so splendidly. Mr. Chancellor has also kindly agreed to defray the cost of preparing some of the groups resulting from the expedition.

One division of the Marshall Field Botanical Expedition to the Amazon is continuing work in Peru, where it probably will remain for several months of 1930. The main division, led by Dr. B. E. Dahlgren, Acting Curator of Botany, returned in the autumn of 1929 with several thousand specimens of the native flora of Brazil.

The Field Museum-Oxford University Joint Expedition to Mesopotamia completed its seventh season of excavations on the site of the ancient city of Kish, and will go into its eighth season of work during 1930. Field Museum's participation in this expedition is sponsored by Mr. Marshall Field. Valuable collections and archaeological data of extreme importance resulted from the 1929 work. Professor Stephen Langdon continued as director of the expedition and Mr. L. C. Watelin as field director.

The Harold White-John Coats Abyssinian Expedition of Field Museum, sponsored and led by Captain Harold A. White of New York and Major John Coats of Ayrshire, Scotland, obtained specimens of various animals for a large water hole group, and valuable miscellaneous collections. The water hole group will be one of the largest and finest ever attempted in the Museum, and the institution owe much gratitude to Captain White and Major Coats for their contributions of money, time and work in connection with this expedition. To Negus Tafari Makonnen of Abyssinia, whose hearty cooperation helped vitally to make the expedition a success, the Museum's thanks and appreciation are also due.

The Thorne-Graves-Field Museum Arctic Expedition, sponsored and led by Mr. Bruce Thorne of Chicago and Mr. George Coe Graves II of New York, obtained a number of fine specimens of walrus and of Alaska caribou for proposed habitat groups. Indications are that the walrus specimens will make possible a remarkably lifelike group. This opportunity is taken to express the appreciation of the Museum to Messrs. Thorne and Graves for financing and undertaking this expedition. To them, and also to Mr. Henry Graves,



THE LATE RUSSELL W. HENDEE

A young mammalogist who gave his life for science in French Indo-China while a member of the William V. Kelley-Roosevelts Expedition to Eastern Asia for Field Museum

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Jr., the Museum is further indebted for a gift of funds to cover the cost of preparing the group.

The Second Marshall Field Archaeological Expedition to British Honduras, led by Mr. J. Eric Thompson, Assistant Curator of Central and South American Archaeology, returned with important collections of Maya artifacts, and much valuable information, resulting from research, which will be used in Museum publications.

The Field Museum-Williamson Undersea Expedition to the Bahamas, working with special equipment for submarine exploration, obtained collections of undersea fauna and data for seven elaborate habitat groups to be constructed in the projected new Hall of Fishes. Mr. J. E. Williamson of New York was leader.

Other expeditions and field work conducted during the year include the researches and photographing of botanical type specimens still in progress in Europe in charge of Mr. J. Francis Macbride of the Department of Botany, under an appropriation received from the Rockefeller Foundation; a botanical expedition in Peru in charge of Dr. August Weberbauer; an ornithological expedition to Arizona; a geological expedition to New Mexico which collected specimens representing the ancient extinct volcanoes of that state, and a zoological expedition in India. The last four were sponsored by Mr. Marshall Field, in addition to the other expeditions already alluded to which were made possible by the funds he provided. The zoological expedition in India was terminated by the unfortunate sudden death of its leader, Colonel J. C. Faunthorpe of Bombay. In addition to the preceding, parties from the Museum conducted paleontological field work in Indiana, and special work for the Department of Zoology in Canada.

The eighteenth expedition to get under way is the Vernay-Lang Kalahari Expedition for Field Museum, which sailed for London on December 27, where final preparations will be made. Departure for Africa is scheduled for early in 1930. This expedition is financed by Mr. Arthur S. Vernay of New York and London, and he will be one of the joint leaders. Associated with him in the leadership will be Mr. Herbert Lang, who is recognized as one of the foremost authorities on African mammals. Other members will be Captain B. E. H. Clifford, Imperial Secretary at Pretoria, Transvaal, British South Africa; Mr. W. Rudyerd Boulton, ornithologist, and Mr. Allan Chapman. A number of rare animals not now represented in the Museum's collections will be sought. One of the chief objectives will be specimens for a group of the beautiful giant sable antelope of

Angola. This opportunity is taken to express the gratitude of the Museum to Mr. Vernay for organizing and conducting this important expedition.

A misfortune befell the William V. Kelley-Roosevelts Expedition to Eastern Asia, in the death of Mr. Russell W. Hendee, young mammalogist of Brooklyn, New York, who was a member of the division which worked in French Indo-China. He died on June 6 at Vientiane, a victim of a tropical fever contracted in the unhealthful interior of that country. His passing was a sad loss not only to his companions but also to Field Museum and all who are interested in zoological exploration. In this field he had won a place which gave promise of unusual accomplishment in the future. Although he had no connection with Field Museum before the expedition started, it had been agreed that he should join its permanent Staff on his return. This agreement had been based upon the reputation he had gained as a student and graduate of the University of Iowa, as a collector of exhibition material in the Arctic for the Colorado Museum, and as a resourceful traveler and collector of scientific material in South America for the British Museum.

The reputation which gained a place for Mr. Hendee on the Kelley-Roosevelts Expedition was more than borne out by his work with the expedition. In a few short months he won the respect and affection of his colleagues to an unusual degree. The amount and the character of the material collected by him, the skill and dexterity evidenced by his preparations, the accuracy of his records, the variety of his interests, and the unselfishness of his devotion to his responsibilities all served to demonstrate that he was a man of rare ability. Skilled and experienced as a naturalist and preparator, possessing abundant energy, having both artistic and literary gifts, educated in science and, withal, having a personal character sympathetic, generous, loyal, and unassuming, he offered that happy combination of qualities needed to make the highest type of museum worker.

The Trustees of the Museum have authorized a pension of \$5,000 to Mr. Hendee's widow, to be paid at the rate of \$1,000 per annum.

Zoological, geological, and anthropological specimens were received by the Museum from the Central Asiatic Expedition of the American Museum of Natural History, in which Field Museum cooperated. Dr. Roy Chapman Andrews led this expedition.

The Museum's operating deficit for the year 1929 was \$108,274.25. During the year the Museum was the recipient of many benefactions,

and it is fitting here to renew the expression of thanks to all who have made contributions in money and material.

Acknowledgments of contributions of funds follow herewith:

Mr. Frederick H. Rawson made gifts totaling \$20,000. One of \$10,000 was for the purpose of conducting an expedition to Angola and Nigeria, West Africa, to collect ethnological material and make ethnological studies among the natives, and the other, also of \$10,000, is to be devoted toward the expense of preparing and installing the proposed Hall of Prehistoric Man which will contain several large groups and various related collections.

Mr. Samuel Insull also made a gift of \$10,000 towards the fund being accumulated for the proposed Hall of Prehistoric Man.

Mr. Silas H. Strawn contributed the sum of \$5,000, which amount has likewise been added to the fund for this hall.

Mr. William J. Chalmers contributed \$521 for the purchase of thirty-four specimens of minerals for the William J. Chalmers Crystal Collection.

The late Mrs. Julius Rosenwald contributed, before her death, the sum of \$50,000. Mrs. Rosenwald placed no restriction upon this gift, which has been designated as "The Mrs. Julius Rosenwald Fund," the income from which will be used for such purposes as the Board of Trustees may approve.

Mrs. James Nelson Raymond made a further contribution of \$3,000 towards the operating expenses of the James Nelson and Anna Louise Raymond Public School and Children's Lecture Division.

Mr. Marshall Field contributed \$165,567 during the year. Of this amount \$100,000 represents his annual gift to the Museum, and \$65,567 was given to pay part of the operating deficit of the Museum. Mr. Field also arranged to add \$100,000 to his annual contribution for the year 1930 in order to take care of the anticipated deficit for that year, which will make his total contribution \$200,000 for 1930.

President Stanley Field contributed a total of \$110,079.50. This amount was given in four different contributions: one of \$52,844.75 was made towards the liquidation of the building fund deficit; one of \$20,000 and another of \$22,707.25 were made to cover part of the operating deficit of the Museum for the year 1929; and the fourth contribution, amounting to \$14,527.50, was to cover the operating

expenses of the Stanley Field Plant Reproduction Laboratories during 1929.

“A Friend of the Museum” contributed \$12,500 for the Field Museum—Williamson Undersea Expedition to the Bahamas, to collect undersea material for marine life groups; to make photographs, sketches, and color notes, and to procure other data for portraying undersea scenes and life. This expedition was in operation during the spring and summer.

Mr. Richard T. Crane, Jr., made a further contribution of \$2,783 for the purchase of gem specimens for H. N. Higinbotham Hall.

The American Friends of China made a further contribution of \$577.50, representing one-half of the dues received by the society during the year 1929.

Mr. Martin G. Schwab made a gift of \$300 to be used towards the purchase of an imperial ceremonial silk robe from China.

The late Mr. Chauncey Keep provided in his will a legacy of \$50,000 for Field Museum.

The late Katherine L. Andrin provided in her will a legacy of \$5,000 for the Museum.

The merits of a plan by which Field Museum would make photographs of more or less inaccessible type specimens of tropical and South American plants in foreign herbaria, and distribute copies of such photographs to herbaria of other institutions, were recognized, and the plan was endorsed by leading botanists. The project was then laid before the Rockefeller Foundation which generously appropriated \$15,000 to cover the expenses of carrying it out during 1929, 1930 and 1931, a contribution for which the Museum is deeply grateful. Under the provisions of this fund Assistant Curator J. Francis Macbride was sent to Berlin to make photographs of the many types of South American plants which are in the collections of the Botanical Garden and Museum of Berlin. Most encouraging reports as to the success of this work have been received from him. In connection with the same project, Dr. B. E. Dahlgren, Acting Curator of Botany, while in Brazil as leader of the Marshall Field Botanical Expedition to the Amazon, took the opportunity for making a large number of photographs of type specimens in institutions of that country.

The South Park Commissioners turned over to the Museum \$222,220.52, representing the amount due the Museum under the tax levy authorized for this purpose by the state legislature. Of



RESTORATION OF A FAMILY GROUP OF NEANDERTHAL MAN

Ernest R. Graham Hall

Gift of Ernest R. Graham. Frederick Blaschke, Sculptor

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this amount, \$72,220.52 was in cash payments made in the usual way by the Commissioners, and the balance of \$150,000 was from the sale of tax anticipation warrants upon which the Museum will pay the interest until the warrants have been redeemed by actual tax payments.

As has been the case every year since the Museum was founded, many friends of the institution have generously contributed material for the collections of the various Departments. Such gifts are deeply appreciated, as they help to make it possible for the Museum to expand its usefulness, and they indicate the constant active interest taken in the institution by its friends. Among outstanding gifts of this kind received during 1929 were two unique mortuary Chinese clay figures of horsewomen engaged in playing polo, presented by Mr. Earle H. Reynolds of Chicago; three rare Chinese carvings presented by Dr. I. W. Drummond of New York; a Japanese wooden saddle, elegantly lacquered, given by Colonel A. A. Sprague; two bird paintings by the artist Fuertes, also presented by Colonel Sprague; three valuable specimens of cut gems presented by Mr. Richard T. Crane, Jr.; thirty-four specimens of crystals presented by Mr. William J. Chalmers for addition to the collection of crystals to which he has contributed year after year; forty-nine specimens of gems presented by Mrs. Joseph W. Work of Evanston, Illinois; important paleontological collections from Mr. and Mrs. William and Toodie Bower and Mr. Franklin Bower of Argos, Indiana, from Former Judge George Bedford of Morris, Illinois, and from Mr. Henry Gebauer of Chicago; specimens of a stoat and a wildcat presented by Lord Astor of London; a sea-elephant skeleton given by Hagenbeck Brothers of Stellingen, Germany; two specimens of a very rare lizard from the Kalahari Desert presented by Dr. W. J. Cameron of Chicago; and a collection of old California Indian baskets, presented by Mr. Homer E. Sargent of Pasadena, California.

In addition to the above, noteworthy collections and specimens for the various Departments were received as gifts from many other individuals and institutions, among whom are the following: Mr. Herbert J. Devine, New York; Mr. Julian Armstrong, Chicago; Mrs. John Alden Carpenter, Chicago; Mr. H. W. Seton-Karr, London; Oxford University; Mr. H. C. Benke, Chicago; the Garfield Park Conservatory; Yale University; Purdue University; Illinois State Museum; Chicago, Milwaukee, St. Paul and Pacific Railroad; Standard Oil Company (Indiana); Mr. F. J. W. Schmidt, Stanley, Wisconsin; Mr. Frederick H. Rawson, Chicago; the General Bio-

logical Supply House, Chicago; Mr. E. B. Williamson, Bluffton, Indiana; Dr. A. R. Emerson, Chicago; Mr. and Mrs. S. Yamagata, Chicago; Ichabod T. Williams and Sons, New York; the F. B. Williams Cypress Company, Patterson, Louisiana; the Pickrel Walnut Company, St. Louis; the Panhandle Lumber Company, Spirit Lake, Idaho; the American Walnut Manufacturers' Association Chicago, and the All-American Mohawk Radio Corporation, Chicago. These are but a few of the many contributors. A complete list of them and their gifts appears in the LIST OF ACCESSIONS beginning on page 170, and detailed descriptions of the various gifts appear in the section of this Report under the heading ACCESSIONS, beginning on page 93.

By bequest the Museum received the important private herbarium of the late Robert Ridgway, of Olney, Illinois. Consisting of some 4,000 specimens, this collection is a valuable addition to the Museum's Illinois Herbarium.

In addition to gifts and bequests, the Museum, as usual, added extensively to its collections through exchanges with other institutions, and through purchases. Details of such acquisitions will also be found in the section of this Report dealing with ACCESSIONS (page 93) and they are listed in the LIST OF ACCESSIONS (page 170).

The plans for the Hall of Prehistoric Man, material for which was collected by Assistant Curator Henry Field in Europe in 1927 (see Annual Report for 1928, pages 423-425), were perfected, and a contract for the life-size groups has been made with Mr. Frederick Blaschke, the sculptor who accompanied Mr. Field on his expedition to Europe. Mr. Blaschke is now at work on the groups in his studio at Cold Spring-on-Hudson, New York. The object of this hall is to illustrate the development of prehistoric man of western Europe from earliest geologic times down to about 10,000 B.C. The hall will contain nine life-size groups, and seven cases devoted to casts of human remains and the contemporary fauna, as well as artifacts made by prehistoric man in flint and bone.

During the summer, the Director, accompanied by Mr. Joseph N. Field, son of President Stanley Field, made a trip to all the principal countries of Europe, visiting the important museums for purposes of studying their methods, and for effecting contacts that would result in wider exchange relations between them and Field Museum.

Towards the end of the year plans were completed for the publication by the Museum of a small monthly bulletin for Members, to be known as *Field Museum News*. Preparations were made

to issue the first number in January, 1930. By this means it is believed the membership will be kept in constant closer touch with the activities of the Museum. The Director will be editor; the Curators will be contributing editors, and the managing editor will be Mr. H. B. Harte of the Division of Public Relations. The bulletin will be printed by the Museum's Division of Printing.

An unprecedented number of publications was issued by the Museum during 1929, the speeding up of this work being made possible by the employment of seven additional printers, and operating the Museum's printing plant on both day and night shifts.

It is pleasing to record that Dr. Charles E. Hellmayr, Associate Curator of Birds, was awarded the Brewster Medal of the American Ornithologists' Union for his work in the continuation of the late Charles B. Cory's *Birds of the Americas* and for his list, *Birds of Northeastern Brazil*.

Professor Roy L. Moodie of Santa Monica, California, was authorized by the Museum to prepare a study of the mummified animals of Egypt in Field Museum, for publication as an appendix to his general report on the Museum's mummies. This work is based on research conducted by means of the Museum's X-ray equipment, presented several years ago by President Stanley Field.

An important contact with the public was made through a series of fourteen radio broadcastings about the Museum and its activities, given, one a week, by the Director, the Curators and other members of the scientific staff over the *Prairie Farmer* station, WLS, in cooperation with the *Chicago Daily Journal*.

Groups of students heard lectures on prehistoric life by Mr. Elmer S. Riggs, Associate Curator of Paleontology, some of these being given in the exhibition halls, and some outside the Museum.

Associate Curator of Geology Henry W. Nichols gave a brief lecture on local geology before the local section of the American Institute of Mining Engineers.

Satisfactory progress has been made in the work of all Departments and Divisions of the Museum during the year. All such activities as enlargement of collections, installations of new exhibits, reinstallations and improvements of older exhibits, improvement and enlargement of study collections and facilities, cataloguing, inventorying and labeling, scientific research into various subjects, and general public service in answering inquiries which come in on

various subjects within the scope of the Museum, have been performed on a large scale. Details of all such work appear elsewhere in this Report.

The educational activities of the Museum were conducted with gratifying success. The usual spring and autumn courses of free illustrated lectures on science and travel by eminent explorers and scientists were given for the general public in the James Simpson Theatre of the Museum, and also a series of special lectures for Members. These were well attended, as shown in a subsequent section of this Report (page 32).

The Department of the N. W. Harris Public School Extension continued its work of circulating traveling cases containing natural history and economic exhibits among the schools of Chicago. As has been the case each year since this Department was organized, the number of cases in use and the number of schools and other centers served have been increased to a noteworthy degree (see page 155).

The James Nelson and Anna Louise Raymond Public School and Children's Lecture Division of the Museum conducted its various activities with the same gratifying response on the part of children, school authorities and teachers, which they have been accorded in other years. These activities include the sending of extension lecturers with lantern slides to the schools; the presentation of series of free motion picture and other educational entertainments for children in the James Simpson Theatre during the spring, summer and autumn; conducting of tours of the exhibits for groups of children, and other activities treated at length in another section of this Report devoted particularly to this Division (page 34).

The guide-lecture tours for adults conducted twice daily, except on Saturdays and Sundays, were continued throughout the year with notable success in the number of persons participating and the wide variety of subjects covered. As in the past special service of this type for groups requesting it, as well as the regular public service, was made available.

The Library of the Museum has seen an expansion in the collections of important and valuable reference works on its shelves, and its services both to the Staff of the Museum and to the general public have continued to be fruitful (see page 45).

Much important work has been accomplished in such Divisions of the Museum as Public Relations, Printing, Photography, Roent-

genology, Illustration and Memberships. Detailed accounts of the work of all these, as well as of the previously mentioned Departments and Divisions, will be found in various other sections of this Report.

In the death of Mr. Chauncey Keep, a member of the Board of Trustees, on August 12, 1929, the Museum suffered a serious loss. Mr. Keep had been a Trustee since 1915. He was also an Honorary Member, a Corporate Member and a Life Member. In tribute to his memory the Board of Trustees adopted the following resolution on September 16:

"The Board of Trustees of Field Museum of Natural History pauses to do homage to the memory of Mr. Chauncey Keep, whose death on August 12, 1929, at the age of seventy-six years, removed from its membership one whose valuable and memorable service had made him an outstanding character in the industrial and financial life of Chicago.

"Mr. Keep became a member of the Board in 1915 and served as a member of the Finance Committee. Thus for the past fourteen years he has been intimately associated with the development of the Museum. Possessed of a clear and comprehensive intellect, his counsel and aid were of incalculable service to this institution.

"Mr. Keep had a charm and a kindly manner, as well as a vigorous personality, which endeared him to all with whom he came in contact. His interest in the welfare and mission of Field Museum of Natural History was manifested not only by his labors for it, which continued during his long illness, but by generous gifts to it during his life and by a bequest of \$50,000 at the time of his death.

"Therefore, be it resolved that this expression of our admiration and esteem for Mr. Keep, and our grief at his passing and the loss of his counsel and companionship be preserved on the permanent records of the Board.

"And be it further resolved that our deep sympathy be conveyed to the members of his family in their bereavement and that a copy of this resolution be sent to his widow."

There were a number of changes in the Museum Staff during the year by resignations and new appointments. Also, creation of a number of new positions made necessary a number of additions to the personnel.

Dr. William D. Strong resigned his post as Assistant Curator of North American Ethnology and Archaeology. Dr. Paul S. Martin,

formerly of the staff of the Public Museum, Milwaukee, and the Colorado State Museum, Denver, was appointed Assistant Curator of North American Archaeology.

Mr. Walter A. Weber, who accompanied the Cornelius Crane Pacific Expedition as artist and ornithologist, upon his return was appointed as Artist and Assistant in the Department of Zoology. Mr. Dwight Davis was appointed as an Assistant in Osteology.

Mrs. Margaret F. Pyatt, Chief of the Raymond Division Staff, resigned, and Miss Margaret M. Cornell, her senior assistant, was promoted to fill the position. Miss Miriam Wood and Mr. Gordon S. Pearsall are new guide-lecturers appointed during the year. Miss Mary Louise Smith was also appointed as a guide-lecturer, but resigned shortly, due to ill health. Mr. Alfred L. Hertel, guide-lecturer, severed his connection with the Museum.

Mr. Douglas W. Gibson, purchasing agent, resigned, and his place was filled by the appointment of Mr. J. L. Jones.

Mr. Lorenz Risili was employed for work in the Stanley Field Plant Reproduction Laboratories, and Mr. Philip C. Orr and Mr. Sven Dorf were employed as preparators in vertebrate paleontology.

Mr. Thurston Wright, assistant bird taxidermist, resigned, and his place was filled by the appointment of Mr. John W. Moyer. Mr. Klaus Abegg was employed as a taxidermist's assistant.

In the Division of Printing, a proofreader, a pressman, a makeup man, compositors, and one bindery girl were added to the working force. This increased personnel has made possible more efficient work, and has enabled publications and exhibition labels to be printed which had previously been delayed because of insufficient help.

Mr. G. S. Wittrock was given a temporary appointment to perform the work of the Custodian of the Herbarium during the absence, due to ill health, of the regular Custodian, Mr. Carl Neuberth.

Volunteer services without pay were rendered in the Department of Zoology by Mr. Daniel Clark and Mr. G. C. Hixon.

The title of Mr. Clifford C. Gregg was changed from General Assistant to Assistant to the Director.

Second Sergeant of the Guards Charles Kuhn was placed on the Museum's pension payroll, following his retirement from active duty after nearly thirty-six years' service.

Following the death of Mr. Joseph Schmitz, monotype operator in the Division of Printing, the sum of \$3,000, representing insurance under the Museum Pension Fund, was paid to his widow.

The newspapers, as in past years, have accorded the Museum wholehearted cooperation in its publicity campaign carried on for the information of the public and to attract visitors to the institution. Not only the press of Chicago, but newspapers and press associations all over the country have devoted more space to Museum activities than ever before. Outstanding news and photographs from the Museum were given international circulation also.

As in the past the Museum has been fortunate in having various powerful advertising media opened to it without charge. It has been advertised in posters displayed by local transportation companies, by using space given in theatre and opera programs, and by the distribution of Museum direction folders by railroads and other transportation companies, hotels, civic associations, and other organizations.

Grateful acknowledgment is hereby extended to those in charge of the various enterprises which have thus given generous assistance in promoting public interest in the Museum. The details of advertising and publicity are to be found in this Report under the heading DIVISION OF PUBLIC RELATIONS (page 157).

Much of the material comprising the transportation exhibits, formerly shown in Field Museum when it was located in Jackson Park, was this year turned over to the new Museum of Science and Industry, founded by Julius Rosenwald. This material had never been exhibited in the present building, due to the limitation of Field Museum's scope to the natural sciences. Practically all of the transportation material is involved in the transfer to the Museum of Science and Industry. It will form the nucleus of an instructive and interesting exhibit in the new museum, and its removal from Field Museum has made available a large amount of additional space excellently adaptable for exhibition purposes.

A large number of publications, which are duplicates of ones on the shelves of Field Museum's Library, or are for other reasons no longer useful to this Museum, were distributed to other institutions to which they would prove valuable. Among such institutions are the Museum of Science and Industry, the Shedd Aquarium, and the University of Chicago. Still other such material was redistributed to the institutions from which it was originally obtained.

Early in the year it was decided to insure the Museum building against fire, and its contents against loss or damage by fire, water or theft. The insurance firm of Marsh and McLennan was employed

to inspect the premises and make recommendations. In order to obtain the lowest possible rate of insurance the Museum carried out certain recommendations made by the engineers of that firm after they had completed a most thorough examination of the building, and had made a study of the institution's operating requirements and the practices involved in carrying them on. These recommendations were followed at a total expense of \$7,433.06, and the Museum agreed to replace gradually all wooden shelving and cabinets of wood with others of fireproof materials. A thorough house cleaning of accumulated hazardous material was made. There were installed in various parts of the building forty-four watchmen's patrol service stations, a fire alarm system consisting of fifteen stations, two annunciator gongs, forty-five chemical fire extinguishers, and sprinkler systems for the pressroom of the Division of Printing, and for the paint and carpenter shops. Fireproof doors with approved closures were installed in the pressroom, paint, carpenter and electrician's shops. A fireproof partition with approved gravity sliding door was built around the woodworking machinery in Room 38 (workshop of Department of Anthropology) on the third floor. A vault for storing supplies of a hazardous nature used in taxidermy was built on the fourth floor. A total of approximately 7,800 feet of fire hose was purchased and connected with fifty-three risers.

Insurance for \$5,000,000 on the building, and \$2,500,000 on its contents, was placed. While it is impossible to determine the actual value of the contents, an estimate of \$50,000,000 would not seem too high. The actual value of the building would be approximately \$7,000,000. However, the amount of insurance placed seems to be adequate to assure a proper measure of protection against what seems the most likely maximum of hazard.

Maintenance and improvement in the Museum received their proper attention during the year. The growing needs of the institution, requiring, as they do, frequent extensive improvements and additions to keep pace with the increasing demands of the Departments, are an indicator of the rapid and constant development of the Museum. More and more each year the Museum is becoming better equipped to perform all of its necessary labor, including not only that for technical and scientific purposes, but that for ordinary maintenance work as well.

Among the improvements may be mentioned the construction of six built-in cases in Ernest R. Graham Hall of Historical Geology. These were built to house the following groups: Neanderthal Man



NEW TYPE OF CASE WITH INDIRECT LIGHTING

Used in Hall J (Archaeology of Egypt). The exhibits in this case are Egyptian stone vessels, predynastic and of the Middle Kingdom (3500-1800 B.C.)

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(already installed), Titanotheres, Mesohippus, restoration of a Carboniferous forest, Cambrian sea life, and Ordovician sea life.

Construction of a case 43' 6" wide, 21' 11" deep and 22' high was nearly completed at the south end of Carl E. Akeley Memorial Hall. This case will be devoted to the group of African animals at a water hole to be prepared from specimens obtained by the Harold White-John Coats Abyssinian Expedition.

Nineteen large cases and three small ones in Akeley Hall, containing African mammal habitat groups, were remodeled and fitted with back panels of light color, and with transoms and illuminating hoods for individual lighting. These cases were regrouped and backed to the walls, thus creating a much wider central aisle in the hall.

By remodeling twelve A-shaped cases in Albert W. Harris Hall to a uniform height and fitting new tops to them, provision was made for a very satisfactory installation of reptiles.

Thirty-seven floor cases have been provided for the reinstallation of certain Egyptological material in Hall J. Of these, twenty-one are remodeled old cases, and the balance new. Each is equipped with a specially designed top for individual lighting.

An individually lighted wall case more than twenty-five feet long, about four feet high, and one foot deep was made in the Museum shops for installation of the Egyptian papyri.

Two cases, one for reinstallation of the reproduction of a pineapple plant and the other for exhibiting a fruit cluster of the sago palm, were purchased.

A case, 108 feet long and two and one-half feet deep, was built and installed on the south wall of Hall J (Egyptian archaeology). It will be used for the exhibition of Coptic textiles. Illumination is provided within the case, but entirely outside the range of vision.

The case, which for many years has contained a large ancient Egyptian boat, was remodeled and furnished with means for lighting its interior.

Special lights were installed for stair lighting at the west entrance leading to the James Simpson Theatre.

Following out the line of improvement begun a little more than a year ago of constructing steel and plaster partitions between the zoological exhibition halls, there were thirty-eight such partitions built between Halls 17, 18, 19 and 20.

Insulating panels were installed in windows of Halls 3, 15, 27 and 30, and the draperies which covered those windows were permanently removed.

All of the twenty-four windows and ninety-six transoms in the bridge corridors connecting exhibition halls on the second floor were bricked up and plastered. These bridges are now available as additional and desirable exhibition areas.

A program of painting the exhibition halls was begun. Fourteen halls, Nos. 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 21, 22, 30 and C, were done. In addition, eleven departmental offices and workrooms, the President's reception room, and the Director's and Auditor's three-room suites of offices were painted. The outside of all windows and the inside of windows on the fourth floor were painted. Many other painting jobs of smaller magnitude but of much importance were also done.

The rope guard around the elephant group in Stanley Field Hall, which had proved unsatisfactory, was removed, and in its place was built a wooden base finished with naturized rubber flooring.

The Frank W. Gunsaulus Japanese Collections, which formerly occupied Hall 30, were removed to a new location recently made available in the west half of Hall C on the ground floor. In this place it was possible to arrange the exhibition cases to better advantage than in the former location. The name, Frank W. Gunsaulus Hall, has been transferred from the old hall to the new one.

The two rooms which had formed Hall 30 were made into one large room by the removal of the partition which separated them. Two large openings, architecturally treated to conform with the entrances to adjacent halls, were made. The hall will be devoted to the exhibition of Chinese jade objects representing all periods. Eight walnut cases, each with an illuminating hood, were purchased for the installation of the jade collections.

Provision for the better display of the Museum's post cards, publications and photographs was made by the construction of two wooden stands with display racks in the northeast and northwest corners of Stanley Field Hall near the main entrance. These stands are of cabinet workmanship and designed in keeping with the character of the exhibition cases of the hall.

Foreseeing the future need for additional exhibition space on the main floor, there was cleared for this purpose Hall 12, which had

been occupied for some years as a classroom by the Art Research Classes conducted in cooperation with the Art Institute of Chicago. In its place, quarters were provided for these classes in the west portion of Hall B on the ground floor. The classes have found the new quarters more suitable for their purposes than the old ones.

Better and increased storage facilities were added to the Departments of Anthropology, Botany, Geology and Zoology.

An unused portion of the transformer room was converted into a storeroom for North and South American archaeological material. It has a floor area of 1,225 square feet, and is fitted with 4,545 square feet of adjustable metal shelving.

The Department of Botany was provided with three blocks of steel herbarium cases, each 9' 2" x 3' 5" x 7' 3". Each block consists of eight compartments with thirty-two pigeonholes to each compartment.

To insure systematic and safe storage of paleontological material awaiting preparation for exhibition or study purposes, twenty-five steel cabinets, each fitted with a metal shelf and two drawers on roller bearings, were provided. These cabinets have a total capacity of 1,000 cubic feet.

The Department of Zoology was supplied with increased storage facilities for birds and mammals by the addition of thirty-two large steel storage cabinets having a total of 1,380 trays. Storage accommodations for all mammal bones now in the Department of Zoology, and for all it is likely to acquire over a long period of time, have been erected along the west passage of the fourth floor. For this purpose forty-eight steel cabinets—each 5' x 4' x 6' 8", with steel shelves and drawers on roller bearings, and with a door in front and back of each cabinet—were installed. The doors close in on thick moth-proof felt.

A fur storage vault consisting of three gas-tight, mechanically ventilated, fireproof rooms, with a floor area of 1,650 square feet, was built on a mezzanine occupying the full width of the north end of the taxidermists' shop on the fourth floor. Under the west end of this fur storage space, and on a level with the floor of the taxidermists' shop, there has been built a soundproof and non-vibrating room with a floor area of 350 square feet to accommodate machines for dressing and cleaning furs. The centralization of these requisites in the Museum's main taxidermy shop will greatly increase efficiency. All wooden shelving and cabinets in the taxidermy shop were replaced with steel ones.

Near the boiler-room there was built a fireproof macerating and degreasing room with three gas-fired tanks. With this greatly needed addition it now will be possible for the Division of Osteology to take care of the present large and steadily increasing number of skulls and other skeletal material.

On the first and ground floors of the Museum 300-watt glassteel lighting fixtures to the number of 349 were installed, in Halls 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 18, 21, B and C. Approximately 100 exhibition cases, in Halls 16, 22, 30, 36, 38, D and J, were wired and equipped for lighting.

Tuck pointing was carried on during 1929 along all of the north side of the Museum building, with the exception of one very small area; along all of the west side except for a small part which had been done previously; and on the southwest corner of the central pavilion. Approximately one-half of the walls of the building now remains to be tuck pointed.

The coal conveyor was overhauled and put in good condition. Brickwork on the boilers was repaired, and fourteen tubes were replaced in two of the boilers. Steam for heating was furnished to the Shedd Aquarium from December 27, 1928, to March 22, 1929, and again from October 11, 1929, to the end of the year and continuing into 1930. Steam was furnished to the building on Soldier Field from November 21 to 27, 1929.

## LECTURES AND ENTERTAINMENTS

GENERAL LECTURES.—The Museum's fifty-first and fifty-second courses of free lectures for the public were given in the James Simpson Theatre on Saturday afternoons during the spring and autumn months. They were illustrated by motion pictures and stereopticon slides. Following are the programs of both courses:

### FIFTY-FIRST FREE LECTURE COURSE

- |          |  |
|----------|--|
| February | 23—Four Years at the Courts of the Sultans of Java.<br>Mr. Tassilo Adam, ethnologist of the Dutch East Indies. |
| March    | 2—From Cairo to the Cape.<br>Captain Carl von Hoffman, F.R.G.S., New York.                                     |
| March    | 9—Man-hunting in the Jungle.<br>Commander George M. Dyott, F.R.G.S., New York.                                 |
| March    | 16—Camera-hunting on the Continental Divide.<br>Mr. William L. Finley, American Nature Association.            |
| March    | 23—Prehistoric Man in America.<br>Mr. Barnum Brown, American Museum of Natural History.                        |

- March 30—Bryce, Zion and the Grand Canyons.  
(Illustrated with Lumiere Autochrome plates.)  
Dr. C. C. Schneider, member of the Sierra Club.
- April 6—Bali—The Garden of the Gods.  
Mr. André Roosevelt, New York.
- April 13—Recent Explorations in Time and Space.  
Professor Forest Ray Moulton, astronomer, Chicago.
- April 20—In the Cellars of the World.  
Mr. Russell T. Neville, cave explorer, Kewanee, Illinois.
- April 27—Indian Winter in the Labrador.  
Dr. William Duncan Strong, anthropologist of the Rawson-MacMillan Subarctic Expedition for Field Museum.

## FIFTY-SECOND FREE LECTURE COURSE

- October 5—Formosa—The Island Beautiful.  
Mr. Clarence Griffin, London.
- October 12—Man's Place in Geologic History.  
Dr. Oliver C. Farrington, Curator of Geology, Field Museum of Natural History.
- October 19—Wild Flowers and Trees.  
Mr. Guy C. Caldwell, American Nature Association.
- October 26—Earth and Neighbor Worlds.  
Dr. Clyde Fisher, American Museum of Natural History.
- November 2—Lands of the Sun.  
Mr. Frederick Monsen, Pasadena, California.
- November 9—Zulu Tribe.  
Captain Carl von Hoffman, F.R.G.S., New York.
- November 16—Bird Islands of Peru.  
Dr. Robert Cushman Murphy, American Museum of Natural History.
- November 23—Explorations and Excavations at Chichen-Itzá, Yucatan, and Uaxactun, Guatemala.  
Dr. Sylvanus G. Morley, Carnegie Institution, Washington, D.C.
- November 30—Through Southern Abyssinia.  
Mr. C. J. Albrecht, Department of Zoology, Field Museum of Natural History, member of the Harold White-John Coats Abyssinian Expedition of Field Museum.
- December 7—Along the Floor of the Ocean for Field Museum.  
Mr. J. E. Williamson, leader of the Field Museum-Williamson Undersea Expedition to the Bahamas.

The total attendance at these twenty lectures was 26,199.

In addition to the regular spring and autumn courses, the following special lectures were given for Members of Field Museum:

- January 13—Beauty and Tragedy under the Sea.  
Mr. J. E. Williamson, New York.
- November 3—Lands of the Sun.  
Mr. Frederick Monsen, Pasadena, California.
- November 10—Zulu Tribe.  
Captain Carl von Hoffman, F.R.G.S., New York.

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- November 17—Bird Islands of Peru.  
Dr. Robert Cushman Murphy, American Museum of Natural History.
- November 24—Explorations and Excavations at Chichen-Itzá, Yucatan, and Uaxactun, Guatemala.  
Dr. Sylvanus G. Morley, Carnegie Institution, Washington, D.C.
- December 1—Trailing the Giant Panda on the Chinese-Tibetan Frontier.  
Mr. Kermit Roosevelt and Mr. C. Suydam Cutting, New York, members of the William V. Kelley-Roosevelts Expedition to Eastern Asia for Field Museum.
- December 8—Along the Floor of the Ocean for Field Museum.  
Mr. J. E. Williamson, New York, leader of the Field Museum-Williamson Undersea Expedition to the Bahamas.
- December 15—The Kingdom of the Million Elephants and the White Parasol.  
(A remote province of Indo-China where pioneer scientific work was done by members of the William V. Kelley-Roosevelts Expedition for Field Museum, and where a distinguished mammalogist gave his life for the cause of science.)  
Mr. Harold J. Coolidge, Jr., F.R.G.S., Boston, leader of the Indo-China division of the expedition.

The total attendance at these eight special lectures was 7,384.

The total number of lectures for adults was twenty-eight, and the total attendance at them was 33,583.

### JAMES NELSON AND ANNA LOUISE RAYMOND PUBLIC SCHOOL AND CHILDREN'S LECTURE DIVISION

ENTERTAINMENTS FOR CHILDREN.—The James Nelson and Anna Louise Raymond Public School and Children's Lecture Fund made possible the continuation of lecture and entertainment work among children, both in the Museum and outside in schools and camps.

Series of entertainments on Saturdays were offered as usual in the spring and autumn months, and a summer series on Thursdays was given during July and August. Following are the programs of these three series of entertainments:

#### SPRING COURSE

- February 23—Pieces of China.
- March 2—The Delta of the Nile.\*  
In and about Cairo.\*  
A Trip down the Nile.\*  
The Cabbage Butterfly.  
Brooding Chickens.
- March 9—Romance of Rubber.  
Our Dog Friends.  
Yosemite's New Roads.  
Quaint People and Queer Places.
- March 16—Rome, the Eternal City.\*  
Naples and Vesuvius.\*  
The Buried City.\*  
Our Animals and How They Help Us.

- March 23—Story of Our National Parks.  
Earthquakes.  
Birds of Prey.  
Felling Forest Giants.
- March 30—King Alfonso's Busy Day.\*  
Gibraltar.\*  
Ronda and Granada.\*  
Invading "Musky" Land.  
Tigers of the North.
- April 6—Familiar Foods from Foreign Lands.  
The Great White North.
- April 13—Scottish Tidbits.\*  
Emerald Isle.\*  
White-tail Deer in the Adirondacks.  
The Horse and Man.  
National Bird Refuges.
- April 20—Arctic and Tropic Houses.  
Arctic and Tropic Boats and Fishermen.  
Wild Flowers.
- April 27—Where Salmon Leap.  
A Cruise to the Land of the Midnight Sun.  
*(By courtesy of the Norwegian America Steamship Line.)*

\*In cooperation with "Topsy Turvy Times" department of the *Chicago Daily News*, which broadcast a "Trip around the World" from WMAQ radio station.

The total attendance at these ten entertainments was 13,505.

#### AUTUMN COURSE

- October 5—Sea Birds.  
Seals.  
Little People of the Sea.  
The International Ice Patrol.
- October 12—Columbus.\*  
Philadelphia.
- October 19—The Panama Canal.  
Pillars of Salt.  
Some Wild Babies.  
The Spider.  
The Ant-lion.
- October 26—Illustrated talk, "Earth and Neighbor Worlds."  
Dr. Clyde Fisher, American Museum of Natural History.  
She's Wild.  
From "Paddy" to Bowl.  
In a Drop of Water.
- November 2—The Story of Steel.
- November 9—Nesting of the Sea Turtle.  
The Cruise of the Princess Pat.
- November 16—Our Chicago.  
Story of the Four Seasons.
- November 23—Beautiful Catalina.  
The Cliff Dwellers.  
Berber Mountain Peoples.

November 30—King Snow Holds Court.  
 Roads to Wonderland.  
 The Pilgrims.\*

December 7—Illustrated talk, "Giants of Long Ago."  
 \*Chauncey Keep gift to Field Museum.

The total attendance for the autumn course of entertainments was 18,554. The total attendance for the spring and autumn course together was 32,059.

To help meet the needs of the children for wholesome entertainments during the summer months, a series consisting of tours of the exhibits, and motion pictures and story hours in the James Simpson Theatre, was presented, as follows:

#### SUMMER PROGRAMS

- J u l y 11—Tour—Indians of Plateau and Desert.  
 Motion Pictures:  
 Aboriginal Inhabitants.  
 The Petrified Forest.  
 Irrigation in the Southwest.  
 The Eagle's Nest.  
 Pagan People in the Painted Desert.
- J u l y 18—Story Hour—"Ptahhotep, the Egyptian Boy."  
 (Illustrated with colored pictures.)  
 Tour—The Egyptian Hall.
- J u l y 25—Tour—A Trip to Java, Borneo and Sumatra.  
 Motion Pictures:  
 Strange Prayers.  
 Maizok of the South Seas.
- A u g u s t 1—Tour—South American Plants and Animals.  
 Motion Pictures:  
 The Zoo.  
 Buenos Aires.  
 Parana.  
 Falls of Iguassu.  
 Monkey Land.
- A u g u s t 8—Story Hour—"Mistanapish Visits His Blood-brother in the West."  
 (Illustrated with colored pictures.)  
 Tour—Farmer, Hunter, and Fisher Indians.
- A u g u s t 15—Tour—African Plants, Animals, and Peoples.  
 Motion Pictures:  
 An Ancient Art.  
 Murder.  
 Bits of Africa.  
 Sacred Baboon.  
 A Jungle Orphan.

This series helped to solve the vacation problem for many parents and leaders of children's organizations. Many favorable comments, and requests for a similar program for the summer of



GROUP OF AMERICAN BISON

Hall of American Mammal Habitat Groups (Hall 16). Specimens presented by Arthur B. Jones

Taxidermy by Julius Friesser. Background by Charles A. Corwin

About one twenty-fifth natural size

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1930, have been received. The total number of groups coming for this series was twenty-four, and the attendance was 7,336. Of this number 4,725 represents the theatre attendance, and 2,611 the tour attendance.

Two special motion picture programs were given during the month of February:

February 12—Abraham Lincoln.  
My Mother.  
My Father.  
The Call to Arms.

February 22—George Washington.  
Yorktown.  
Alexander Hamilton.

Due to the crowds, it was necessary to show each three times. The total attendance for the two special programs was 9,050.

In all, twenty-eight different programs were offered free to the children of the city and suburbs during the year, and the total attendance at these was 48,445.

In addition to the cooperation with "Topsy Turvy Times" of the *Chicago Daily News*, the following assisted by giving the programs publicity in newspaper articles and radio broadcasts: the *Chicago Daily News* and Station WMAQ; the *Chicago Tribune* and Station WGN; the *Prairie Farmer* and Station WLS; the *Chicago American*; the "Junior Journal" of the *Chicago Daily Journal*; the "Boys' and Girls' Post" of the *Chicago Evening Post*; the *Herald and Examiner*; and Station WCFL.

Thanks for films loaned for the programs is due to the United States Department of Agriculture, the Norwegian America Steamship Line, the Rothacker Film Corporation, the General Electric Company, and the Commonwealth Edison Company.

The Museum Stories for Children, written by members of the Raymond Division Staff, were handed to all children attending the entertainments. Copies of these often were furnished also to teachers, who requested them for use as reference material in classroom work. A new style of folder has made the binding of the Museum Stories possible, and the children are being encouraged to so preserve the series and establish a natural history library. Many of the stories were reprinted in the "Boys' and Girls' Post" department of the *Chicago Evening Post*.

Following are the subjects of the Museum Stories for Children issued during 1929:

Chinese Kites.  
 Nile Farmers.  
 Rubber Producing Plants.  
 Buried Cities.  
 Fossil Trees.  
 Cork.  
 Champion Fliers.  
 Horses—Past and Present.  
 Early Spring Flowers.  
 Salmon and Cedar Indians.  
 The First Cave People.  
 Glaciers and Icebergs.  
 Liberty Bell and Other Bells.  
 Spiders.  
 An Arapaho Sun Dance.  
 Meteorites.  
 Turtles.  
 Woodchuck.  
 Goats.  
 Wild Turkeys.  
 Elephants of Long Ago.

A total of 53,500 copies of these stories was printed.

LECTURE TOURS FOR CHILDREN.—As in previous years, emphasis was laid on lecture tours correlating with the school curriculums. Other tours were organized to give a general knowledge of the Museum and its activities. Groups from public, parochial, and private schools, both in the city and surrounding areas, and from clubs and other organizations, participated. In all, 480 such groups received guide-lecture services, with a total attendance of 21,576.

EXTENSION LECTURES.—Extension lectures were offered as in former years to the public schools of the city. To meet the needs of the junior and senior high schools a series of lectures was especially arranged for correlation with classwork in history and the sciences. The series embraced the following subjects:

The Story of Steel.  
 The Ancient Egyptians.  
 The Romans: Their Arts and Customs.  
 Our Friends, the Birds.  
 Animals of the Past.  
 Reptiles and Insects.  
 Wild Flowers of the Chicago Area.  
 Activities of Field Museum.

For presentation in the elementary schools, the following series was offered:

For Geography and History Groups—South America.  
 North American Indians.  
 Glimpses of Chinese Life.  
 Native Life of the Philippines.  
 Marcus, the Roman.  
 Ptahhotep, the Egyptian.

For Science and Nature Study Groups—Story of Flax and Cotton.  
 Story of Silk and Wool.  
 Story of Coal and Iron.  
 Food Fish of the World.  
 African Animals.  
 American Fur-bearers.  
 Chicago Mammals.  
 Chicago Birds.  
 Chicago Wild Flowers.  
 Activities of Field Museum.

The total number of schools visited was 215, and the total number of lectures given in the schools was 496. In addition to these were several given for school clubs, at conferences, and at Camp Algonquin, which brings the total number of extension lectures presented during 1929 to 509. The total attendance at these was 180,964.

ACCESSIONS.—The Raymond Division acquired during the year 768 stereopticon slides for extension lectures, 34 negatives for making slides, and 581 prints, all made by the Division of Photography. It also received, as a gift from the United Fruit Company, Boston, material for a lecture entitled "A Trip to Banana Land," including four sets of forty-six slides each, one motion picture reel, and accessories for the same.

### NATURE STUDY COURSES

In response to requests for a series of talks on natural history topics especially arranged for leaders of nature study in camps and other recreational organizations, a class was organized to meet each Thursday morning during February, March and part of April. The programs consisted of lectures followed by tours of exhibits illustrating the topics discussed.

Letters were mailed to various organizations inviting them to send representatives to participate in the class meetings. Following is a list of some of the organizations which sent representatives: the Chicago Boys' Club, the Boy Scouts of America, the Young Men's Christian Association, the Salvation Army, the Girl Scouts, the United Charities, the Wild Flower Preservation Society, the Camp Fire Girls, and the Young Women's Christian Association.

Various neighborhood clubs, social centers and settlement houses also sent representatives.

The programs for the classes were as follows:

- February 7—Chicago Mammals.
- February 14—Winter Birds.
- February 21—Trees.
- February 28—Ecology of the Chicago Region.
- March 7—Geography of Chicago.
- March 14—Flowers, Ferns, and Mosses.
- March 21—Spring Birds.
- March 28—Insects.
- April 4—Fish, Reptiles, and Amphibians.
- April 11—Stars and Clouds.
- April 18—Forum.

The total number of lectures, tours and conferences held in connection with this nature study course was twenty-seven, and the total attendance was 835.

In response to a request from Mr. Allen Carpenter, Educational Director of the Chicago Council of Boy Scouts of America, that a course similar to the one presented on Thursday mornings be given for the scoutmasters of the city who could meet only on Saturday afternoons, a second course of five lectures was given. The subjects presented were substantially those of the first course, but in each lecture several of the topics were combined, as follows:

- March 30—Ecology and Conservation.
- April 6—Birds.
- April 13—Plant Life.
- April 20—Reptiles, Fish, Amphibians, and Insects.
- April 27—Mammals.

The total number of lectures and conferences in the second course was ten, and the total attendance was 461. The number of nature study groups in both courses of instruction was thirty-seven, with an aggregate attendance of 1,296.

### LECTURE TOURS FOR ADULTS

As in previous years the services of Museum guide-lecturers were offered without charge to clubs, conventions, and other organizations, and to Museum visitors in general. For the public 124 general tours and 386 tours covering specific subjects were arranged. Printed monthly schedules were kept at the main entrance for distribution to visitors. Hundreds of copies were sent at the beginning of each month to libraries, social settlements, retail stores, and other centers of distribution.

There were 149 special parties, including groups from clubs, conventions, colleges, and other organizations, and 391 general

public groups. The special parties totaled 4,440 persons, and the public groups 4,360, making a total of 8,800 adults who received guide-lecture service during the year.

### EDUCATIONAL MEETINGS

The use of the Lecture Hall was extended to thirty-seven educational and civic groups. These meetings were attended by 1,746 persons.

On June 13, the graduating exercises and presentation of diplomas of the adult department of the public schools of Chicago were held in the James Simpson Theatre, with appropriate ceremonies. The total attendance of graduates and guests was five hundred.

### RADIO BROADCASTING

Radio broadcasting for the year 1929 included talks for both adults and children. Some of these talks were presented by a member of the Raymond Division. Others were prepared for presentation by members of the broadcasting staffs of the radio stations.

During the spring course of Raymond Division entertainments for children, material for broadcasting was sent to Station WMAQ, operated by the *Chicago Daily News*, to be given during the "Topsy Turvy Times" hour. These talks correlated with the films to be shown in the James Simpson Theatre, or gave a short summary of the tours to be given in the Museum.

From February 11 to April 1 inclusive, a series of talks on "Field Museum and Its Activities" was broadcast each Monday night over Station WCFL, operated by the Chicago Federation of Labor.

During the summer course of entertainments, broadcasting material was prepared each week for various stations giving publicity to the children's programs.

To assist in the promotion of Chicago's proposed Century of Progress exposition, the Museum cooperated with WGN, the *Chicago Tribune* station, by preparing eight radio talks on the work, history, and educational value of the Museum, and its attractions for visitors to the exposition.

Among the broadcasts especially prepared for young people were those given over Station WMAQ in connection with programs presented for the schools. Three such scientific talks on "The Peoples of the Earth" were given during the fall.

A series of eleven radio talks for adults, on the Museum, its expeditions, and other activities, was broadcast from the *Prairie Farmer* Station, WLS, in cooperation with the *Chicago Daily Journal*. Speakers included the Director, several of the Curators, and other members of the scientific staff.

TOTALS.—The total number of groups receiving instruction by means of entertainments, tours, and lectures was 1,622, with an aggregate attendance of 292,882. This figure includes both the adults and children participating in Museum educational activities.

#### DIVISION OF PUBLICATIONS

The activities of the Division of Publications were greatly increased in the past year because an unprecedented number of scientific publications was issued by the Museum, due largely to additions to the personnel of the Division of Printing.

During 1929 the Museum distributed to the libraries, museums, and other institutions from which it receives publications for the enlargement of its own library resources, 8,951 copies of scientific publications and 2,729 copies of leaflets. About half of these were sent to institutions in the United States and its possessions, the other half being forwarded to foreign destinations through the courtesy of the Smithsonian Institution's international exchange bureau at Washington, D.C. In addition, 5,489 copies of the 1928 Annual Report of the Director and 6,132 leaflets were sent to Members of Field Museum. Sales for the year totaled 1,085 publications, 7,023 leaflets, and 12,447 miscellaneous publications and pamphlets.

*Field Museum and the Child*, a pamphlet which outlines the work carried on by the Harris Extension and the Raymond Division of Field Museum of Natural History among school children of Chicago, was given further distribution in 1929. It was originally published in 1928 and sent during that year to the institutions with which the Museum carries on exchange relations, to the Life, Associate, and Sustaining Members of this institution, to Chicago public grade and high schools, and branch libraries. Copies were sent in 1929 to 2,678 Annual Members, 521 clubs, parochial schools, and suburban schools, and 502 persons and institutions on a list selected from an educational directory.

An appreciable increase was made in the number of names of institutions on both the Museum's domestic exchange list and its foreign list.

Sixteen additions to the regular series of Field Museum publications were issued, one of which was anthropological, four botanical, two geological, eight zoological, and one the Annual Report of the Director for 1928. In addition to these, six numbers were added to the general leaflet series and three miscellaneous items were published. Following is a detailed list of these publications:

Publication  
number

- 254.—Geological Series, Vol. IV, No. 5. Contributions to Paleontology. By Sharat K. Roy. February, 1929. 22 pages, 9 photogravures. Edition 1,275.
- 255.—Zoological Series, Vol. XII, No. 18. A Contribution to the Ornithology of Northeastern Brazil. By Charles E. Hellmayr. March 4, 1929. 268 pages, 1 map. Edition 1,016.
- 256.—Report Series, Vol. VII, No. 3. Annual Report of the Director for the Year 1928. January, 1929. 224 pages, 20 photogravures. Edition 7,663.
- 257.—Zoological Series, Vol. XVII, No. 1. The Birds of the Neotropical Genus *Deconychura*. By John T. Zimmer. May 18, 1929. 20 pages. Edition 1,068.
- 258.—Botanical Series, Vol. IV, No. 6. I. Supplement to the Flora of Barro Colorado Island, Panama. By Leslie A. Kenoyer and Paul C. Standley. II. Two New Species of *Chara* from Tropical America. By M. A. Howe. July 5, 1929. 22 pages, 6 photogravures. Edition 1,040.
- 259.—Botanical Series, Vol. IV, No. 7. Spermatophytes, Mostly Peruvian. By J. Francis Macbride. July 5, 1929. 32 pages. Edition 1,100.
- 260.—Geological Series, Vol. V, No. 2. The Mineral Composition of Some Sands from Quebec, Labrador and Greenland. By James H. C. Martens. July 12, 1929. 17 pages, 3 zincs. Edition 1,611.
- 261.—Zoological Series, Vol. XVII, No. 2. A New Rodent from the Galapagos Islands. By W. H. Osgood. July 12, 1929. 6 pages. Edition 1,105.
- 262.—Zoological Series, Vol. XII, No. 19. Contents and Index to Volume XII. Numbers 1 to 19. October, 1929. 34 pages. Edition 1,085.
- 263.—Zoological Series, Vol. XVII, No. 3. Birds of the James Simpson-Roosevelts Asiatic Expedition. By Charles E. Hellmayr. October 18, 1929. 120 pages. Edition 1,064.
- 264.—Botanical Series, Vol. IV, No. 8. Studies of American Plants—I. By Paul C. Standley. Studies of American Plants—II. By Paul C. Standley. October 24, 1929. 152 pages. Edition 1,051.
- 265.—Zoological Series, Vol. XVII, No. 4. The Land Mammals of Uruguay. By Colin Campbell Sanborn. October 24, 1929. 24 pages. Edition 1,068.
- 266.—Zoological Series, Vol. XIII, Part VI. Catalogue of Birds of the Americas. By Charles E. Hellmayr. November 14, 1929. 264 pages. Edition 1,530.
- 267.—Botanical Series, Vol. IV, No. 9. Honduran Mosses—Collected by Paul C. Standley. By Edwin B. Bartram. December 10, 1929. 18 pages, 3 photogravures. Edition 992.
- 268.—Anthropological Series, Vol. XIX, No. 1. Melanesian Shell Money in Field Museum Collections. By Albert B. Lewis. December, 1929. 36 pages, 25 photogravures. Edition 1,015.

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269.—Zoological Series, Vol. XVII, No. 5. A Study of the Tooth-billed Red Tanager, *Piranga Flava*. By John T. Zimmer. December 18, 1929. 54 pages, 1 map. Edition 1,022.

LEAFLETS

Anthropology, No. 28.—The Field Museum—Oxford University Expedition to Kish, Mesopotamia, 1923–1929. By Henry Field. November, 1929. 34 pages, 14 photogravures, 2 maps. Edition 2,993.

Geology, No. 10.—Famous Diamonds. By O. C. Farrington. February, 1929. 28 pages, 4 photogravures, 1 colored plate. Edition 6,023.

Geology, No. 11.—Neanderthal (Mousterian) Man. By O. C. Farrington and Henry Field. September, 1929. 16 pages, 8 photogravures, 1 map. Edition 6,056.

Geology, No. 12.—Cement. By H. W. Nichols. September, 1929. 16 pages, 4 photogravures. Edition 3,036.

Zoology, No. 10.—The Truth about Snake Stories. By Karl P. Schmidt. January, 1929. 20 pages, 1 cover design. Edition 3,045.

Zoology, No. 11.—The Frogs and Toads of the Chicago Area. By Karl P. Schmidt. March, 1929. 16 pages, 4 photogravures, 1 colored plate, 1 cover design. Edition 3,002.

MISCELLANEOUS PUBLICATIONS

Memoir Series, Vol. I, No. 2.—A Sumerian Palace and the "A" Cemetery at Kish, Mesopotamia. Part II. By Ernest Mackay, with preface by Stephen Langdon. December 26, 1929. 152 pages, 42 photogravures, 1 map. Edition 1,472.

Field Museum and the Child. 34 pages, 8 photogravures, 5 halftones. Edition 4,070.

General Guide. Thirteenth Edition. 38 pages, 1 photogravure, 3 zincs. Edition 8,530.

POST CARDS.—The installation of two accessible card stands, which permit of an easy view and selection, helped to bring the total of post cards sold up to 161,226, an increase of more than 28,000 over the 1928 sales.

Sets of post cards were issued in October. An endeavor was made to serve the interest of the public and to make each series interesting and instructive by supplying on each card specific data as far as space permitted. It is hoped that these sets will contribute their share in disseminating knowledge of the Museum and its collections.

Twenty-seven sets, containing a total of 289 cards, were issued by the Department of Anthropology and illustrate selected objects from the collections of the Museum. China, Tibet, India, Mexico, Peru, Melanesia, Egypt, Benin, and Cameroon are the countries represented. The objects were chosen with a view to popular appeal and grouped under such headings as bronzes, pottery, sculpture, costumes, masks, and carvings.



ANCIENT MESOPOTAMIAN BARLEY

(Hall 25)

Charred grains of six-rowed barley excavated on site of Kish by the Field Museum-Oxford University Joint Expedition to Mesopotamia

Three times natural size

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The two sets thus far issued by the Department of Geology have been greatly in demand. They depict Neanderthal Man and the mural paintings of prehistoric landscapes, plants, and animals. The Department of Zoology's post cards illustrate apes and monkeys, rodents, marsupials, insects, moths, butterflies, skates and rays. Of the zoological subjects 2,200 cards were sold during the last three months of the year. One set was issued showing seven types of exhibition cases loaned to Chicago schools through the N. W. Harris Public School Extension. Additional views will be prepared by the various Departments from time to time.

### LIBRARY

The accessions of the Library during 1929 consisted of 3,105 books and pamphlets, acquired variously through gifts, purchases, and exchanges.

The gifts received from friends of the Museum and from members of the Staff are all useful, and in several instances have consisted of rare and unusual works. The largest single gift was received from Mr. John P. Kellogg, of Chicago, who presented a collection of especially valuable books to the Anthropological Library. Such gifts indicate in a material way interest in the Museum's work that is greatly appreciated.

The Library relies largely upon exchanges received from contemporary institutions throughout the world to increase its collections. During the year publications were received from 748 institutions and individuals, and sixteen new exchange arrangements with foreign societies were established. From the John Crerar Library, Chicago, there were received in exchange for the Museum's publications 259 reprints of botanical papers that will be exceedingly useful in the work of the Department of Botany.

Among the periodicals purchased during 1929 that filled in some of the incomplete sets of the Botanical Library, were the early volumes of *Curtis's Botanical Magazine*. This purchase comprised 125 volumes, from 1777 to 1843, and is an unusually fine set which brings the Museum's file of this magazine complete to date. Also purchased were the *Botanische Jahrbücher*, Volumes I-XXXIII; Fedde's *Repertorium specierum novarum regni vegetabilis*, Beihefte, Volumes II-LI; Hooker's *Icones plantarum*, Series 3, Volumes I-X, and *Flora of Tropical Africa*, by Oliver and others, nineteen volumes.

Other works purchased were *Iconum botanicarum index Londinensis*, in six volumes; Ascherson and Graebner, *Synopsis der mitteleuropäischen Flora*; Cortés, *Flora de Colombia*; Moricand, *Plantes nouvelles d'Amérique*, 1833-46; the fifth and last volume of *North American Wild Flowers*, by Mary Vaux Walcott; Bertholet, *Religionsgeschichtliches Lesebuch*; Chardin, *Travels in Persia*; Dampier, *New Voyage round the World*; *Mural Paintings of Tel El-Amarnah*; Sarasin, *Ethnologie der Neu Caledoner und Loyalty Insulaner*; Stein, *On Alexander's Track to the Incas*; Steinen, *Die Marquesaner und ihre Kunst*; Lacroix, *Minerals of Madagascar*; Lee, *Stories in Stone*; Weber and Beaufort, *Fishes of the Indo-Australian Archipelago*; Perrier, *Traité de zoologie*; Beaufort, *Birds from Dutch New Guinea*; Bechstein, *Ornithologisches Taschenbuch*, 1802-12; Naumann, *Ueber den Haushalt der nordischen Seevögel Europa's*, 1824; Maynard, *Warblers of North America*; Yerkes, *The Great Apes*; Forster, *Indische Zoologie*, 1781; Schreiber, *Herpetologia Europaea*; and the fourteenth edition of the *Encyclopaedia Britannica*.

Among activities of the year was the unpacking of some forty large boxes of books and pamphlets that had been stored for years. These boxes contained books and papers duplicating works on the shelves of the Library or for other reasons no longer applicable to the work of the Museum. It was necessary to reduce drastically this large collection. A general classification of all the items included was made, and for convenience they were temporarily stored in stacks in one of the rooms on the ground floor. Among the duplicates were many items that would be useful for redistribution by the institutions from which they were originally obtained. Upon inquiry it was found that some of these institutions desired them, and boxes of them were returned to the United States Geological Survey, Washington, D.C., the American Museum of Natural History, New York, and the New York State Museum, Albany. The Museum of Science and Industry, Chicago, was given five boxes of publications selected from this collection by a member of its staff. Approximately one thousand excerpts and reprints of ichthyological papers from early periodicals and serials, now difficult to obtain, were sent to the Shedd Aquarium library, and 200 volumes of Russian literature were sent to the University of Chicago. Several hundred excerpts and reprints were sorted according to subject and distributed among the departmental libraries of the Museum. When this work can be completed it will be possible to use the remainder

as exchange material for that offered from time to time by other institutions.

Cards indicating the additions made to the periodicals in the Library during the year are being supplied for a supplement to the Union List of Serials whose index is indispensable for information relative to old and new periodical literature.

There were received during the year 8,137 individual issues of journals, periodicals and serials.

There were prepared, forwarded and returned from the bindery 736 volumes. Cards for 8,047 different titles were typewritten and added to the various catalogues. Monthly deposits of author cards were received from the John Crerar Library totaling 9,360 cards for the year.

### EXPEDITIONS AND RESEARCH

ANTHROPOLOGY.—During the year three expeditions were operating in the interest of the Department of Anthropology.

The Museum's work in British Honduras, inaugurated in 1928, was continued this year. This expedition, known as the Second Marshall Field Archaeological Expedition to British Honduras, was again under the leadership of Assistant Curator J. Eric Thompson, and was in the field from December, 1928, to June, 1929.

During the first month Mr. Thompson lived at San Antonio in the south of British Honduras, where he was engaged in obtaining ethnological information. San Antonio is a village of about 600 inhabitants, all of whom are pure Maya, descendants of the ancient people who built up the great Maya civilization. In order to make a thorough study of their religion and customs, Mr. Thompson lived exactly the same life as they do, lodging with a Maya family and subsisting on the native food. A wealth of ethnological data was secured, including records of a considerable number of traditions and legends that are undoubtedly many hundreds of years old. Considerable light will also be thrown on the religion of the Mayas by the information obtained in San Antonio. The Mayas are nominally Catholics, but still retain much of their old faith. The results of these ethnological researches are in course of publication.

Early in 1929 Mr. Thompson proceeded to Belize, where, after purchasing stores, he proceeded to the ruins of Tzimin Cax, Cahal

Pichic, and Hatzcap Ceel, situated in the south of the Cayo District close to the Guatemala frontier. Seventeen San Antonio Mayas accompanied him as laborers. Practically none of them had ever been away from the vicinity of their village before.

To reach the ruins it was necessary to travel two days up the Belize River in a small launch, thence three days on mule-back through a dense, uninhabited forest. These ruins had been discovered the previous year by Mr. Thompson while conducting the First Marshall Field Archaeological Expedition to British Honduras. This year more extensive excavations were carried out, with the result that the sequences of culture in that area were more clearly brought out through the discovery of stratified pottery and graves of different periods superimposed one upon another. A small, round altar was found at Hatzcap Ceel giving the date 9.19.0.0.0. 9 Ahau 18 Mac, corresponding to June 28, A.D. 810 (in the correlation adopted by the Museum). This date fits in with that of the altar discovered last year, the date of which is 10.0.5.0.0. 13 Ahau 13 Uo, just twenty-five years later. However, most of the objects excavated, including jade, painted pottery, filed and inlaid teeth, and a mirror of iron pyrites, are of an earlier date.

At the close of the activity at these sites, a visit was paid to the ruins of Uaxactun and Tikal situated in the heart of the great forest-covered Peten District of northern Guatemala. At the former site a comparison was made between the pottery types discovered there by the Carnegie Institution and those discovered by the Field Museum expeditions. It was found that the artifacts and types of pottery were the same in both areas, showing that they must have formed part of the same cultural zone in ancient times.

Subsequently the ruined city of Copan in the Republic of Honduras was visited. There a new stele (No. 26) was found. This stele had been re-used as one of the steps on the northwest side of the great plaza. Only a portion of the inscription was preserved, and this yielded no date, but the style of the carving shows plainly that the monument dates from the early period. It had been carved on three sides, if not on all four.

A collection of Guatemalan textiles was obtained in the highlands of Guatemala. The natives in this region are also of the Maya stock, but speak different languages. They are excellent weavers, and the cotton blouses of the women embroidered with designs of birds and animals are very spectacular.

In June, with the arrival of the rainy season which precluded further work, Mr. Thompson returned to Chicago.

Under the patronage of Mr. Frederick H. Rawson, ethnological field work in Africa was undertaken this year for the first time in the history of the Museum. The Rawson-Field Museum Ethnological Expedition to West Africa, headed by Mr. Wilfrid D. Hambly, Assistant Curator of African Ethnology, was organized to make studies of the tribes of Angola (Portuguese West Africa) and Nigeria (British West Africa), countries which have been but little explored. Mr. Hambly left Chicago on February 18, and after making preparations and official arrangements in England for his expedition, proceeded to Antwerp and thence sailed to Angola. He stopped at the port of Loanda, capital and administrative center of the Portuguese colony, where the plans of the expedition were approved by the High Commissioner for Angola. He arrived at Lobito, the chief port of the territory, on April 29, and left for the interior on May 11, using the railway which runs for about 700 miles across the colony into the Belgian Congo. He established his base at Elende, Benguela, which is the center of the Ovimbundu, a most numerous and powerful tribe, who occupy the major portion of Angola. He made a thorough study of the domestic life of these people, their agriculture and industries, social organization, customs and habits, folklore, magic, and religion. With Elende as his base of operations, he made three arduous journeys which carried him far into the interior of the country in all directions.

In August he undertook a journey into the country of the Esele, a tribe living in the hinterland of the port of Novo Redondo in northwestern Angola. Their villages are well hidden amid the rocks or the tall grasses and bushes of the valleys, and shelter four or five families. He made his way through this country in a motor car which was used as a base to which the collections were returned at the end of each day. The Esele tribe differs from the Ovimbundu in both outward appearance and language. They decorate their bodies with red pigments, tattoo concentric circles around their eyes, and file their upper and lower incisors to very sharp points. They are good agriculturists, cultivating small patches of ground on precipitous and seemingly barren slopes. Maize is one of their staples and is stored on the cob. Pottery made by their women is the finest in Angola. An interesting

object obtained from this tribe is an ancient ax formerly used by the king both as a symbol of authority and as a weapon for beheading offenders.

On the return journey from the Esole country Mr. Hambly passed through the district of Bailundu, also inhabited by Ovimbundu, where he made a collection of charms and magical appliances. He then covered several thousand miles in the interior of Angola eastward and northward to obtain collections representative of the tribes surrounding the Ovimbundu people. Some very rare masks and costumes were collected, and several ceremonies, such as the initiation rites of boys and the healing of the sick, were witnessed on this tour. In September he returned to Lobito, taking passage to Matadi on the Congo and proceeding to Nigeria, where he will operate until the end of January, 1930.

Measurements of fifty-four adult males and sixty large photographs of racial types were obtained. Five reels of motion pictures (more than 2,000 feet) were made, the subjects being the native blacksmith's craft; basket, pottery, and mat making; dances, and a funeral. Some 500 still pictures were taken. Fifty cylinders of records of drum music and specimens of the Ovimbundu language were taken on the dictaphone. The blacksmith work was studied in great detail, and tools and products of the forge have been acquired. A collection of 1,239 objects, including some excellent wood carving, pottery, and basket work, was brought together. Snakes, lizards, and other reptiles whose skins are used in native industries or which play a significant role in native folklore were also collected.

The Field Museum-Oxford University Joint Expedition to Mesopotamia, financed by Mr. Marshall Field and Mr. Herbert Weld, completed its seventh season at Kish, Irak, working from the early part of December, 1928, till the middle of March, 1929. The direction of the field work was again entrusted to Mr. L. C. Watelin, who was assisted by his son, Mr. René Watelin, and by Mr. T. K. Penniman of Trinity College, Oxford, who was in charge of the excavation of human skeletal remains. The general supervision of the expedition's activities was, as in previous years, in the hands of Professor Stephen Langdon of Oxford University.

Two hundred laborers were employed in the work of excavation this season. The digging of a small trench for the purpose of laying the tracks for a narrow gauge railroad resulted in the discovery of ten Babylonian sarcophagi of bluish-gray pottery, shaped

like bathtubs and containing human skeletons. They were found at a depth of three feet. In each case the body was lying on its left side. In some cases the body was in the sarcophagus, which then was without a cover; in other cases the sarcophagus was placed over the body. One curious sarcophagus was found, made of two hemispheres of pottery fitted together and containing the remains of an old man. Although the skeletons were in a rather poor state of preservation, they revealed many interesting racial characteristics. The bones were large and indicated muscularity, and the skulls were uniformly dolichocephalic, with narrow noses, and large, much-worn teeth.

The main result achieved in the progress of excavation this season is that virgin soil has ultimately been reached about ten feet beneath the present water level, or sixty feet below the top of the mound. The fact has been ascertained that between water level and virgin soil the city of Kish was destroyed and reconstructed three times. The periodical demolition of the walls appears to have been caused by local inundations. Mr. Watelin discovered in horizontal layers consisting of clay deposits evidences of three floods, the most important of which he dates at 3300-3200 B.C. This great flood was followed by two lesser ones which in each case destroyed the whole or part of the city. Mr. Watelin contends that it is impossible to state at present which of these floods may be identical with the deluge recorded in the Old Testament, and states that investigations in different localities are required to settle this question definitely.

The capital result of this season is the discovery in the lowest strata of numerous flint implements of novel and varied types, such as have never been found in Mesopotamia before. Stone implements previously gathered in Mesopotamia on the surface of mounds were of a limited variety of forms, and had been accidentally pushed up from the depth of the mounds as these were gradually rebuilt. In other words, they were not found in the strata in which they had been left. At Kish, however, the flint implements were actually encountered *in situ*, at a depth of about eighteen feet, among a mass of flakes and rejects, which go to prove that the flints were manufactured in the very place where they were encountered. Saws and sickle blades embedded in a layer of bitumen for the attachment of wooden handles, knife blades, drills, scrapers, and axes were brought to light. A very curious small implement of irregular shape, with a very sharp point, was

found in abundance, and may have been used for making perforations in wood, leather, shell, or other soft materials. Bone drills which also occur abundantly were used at the same time with flint drills. Mr. Watelin, who has published a well illustrated article on the lithic industry of Kish in *L'Anthropologie*, has arrived at the conclusion that these flints date to about 4000 B.C. and that on the whole they point to a strictly lithic or neolithic period. However, copper is not entirely absent from this stratum; at least a long and thin copper needle and a cylinder of bitumen wrapped in copper foil were discovered. Metal, at any rate, was rare at that time and presumably restricted in its use to ornaments, while all implements for domestic and industrial purposes were made of flint.

Other objects found in the deep strata are statuettes of crude earth and bitumen, the latter representing figures of bearded gods in profile, the hair falling down in tresses on all sides of the head. The shoulders are square, the arms project from the body, and the legs are represented only by a cylindrical support. Animal representations are frequent. A model of a chariot with its team was found. The driver is standing on the shaft of the vehicle, directing a pair of animals close to the chariot and five others farther forward. According to Mr. Watelin's calculations, this chariot model belongs to the period of the third reconstruction of the city, which took place about 3300–3200 B.C.

The vicissitudes and successive destructions of the city have not been favorable to the preservation of pottery, which is found to have been smashed on the pavement. The fragments point to a coarse ware turned on the wheel and intended for everyday use. Several broken vases were found, badly fired and coated with a red pigment; other sherds are painted exclusively in black or in red, and are intersected by lines; other sherds are of a fine, black pottery. Many fragments bear incised geometrical designs. In the lower strata, beneath the water level, several pieces of fragmentary pottery were encountered with painted designs on the same order as those previously found at Jemdet Nasr; others have a unique decoration of painted concentric lines in brown, apparently made with a comb.

The stratification now obtained permits the establishment of a chronology in a series of seven periods down to the Neo-Babylonian epoch of the sixth century B.C. The lowest stratum, about twenty-seven feet below the level of the plain and ten feet beneath the present water level, is occupied by the earliest Sumerian culture

**GOLDEN PLOVER.**

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**GOLDEN PLOVER.**

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PL. E-185



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which, according to Professor Langdon, is not later than 4000 B.C., and this is the date adopted by him for the foundation of the city of Kish. It is this stratum which contained the flint implements, the black and red pottery, as well as the monochrome and polychrome pottery like that excavated at Jemdet Nasr.

Mr. Watelin also discovered a polychrome terra-cotta head portraying a Sumerian, half natural size (about 3000 B.C.), which he believes is the only example of painted statuary known in Sumerian art. The face is yellow; hair, beard, eyebrows, and eyelashes are indicated in black. In the division of the objects, this head was retained by the Museum of Bagdad. He likewise found a tomb containing copper vases in a rather good state of preservation and a very beautiful copper object, a support for a vase made of coiled copper wire in which a tall stone vase had been placed. Two or three hundred fragments of Babylonian tablets and about twenty Sumerian tablets were also brought to light.

Assistant Curator Thompson completed a monograph on the ethnology of the Mayas of central and southern British Honduras. The material for this work was obtained by him during the course of his four visits to British Honduras, the greater part of it, however, in 1929 when he conducted the Second Marshall Field Archaeological Expedition to British Honduras. The majority of the laborers employed in the excavations consisted of Maya Indians. Although usually very reticent about their customs and beliefs, they were more willing to volunteer information when far from their own homes. This information sheds much light on the life of the Mayas at the height of their civilization, particularly of the rank and file. Much information, too, was obtained on Maya religion. On the arrival of the Spaniards in Central America, the old religion was overthrown, and the priests exterminated. The simple religion of the layman, however, persisted, although only practised in secret. This study of the modern Mayas permits a close reconstruction of the religion of the Maya peasant stock of a thousand years or more ago. Previously only the religious concepts of the small group of educated priests and nobles were known, and even these imperfectly. Steps in religious fusion among the Mayas 1,500 years ago can now be traced in the light of the new information obtained. This study of the modern Mayas is now in press, and should be available early in 1930.

Assistant Curator Henry Field has made good progress on a report which will give the results of his expedition into the Arabian Desert,

the first part of which it is planned to publish in the coming year. Both geological and archaeological evidence points to the fact that in prehistoric times this desert was fertile and well-watered, and able to support a large semi-nomadic population. Many geological specimens brought back by the expedition now await identification and chemical analysis. The evidence now available would suggest that in a prehistoric age this area lay upon one of the old lines of migration between Africa, Asia, and Europe, so that new light will be thrown upon the question of the ancient population of the Near East. Assistant Curator Field also prepared anthropometric and statistical tables of 550 inhabitants of the Kish area.

An interesting discovery was made this year in tracing three lots of barley in some of the pottery jars excavated from the low strata of the ruins of the ancient city of Kish. Botanical investigation disclosed the fact that this barley is of the six-rowed variety (see Plate VI), and this, as far as is known here, is the first actually brought to light in Mesopotamia. Barley seeds of the four-rowed variety were formerly discovered at Nippur. The six-rowed type is the characteristic prehistoric barley which was known to the Indo-European nations, numerous examples of which have been found in the Swiss lake dwellings. It is this species which was taken along by the Anglo-Saxons on their migration from their original home to the British Isles and then cultivated by them in England. In view of the discovery of the six-rowed barley at Kish the conclusion is now warranted that this cereal, so important in the development of agriculture, was first brought into cultivation at a prehistoric date in Mesopotamia where the wild species also occurs, and that the cultivated species was diffused from that center to all other countries of the Near East, Egypt, and Europe.

Curator Berthold Laufer completed the manuscript of a detailed study entitled *Geophagy* in which the curious practice of earth-eating is traced in China and all other parts of the ancient and modern world. Numerous new data and results of research are contained in the work. He also contributed a number of articles to scientific publications of this country, Canada, and England.

Professor Frank E. Wood, a volunteer worker in physical anthropology, spent the first part of the year in the computation of averages, indices, and coefficients of the 300 Peruvian skulls measured by him last year. He also gave a preliminary cleaning and treatment with shellac to the forty Eskimo skeletons obtained

by Dr. W. D. Strong in Labrador, and measured about half of the skulls. He made the mathematical computations based on the measurements of 200 living Eskimos taken by Dr. Strong, and prepared the plates and descriptions of trepanned skulls from Peru to be used in connection with Professor Roy L. Moodie's work on *Roentgenologic Evidences of Disease and Injury in Ancient Unopened Mummy-packs from Egypt and Pre-Columbian Peru, in Field Museum of Natural History.*

**BOTANY.**—The collections of the Department of Botany were greatly enriched during 1929 by the results of the several expeditions conducted by the Department or with which it cooperated. The most valuable additions to the Department's collections were procured in this manner.

Of greatest importance was the Marshall Field Botanical Expedition to the Amazon, which with its separate divisions amounted in effect to two expeditions. This expedition got under way at the end of January when Acting Curator B. E. Dahlgren, accompanied by Mr. Emil Sella of the Department's Staff, sailed from Jacksonville for Belem, the Brazilian port usually known as Pará from the name of the state of which it is the capital. The departure of the third member of this expedition, Mr. Llewelyn Williams, Assistant in Wood Technology, who was to proceed to Iquitos, Peru, to collect herbarium specimens and woods, was delayed until later in the year when weather conditions would be more favorable for his work.

Headquarters were established in Belem, at the mouth of the Amazon. This city, close to the equator, has two well-known museums of its own, the Museu Paraense, better known as the Museu Goeldi, devoted to natural history, and the Museu Commercial, dealing with forest and other economic products of the region.

In view of the almost total absence from the Department's collections of specimens from this region, of the strategic location of the city at the entrance to the entire Amazonian river system, and its importance as the principal point of export for the tropical produce of a region as large as all of Europe, it seemed to possess great possibilities as a collecting ground. It was hoped to obtain material for the Department's exhibits, collections of woods and other economic material, and interesting specimens to be reproduced for the Hall of Plant Life. The Department had long desired to make first-hand acquaintance of the possibilities and conditions for work in this region, which undoubtedly has more to offer in the way of collecting and material for study than any other part of the

American continents. The presence of the two museums in Belem, both devoted exclusively to the natural history and products of the region, also offered unusual advantages.

The rainy season was selected for arrival at Pará, as it had the important advantage of being the general time of ripening for most of the fruits it was hoped to obtain, which could not be had in the drier season. The rainy months, however, turned out to be far wetter than usual. Nevertheless, it was decided to collect immediately in Pará and environs all the material possible, especially that for plant reproductions and the economic material offered by the markets.

Previous field work in the American tropics had already supplied the Department with most of the easily obtainable economic plants to be found there, but it was evident that in spite of this there could be secured at once many important items with which to enrich the exhibits. Some of these had long been on the Department's list of principal desiderata, e.g., the souari nut, *Caryocar*, of which two species were common under the names of piquia and piquiarana, and the sapindaceous climber, *Paullinia sorbilis*, the guarana of the Amazon. The ground-up fruits of the latter are usually marketed in stick form, and used in the preparation of a drink by the same name, which has stimulating properties similar to tea, coffee, or cola, due to the presence of an alkaloid of the nature of caffeine. Since the loss by Brazil of its virtual monopoly of the world's rubber trade through the establishment elsewhere of plantations of the Brazilian rubber tree from seeds obtained on the Amazon, the export of guarana as well as of rubber seeds has been forbidden. The plant is little cultivated, but it is interesting to learn of the recent establishment farther up the river of a Japanese plantation for the production of guarana.

An excellent coca shrub, almost a small tree, was found in flower in the botanical garden of the Museu Goeldi, far from its native habitat, which is Peru. A fine specimen of this was secured and prepared for the exhibits, where a place has long been reserved for it. It is the source plant of cocain. An excellent specimen of cinchona, the source of quinine, was also obtained in one of the small towns farther up the river. Attractive-looking big clusters of the farinaceous fruit of the pupunha, or peach palm, were to be seen almost daily in the market of Belem, and photographs and specimens were easily obtained of this and various other fruits characteristic of the locality. While fruits could readily be bought in the market, it was

not always so simple to find in each case a tree in bearing from which to obtain an adequate botanical specimen, because the produce sold in the Pará market generally was brought by small sailing vessels from various more or less distant points.

Among the most desirable collections made for the exhibits were branches of the principal kinds of rubber trees. Properly reproduced from formalin specimens with the aid of the photographs, molds, and color sketches that were always prepared for such items, and exhibited together with their respective trunks showing the methods of tapping, they will enable the Department to make a comprehensive rubber exhibit based on Amazon material. For this purpose as complete a collection of specimens as could be made was secured of the various kinds and grades of rubber and caoutchouc from various localities. This material will be given place in the Department's exhibit of industrial raw materials which is to be reorganized in Hall 28 during the coming year.

The vegetable oil industry is assuming increasing importance in northern Brazil, the city of Belem having several mills for the production of oils and fats, chiefly from palm seeds, e.g., babassu, murumuru, and others. Samples of the fruits used and their respective oils, edible or otherwise, were obtained. Tobacco of various types in characteristic and curiously wrapped packages, mandioca or cassava products in their various forms, different varieties of cacao cultivated there, and various beans, seeds, palm fibers, and woods were likewise collected.

The number of woods in this region is extraordinary, though as a matter of fact only a relatively small proportion of them have as yet found general use in the woodworking industries or in special applications. The Museum's foreign wood exhibits include some Brazilian woods, but these are all from eastern and southern states of the country. Woods from the large Amazon region have hitherto been entirely unrepresented. Planks that were secured of the twenty-five principal species of commercial woods of Pará will thus fill an important place.

For the Herbarium a valuable collection of some 2,500 numbers was secured from the vicinity of Belem and from other points visited. The important herbarium of the Museu Goeldi was examined in its entirety and every courtesy was extended by the museum officials, especially Messrs. Siqueira Rodrigues and Bento Chermont. With the kind assistance of the latter, who is curator in charge of the botanical collections, a selection was made of type specimens

to be photographed. Most of these were of the little-distributed plants of the famous Brazilian botanist Huber, a few were types of plants described by the Brazilian botanist Ducke, and a few were co-types of Ule, selected for special reasons. This work was done in connection with the Department's program, begun this year with the aid of an appropriation from the Rockefeller Foundation, for obtaining photographs of type specimens of tropical American and South American plants. One of the rooms in the expedition headquarters was used for the photography. The Museum acknowledges with deepest appreciation the cooperation given to its expedition by the officials of the Museu Goeldi.

The Acting Curator made a trip to the near-by state of Maranhao and to various points along the coast, including Ceará, Parahyba, and Bahia, obtaining in each locality the most available and characteristic woods and products. In this connection should be acknowledged gifts of cacao and a carefully prepared set of specimens of tobacco donated by Epiphanio Souza Cruz and Company of Bahia. A small collection of the wood of Ceará was obtained in Fortaleza. Trips were made also on the Amazon to Marajó, to Santarem at the mouth of the Tapajoz, up the river Tapajoz to Boa Vista, and to Manaos.

A visit to the Henry Ford concession at Boa Vista, where the Field Museum party for several days enjoyed the hospitality of the management, proved especially interesting and resulted in the collection of several hundred specimens. Felling of the forest for the planting of rubber trees was about to end for the season, but was still in progress at the time the visit was made. The Museum party had thus an exceptional opportunity to test out the possibilities of obtaining wood and herbarium specimens in the wake of the woodcutters. Collecting from small trees seldom presents any insuperable difficulty, at least none beyond that of climbing or felling the trees, but the near impossibility of obtaining flowering or fruiting branches from forest giants has always been baffling to botanists. It would therefore seem that in a place such as the Ford concession, where cutting operations are conducted on a large scale and even the very largest species are felled to make room for plantings, it should be a simpler task to secure adequate specimens, but this proved far from being the case. The fall of a forest giant is no small matter. As it begins to topple, many times carrying with it smaller trees in the way, it gathers momentum until it hits the ground with a terrific crash, the concussion resulting in a cloud

of torn foliage and flowers as if an explosion had taken place. Leaves and pitch continue to whirl in the air for minutes and in descending scatter far and wide. An examination of the tree top afterwards often shows it to be practically stripped with not a flower to be found, where previously it had been literally covered with them. The one very great actual advantage of collecting woods where trees are being felled on a large scale lies in the possibility of obtaining with facility not only herbarium specimens but proper specimens of the wood, including a good representation of the heart- as well as sapwood.

The courtesies extended to the Museum party on this occasion are most gratefully acknowledged and thanks are due especially to the resident director of the work, Captain Erno Oxholm, to the physician in charge of personnel and sanitation, Dr. Clarence Falles, and to Mr. Earl Bricker and Mr. R. G. Carr. In connection with the stay in Pará thanks should be extended to the American Consul, Mr. Gerald Drew, for his invariably helpful attitude and valuable suggestions.

After the close of the work in Pará the Acting Curator returned to Chicago, stopping en route in southern Brazil, and visiting the botanical garden and its herbarium in Rio, and the herbarium in Sao Paulo to make arrangements for photographing type specimens there. It is expected that from both of these places there will be secured certain additions to the collection of negatives which is described elsewhere in this Report. The visit to these herbaria and the work accomplished in Pará at the Museu Goeldi emphasize the desirability of confining for the present the work of gathering photographs of type specimens to the larger, more important botanical centers where types are to be found in great numbers and where photographs may thus be secured with a minimum of effort and expense.

Mr. Williams, in charge of the other division of this expedition, spent most of the year in the field searching for material to increase the study series of the Department. Leaving Chicago in March, he sailed from Savannah, Georgia, for Brazil, and proceeded to Belem. There he spent only a few days, but was able to form a small collection of plants. He then proceeded up the Amazon River by steamer to Iquitos, Peru, at the head of navigation, where he established headquarters for his season's work. From Iquitos he made numerous voyages by canoe along the tributaries of the Amazon. Extended trips, each consuming several weeks, were made

up the Itaya and Nanay Rivers, and down the main river as far as the Brazilian frontier. He thus visited many localities which doubtless had never been seen previously by a botanist.

That his work has been successful is proved by the bulk and quality of the material already received in Chicago. This consists of 9,500 well-prepared herbarium specimens, and of 1,088 specimens of Peruvian woods. The wood specimens are of unusual value, due to the fact that corresponding herbarium material was obtained in each case from the same trees and shrubs from which the wood samples were taken. It is only thus that one can be certain as to the identity of the wood material, which, if not referable to its proper genus and species, is worthless for scientific purposes. This really huge wood collection, when thoroughly studied and reported upon, will furnish data concerning the wood products of the wet forests of eastern Peru, such as are available for no other part of tropical South America. The region is immensely rich in tree species, and is known to produce many kinds of lumber, some of which may prove to be of importance to the woodworking industries of the United States and Europe.

The herbarium specimens collected by Mr. Williams form the most desirable addition to the Museum Herbarium which it would be possible to obtain. They will be cited in the flora of Peru upon which Assistant Curator J. Francis Macbride is now engaged, and they will enable him to cover satisfactorily a portion of Peru which hitherto has been almost unknown botanically. It is expected confidently that the collection will prove astonishingly rich in new species of Peruvian plants, and that it will provide extensions of range for others known at present only from Brazil. Mr. Williams will remain in Peru until early summer in 1930, and by that time probably will have doubled the collections already received from him.

Dr. August Weberbauer, well-known botanist of Lima, Peru, conducted for Field Museum the Marshall Field Expedition of 1929 to Peru. Dr. Weberbauer's similar activities in preceding years have brought to the Museum an enviable amount of exceptionally desirable herbarium material to be utilized in the preparation of the flora of Peru, which is to be published by the Museum. His collections, although not so extensive as those obtained by some other collectors, are of outstanding value because of the fact that he is thoroughly familiar with the Peruvian flora, and collects only those plants which seem to him new or rare. On this account, his Peruvian collections always have been found to be rich in plants previously unknown to botanists.



MURAL PAINTING, RESTORATION OF GREAT GROUND SLOTHS AND GIANT ARMADILLOS

Ernest R. Graham Hall

Gift of Ernest R. Graham. Painted by Charles R. Knight

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In February and March Dr. Weberbauer spent more than a month in the field, and obtained 888 carefully prepared and annotated specimens of plants. His work was performed in the southern province of Cuzco, from which the Museum has possessed but scant material. He collected particularly in the region of Marcapata, and the majority of his plants were gathered at high altitudes. Their study doubtless will reveal a large number of species new to the Peruvian flora, which already has been found to be so extensive.

Dr. Weberbauer's collections, with those of Mr. Williams, and the fine series presented by Professor Fortunato L. Herrera, of the University of Cuzco in Peru, and Mr. Oscar L. Haught, of Negritos, Peru, make a quite unprecedented addition to the Museum's Peruvian herbarium. When further material now expected has been received, it seems certain that Field Museum will possess a representation of the Peruvian flora which cannot be matched elsewhere in the world.

The most important systematic work ever undertaken by the Department of Botany was initiated during 1929. It was first proposed and planned by Acting Curator Dahlgren, and it has been placed in operation through a fund generously supplied for the purpose by the Rockefeller Foundation.

In systematic botanical work, which has to do primarily with the naming and classification of plants, it is essential that specimens be named accurately. This can be done with perfect satisfaction only by comparison of the plant to be named with the first, original or type specimen, upon which the Latin name of the plant originally was based. Field Museum has many such types, but since the Herbarium has been developed wholly within the past thirty-three years, the number is comparatively small. Large numbers of type specimens exist in some eastern herbaria, particularly in the Gray Herbarium of Harvard University, where are deposited the collections studied by America's greatest botanist, Asa Gray, and also in the herbarium of the United States National Museum in Washington.

In the United States during recent years a great deal of attention has been devoted to exploration and study of the botanical features of South and Central America. The early students of the South American flora were all Europeans and the types of most species described from South America are preserved in European herbaria, many of the species not being represented at all by any specimen in American institutions. In order to determine properly the

recently accumulated collections, it is necessary to have access to some of these historic type specimens, this being obtained ordinarily only by a visit at considerable expense to Europe for the purpose. For purposes of determination, a photograph of the type specimen, especially when accompanied by a fragment of leaf or flower of the original, is almost as helpful as the actual specimen itself. The value of such photographs has long been recognized by botanists, but the number of photographs made has been small, because of lack of funds for the purpose.

In 1929 Field Museum was granted by the Rockefeller Foundation a substantial sum to be used in photographing type specimens of American plants preserved in European and South American herbaria. The grant is to be continued for three years, and it is believed that the results will be of unprecedented value to American botanists in facilitating study of the tropical American flora. The negatives obtained in this manner are to be preserved in Field Museum, and prints of them will be available to other institutions which may wish to bear the actual cost of their printing. It is believed that no other development of recent years can have such far-reaching and helpful results as this in the promotion of systematic and floristic work upon tropical American plants by the systematic botanists of the United States and other parts of the American continents.

During the summer Acting Curator Dahlgren had prepared at Belem, Brazil, 819 negatives of type specimens of Brazilian and Peruvian plants preserved in the Museu Goeldi. These specimens, representing chiefly species described by the eminent Brazilian botanist Huber, heretofore have been quite unavailable to North American botanists. The photographs will be exceedingly useful in the determination of recent Brazilian collections acquired by Field Museum and equally so to other institutions interested in the study of the flora of that country. Many of the species represented are forest trees yielding valuable lumber, and it is expected that some of these will be associable with the collections now being made along the upper Amazon by Mr. Williams.

Further work under the Rockefeller Fund for the Photographing of Type Specimens is now being conducted by Assistant Curator Macbride in Europe. Mr. Macbride left Chicago at the end of July, going to Berlin, where he has been engaged since that time. He has received the most cordial support from Dr. Ludwig Diels, Director of the Berlin Botanical Garden and Museum, and from the

entire staff of the museum. Every facility has been provided for photographing the unequalled series of South American types owned by the garden, and the work has been successful far beyond reasonable expectations. More than 2,000 negatives already have been prepared under Mr. Macbride's supervision, and although they have not yet been received by Field Museum, prints made from some of them demonstrate that they are of superior quality, and will form an indispensable addition to any institution interested in the identification of tropical American plants. The types of several large and important families have been selected for photographing, especially types from the Andes of South America. Since most active American systematic botanists are interested to some extent in this region, it is believed that the results of the completed collection will be eminently and immediately helpful to American botanists generally. The Museum is greatly indebted to the Rockefeller Foundation for its sponsorship and financing of this highly important scientific work.

Field Museum acknowledges with the deepest appreciation the cordial interest and the generous cooperation of the director and staff of the Berlin garden, which has resulted in the favorable accomplishment of this project. It is gratifying to be able to record, also, the promises of cooperation received from the directors of other European herbaria, where it is expected that the work will be continued during the next few years.

The Department of Botany shared in one of the Museum's zoological expeditions, the William V. Kelley-Roosevelts Expedition to Eastern Asia. Mr. F. Kingdon Ward, the well-known English collector of Chinese plants, who has introduced into European and American gardens so many beautiful plants from the Chinese mountains, was attached to this expedition. In March and April, 1929, he collected plants in the southern Shan states and Burma, and in May and June he botanized in upper Laos, Indo-China. The Museum received a collection of approximately 400 herbarium specimens which he collected in these two areas.

Mr. Herbert Stevens, in connection with his zoological work as a member of the same expedition, made a large collection of plants in the high mountains of the province of Szechwan, China. It is composed largely of herbaceous plants, many of them alpine species, and it amounts to more than 2,400 specimens. When determined, as it is expected they will be with the cooperation of specialists upon the eastern Asiatic flora, these collections will

make a useful addition to the Herbarium, which needs a much better representation of the flora of eastern Asia. Asiatic specimens often are helpful for comparison with American material, since it has long been known that the floras of China and the United States have much in common.

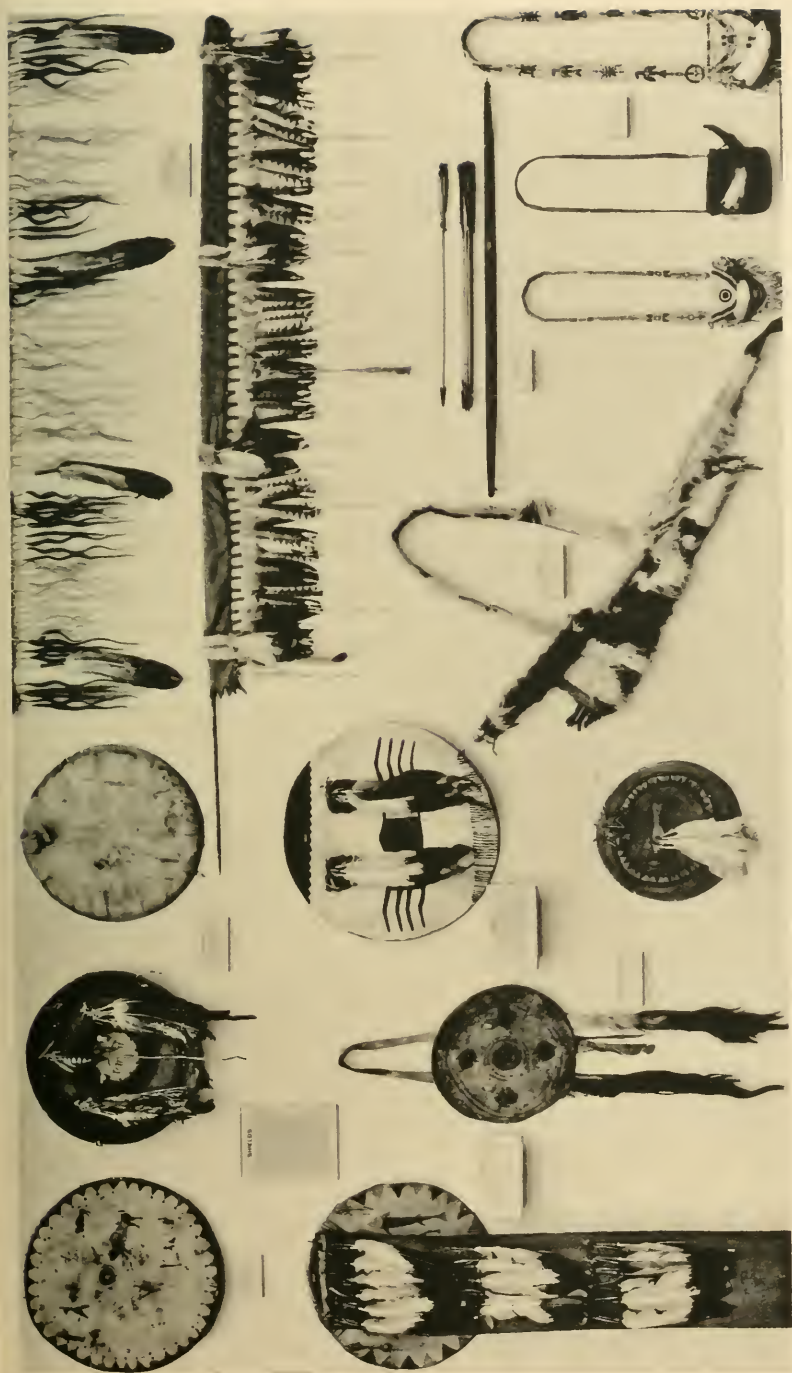
As evidence of the continued and increasing use being made of the Museum's Herbarium may be mentioned the fact that during 1929 there were published at least thirty-seven papers based wholly or in part upon its collections. Some of these papers were written by members of the Staff; others by persons who had visited the Museum and consulted the Herbarium, or had borrowed specimens for study elsewhere.

Professor Samuel J. Record, Research Associate in Wood Technology, published in *Tropical Woods*, a periodical issued by Yale University School of Forestry, a paper upon the "Trees and Shrubs Collected by F. C. Englesing in Northeastern Nicaragua." The material upon which the paper is based is deposited in the Museum's Herbarium, and the determinations were made by Associate Curator Paul C. Standley.

Mr. Standley published eighteen papers based wholly or in part upon the Museum collections. The most important of these are two long papers bearing the title, *Studies of American Plants*, printed in Volume IV of the Botanical Series of Field Museum. These are devoted chiefly to descriptions of new species which were included in the abundant collections received here for determination.

In association with Professor Leslie A. Kenoyer, of Western State Teachers' College, Kalamazoo, Michigan, Associate Curator Standley published a *Supplement to the Flora of Barro Colorado Island, Panama*, with five plates, which was issued as No. 6, Volume IV, of the Botanical Series of Field Museum. In *Tropical Woods* there appeared nine articles which Mr. Standley had prepared. Most of them dealt with new trees recently discovered in Central and South America. One described a new genus of trees from Peru, collected on one of the Marshall Field Expeditions to Peru, and named *Macbrideina*, in honor of its discoverer, Assistant Curator Macbride. Another paper by Mr. Standley which appeared in *Tropical Woods* contained a brief biographical sketch of Captain John Donnell Smith, the eminent botanist of Baltimore, who died in 1929 at the age of ninety-nine.

Mr. Standley and Mr. Macbride published jointly in Volume XXXI of *Rhodora* a paper entitled "A New Form of Red Cedar



WEAPONS AND SHIELDS OF CHEYENNE AND ARAPAHO

This exhibit is an example of the new method of installation on light-colored screens in Hall 5

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from Indiana." This described *Juniperus virginiana* var. *Bremerae*, which was discovered recently in the dunes near Port Chester, Indiana.

Assistant Curator Macbride published in Volume XIX of the *Journal of the Washington Academy of Sciences* two papers dealing with problems of nomenclature. In a paper with the title *Spermatophytes, Mostly Peruvian*, which was issued as No. 7 of Volume IV of the Botanical Series of Field Museum in July, 1929, he described a large number of interesting new plants from Peru, obtained in the course of the Marshall Field Expeditions to that country. He published, also, in *Tropical Woods* three shorter papers discussing plants of Peru and other parts of South America.

Mr. Llewelyn Williams published in No. 20 of *Tropical Woods* a paper entitled "The Wood of *Caryodendron angustifolium* Standley," dealing with one of the new trees discovered by the Marshall Field Expedition to Panama, 1928.

Dr. William Trelease of Urbana, Illinois, in a paper entitled "New Piperaceae from Central America and Mexico," printed in Volume XIX of the *Journal of the Washington Academy of Sciences*, described no less than thirty-six new species and varieties of plants of the pepper family. Many of them were collected in northern Honduras by Associate Curator Standley, and the types of all of them are in the Museum Herbarium.

Professor E. E. Watson, of Michigan State College, Lansing, Michigan, in *Contributions to a Monograph of the Genus Helianthus*, an exhaustive account of the sunflowers native in the United States, cited many specimens from the Herbarium of Field Museum. Two of the new species which he described were based upon type specimens belonging to this Herbarium.

Miss Nellie V. Haynie, of Oak Park, Illinois, published in Volume XXXI of *Rhodora* two papers reporting plants of the Chicago region. She very kindly deposited in the Museum Herbarium the specimens upon which the records were based, in order that they might be preserved permanently.

Professor M. L. Fernald, of the Gray Herbarium of Harvard University, published in No. 83 of the *Contributions from the Gray Herbarium*, issued in March, 1929, a description of a new bluegrass, *Poa labradorica*, based partly upon specimens collected by the Rawson-MacMillan Subarctic Expedition.

Mr. Ellsworth P. Killip, of the United States National Museum, published in Volume XIX of the *Journal of the Washington Academy*

of *Sciences* a paper with the title "New Plants Mainly from Western South America. II," in which he described a new plant, *Loasa vestita*, whose type is in Field Museum. Dr. S. F. Blake, of the United States Department of Agriculture, was the author of another paper in the same volume, entitled "New Asteraceae from the United States, Mexico, and Honduras," in which there were described two new plants discovered in Honduras by Associate Curator Standley. There appeared in No. 20 of *Tropical Woods* a paper, "A New Peruvian Capparis," by Mr. Oscar L. Haught, of Negritos, Peru, who has contributed so much interesting Peruvian material to Field Museum Herbarium. The type specimen of this new species is in the Museum collections.

The research work of the Department of Botany, as well as the care and identification of the collections, has been greatly facilitated by the ample additions made during the year to the Library through the acquisition of important books, especially certain ones published years ago and now very difficult to acquire. The Department now has an excellent working library, at least for the study of American plants. The liberal policy of the Museum regarding the development of the Botanical Library resulted in the purchase of most of the desirable works relating to tropical American plants which were offered for sale during the year. There were acquired, also, several important books dealing with extra-American plants, such as a set of Oliver's *Flora of Tropical Africa*, and Ascherson and Graebner's *Synopsis der mitteleuropäischen Flora*.

Most important of the botanical works received were the many volumes needed to complete the Museum's set of *Curtis's Botanical Magazine*, whose thousands of fine plates are so necessary for determinative work with tropical American plants. A unique addition to the library was a photostat copy of Ruiz and Pavón's fourth volume of the classical *Flora Peruviana*. Three imposing volumes of this monumental and basic work were published at the end of the eighteenth century. They are seldom offered for sale, but the Museum is fortunate in possessing one of the few complete sets in America. Plates were engraved for a fourth volume, but the letterpress never was issued. Only three or four copies of the plates are known to exist. From one of these sets, in the library of the British Museum, through the courtesy of the director of that institution, the photostat copy now at Field Museum was obtained. So far as known, no representation of these plates

is owned by any other American library. The plates represent many plants peculiar to Peru and are almost indispensable to a study of that country's flora.

The year has been a busy one for the Staff of the Department of Botany because of the unusually large amount of material received, especially in the Herbarium. The care, labeling, determination, and distribution into the Herbarium of this material have severely taxed the resources of the Staff.

Especially urgent have been the requests from many correspondents for assistance in the determination of material. Some idea of the activity of the Herbarium Staff may be gleaned from the fact that during the year there have been determined and reported more than 13,000 specimens of plants. Of this material, 5,944 specimens were sent to Field Museum on loan, and were returned after they had been named. Of the specimens determined 7,134 were retained for the Museum's Herbarium. They included much of the most valuable material acquired by the Department during 1929, particularly specimens of numerous new species of which descriptions were prepared and either have been published or are in the course of publication.

Numerous lots of plants were received for determination from many parts of the United States, ranging from New England to California, and from correspondents in such widely separated countries as Mexico, British Honduras, Guatemala, Salvador, Honduras, Nicaragua, Costa Rica, Panama, Peru, Venezuela, Sweden, England, the Union of Socialistic Soviet Republics, Hawaii, the Philippine Islands, Japan, Denmark, France, and Germany. Material from still other countries also was determined, but was received from persons in the United States or Europe.

The monographic work upon the family Rubiaceae begun in 1928 by Associate Curator Standley has been continued during 1929. The Rubiaceae constitute one of the largest tropical American groups, and include such important plants as coffee, cinchona, and ipecac.

The prosecution of the work has been aided by the cooperation of other herbaria, which have been generous in lending the South American material in their keeping. More than 5,000 specimens of Rubiaceae were received on loan from the Royal Botanic Gardens, Kew, England, the Royal Natural History Museum of Stockholm, the Jardin Principal Botanique of Leningrad, the University Botanical Museum of Copenhagen, the United States National

Museum of Washington, the Gray Herbarium of Harvard University, the New York Botanical Garden, the Philadelphia Academy of Sciences, and the Missouri Botanical Garden, St. Louis. All this material was critically determined and annotated before being returned to the senders. Photographs were made of type specimens and of species not represented in the Herbarium of Field Museum. These have been placed in the Herbarium, and it now contains a more complete representation of South American Rubiaceae than exists anywhere else in the United States, if not in the whole world. The negatives will be placed with other negatives of types which are being obtained abroad.

As a result of the study of this large amount of material, with that of the Museum's Herbarium, there has been prepared a systematic account of that family as represented in each of the following countries: Colombia, Venezuela, Ecuador, Peru, and Bolivia. The first of these papers, that devoted to the Colombian Rubiaceae, is now in press, to be issued as the first part of Volume VII of the Botanical Series of Field Museum.

Associate Curator Standley spent a great deal of time in the determination of the collection of plants which he made in Honduras in 1927-28, and this work has been nearly completed. As had been expected, the collection was found to contain a large number of new species, descriptions of many of which have since been published. A paper was prepared enumerating the trees of Honduras, and it will appear early in 1930 in *Tropical Woods*. Another paper, listing the woody plants of Siguatepeque, Honduras, will be printed soon in the *Journal of the Arnold Arboretum*. The *Flora of the Lancetilla Valley of Honduras*, which will consist of a complete report upon the 1927-28 collection and be practically a flora of the north coast of Honduras, has been almost completed.

The *Flora of Yucatan*, which has been in preparation for several years, was completed by Associate Curator Standley near the close of the year, and submitted for publication as the concluding part of the third volume of the Botanical Series of the Museum. A paper entitled *Studies of American Plants—III* also was submitted for publication toward the end of the year.

Assistant Curator Macbride, during the first half of 1929, before leaving for Berlin to engage in the work of photographing type specimens, devoted most of his time to preparation of the manuscript of the flora of Peru, which is now well advanced. During the year he prepared the portions dealing with several

larger and more important families, particularly the Solanaceae or potato family, and began work upon the very large group, Leguminosae.

In the work of determination of Illinois and other United States plants, Mr. H. C. Benke of Chicago, as in past years, was generous in donating his time, and was of invaluable assistance, especially in the case of such difficult groups as grasses, asters, and goldenrods, with which he is thoroughly familiar. Dr. Earl E. Sherff, of Chicago, rendered valuable assistance in the determination of Compositae, especially of those groups, such as *Bidens* and *Cosmos*, with the revision of which he is engaged.

Assistant Curator James B. McNair has made a very useful card index of plants that contain large quantities of starches, sugars, gums, tannins, resins, drying oils, semi-drying oils, non-drying oils, fats, and waxes. These cards give family, species, and common names, places where native and cultivated, percentage of the respective substances yielded, and part of the plant in which located.

The information tabulated in a paper written by Mr. McNair, and now in press, on the differential analysis of starches makes it possible to analyze readily a sample of starch so as to distinguish it among some 300 starches and thus to determine not only the plant family, genus and species of its origin, but, in some cases, the variety as well—for example, sweet corn from dent corn.

Another paper on oils, also by Mr. McNair and now in press, points out the relationship between the habitat of plants and characteristics of their oils and fats, including information helpful in the differential analysis of plant oils and the identification of their botanical sources.

A third paper, on gums, tannins, and resins, likewise prepared by Mr. McNair, indicates the relation between plant habitat and gum, tannin, and resin content, their relation to each other, to specific plants, and their possible function in plants.

A botanical leaflet by Mr. McNair on Indian corn will soon go to press. This leaflet, dealing with the most important agricultural crop in the United States, should be popular and of wide interest in a locality which is the principal corn market of the country and the center of the corn producing area. It includes a consideration of the origin of corn, its varieties and areas of present cultivation, its use by the Indians, and its present importance, including the various chemical products manufactured from it, such as solvents, starch, oil, paper, and wall board.

A substantial amount of time was devoted by the Staff of the Herbarium to the distribution of duplicate material, which had accumulated in large quantities and occupied space urgently needed for other purposes. During the year 34,623 duplicate specimens were distributed in exchange to a large number of institutions and individuals. Part of this material consisted of duplicate sets of the plants collected in Yucatan by the late Dr. George F. Gaumer, of Izamal, Yucatan, and some of it represented duplicate mounted sheets removed from the Herbarium, but the greater part consisted of miscellaneous duplicate material from the United States, and of the duplicates of recent tropical American collections received for study. This duplicate material was distributed to thirty-five institutions and individuals in the United States, and to sixteen herbaria of Europe and Canada. It is expected that there will be received in return a large amount of material useful for the Herbarium of Field Museum, and, in fact, several important sets of South American plants already have been received as a direct result.

Loans made from the Herbarium during 1929 amounted to 976 specimens, lent to fourteen institutions and individuals for study or for determination. To the Missouri Botanical Garden were lent 197 sheets of *Ayenia* and *Halenia*, for use in the preparation of monographic accounts of those genera. To Mr. E. R. Bogusch, of the University of Illinois, there were lent fourteen specimens of *Phlox*, for critical study, and to the United States National Museum 299 specimens of the same genus, for examination by Dr. E. T. Wherry, who is monographing the group. To Professor Ralph W. Chaney, of the University of California, there were lent forty-one specimens of tropical American plants, for use in his investigations of certain fossil floras of the western United States. Other loans were made to the Gray Herbarium of Harvard University and to the New York Botanical Garden. To Dr. Gunnar Samuelsson of Stockholm were sent on loan forty-three specimens of *Epilobium* to be used in the preparation of an account of the South American representatives of the genus. The loan of all this material is useful not only to the persons by whom it is studied, but also to Field Museum, since it results in the critical determination of the specimens, thus greatly enhancing their value for study purposes.

As in past years, the Museum has received valuable and greatly appreciated assistance from botanists of the United States and Europe in the determination of material of certain difficult or critical

groups of plants. In most cases it has been possible to submit for determination duplicate specimens which might be retained as a return for the labor of making the determinations.

Among those who have rendered important aid in such determinative work should be mentioned the following: Mr. Edwin B. Bartram of Bushkill, Pennsylvania, who determined the mosses collected in Honduras by Mr. Standley and prepared an account of them, which has been published by the Museum; Dr. Theodor Herzog of Jena, Germany, who is studying the hepatics of the same collection, and Dr. G. Einar Du Rietz, of Upsala, Sweden, who is determining the lichens; Dr. William Trelease, of Urbana, Illinois, who has named a large number of plants of the Piperaceae, or pepper family; Professor Oakes Ames, of the Botanical Museum of Harvard University, who has identified orchids; Dr. B. L. Robinson, Dr. I. M. Johnston, and Mr. Lyman B. Smith, of the Gray Herbarium of Harvard University, who have determined material in the various groups in which they are especially interested; Professor M. L. Fernald, of the same herbarium, who very kindly named the collections of the Rawson-MacMillan Subarctic Expeditions of Field Museum; Dr. William R. Maxon, of the United States National Museum, who has determined many ferns; Mr. Ellsworth P. Killip and Mr. Emery C. Leonard, of the same museum, who have named specimens of special groups; Dr. S. F. Blake, of the United States Department of Agriculture, who identified the Compositae collected in Honduras by Associate Curator Standley, as well as material of the same family from other regions; Dr. A. S. Hitchcock and Mrs. Agnes Chase, of the United States Department of Agriculture, who have given important assistance in the naming of tropical grasses; Dr. N. L. Britton and Dr. H. A. Gleason, of the New York Botanical Garden, who have determined plants of several groups; Dr. C. L. Shear, of the United States Department of Agriculture, who has supplied determinations of fungi; and Mr. Kenneth K. Mackenzie, of Maplewood, New Jersey, who has identified specimens of the genus *Carex*.

The Department has received during the year many personal and telephone calls from persons in Chicago who wished to obtain assistance or information regarding botanical matters, and in most instances it has been possible to supply the information desired, sometimes in matters of considerable importance. Many specimens of plants have been brought or sent to the Herbarium with requests for their names by residents of the Chicago area. Appeals received

by mail for information upon a wide range of botanical subjects required a substantial amount of time for answer. The Department also has been called upon frequently for aid regarding botanical subjects by the other Departments of the Museum.

The Staff of the Department has been pleased to receive many visits from botanists who wished to consult the collections, or observe the method of their installation. Professor H. M. Hall, of the University of California, spent some time in examining material of the Compositae. Mrs. Eva M. Roush and Miss Mildred E. Mathias, of the Missouri Botanical Garden, studied the herbarium collections of Malvaceae and Umbelliferae. Professor Ralph W. Chaney, of the University of California, spent several days in comparing fossil plants with specimens in the Museum's Herbarium.

Among other visitors may be mentioned Mr. Heinrich Teuscher, formerly of the Morton Arboretum; Mr. T. Naito of the Imperial College of Agriculture and Forestry of Kagoshima, Japan; Professor C. H. Kauffman of the herbarium of the University of Michigan; Professor A. O. Garrett of Salt Lake City; Dr. G. R. Wieland of Yale University; Professor E. B. Mains of Purdue University; Professor Leslie A. Kenoyer of Western State Teachers' College, Kalamazoo; Dr. N. E. Fassett of the Department of Botany of the University of Wisconsin; Mr. C. D. Mell of New York; Dr. E. D. Merrill, Director of the New York Botanical Garden; and Dr. Th. Just of Notre Dame University. Several students of the University of Chicago have visited the Herbarium in order to study its collections.

GEOLOGY.—Associate Curator Henry W. Nichols spent the last two weeks of July collecting in the volcanic regions of Mount Taylor, New Mexico. A large and valuable collection illustrating the surface features of the lava beds and volcanic cones in that locality was secured. Headquarters were maintained at Grant, New Mexico, within easy reach by automobile of the Tertiary lavas of Mount Taylor and the San Mateo Mountains to the north, and of recent craters and lava flows of the Zuñi Mountains to the south. The district covered is largely in the United States Forest Reserve. The cordial and efficient cooperation of the United States Forest Ranger, Mr. J. H. Mimms, who knew the smallest details of the topography and lava flows, permitted an unusually complete collection to be made, with great economy of time. Thanks to his assistance, tedious prospecting for good collecting grounds was entirely eliminated.

Perhaps the most interesting specimens were those secured from Flagpole Crater on the Zuñi Mountains. This cone and crater are in perfect condition, and their lava and ashes are as fresh and unaltered as if just cooled from a late eruption. The rim of the crater was reached with some difficulty, on account of the loose cinders covering its steep slopes. This rim is a level surface about forty feet wide, of coarse, black cinders, interrupted in places by projecting pinnacles and masses of brown lavas which take very grotesque forms. The crater, which is slightly elliptical, is about 1,000 feet in diameter and has an estimated depth of 400 feet. From the cone, numerous contorted and stalactitic shapes of light-brown lava, covered with a siliceous glaze, were secured, as well as fragments of the spindle-like volcanic bombs, black scoria and light-gray lapilli or ashes of the size of fine gravel. The ice caves about a mile from this crater, where large bodies of ice persist throughout the summer, were visited but yielded no specimens of importance.

On a basalt flow from the Tintero Crater the lava was found to be as fresh as if recently cooled, and many specimens illustrating surface features as well as such phenomena as steam holes, flow structures, scoria, *et cetera*, were collected there. Among the specimens secured in the Zuñi Mountains were two slabs, two by three feet each, which illustrate two aspects of the rough *malpais* surface of the cooled lava, which was thrown into extraordinary forms by the turbulence induced by escaping steam during solidification. Several lighter slabs, about a foot square, show other interesting aspects of this lava surface. This lava is underlaid by large caverns left when the molten lava of the interior of the lava stream had continued to flow after the exterior had cooled. In many places the roofs of these caverns had fallen, thus giving access to their interiors. However, no specimens of interest were observed in these openings.

One day was spent near the government ranger station in Canyon Lobo near Mount Taylor. Here numerous specimens illustrating the features of the older lava were secured. A trip to another part of Canyon Lobo provided specimens of volcanic bombs, pumice, obsidian, flow structures, agglomerates, and similar material. A bed of wind-blown volcanic ash near Grant which has altered to bentonite was visited and specimens secured. A visit to the neighboring town of Blue Water yielded two other varieties of fine, wind-blown

ash, some silicified wood, septaria, and other material. The soil of the district is a typical loess formed from wind-blown dust, and a characteristic specimen of this was secured.

The volcanic neck, Alesna, which lies north of Mount Taylor, was visited, studied, and photographed during a violent storm, in the course of which lightning bolts were repeatedly seen striking into the impressive basalt spire which points hundreds of feet into the air. Material found here proved to be quite unsuited for exhibition and was not collected. Two other volcanic necks of a similar nature were studied, one about half a mile from Alesna, and the other in Canyon Lobo. The latter showed some very unusual features.

While the collections were being secured, about 100 photographs of volcanic and topographic features were taken. Altogether, 173 specimens were collected and 100 photographs made.

A short field trip was made by Associate Curator Elmer S. Riggs and Preparator P. C. Orr to Argos, Indiana, in order to recover a specimen of mastodon which had been encountered in digging an open ditch at that place. Through the generous cooperation of Mr. P. C. Yoder, the ditching contractor, and Mr. William Bower, the landowner, a fine specimen of *Mastodon americanus*, consisting of a skull with both tusks and lower jaws and more than half of the remainder of the skeleton, was recovered. Another find investigated at Beecher, Illinois, on the same trip, failed to produce any results of importance.

Further excavation was carried on during the year, in part under Museum auspices, at the historic fossil bone-bed near Minooka, Illinois, first discovered in 1902. Former Judge George Bedford of Morris, who was one of the discoverers of this locality and is an enthusiastic amateur collector of fossils and artifacts, undertook upon his own responsibility the further exploration of the bone-bed. This was located in a small bog from which a spring issued. From it parts of seven skeletons of mastodons of various sizes and ages had previously been removed. Mr. Bedford, during August, 1929, personally supervised exhaustive excavations and presented to the Museum the collection there secured. This collection consists of three jaws, various tusks, a pelvis, leg and foot bones, vertebrae, ribs, and numerous other parts of mastodon skeletons, together with a pair of lower jaws and a fine tusk of the Columbian Mammoth, a skull, antler, and leg bone of an extinct genus of moose, *Cervalces*, and various bones of bison and other more modern animals.

As opportunity permitted, Curator O. C. Farrington continued investigation of new meteorite falls. Descriptions of six of these, the Bishop Canyon, Kofa, Navajo, Santa Luzia, South Byron, and Tilden falls, were completed during the year, and considerable progress was made in the study of the Coldwater and Lafayette meteorites. These studies included complete chemical analyses by Associate Curator Nichols.

Curator Farrington prepared a Museum leaflet on *Famous Diamonds*, and, in collaboration with Assistant Curator Henry Field, one on *Neanderthal (Mousterian) Man*. Associate Curator Nichols prepared a leaflet on *Cement*. All of these were published during the year. Manuscript for a leaflet on *The Evolution of the Horse* by Associate Curator Riggs and Preparator Bryan Patterson was nearly completed during the year.

Professors William B. Scott and William J. Sinclair of Princeton University completed their studies of the groups of South American fossil mammals collected by the Marshall Field Paleontological Expeditions which had been submitted to them for investigation, and these studies were seen partially through the press during the year. They inaugurate Volume I of the Geological Memoirs of the Museum. Professor Scott's paper is on *A Partial Skeleton of Homalodontotherium* and gives a nearly complete description of this hitherto little known large South American mammal. It also provides data for determining the true taxonomic position of two important orders of extinct South American mammals, the relations of which have hitherto been obscure. In Professor Sinclair's paper some new species of South American fossil marsupials are described.

Two other geological publications issued by the Museum during the year were *Contributions to Paleontology* by Assistant Curator Sharat K. Roy, and *The Mineral Composition of Some Sands from Quebec, Labrador and Greenland*, by Dr. J. H. C. Martens. Mr. Roy's paper described one new genus and ten new species of various fossil forms. In Dr. Martens' paper the compositions of sands from a region of cold climates and recent weathering are described. His studies were made on specimens which he collected as a member of the First Rawson-MacMillan Subarctic Expedition of Field Museum. During the year, Assistant Curator Roy has been engaged in the study of the fossils of the Frobisher Bay region and on some Drift fossils from Labrador which he collected while on the Second Rawson-MacMillan Subarctic Expedition of Field Museum. The

results of these studies will soon be ready for publication, as will also Mr. Roy's studies of the fossil plants of Gilboa, New York, specimens of which he collected in 1926.

The demands upon the Department Staff by correspondents and visitors for information have been increasingly large during the year, and a considerable amount of time has necessarily been devoted to this work. Inquiries were received from 426 correspondents and 162 visitors, as well as an unrecorded number by telephone.

ZOOLOGY.—Eight zoological expeditions were in the field during 1929, including some of the largest and most important ever conducted under the Museum's auspices. The major ones were the following: William V. Kelley-Roosevelts Expedition to Eastern Asia for Field Museum, Cornelius Crane Pacific Expedition of Field Museum, Harold White-John Coats Abyssinian Expedition of Field Museum, Chancellor-Stuart-Field Museum Expedition to the South Pacific, Thorne-Graves-Field Museum Arctic Expedition, and Field Museum-Williamson Undersea Expedition to the Bahamas.

In addition to the larger expeditions to remote parts of the world, certain field work was also conducted nearer home. Mr. Ashley Hine worked in southern Arizona collecting birds, and Messrs. Julius Friesser and Arthur G. Rueckert made a brief trip into Canada for the purpose of obtaining Arctic plants and other accessory material needed for the preparation of exhibits. Prior to the lamentable death of Colonel J. C. Faunthorpe in India, he made some further collections in that country for the Museum. Cooperation was continued with the American Museum of Natural History in connection with the Third Asiatic Expedition of that institution.

The William V. Kelley-Roosevelts Expedition to Eastern Asia, as stated in the 1928 Annual Report, left the United States in November, 1928. This expedition was made possible through the generous support of Mr. William V. Kelley, a Benefactor and, more recently, a Trustee of the Museum. During 1929 it was carried through to a successful conclusion, resulting in a great enrichment of the Museum's zoological collections.

The objects of this expedition were to obtain certain very rare animals in remote parts of western China, to provide material of high quality for exhibition in habitat groups in William V. Kelley Hall, and to make additions to knowledge by intensive collecting in little known regions in northern French Indo-China and in southwestern China. In order to carry out this program, it was necessary

to divide into several parties, at least one of which should be able to travel rapidly, obtaining information as to rare animals from native sources, and concentrating its efforts upon these particular animals rather than upon general collecting. Accordingly, Colonel Theodore Roosevelt and Mr. Kermit Roosevelt, with their friend and co-explorer, Mr. C. Suydam Cutting of New York, constituted themselves into a fast-moving first division. A second division including several able naturalists, under the leadership of Mr. Harold J. Coolidge, Jr., was organized for detailed collecting in French Indo-China; and a third division, consisting only of Mr. Herbert Stevens of Tring, England, worked slowly and carefully in western China.

The first division proceeded via Bombay and Calcutta to Rangoon, and thence by rail and boat up the Irrawaddy River to Bhamo, near the border between Burma and China. Thence travel was northeastward by pack train via Tengyueh to Talifu, an old and well-known city in the province of Yunnan. From here the trail led almost directly north to Likiang and beyond into very elevated and difficult country where camps were seldom lower than 10,000 feet and where passes rose to more than 16,000 feet. On February 26, after more than three weeks' continuous mountain travel, much of the way in country frequented by bandits, the party reached Tatsienlu, principal settlement in the province of Szechwan. On the way, a little hunting was done near Muli on Mount Gibboh, where a specimen of the goat-antelope known as the serow was obtained. Somewhat farther on, near Chuilung, a deer related to the Indian sambar was taken, this being one of the northernmost records for the species.

As they worked northward, the hunters made frequent inquiries regarding the occurrence of large animals, but until they reached Tatsienlu they were not encouraged to give much time to hunting for the great panda or giant panda, which was a prime objective of the expedition. This bear-like animal had never been killed by white hunters, and although a few specimens from native sources had come out to European museums, they had been in most cases somewhat imperfect and poorly preserved. Reliable information about it was difficult to obtain, and it seemed quite certain that even after its habitat was located it would be very rare and hard to find. A first trial for it was made in a region only two days' travel to the northward from Tatsienlu, but this proved to be

based on false reports and the party returned to Tatsienlu. On this short trip, however, several specimens of the burrhel or blue sheep were obtained.

On March 6, the party left Tatsienlu to proceed eastward to Mouping, where definite information was forthcoming to the effect that at least one giant panda had been seen and killed in that region about ten years before. With this scant encouragement and with the knowledge that the original discovery of the animal had been in this vicinity, six days were devoted to intensive hunting in the hills near Mouping. This was laborious work near the timberline and through heavy bamboo growth in which one can see but a short distance. Old traces of the animal sought were found, but in spite of the best efforts of the Roosevelts and fourteen native hunters who accompanied them, no large game was sighted. In one place, however, they encountered a troupe of the rare and beautiful monkeys known as the golden or snub-nosed monkeys (*Rhinopithecus*) and nine specimens were collected.

From Mouping the expedition turned southward to the old walled village of Yachow and thence through fairly populous valleys to Tzetati and Tsalo. Near this last place word came that giant pandas might be found in the country of the Lolo tribe adjoining this Chinese outpost. Hence a special hunt was arranged in the vicinity of a place called Yehli at about latitude 29° 15' north and a little north of the Chinese village of Tachow. This took place on April 13 and was crowned with success. The trail of a panda was found and, by persistent tracking through snow patches and thickets of bamboo, the animal itself was finally sighted and killed by the joint fire of Theodore and Kermit Roosevelt. Its skin and the entire skeleton were carefully prepared, and after very friendly relations with the supposedly savage and hostile Lolos, the party proceeded at once to Tachow and Lokow, and thence to Ningyuan by boat on the Amning River.

From Ningyuan, the expedition pushed through rapidly by caravan to Yunnanfu, arriving on May 3. Here rail connection was made for Hanoi in French Indo-China, and by coasting steamer Colonel Theodore Roosevelt hastened south to Saigon to prepare for hunting big game in the province of Cambodia. Meanwhile, Mr. Kermit Roosevelt found it necessary to return at once to the United States. Colonel Roosevelt hunted in the hot lowlands for seladang, banting, and water buffalo to fulfill requirements for large

habitat groups of these animals for the Museum. He worked under great difficulties without expected assistance and obtained a sufficient number of the needed specimens to ensure the building of the groups.

The second division of the Kelley-Roosevelts Expedition was organized for more detailed work with a somewhat larger personnel, as follows: Mr. Harold J. Coolidge, Jr., of Cambridge, Massachusetts, division leader; Mr. Russell W. Hendee, of Brooklyn, New York, mammalogist and artist; Dr. Ralph E. Wheeler, of Cambridge, Massachusetts, physician and naturalist; and Dr. Josselyn Van Tyne, of Ann Arbor, Michigan, ornithologist.

This division arrived in Hanoi in northeastern French Indo-China on February 1, after a main base had already been established in Hué in the province of Annam and some preliminary collecting done near that coastal locality. On February 9, the expedition proceeded by rail from Hanoi to Lao Kay on the Chinese border of northern French Indo-China in the province of Tonkin. Subsequent work was confined almost entirely to the central and western part of this province, and in the adjoining province of Laos, a mountainous region difficult of access and not previously explored by zoologists.

From Lao Kay, the party traveled westward by pack train for seven days to Lai Chau in the vicinity of which work was carried on until April 14. At this place a division was effected by which Messrs. Coolidge and Hendee worked in neighboring localities to the northward while Messrs. Van Tyne and Wheeler worked to the southward. Rejoining at Lai Chau, they then continued westward for ten days to Phong Saly, which formed another base of operations.

Here work was continued until June 6, but, while the others remained, Mr. Hendee started on May 14 to push out rapidly for Saigon in Cochin China where he expected to meet Colonel Theodore Roosevelt and assist him in collecting large mammals for group purposes. At this time the onset of the rainy season brought increased hazards to health and made further travel with horses impractical. Therefore, in accordance with previous plans, the return to the coast was made by river travel which was possible for more than a thousand miles via the great Mekong River and its tributaries.

Shortly after Mr. Hendee left the other members of the party he was attacked by a malignant malarial fever. This was about May 27, two days after leaving Luang-Probang on a well-appointed

raft by which weekly mail service is maintained between that point and Vientiane. Sharing the raft with him was M. Chevalier, a French inspector of schools, who gave him all possible care; but the fever increased and when the raft reached Vientiane, June 3, he was in a very serious condition. Here he was taken to a hospital and placed under the care of two French physicians, Dr. Luisi and Dr. Cardirat. In spite of their best efforts to save him, he died three days later. The sad news was communicated to his colleagues who were then on their way to Luang-Probang by the route he had just taken. They hurried on to Vientiane where, with great sympathy and full cooperation extended by the French officials, appropriate services were held.

On July 7, Messrs. Coolidge, Van Tyne, and Wheeler arrived with the collections at their original base at Hué in the province of Annam. At this time two of them also were suffering from tropical illness, and all were shocked and saddened by the recent untimely death of their comrade, whom they all greatly admired. They proceeded to Saigon and there disbanded on July 22, returning by various routes to the United States.

Mr. Herbert Stevens, traveling in western China, for the most part alone, constituted a third division of the Kelley-Roosevelts Expedition. He accompanied the Roosevelt brothers a short distance beyond the border between Burma and China, and then on January 5 he continued northward from Tengyueh with his own caravan, working slowly and making varied collections on the way which were impossible for the fast-moving first division. Mr. Stevens spent the entire month of February collecting in the big bend of the Yangtze Kiang, a little north of Likiang in the province of Yunnan. In the latter part of March he entered the province of Szechwan, and after spending the greater part of May at a place called Wushi in the mountains southwest of Tatsienlu, he worked out in various directions from Tatsienlu during June, July and August. He first went south to Ulongkong, then northwest to Kwanchai, and then east and northeast into the Mouping district whence he reached Yachow, and finally Kiating. From this point he ceased active work and descended the Yangtze Kiang River to the coast at Shanghai.

By the division of its personnel into sections, by well-directed effort in particular regions, and by the employment of trained natives to assist in the preparation of specimens, the Kelley-Roosevelts Expedition in a single season brought together a very large



GROUP OF MUSK-OX

Hall of American Mammal Habitat Groups (Hall 16)

Taxidermy by Carl E. Akeley. Reinstallation by Julius Friesser. Background by Charles A. Corwin

About one twenty-second natural size

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and important collection. This includes not only the very rare and striking giant panda, but selected examples of large hoofed animals for habitat groups, and a greatly varied collection of the entire vertebrate fauna of a little-known part of the world. The collection of birds is augmented by 920 selected specimens from Siam, obtained through a fortunate purchase from Mr. C. F. Aagard, a resident collector, whose work extended over a period of years. The total number of zoological specimens to be credited to the expedition is 15,397, of which 1,479 are mammals, 5,194 birds, 453 reptiles, 438 fresh-water fishes, and 7,833 insects. In addition there are 2,400 sheets of plants.

The Cornelius Crane Pacific Expedition of Field Museum, sponsored and led by Mr. Cornelius Crane, son of Mr. Richard T. Crane, Jr., Trustee and Benefactor of Field Museum, sailed from Boston November 16, 1928, on Mr. Cornelius Crane's brigantine auxiliary yacht, the *Illyria*. The personnel included three friends of Mr. Crane's, Messrs. Sidney N. Shurtleff, of Boston, Charles R. Peavy, of Mobile, Alabama, and Murry Fairbank, of New York. Mr. Shurtleff served as photographer for the expedition. The scientific staff included Assistant Curator of Reptiles Karl P. Schmidt, of Field Museum, leader of the scientific section; Dr. W. L. Moss, of Harvard University Medical School, physician and anthropologist; Dr. Albert W. Herre, of Stanford University, ichthyologist; Mr. Walter A. Weber, of Field Museum, artist and ornithologist; and Mr. Frank C. Wonder, of Field Museum, taxidermist and field collector of mammals.

The *Illyria's* first stop for collecting was made at Port-au-Prince, Haiti, where the party was cordially received by Brigadier General John H. Russell, High Commissioner of the American Mission. Material aid was given by the members of the Service Technique. While three members of the party collected birds and reptiles in the mountains to the south of Port-au-Prince, at altitudes of 4,000 to 6,000 feet, Dr. Herre, with the aid of the Service Technique, collected fishes from the fresh waters of the Republic.

The expedition reached Panama December 11. While alterations and repairs were being made to the *Illyria* at Balboa, the scientific party spent nearly the entire time at Barro Colorado Island, the research station and wild life reservation maintained by the Institute for Tropical Research in America, and there collected a representation of the rich and varied animal life of the Panama jungle, which is typical of the American tropics.

After a brief visit to Cocos Island, where specimens of the four species constituting the only land birds known to the locality were secured, the expedition sailed to the Galapagos Islands. In this famous group four of the larger islands were visited, and collections of remarkable animals, birds, and reptiles were made by Messrs. Schmidt, Weber, and Wonder, while the rest of the party was engaged in fishing and in photography. Notable among the collections obtained were living specimens of the giant tortoises of Indefatigable Island; complete shells of the tortoise of Charles Island, which has been extinct for nearly a century; specimens of the flightless birds, penguin and cormorant, native to the archipelago; and specimens and studies of the remarkable large lizards, the marine and land iguanas.

The voyage of some 3,000 miles to the Marquesas was made under sail. Two islands, Hiva-oa and Nukahiva, were visited. The scantiness of animal life on these well-watered islands was in notable contrast to its abundance on the arid Galapagos.

En route to Tahiti, two stops were made in the Tuamotu Islands, at Takaroa and at Makatea. The stay at Papeete, the capital of French Oceania, was occupied largely with packing and shipping of specimens. Grateful acknowledgments are due to M. Bouge, the Governor of French Oceania, and to the Vice-Governor of the Marquesas for their cordial reception of the expedition in French territory.

After a brief stop at Bora-bora, the *Illyria* sailed to Suva, Fiji Islands. Two weeks, March 10 to 24, were spent in Fiji, collecting fishes, birds, reptiles, and bats. Much aid was received by the party from Dr. John D. Tothill, Director of Agriculture for the Fiji Islands.

In the New Hebrides, where the expedition stopped from March 27 to April 7, at Malekula, Malo Island, and on the largest of the group, Espiritu Santo, collections of birds, bats, and reptiles were accumulated. Mr. Crane and several members of the party visited the Big Nambas tribe on West Malekula, under the guidance of the British agent, Mr. Adam. The collectors were assisted at Hog Harbor by Mr. W. T. Robertson, a resident.

Upon arrival at the Solomon Islands, hornbills were seen for the first time; parrots with extraordinarily brilliant plumage were abundant; and fruit-bats, already encountered in several species in the New Hebrides, were still more abundant and varied. Reptiles were here supplemented by an abundance of frogs, several

of which were remarkable for curious coloration or other characteristics. One of the most remarkable of the skinoid lizards, the large prehensile-tailed *Corucia*, was secured from natives. Reef fishing was constantly productive, not only of brilliantly colored fishes, but also of the remarkable marine snakes, of which one species was extremely abundant in the Solomons. The itinerary in the Solomons included Ugi, Tulagi, Malaita, Ysabel, Kulambangra, New Georgia, and Shortland Islands. The period from April 10 to April 24 was spent in these islands.

A stop of some days at Rabaul, New Britain, the capital of the territory of New Guinea, enabled the expedition to ship accumulated collections and to prepare for the long sail along the coast of New Guinea. Mr. George Murray, a relative of Captain Selden Boutilier of the *Illyria*, is director of agriculture for the territory, and he was most cordial and helpful during the party's stay in New Britain.

Stops were made on the north coast of New Guinea at Lae in Huon Gulf; Madang and Sek in Astrolabe Bay; on the Sepik River; in Australian territory; and at Manokwari in Dutch New Guinea. The voyage up the Sepik, under the guidance of Father Franz Kirschbaum, of the Catholic Mission of the Society of the Holy Word, was one of the most notable portions of the whole route, both for its view of the interior of New Guinea with its extraordinary animal life, and for the glimpse of the no less remarkable tribes which inhabit its banks. The *Illyria* reached the junction of the May River with the Sepik, a point some 450 miles from the sea. Besides interesting contacts with the diverse cultures of the tribes of the lower, middle, and upper river, visits were made to tribes on the May River which had only once before seen white men—on the visit of a German expedition seventeen years before. A small anthropological collection was made among these people. Collections of birds, mammals, and reptiles were made, chiefly at Marienberg. The collection of fishes made by trade with the natives seems to represent a fauna previously unknown.

Waigeu Island is known to naturalists from descriptions of Wallace and Guillemard. The *Illyria* was anchored in one of its bays from June 4 to June 9. The short stay made general collecting difficult, but notable collections of fishes were made. At Ternate, official visits to the Resident occupied the brief duration of the *Illyria's* stay.

The anchorage chosen for the work of the expedition in Celebes was Lembeh Strait, between the small island of Lembeh and the tip of the great northern peninsula of the main island. Aided by Malay hunters, the party secured a representation of the remarkable Celebesian fauna, including dwarf buffalo, babirusa, wild pig, deer, monkeys, and a great variety of small game.

The volcanic islands of the chain between Mindanao, southernmost of the Philippines, and the northern peninsula of Celebes, form a series of stepping-stones for the collecting of the marine fishes of the two islands, the relations of which were of special interest to Dr. Herre on account of his eight years of work on the Philippine fishes. The expedition made a stop of two days at Sangir Island, almost midway between Mindanao and Celebes, primarily to collect fishes from the bays and reefs.

The expedition concluded its principal itinerary at Sandakan, British North Borneo, where the *Illyria* arrived on June 27. Mr. Crane, with Dr. Moss and Messrs. Peavy, Fairbank and Shurtleff, returned to the United States after leaving the *Illyria* at Surabaya and making a brief tour of Bali, Java, Siam, and Indo-China. Dr. Herre returned to America later.

Messrs. Schmidt, Weber, and Wonder, after ten days of collecting in the vicinity of Sandakan, proceeded to Zamboanga, where an important addition to the series of plaster molds of fishes for exhibition was made, after which Messrs. Schmidt and Weber returned to the United States via Manila, reaching Chicago September 3. After a further ten days' collecting in Mindanao, Mr. Wonder returned to North Borneo and made important additions to the collections of mammals, birds and reptiles, including specimens and accessories for a group of orang-utan. His work, extending to August 29, concluded the field collecting of the Cornelius Crane Pacific Expedition.

The *Illyria*, with Captain Boutilier and crew, returned to Gloucester, Massachusetts, via the Suez Canal.

The results of the expedition, in specimens collected, amount to 12,000 fishes (estimate); approximately 2,000 reptiles and amphibians; 1,228 birds; and 879 mammals. Some 2,000 invertebrates were collected, including 75 vials of termites, a series more than twice as extensive as any previous collection of termites from the Pacific islands.

Notable elements in the fish collection are the series of new forms from the Sepik River, the brilliantly colored novelties added



RAGWEED (*Ambrosia elatior*)

Hall of Plant Life (Hall 29)

The most abundant of the ragweeds of the Chicago region, and probably the principal source of hay fever pollen

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One-fourth natural size

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to the Philippine fauna, and the series of molds and color notes for use in the preparation of exhibition specimens for Field Museum's new Hall of Fishes.

Among the amphibians and reptiles, the more interesting results of the expedition include observations on the habits of Galapagos reptiles; the collection of specimens of the extinct Charles Island tortoise; the notable series of specimens from the Fiji Islands, Solomon Islands, and New Hebrides; a fine series of the two species of crocodile from New Guinea, amply substantiating Assistant Curator Schmidt's recently described *Crocodilus novae-guineae*; and a representation of the fauna of New Guinea, Celebes, Borneo, and the Philippines hitherto altogether lacking in Field Museum's collections.

The birds brought back by the expedition add numerous genera and species of especially brilliantly colored or otherwise remarkable forms, many of them prepared for exhibition in the Museum's Systematic Bird Hall. The pigeons, cockatoos, lorries, hornbills, and birds of paradise reach their maximum development in the regions visited, some of them being confined to the New Guinean region. The series of paintings and color notes of birds prepared by Mr. Weber in the course of the expedition form a valuable supplement to the collection.

The mammals obtained by the expedition add important genera and species to Field Museum's collection. The collection of bats includes thirty-two species, and the fruit-bats (Megachiroptera) obtained more than double the total representation of this group formerly in Field Museum. An interesting discovery was made on the barren Galapagos of a new species of rodent. This addition to the small but significant mammal fauna of those islands has been named *Nesoryzomys darwini* Osgood, and is described in a Museum publication issued in 1929. Other noteworthy mammals include New Guinean and Celebesian marsupials, monkeys, pigs, deer, the dwarf buffalo of Celebes, and a representation of the lowland fauna of Borneo.

The special equipment carried by the Cornelius Crane Pacific Expedition, including cold storage facilities, diving helmets for undersea observations, and power launches for local transportation, contributed to effective work even in localities where only brief stops were made. The result is a substantial addition to Field Museum's collections both for exhibition and for study.

The Harold White-John Coats Abyssinian Expedition of Field Museum, as stated in the Annual Report for 1928, left New York in October, 1928. This expedition was wholly financed by Captain Harold A. White, of New York, and Major John Coats of Ayrshire, Scotland, both of whom actively participated in the undertaking. In addition to the two principals, the personnel of the expedition included Mr. George E. Carey, Jr., of Baltimore, Maryland, and Mr. C. J. Albrecht, of Field Museum's staff of taxidermists. There were also connected with the party as photographers and associates Messrs. Charles Ohneiser and E. Steineger of Berlin, and M. Hubert of Paris.

The principal members of the expedition left Addis Ababa, the capital of Abyssinia, on December 13, 1928, and proceeded south through the province of Arussi to Mount Kaka, on the slopes of which about a month was spent in general hunting. Later they were met by the others with their main supply caravan of mules and camels at Gatela in the province of Sidamo, a short distance east of the southern end of Lake Abaya.

The chief base camp of the expedition was made south of the Bisan River. From there hunting was carried on westward to the Sagan River near the border of the province of Boran. There, forty-six days in March and April were spent in fulfilling the principal object of the expedition, which was to obtain selected examples of the reticulated giraffe and other large mammals for use in a proposed "water hole" group of African game animals. In this region five fine giraffes, and various specimens of oryx, koodoo, Grant's gazelle, hunting dogs, and one aard-vark were taken.

Later in April the expedition moved south to Mount Kunchorro, finding water very scarce and conditions of travel correspondingly difficult. Thence they turned west and reached the bed of Lake Stephanie but, finding it wholly dry, they turned back at once and made southeastward to Mount Mega in southern Boran, not far from the Kenya border. This region yielded an interesting series of dik diks, including several which are nearly pure white and appear to represent an instance of local albinism which threatens to supersede the normal type of coloration. Three specimens of the rock or mountain reedbuck also were taken on Mount Mega.

In June the expedition moved on to Moyale at the Kenya border, and thence by motor some 600 miles to Nairobi, successfully transporting its accumulation of skins of large mammals to this metropolis and shipping point in first-class condition.

With the especial object of obtaining specimens for a lion group, a month's trip was then made to the Zerengetti Plains in Tanganyika. Here, in a relatively short time, six fine lions including both old and young were obtained, and in addition a good black rhinoceros, two aard-varks, several zebras, and more Grant's gazelles for use in the water hole group.

The expedition finally disbanded in Nairobi, Mr. Albrecht leaving for the United States August 5 and reaching Chicago September 20. Some time later the collections were received in excellent condition. Captain White and Major Coats must be given great credit for carrying through a difficult program, traversing a region largely waterless and subject to restrictions imposed by loosely governed natives. But for the cordial cooperation of Negus Tafari Makonnen of Abyssinia, again graciously accorded a Field Museum expedition, it would have been impossible. The Negus, it will be remembered, generously cooperated also with the Field Museum—*Chicago Daily News* Abyssinian Expedition of 1926–27.

The results of the Harold White—John Coats Expedition provide material for a group of lions, a group of aard-varks and a water hole group, which, as projected, will be the largest habitat group ever produced at Field Museum. This group will include five reticulated giraffes, a black rhinoceros, a herd of eight or ten Grant's gazelles, several zebras, and some smaller animals.

The expedition was not equipped for general collecting of small animals, but concentrated on the group material. Nevertheless, a few small mammals were obtained, and also certain interesting and valuable birds. Among these is a series of the Abyssinian blue goose, a species of restricted range, which is rare in collections. There is also a good representation of the game birds of the francolin group, including one specimen of an entirely unknown species very distinct from those previously described.

The Chancellor—Stuart—Field Museum Expedition to the South Pacific left San Francisco February 20 for New Zealand, Australia, and the East Indies. The expedition consists of Mr. Philip M. Chancellor of Santa Barbara, California, and Mr. Norton Stuart, also of Santa Barbara. Mr. Chancellor, who is financing the expedition, acts as photographer to the expedition. Special equipment for intimate photographic studies of living animals, including a diving bell for undersea work, is carried. Mr. Stuart, who is an

expert technician and museum preparator, is equipped for collecting and, to a certain extent, actually preparing exhibition material in the field.

The object of the Chancellor-Stuart Expedition was to obtain specimens, accessory group material, and careful, first-hand life studies of certain rare and interesting animals, especially reptiles, of which some of the most extraordinary forms now living are found in the Australasian and East Indian regions. Its plans also included some reconnaissance travel for the purpose of making contacts and obtaining preliminary information for use in a second expedition proposed for 1930. At the close of 1929 the expedition had not yet returned, but reports received from it indicated that its main objects had been successfully achieved.

Messrs. Chancellor and Stuart arrived in Wellington, New Zealand, about March 14. On the South Island of New Zealand they obtained by special permission two specimens of the tuatara lizard or *Sphenodon*, one of the most peculiar of living reptiles, very primitive in character and of much zoological interest. Here, also, was secured material for a small group of the flightless bird known as the kiwi.

From New Zealand they crossed to Sydney, Australia, and made a short trip through New South Wales, Victoria, and South Australia for reconnaissance purposes. Returning to Sydney, they sailed to Batavia, Java, which served as headquarters for several months. One of their especial quests was the *waraan* or giant lizard of Komodo Island, a Dutch possession little known and seldom visited.

Messrs. Chancellor and Stuart took up the matter of permission to collect specimens of the Komodo lizard with Mr. Coert du Bois, American Consul-General at Batavia, and through his good offices and those of Dr. K. W. Dammerman, Director of the Zoological Museum at Buitenzorg, they were invited to join a Dutch expedition to Komodo for the purpose of obtaining such specimens as seemed justifiable.

The joint expedition sailed from Batavia October 8, and on November 6 sent the welcome news that two fine specimens of the giant lizard had been secured for Field Museum. One of these is reported to be nine feet in length and the other eight feet ten inches. These specimens with accessories and field notes will provide material for one of the largest and most striking exhibits of the Museum's Hall of Reptiles.

During July and August, while negotiations regarding the Komodo trip were pending, the expedition visited the interior of Sumatra and there obtained two fine specimens of the reticulated python. One of these, a male, measures twenty-four feet ten inches in length and the other, a female, twenty-one feet three inches. With them was collected a clutch of eighty-one python eggs. The reticulated python is the largest of living snakes and is characterized by an intricate and beautiful color pattern, altogether providing a highly desirable creature for museum exhibition.

From Komodo, the expedition returned to Batavia and thence to Australia for further work in that country with the intention of reaching the United States about February 20, 1930. Although the material collected by this expedition has not yet reached Field Museum, the reports of its success are very gratifying. Mr. Chancellor's expressed intention of continuing similar work in the future and of financing not only field work but subsequent preparation of material gives promise of very important contributions to science and education.

The Field Museum-Williamson Undersea Expedition to the Bahamas was carried out during the spring and early summer of 1929. This expedition was for the primary purpose of obtaining material for a series of large groups of fishes in undersea settings for the Museum's projected new Hall of Fishes. The work involved not only the collection of numerous fishes but also of large quantities of corals, sea fans and other delicately formed and beautifully colored undersea life in which the fishes have their habitat.

Mr. J. E. Williamson of New York, well known for his undersea photography and his unique equipment for submarine observations, was engaged for the season with his staff, his floating gear, and his special apparatus. One of Field Museum's taxidermists, Mr. Leon L. Pray, was assigned to work with him during a period of ten weeks.

Mr. Williamson left New York for Nassau on March 15 and was joined by Mr. Pray about April 1. The Governor of the Bahamas cordially afforded them facilities for their work. Headquarters were established at Sandy Cay, a small island near Nassau, which was placed at their disposal by the owner. Here, with a shore camp and various craft near-by, work was prosecuted intensively and very successfully.

By use of the undersea tube, Mr. Pray was enabled to make numerous colored sketches and observations of undisturbed life on

the sea bottom and to design and plan the proposed fish groups with complete fidelity to nature. Meanwhile, with an abundance of local help, fishes of many kinds were taken, cast in plaster, and recorded with detailed color notes. Altogether, 190 casts of fishes were made, ranging from dainty little angel fish to great sharks.

By the use of ingenious methods and special gear for heavy work, corals of very large size and fragile structure were lifted without injury direct from the sea bottom and transported to shore where they were carefully prepared, packed and crated for shipment. One large palmate coral had dimensions of 10'9" x 6' x 4'3" and is perhaps the largest specimen of the kind ever preserved entire. It weighs about two tons.

The material obtained by the expedition to the Bahamas was transported in fifteen large cases to Jacksonville, Florida, where it was delivered to the Illinois Central Railroad which gave it special handling and delivered it in Chicago with everything in excellent condition. It forms the largest shipment of the kind ever received at Field Museum and will fulfill the principal and immediate needs for the Hall of Fishes.

The Thorne-Graves Arctic Expedition was organized and financed by Mr. Bruce Thorne of Chicago and Mr. George Coe Graves II, of New York. Its first purpose was the acquisition of specimens of Pacific walrus for a habitat group in the Museum's Hall of Marine Mammals. A further object was material for a group of Alaskan caribou to fill one of the few remaining spaces in the Hall of American Mammal Habitat Groups.

Messrs. Thorne and Graves chartered the power schooner *Dorothy*, in Seattle, and sent it north early in June with a capable crew. Mr. John Jonas, taxidermist of Yonkers, New York, was engaged and went north on the *Dorothy*. Meanwhile, Messrs. Thorne and Graves proceeded by mail steamer to Anchorage, Alaska, whence they flew by airplane to Nome. There they embarked on the *Dorothy* and sailed for the Arctic on July 3. Two Eskimos were taken aboard at the Diomed Islands and the ship then continued to the edge of the Arctic ice pack. Ice conditions were very severe and it was necessary to work near the Siberian coast. Most of the time was spent in the vicinity of Koliuchin Island, scarcely twenty miles from the Asiatic shore, at about longitude 175° west.

Walrus were found in abundance and seven selected specimens were taken and preserved for the Museum's group. Several

polar bears also were killed. This was done during some rather hazardous cruising among the ice floes. At one time the *Dorothy* was fast in the ice, unable to move an inch, and at another her rudder was broken by submerged ice, necessitating a difficult return to Nome for repairs.

On July 28 the expedition crossed the Arctic Circle on its return journey and seven days later landed at Seward. Here Messrs. Thorne and Graves left Mr. Jonas to continue with the ship to Seattle, bringing the specimens secured in the Arctic. They then started at once with pack horses for the Talkeetna District for the fall hunting of caribou and other game. Finding caribou with horns still in the "velvet" and unsuitable for the Museum's use, they engaged local hunters to secure the needed specimens at a later date when in proper condition. On September 27 they sailed for Seattle, and somewhat later five specimens of caribou, well prepared in accordance with their instructions, were received by Field Museum.

The prompt, energetic, and businesslike way in which Messrs. Thorne and Graves undertook and successfully carried out their expedition entitles them to great credit. Since their return, Mr. Thorne has cooperated further with the Museum by consultation with the Staff regarding plans for the preparation of their material and, in the case of the walrus group, contributions from Mr. Thorne, Mr. Henry Graves, Jr., and Mr. George Coe Graves II, will insure its completion in the near future, probably before the end of 1930.

While large expeditions were afield at distant points, Mr. Ashley Hine, bird taxidermist of the Museum, spent some weeks in Arizona collecting birds especially needed for systematic exhibits now under way. He left Chicago April 2 and continued in Arizona until June 5. Dr. Alfred Lewy of Chicago voluntarily assisted him from April 17 to May 5. One month was spent near Tucson where a base was established from which short trips were made to the Papago Indian Reservation and the Santa Catalina Mountains. From May 5 to May 23 work was done in Carr, Ramsey, and Miller Canyons in the Huachuca Mountains, at altitudes ranging up to 9,300 feet. A total of 323 specimens of birds was obtained.

In the latter part of 1929 an important zoological expedition for 1930 was organized under the patronage of Mr. Arthur S. Vernay of New York. This is called the Vernay-Lang Kalahari

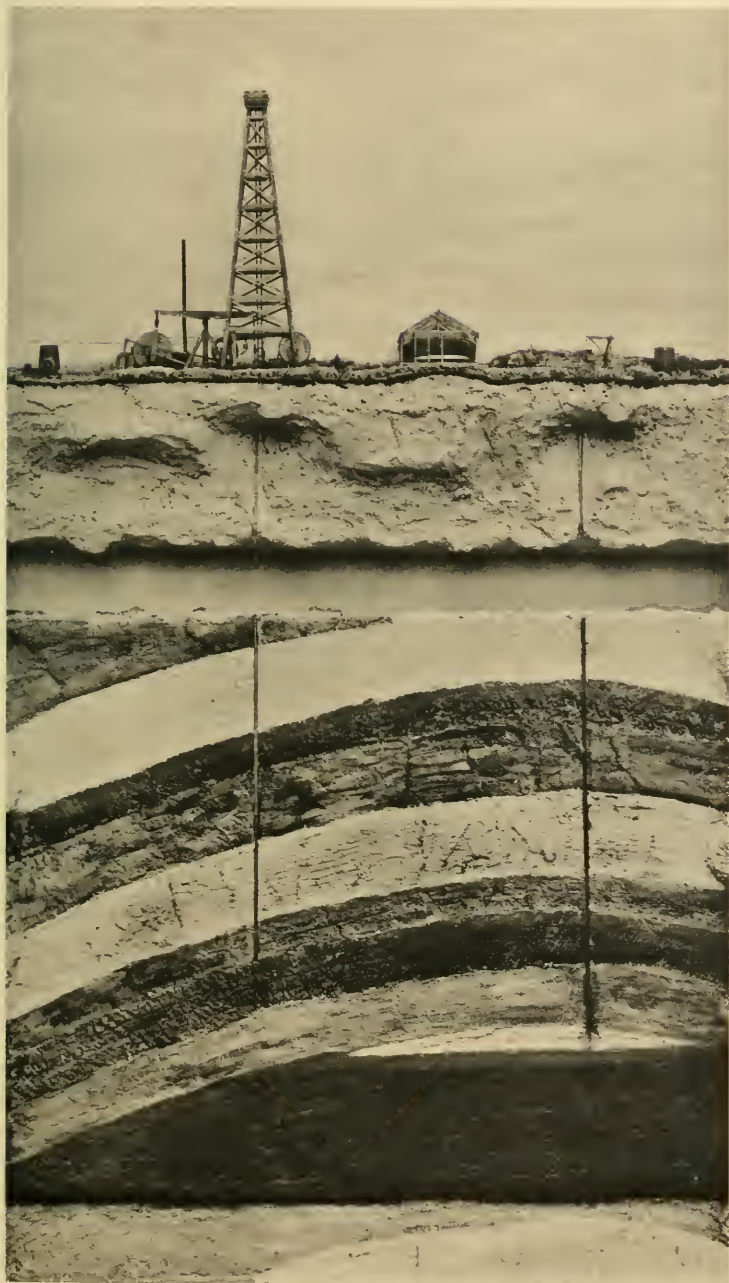
Expedition of Field Museum and will have the personal leadership of Mr. Vernay. The expedition will be accompanied by two well-qualified naturalists and collectors, Mr. Herbert Lang, well known for his very successful Congo expedition for the American Museum of Natural History, and Mr. W. Rudyerd Boulton, of the Carnegie Museum, who was associated with Mr. Vernay on a previous expedition in Angola. A further assurance of the success of the expedition is the expressed intention of the Imperial Secretary of British South Africa, the Honorable Captain B. E. H. Clifford, to accompany it part of the time. The expedition also expects to meet Mr. Allan Chapman, who will cooperate in the work in Angola.

Mr. Vernay sailed from New York on December 27 for London, whence he will continue in February to Capetown. From there he will proceed north by rail to Francistown, where he will meet the other members and start westward by motor caravan. It is proposed to visit British Bechuanaland, principally the region of the Botletle River and Lake Ngami, the northern part of the Kalahari Desert and, if conditions are favorable, to continue to the west coast through Angola.

The expedition will carry full equipment for collecting vertebrates of all kinds, and a large general collection is to be expected as well as certain special animals for Museum exhibits. In Angola, by special permission of the Portuguese government, an effort will be made to secure specimens of the giant sable antelope for a habitat group to be placed in Carl E. Akeley Memorial Hall. This species, which has a restricted range and is rare in collections, is regarded by many as the finest of all the antelope tribe. The Museum is greatly indebted to Portuguese officials for their cordial assistance.

The following list indicates the various expeditions and other field work conducted during 1929 for all Departments of the Museum:

LOCALITY	COLLECTORS	MATERIAL
KISH, MESOPOTAMIA . . . (Seventh season)	Stephen Langdon L. C. Watelin René Watelin T. K. Penniman	Archaeological collections
WEST AFRICA . . . . .	W. D. Hambly	Ethnological collections
BRITISH HONDURAS . . . . .	J. Eric Thompson	Archaeological and ethnological collections
BRAZIL AND PERU . . . . .	B. E. Dahlgren Llewelyn Williams Emil Sella	Botanical collections
PERU . . . . .	August Weberbauer	Botanical collections



MODEL OF OIL WELL

The strata are shown as they occur at Lawrenceville, Illinois

Constructed by H. W. Nichols and Valerie Legault

Scale of model, five feet to the inch

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EUROPE . . . . .	J. Francis Macbride	Photographing botanical type specimens
NEW MEXICO . . . . .	Henry W. Nichols	Geological collections
INDIANA . . . . .	Elmer S. Riggs P. C. Orr	Paleontological collections
SOUTHEASTERN ASIA . . . . .	Colonel Theodore Roosevelt, and Kermit Roosevelt (joint leaders) Harold Coolidge, Jr.* C. Suydam Cutting Herbert Stevens Josselyn Van Tyne Russell W. Hendee Ralph E. Wheeler	Zoological, botanical and ethnological collections
PACIFIC ISLANDS AND EAST INDIES . . . . .	Cornelius Crane Karl P. Schmidt** Albert W. Herre W. L. Moss Walter A. Weber Frank C. Wonder Sidney N. Shurtleff Murry Fairbank Charles R. Peavy	Zoological and ethnological collections
ABYSSINIA, KENYA COLONY, AND TANGANYIKA . . . . .	Captain Harold A. White, and Major John Coats (joint leaders) C. J. Albrecht George E. Carey, Jr.	Zoological collections
INDIA . . . . .	Colonel J. C. Faunthorpe	Zoological collections
NEW ZEALAND, AUSTRALIA, AND EAST INDIES . . . . .	Philip M. Chancellor Norton Stuart	Zoological collections
ARCTIC OCEAN AND ALASKA . . . . .	Bruce Thorne, and George Coe Graves II (joint leaders) John Jonas	Zoological collections
BAHAMA ISLANDS . . . . .	J. E. Williamson Leon L. Pray	Zoological collections
ARIZONA . . . . .	Ashley Hine	Ornithological collections
CANADA . . . . .	Julius Friesser Arthur G. Rueckert	Arctic plants

Leader of expedition named first in each case.

\*Leader, second contingent.

\*\*Leader, scientific section.

### ACCESSIONS

ANTHROPOLOGY.—Accessions received and recorded during the year by the Department of Anthropology amount to fifty-four. Of these thirty-six are by gift, seven as the result of expeditions,

three by exchange, and eight by purchase. These accessions aggregate a total of more than 3,700 objects.

The collections made by Assistant Curator J. Eric Thompson as leader of the Second Marshall Field Archaeological Expedition to British Honduras, consist of some 350 archaeological and ethnological objects obtained in British Honduras and Guatemala.

Some 200 archaeological objects were obtained in the excavations carried out at the sites of Tzimin Cax, Cahal Pichie, and Hatzcap Ceel in western British Honduras (see page 47). Of these three sites Tzimin Cax proved to be the most interesting as well as the richest. It is not a real Maya city as the word is understood, for it does not consist of a series of temples placed on the tops of high mounds gathered around a ceremonial court, but of a number of small, scattered courts perched on the tops of natural hillocks. Around these courts are grouped small mounds, which in many cases contain burials.

These burials, together with other material found, can be grouped into three periods. The latest belongs to the so-called Holmul 5 type, and dates from around the close of the Maya Old Empire (about A.D. 800). The pottery of this period is badly fired and of poor quality, but is elaborately painted, and was made in a large number of different shapes. Of these the commonest are ring-based plates and tall, cylindrical jars. A large number of objects of this culture was found, but unfortunately most of the paint had disappeared from the pottery owing to the dampness and chemical reactions from roots which they endured for centuries. Several of the buried chiefs had their teeth filed to points or inlaid with iron pyrites. Prior to this occupation the site was probably abandoned for a considerable period.

The next earliest occupation is represented by fine, well-made pottery, but usually unpainted. The most typical range of vessels is formed by tetrapods, the legs of which in many cases are in the shape of female breasts. In one case this earlier culture was found in a burial directly below that of the Holmul 5 period, thereby confirming its greater age. At that period jade was carved into ear-plugs and tubular breast-ornaments. One of the vessels of that period now in the Museum is unique. This is a low bowl with four small feet. In the center of the bowl squats a frog of naturalistic style, originally painted blue.

A yet earlier culture, which might conveniently be termed pre-Maya, has also been located. This culture was first discovered last

year at the site of Uaxactun in the Peten by Mr. O. G. Ricketson of the Carnegie Institution. Uaxactun, judging from the sculptured monuments, is the earliest known Maya site, and these pottery types appear to antedate the earliest monument. Mr. Thompson found the same culture under the floors of these little courts just above bed-rock. The ware is well made, and is distinguished by a rippled surface effect. One large bowl, which was found practically complete, in all probability belongs to that culture. If this should really be the case, this vessel will be the only complete pre-Maya vessel in the world.

The sites of Hatzcap Ceel and Cahal Pichic yielded a number of votive offerings of jade, wrought shell, and in one instance a mirror, the face of which consists of iron pyrites cut into small squares.

The ethnological material collected illustrates the present culture of the Mopan Mayas of southern British Honduras, as well as that of the Quiche and Cakchiquel tribes of southern Guatemala. The Mopan Mayas have lost a great deal of their old artistic skill, but the Highland tribes still weave very beautiful cotton cloth. Practically every village in the highlands of Guatemala has its distinctive dress, the women wearing gaily embroidered cotton blouses. A large collection of these was obtained for the Museum, as well as men's costumes, blankets, and shawls.

Through the good offices of Mr. W. A. Newcombe of the Provincial Museum, Victoria, B.C., a son of the late Dr. C. F. Newcombe who did so much in building up the Museum's north-west coast material, a part of the Merrill collection of prehistoric artifacts from Illinois, gathered in 1877, was acquired through purchase. The accession comprises thirty pieces from Calhoun, Greene, Sangamon, Schuyler and Scott counties, and consists of plummets, celts, and other problematical stones of hematite; pendants and banner stones of banded slate; a discoidal of granite; arrowheads and drills of chert; and two small, but beautiful specimens of shell-tempered pottery. The last-named are from mound-graves. Such perfect pieces of pottery are rare, and make a valuable addition to the Museum's archaeological material from the middle west.

The Museum has also secured as a gift from Mr. Frank Vondrasek of Cicero, Illinois, twenty-three excellent quartz arrowheads from Magnet Cove, Arkansas. These specimens range in length from about one-half inch to three inches, and are delicately chipped from rose

and pearl colored chalcedony. They include three types—those with convex bases, those with flat stems or bases, and those with notched bases.

Mr. Homer E. Sargent, of Pasadena, California, added forty-six California baskets to his former gifts of American basketry. All are of superior workmanship and fine quality, and are old productions of a type no longer made.

An otter skin medicine bag decorated with beadwork designs, from the Potawatomi of northern Wisconsin, was presented by Mrs. Lynden Evans of Evanston, Illinois. An otter skin used for medicine by the same tribe was acquired through purchase. A Winnebago necklace of grizzly bear claws and a Haida chief's coat of ermine were also purchased.

Dr. John Kercher, of Chicago, presented a small number of interesting Eskimo articles, among these a wooden mask and models of a kayak and a sledge, from the Golovnin Bay District, Alaska. Several Eskimo objects from Angmagsalik, on the east coast of Greenland, are the gift of Erich Hansen of Chicago, who had formerly accompanied one of the Danish exploring expeditions to Greenland; he also placed at the Museum's disposal a number of good photographs taken by him on this journey, for reproduction.

From the Cornelius Crane Pacific Expedition of Field Museum, working primarily in the interests of the Department of Zoology, were received eight objects, including a very large, finely painted tapa screen from Fiji and seven ornaments from the Sepik River in New Guinea. Four of these are egret feather hair ornaments; the other three are peculiar ornaments having as their most conspicuous feature the large beak of a hornbill.

Ten articles from the upper Sepik and May Rivers, New Guinea, were presented by Assistant Curator Karl P. Schmidt, Department of Zoology, who was a member of the Crane Expedition. There are three nicely ornamented tops used as toys, an incised coconut cup, a decorated lime gourd with carved bone spatula, a plaited and a bamboo puberty cover, a tobacco pipe made of a long, curved gourd, a spear with a pointed bamboo head, and a peculiar double-pointed weapon about seven feet long.

All this New Guinea material is different from any previously received by the Museum, and is therefore a welcome addition.

A collection of stone implements found in kitchen middens near Sydney, Australia, was secured through an exchange with Mr. Keith Kennedy of Sydney, Australia.



LIFE-SIZE FIGURE OF DYAK HUNTER, BORNEO  
(Hall G)

The Arthur B. Jones Expedition to Malaysia, 1922-23  
Modeling by John G. Prasuhn

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The William V. Kelley-Roosevelts Expedition to Eastern Asia, although principally a zoological expedition, resulted in an interesting acquisition for this Department. Mr. Harold J. Coolidge, Jr., of Boston, leader of the second contingent of this expedition, brought back from Indo-China four attractive women's dresses, two from the White Tai of Tonkin and two from the Phunoi and Khakho tribes in northern Laos. The two latter are complete with head-dresses and jewelry and will lend themselves to a picturesque exhibit. The present acquisition is especially appreciated because the very interesting and complex ethnology of this entire region is not yet represented in the Museum.

Two mortuary Chinese clay figures of horsewomen engaged in a game of polo (Plate XVIII) are a notable contribution from Mr. Earle H. Reynolds of Chicago. Technically they differ from most clay figures interred with the dead under the T'ang dynasty (A.D. 618-906). These, in general, are hollow, being made from molds, which accounts for the fact that thousands of the same type have survived. The polo figures in question, however, are solid and freely modeled by hand with great artistic skill. They are delicately painted in colors and distinguished by their excellent expression of motion and dramatic action. The game of polo was introduced into China from Central Asia in the beginning of the seventh century and was a favorite pastime of the emperors of the illustrious T'ang dynasty. The game was eagerly played also by both men and women of high rank. Polo has had a long and honorable history in China, and has been a favorite subject of many great painters. These T'ang clay figures are the earliest representations of the game now in existence.

Dr. I. W. Drummond of New York, well-known collector of jade and amber and for many years a friend of the Museum, presented three important objects. A small vase skilfully carved from pudding-stone and decorated on the sides with tiger heads holding rings in their jaws is a rare work of the K'ien-lung period (1736-95). The two other objects are hornbill carvings: one is a girdle buckle decorated in openwork with the eight Buddhistic emblems of luck; the other is a complete beak of the helmeted hornbill (*Rhinoplax vigil*) carved with an elaborate scene representing the visit of an emperor to the fairy of the moon. It contains six figures, a double-roofed pavilion, and trees and birds, of exquisite workmanship. This carving was immediately placed on exhibition in Hall 32.

The head of a Bodhisatva of the T'ang dynasty (A.D. 618-906), modeled in black lacquer, was presented by Mr. Herbert J.

Devine of New York. Examples of this typically Chinese technique, commonly known as "dry lacquer," are exceedingly rare, and only a few have come to this country. The head in question, detached from a life-size statue, is beautifully modeled in harmony with the best style of T'ang marble sculpture, and as the first example of lacquer sculpture in the Museum is a most welcome addition to the Chinese section.

The collection of archaic Chinese jades was signally enriched by a small, but very important object presented by Mr. J. A. Möller of New York. This is a spike of white jade delicately carved all around into a human figure of archaic style, which belongs to the Chou period (about 500 B.C.). Human figures from that period are exceedingly rare, and this specimen is unique and valuable.

The framework of a Japanese wooden saddle, elegantly lacquered in black and gold, is a gift of Colonel A. A. Sprague of Chicago. It is decorated with two crests, each consisting of three hollyhock leaves, which are the coat of arms of the renowned Tokugawa family. An incised inscription discloses the name of the maker, Yasuyuki, and the date, which is the first year of the period Meiji, corresponding to our year 1868.

A ceremonial battledore from Japan is a gift from Mr. and Mrs. S. Yamagata of Chicago. This is a most artistic object of unusual interest. A battledore like this one was a favorite New Year's gift among the wealthy. It is carved from a white wood, and on one side it is adorned with the portrait of Ichickawa Sadonji, a popular actor, with sword in hand, formed by gold brocade and colored silks. On the other side is a symbolic painting expressive of good wishes, set off from a gold-speckled ground.

Seventy-two packages containing neolithic stone implements found in the Gobi Desert were received from the Central Asiatic Expedition of the American Museum of Natural History, New York, under the leadership of Dr. Roy Chapman Andrews. Field Museum contributed to the financing of this expedition.

An interesting screen of felt decorated with painted appliqué designs of cotton was presented by Mr. Julian Armstrong of Chicago. It was presumably made in India, or possibly in Burma, and may originally have served as the door of a tent. The appliqué work consists of human figures and sprays of leaves as well as panels showing altars with bowls and umbrellas (an emblem of regal power) and a man astride an elephant.

Mrs. John Alden Carpenter of Chicago presented two marionettes used in the puppet plays of Persia. The heads are carved from wood and lacquered. One represents an Armenian priest with tall, black hat and long beard, clad in a black cotton gown with an inset of gold brocade, and equipped with satin shoes. The other figure is a Persian soldier with a black cap on which a lion, the emblem of Persia, is painted. The interesting point is that these marionettes are manipulated from threads or strings attached to the top, and this technique is the oldest form of puppets attested for ancient Greece, India, and China.

A rich harvest has been gathered this year as the result of the excavations at Kish. The more important objects have been unpacked and properly treated. Repairs and restorations have been made whenever necessary. Many stone jars of fine workmanship, as well as several painted pottery jars, have been restored. After one of the rein-rings from the front of a four-wheeled chariot had been cleaned, the figure of an animal surmounting it was found to be a stag with large antlers. There is a fragment of pottery from Jemdet Nasr with a similar animal of the deer family painted on it. Other objects of unusual interest are a copper dagger with decorated handle, the model of a chariot described on page 52, a large saw with copper blade, stone and copper vessels, numerous pieces of pottery, and clay tablets. A beautiful alabaster jar and also a stone bowl which were found had been broken in ancient times and riveted together. One of the rivets has been analyzed by Associate Curator Nichols, who reports that it consists of pure lead with a white lead corrosion on the surface. It is an interesting coincidence that this is the same method of repair employed by the Chinese in mending porcelain. From a scientific standpoint the flint implements from the lowest strata of Kish are the most important objects secured, presenting as they do types previously unknown from Mesopotamia.

Mr. H. W. Seton-Karr of London contributed fifty-eight paleolithic and neolithic knives, scrapers, arrowheads, and other prehistoric implements from England, Belgium, Egypt, India, and Ceylon. Flint flakes from the North Arabian Desert were presented by Dr. E. W. Andrau of The Hague, Holland; Mr. S. W. Quarrie of Royston, Herts, England; and Captain L. W. B. Rees of London.

An excellent collection of painted pebbles from Mas d'Azil, France, was purchased from Professor Henri Breuil of Paris. On these pebbles are designs, partially of a geometric and partially of a

realistic style, which were painted with red ochre by prehistoric men. This is the largest collection of Azilian painted pebbles outside the National Collection of France. The courtesy and friendly cooperation of Professor Breuil and the French Ministry of Beaux-Arts, which allowed this important collection to go to Field Museum, are much appreciated.

A valuable collection of stone and antler implements and pottery sherds from the Swiss lake dwellings was acquired by purchase from Dr. Paul Vouga of the Musée d'Histoire, Neuchatel, Switzerland, who recovered them from Lake Neuchatel. This material makes a good supplement to the excellent collection of Swiss lake dwellers' antiquities previously presented to the Museum by Mr. Martin A. Ryerson.

The Department of Human Anatomy of Oxford University presented several casts of bones which will form the basis for a reconstruction of a Neanderthal child from Gibraltar. The cast of a famous female figurine, known as "Venus," of the Lespuge-Aurignacian period, was received as a gift from Count de St. Périer of Morigny, France, discoverer of the figurine. A plaster impression of a Magdalenian footprint found in a cave of Montespan, together with a plan of this cave drawn to scale, is the gift of M. Felix Trombe, Gauties-les-Bains, France. Copies of prehistoric sketches of animals engraved on the walls of the same cave were presented by M. Georges Debuc of the same place.

The first installment of the material collected by Assistant Curator Hambly as leader of the Frederick H. Rawson-Field Museum Ethnological Expedition to West Africa was received toward the middle of December. The collection includes some fine old wood carvings, large decorated gourds, weapons, implements, musical instruments, smoking utensils, baskets, mats, ornaments, and other ethnographical material illustrating the life and culture of the Ovimbundu in Portuguese Angola.

A small but interesting collection from Sierra Leone, West Africa, was presented by Mrs. William G. Burt of Old Lyme, Connecticut. The collection, made by her father in 1901, includes two wooden masks, decorated gourds, carved wooden paddles, straw hats, leather sandals, a grass skirt, a bow, spears, swords, a pouch, and a stool.

**BOTANY.**—During 1929 the Department of Botany received 40,996 specimens, more than twice as many as were received in

1928. The number of accessions was 412, representing more than 175 individuals and organizations. Of the specimens acquired, 1,321 were samples and exhibition material of woods, 374 represented miscellaneous economic material for exhibition purposes or for the study series, and the remainder, 39,301 specimens, were herbarium specimens, photographic prints of plants, and negatives of type specimens.

Of these 40,996 specimens 12,974 were presented by correspondents of the Museum, 7,326 were received in exchange, 4,710 were purchased, and 15,986 were received as the result of Museum expeditions.

Of the gifts to the Herbarium during the year the most important is the private herbarium of the late well-known ornithologist Robert Ridgway of Olney, Illinois, received by bequest. In addition to his zoological work, he always maintained a deep interest in plant life, especially that of Richland County, Illinois, with which he was thoroughly familiar. His herbarium, of approximately 4,000 specimens, forms a valuable addition to the Illinois Herbarium of Field Museum, since it contains an approximately complete representation of the flora of Richland County, botanically one of the most interesting portions of the state of Illinois.

The United States has been well represented among the accessions of the year. Professor A. O. Garrett of Salt Lake City, Utah, forwarded 700 plants, chiefly from Utah, a state but imperfectly represented in the Museum's Herbarium. Witte Memorial Museum of San Antonio, Texas, transmitted 392 specimens of plants, chiefly from the arid regions of western Texas, through the interest of Mrs. Ellen Schulz Quillin, Curator of the museum, whose volumes upon Texas plants contain interesting information regarding a little-known flora. Father I. Chateau of Mission, Texas, forwarded thirty-seven plants from the same state.

Mr. H. C. Benke of Chicago, who in past years has been so active in contributing material from the Mississippi Valley states, especially from Illinois, donated this year 517 sheets of herbarium material, largely from New Mexico, Texas, and Kansas, with some interesting specimens for the Illinois Herbarium. His donation included also 140 packets of seeds, chiefly from Illinois and Indiana.

The Misses Sophia and Mary Bremer of Crown Point, Indiana, presented twenty specimens of Indiana plants, including material of several interesting forms new to the Herbarium, and also eighteen packets of seeds of Indiana wild flowers.

Miss Nellie V. Haynie, of Oak Park, Illinois, visited the Herbarium several times during the year to determine plants of her own collections, and she contributed thirteen specimens from Illinois and Colorado, among them the type specimen of a new color form of a wild strawberry found at Waukegan, Illinois.

Mr. G. Eifrig of River Forest, Illinois, continued his donations of previous years, presenting fifty-six specimens from the north-central and southern United States. Professor L. A. Kenoyer of Kalamazoo, Michigan, forwarded 150 specimens of plants from the vicinity of Kalamazoo, among them a large number of grasses and sedges. Mr. E. L. Moseley of Bowling Green, Ohio, contributed a representative series containing 196 plants of northern Ohio, and from Oberlin College, Oberlin, Ohio, there were received 480 specimens, chiefly plants of California and other western states. Miss Ella M. Martin of Greensboro, North Carolina, presented to Field Museum fifty-nine sheets of North Carolina plants.

A special effort was made during 1929 to procure material of the mosses and other cryptogams of the local flora. Mr. G. L. Wittrock, of Chicago, collected and presented 121 specimens of Illinois mosses. Associate Curator Standley, and Mr. Arnold Doubleday, of Chicago, collected for the Herbarium 891 specimens of mosses and other plants in Illinois and Indiana, and 289 packets of wild flower seeds, to be used for exchange and propagation purposes. Mr. Standley and Assistant Curator Macbride jointly collected and donated 105 specimens of mosses and other cryptogams from Indiana. The moss herbarium was further enriched by a valuable lot of seventy-five Arizona mosses, presented by the collector, Mr. Edwin B. Bartram of Bushkill, Pennsylvania.

Of miscellaneous collections there deserve mention three specimens of cycads, presented by the Garfield Park Conservatory, through Mr. August Koch, chief florist, who always has been generous in supplying Field Museum with material of unusual plants which flower in that justly famous collection. Dr. C. R. Ball of Washington, D.C., contributed twelve specimens of willows of the United States, particularly valuable because of the critical determinations which accompanied them. Dr. J. C. Chamberlain, of the University of Chicago, presented two specimens of rare cycads, a group in which he stands pre-eminent as an authority.

Dr. C. E. Hellmayr of Field Museum made a welcome gift of fourteen specimens of European orchids, useful for purposes of comparison with related American forms. Dr. E. E. Sherff con-

tinued to place in the Herbarium material of desirable Compositae, particularly of the genus *Bidens*, and during 1929 contributed thirty-three specimens. Mr. Eric Walther, of San Francisco, forwarded ample material of a handsome Mexican cycad, apparently representing a new species of the genus *Ceratozamia*, grown in the conservatories of Golden Gate Park. Professor W. S. Cooper, of the University of Minnesota, presented a series of 349 plants which he had collected in Alaska and British Columbia. His collection, when named, was found to contain an orchid (*Cypripedium*) new to the Alaskan flora, and an unnamed albino form of a *Hedysarum*.

From Mexico and Central America there was acquired by gift a large amount of interesting and exceptionally valuable herbarium material. There were received from Mr. William A. Schipp of Belize, British Honduras, 466 specimens of British Honduras plants. These were determined by Associate Curator Standley, who found among them numerous new species of which descriptions have been prepared for publication, and representatives of several noteworthy species hitherto absent from the Herbarium of Field Museum. Mr. Schipp's collections included many records of genera and species new to Central America, and of some unreported even for the North American continent. Another important collection from British Honduras, presented by Mr. C. L. Lundell, of New York, consisted of 210 specimens, several of which represented new species. Mr. Lundell's plants were collected in the extreme northern part of the colony, in connection with his work upon the latex-yielding plants of the region. The British Honduras material thus received is of particular value for comparison with collections from near-by Yucatan, in which Field Museum Herbarium is unequalled. Many of the British Honduras species found in these recent collections were known previously only from Yucatan. Besides the accessions mentioned, Mr. Neil Stevenson, of Belize, forwarded five specimens illustrating the palms of British Honduras.

From Guatemala there were received from the Dirección General de Agricultura 189 very desirable plants characteristic of the flora of that republic. Dr. Salvador Calderón of the laboratories of the Department of Agriculture, San Salvador, Salvador, has continued to collect, with his usual enthusiasm and persistence, the rarer plants of that country, and presented Field Museum with 238 specimens of plants, many of which were new to science or additions to the recorded flora of Salvador.

Dr. C. A. Purpus of Zacuapam, Veracruz, Mexico, veteran collector of Mexican plants, visited certain exceptionally rich regions of Veracruz during 1929, and sent to the Herbarium 443 specimens. Although the flora of that state has been investigated by many collectors during the past 150 years, Dr. Purpus' recent collections contain representatives of several plants quite unknown to science. The Dirección de Estudios Biológicos of the Mexican government, through its director, Professor A. L. Herrera, presented samples of *Ochroma* fiber from Mexico, this being the product of the tree yielding balsa wood of commerce, which is lighter than cork. Professor Maximino Martínez, of Mexico City, contributed during the year fifteen specimens of the less common Mexican plants.

From the School of Forestry of Yale University, New Haven, Connecticut, there were received, through the interest of Professor Samuel J. Record, Research Associate in Wood Technology of Field Museum, 183 specimens, mainly of tropical American plants. Most of these represented tree species whose wood has been studied by Professor Record. Several of them were discovered to represent trees heretofore unknown botanically, and descriptions of them have been published in *Tropical Woods*.

From Honduras there were received 101 specimens of trees transmitted by Dr. Wilson Popenoe, Director of the Lancetilla Experiment Station of the Tela Railroad Company. This collection supplements one made in the same region in 1927-28 by Associate Curator Standley, and it contains several species which he did not find in the course of his work in the area. Dr. Holger Johansen of La Lima, Honduras, forwarded fifty-two specimens of plants from the region in which he lives, and these, likewise, proved to contain several species of more than casual interest.

Of Nicaraguan plants there were received fifty-six specimens, collected by Rev. E. E. Schramm of Cabo Gracias a Dios, whose mission station is situated on the banks of the Wanks River, a week's journey by gasoline launch upward from the mouth of the river, in a wild region quite unknown botanically.

The most important single Central American collection received by the Museum in 1929 consisted of 668 specimens of Costa Rican plants, collected and presented by Professor H. E. Stork of Carleton College, Northfield, Minnesota. Professor Stork had collected in earlier years in Costa Rica and Panama, but his collections of 1929 have proved even more interesting than previous ones. They have

not yet been fully identified, but it is evident that they contain numerous species not detected heretofore in the Costa Rican flora.

Mr. C. H. Lankester, of Cartago, well-known collector of Costa Rican orchids, birds, and butterflies, presented seventeen specimens of unusual Costa Rican plants. Mr. Ferdinand Nevermann of San José, Costa Rica, who has made a name for himself in the entomological world by his studies and collections of Costa Rican beetles, sent to the Herbarium ten specimens of fungi.

From Panama there were received 251 specimens of plants collected in the Canal Zone by Mr. S. W. Frost of Pennsylvania State College, Arendtsville, Pennsylvania. These were obtained on Barro Colorado Island, in Gatun Lake in the Panama Canal, where is located the laboratory of the Institute for Tropical Research, directed with such signal success in recent years by Mr. James Zetek. Several of Mr. Frost's plants proved to be additions to the known flora of Barro Colorado Island, of which two lists have been published by Associate Curator Standley, the second of which, prepared in association with Professor L. A. Kenoyer, appeared in Volume IV of the Botanical Series of Field Museum. Mr. R. H. Wetmore of the Botanical Museum of Harvard University, Cambridge, Massachusetts, presented an equally interesting series of seventy-seven specimens, collected on the same island, and containing other new records for the Barro Colorado flora.

The Museum's already very extensive collection of Peruvian plants has received several notable additions during 1929. Professor Fortunato L. Herrera of Cuzco, Peru, generously contributed a collection of 551 specimens, chiefly from the Department of Cuzco. The collection is an especially helpful one, since it comes from a region scarcely represented previously in the Museum collections, and it will, therefore, be valuable for citation in the flora of Peru, now in course of preparation by Assistant Curator Macbride. Mr. Oscar L. Haught of Negritos, Peru, presented a carefully selected series of 259 specimens, illustrating the flora of an arid region of Peru little known botanically. Still another important collection of Peruvian plants was received during the year. It consisted of 206 specimens gathered by Mr. M. Sawada, and was received from Professor R. Kanehira of Fuoka, Japan. Although not yet fully determined, it is evident that the collection contains a large number of plants of species not expected from Peru.

A fine Brazilian collection, consisting of eighty-one uncommonly well-prepared specimens from the state of Pará, was presented by Mr. Emilio Kauffmann of Belem, Brazil.

In 1929 the Museum received by exchange from various botanical institutions and from individuals more than 7,300 herbarium specimens, including much material of great value.

From the Arnold Arboretum, Jamaica Plain, Massachusetts, there were acquired 785 specimens. Part of these represented critical forms of the trees of the United States. There were also 285 specimens of plants collected on Barro Colorado Island, Canal Zone, by Mr. W. N. Bangham. This collection, like the others already mentioned from that island, contained various further additions to the published flora of Barro Colorado. It may be observed that an unusual amount of botanical exploration has been conducted there during the past year. The Arnold Arboretum material included more than 100 specimens of plants obtained in northern Yucatan in the summer of 1929 by Dr. J. Becquaert. These are noteworthy as forming the only Yucatan collection obtained in many years, and among them were found three new species, from an area which had been believed to have been rather thoroughly explored. The Becquaert series makes a much appreciated addition to Field Museum's unique representation of the flora of the Yucatan Peninsula.

The Botanical Garden and Museum of Berlin very generously transmitted fifty specimens of plants, mostly Leguminosae, from Peru. Since most of these represent type material of Peruvian species, they will be invaluable for use in the preparation of the flora of Peru.

The Botaniska Institutionen of Upsala, Sweden, sent in exchange 450 specimens from the classical series procured in Brazil by Regnell, which will be found helpful in the determination of the collections made by the Museum's expeditions to that country. The British Museum (Natural History), London, through the courtesy of Dr. A. B. Rendle, sent 1,034 specimens, mostly from early Chilean collections, with some material from other South American regions.

The Farlow Herbarium of Harvard University, Cambridge, Massachusetts, contributed 141 specimens of interesting and carefully determined cryptogamic plants. The Gray Herbarium of Harvard University continued its exchanges with ninety-two specimens, which included a valuable series from the north coast of

Honduras, and critical species of bromeliads. From Mr. Ludlow Griscom of Cambridge, Massachusetts, there were received 119 specimens of plants, chiefly native to the United States.

The Jardin Botanique de l'Etat, Brussels, Belgium, transmitted in exchange 200 specimens of tropical American plants. From the Jardin Botanique Principal, of Leningrad, Union of Socialistic Soviet Republics, were received 130 specimens of plants collected in Mexico, Colombia, and Venezuela by Dr. Georges Woronow. This material consisted largely of Rubiaceae, and was determined in Field Museum by Associate Curator Standley.

The Natural History Museum of Vienna, Austria, forwarded in exchange a valuable series of 671 European plants, many of them from classic series obtained by early collectors. The Royal Natural History Museum of Stockholm, Sweden, through Dr. Gunnar Samuelsson, sent 257 plants from tropical America. Most of these were obtained in Cuba by the eminent collector, Dr. Erik L. Ekman, of Haiti, and they include duplicate types of many endemic species described by Dr. Ignatius Urban of Berlin.

The New York Botanical Garden transmitted ninety-four specimens, mostly from tropical America. From Pomona College, Claremont, California, there were sent by Professor Philip A. Munz 915 specimens of plants, chiefly from the Rocky Mountain region of the United States, which were welcome as supplementing the Museum's too inadequate representation of the Rocky Mountain flora.

From the Royal Botanic Gardens, Kew, England, was received a generous contribution of 676 specimens. Part of these was collected in western Mexico, and there was included also an important fascicle of the Lehmann Colombian collections, which have proved so rich in new species. The Royal Botanic Gardens of Edinburgh, Scotland, contributed 401 specimens of plants from Paraguay, a country with but slight representation in American herbaria. This material is, therefore, most welcome.

The United States National Museum, Washington, D.C., through Dr. William R. Maxon, continued to send exchange material, and this year forwarded to Field Museum 1,001 specimens, principally from Mexico and Panama and other parts of tropical America. From the Office of Systematic Agrostology of the United States Department of Agriculture, through the interest of Professor A. S. Hitchcock and Mrs. Agnes Chase, there were received 312 specimens of grasses, chiefly from tropical American countries.

The Museum has continued its policy of confining purchases of herbarium material chiefly to collections from tropical America, and almost all the 4,710 specimens so acquired during the year are from Central and South America.

The purchases include 300 specimens from Trinidad, a continuation of the series of former years obtained from Mr. W. E. Broadway of Port-of-Spain. There were obtained by purchase, also, 100 specimens of cryptogamic plants collected in Europe, and fifty-three photographs of Mexican plants procured by Mrs. Ynes Mexia, San Francisco, California.

From Mr. Marcus E. Jones of Claremont, California, there were purchased 623 specimens which he had gathered in Lower California. The collection contained many duplicate types of species described by the collector in his publication, *Contributions to Western Botany*.

Mr. C. L. Lundell of New York, in the course of his studies of rubber- and chicle-yielding plants of British Honduras, collected for Field Museum an excellent series of 962 specimens, illustrating the flora of the northern part of the colony. The material contains many unusual and some new species, and the numerous duplicates will be available later for exchange purposes.

Most of the material acquired by purchase came from South America. The largest collection consisted of 1,079 specimens obtained in Bolivia by Mr. José Steinbach of La Paz. Study of certain groups of his collections indicates that the flora of this country is far from exhausted, as some botanists had erroneously supposed, for his series contains a large proportion of plants which seem altogether to have escaped the attention of earlier and presumably competent collectors in the region.

From Mr. Henry Pittier, of Caracas, Venezuela, whose collections have contributed so greatly to the present knowledge of Central and South American floras, there were purchased 320 specimens of Venezuelan plants. From Ecuador were received 342 specimens brought together from the high mountains by Brother Gemel-Firmín of Quito.

Of Argentine plants there were purchased 500 specimens, mostly of woody species, gathered by Professor S. Venturi of the Museo de la Universidad de Tucumán, Argentina. Another collection acquired consisted of 331 specimens procured by Mr. W. Lossen. One hundred specimens of Chilean plants collected by Professor Montero also were obtained by purchase.

More than one-third of the herbarium material received during the year was the result of the work of Museum expeditions.

Great success attended the efforts of the Marshall Field Botanical Expedition to the Amazon in securing herbarium material and wood specimens. Acting Curator Dahlgren and Mr. Emil Sella of this expedition obtained in the vicinity of Belem, state of Pará, Brazil, and upon the Tapajoz River, 2,500 herbarium specimens of plants. Only a small portion of their collections has been named up to the present time, but it is expected that the determination will be completed in the near future. The material, when fully identified, will give the Herbarium a valuable representation of the flora of the Amazon Valley.

The varied economic and other collections made in Pará on the lower Amazon, and in other localities in Brazil, have at the present writing not been catalogued. They include rubber of various kinds; varieties of cacao in pods and the beans; the principal tobaccos of the state of Pará (Parahyba, Bahia, and Rio Grande do Sul), cigars and cigarettes; oils and fats of vegetable origin and their source material; fibers and products, such as baskets, hats, rope, cassava products, beans, seeds, and woods, the last chiefly for the study collections. In addition these collections contain plant material, both dry and preserved in formalin, for use in the preparation of exhibits for the Hall of Plant Life, together with photographs, molds, and color sketches of the material collected.

Dr. Dahlgren also obtained in the state of Pará a splendid exhibition series of the woods most valued in the local industries of the region, which is noted for its abundance of fine cabinet woods.

Mr. Williams, of the Peruvian division of the Marshall Field Botanical Expedition to the Amazon, has forwarded to the Museum 9,500 herbarium specimens, and 1,088 wood specimens which he assembled in eastern Peru. The wood specimens were all accompanied by herbarium specimens, which will make possible their accurate determination. This collection, when it has been named, will add many species to the Museum's series, and make a noteworthy addition to the present knowledge of the woods of the Amazon Valley. Mr. Williams' operations thus far have been in the general region of Iquitos, at the head of navigation on the Amazon River. The results of his labor bring to North America the first adequate representation of the flora of this area, which is almost unknown botanically except for the historic collections made there

many years ago by Richard Spruce. Mr. Williams' material makes a very notable addition to the Museum's already rich collections of Peruvian plants.

A further addition to the Museum's Peruvian series consisted of 888 specimens obtained in the Department of Cuzco, Peru, by Dr. August Weberbauer (Marshall Field Expedition to Peru, 1929).

Five specimens of economic British Honduras plants were received from Assistant Curator J. Eric Thompson, Department of Anthropology (Second Marshall Field Archaeological Expedition to British Honduras).

From the William V. Kelley-Roosevelts Expedition to Eastern Asia there were received 400 specimens of plants obtained by Mr. F. Kingdon Ward in Burma and Indo-China, and more than 2,400 collected by Mr. Herbert Stevens in the province of Szechwan, China.

As a result of work under the Rockefeller Fund for Photographing Type Specimens, a total of 2,603 negatives has been secured. There had been received at the end of the year 819 negatives of types in the Museu Goeldi of Pará, obtained by Acting Curator Dahlgren, and thirteen photographic prints of type specimens in the Berlin Herbarium, received from Assistant Curator Macbride. A total of 1,784 negatives had been made in Berlin, but these had not been received at the time this Report was prepared.

Among the accessions should be mentioned, also, 5,593 photographic prints prepared in the Division of Photography of Field Museum. These include prints of many type specimens of Brazilian species, and photographs of interesting specimens received by the Department on loan for study purposes. Placed in the Herbarium, they are of the greatest value in the determination of collections received currently for identification, and as a basis for monographic work. Among these prints are many duplicates, especially of Peruvian types, which it is expected will be used to good advantage for exchange purposes.

Through the interest of Professor Record, Associate in Wood Technology, there have been obtained several important gifts of wood specimens for exhibition purposes. Particularly noteworthy are three handsome panels illustrating the best types of Cuban, Mexican, and Peruvian mahoganies, presented by Ichabod T. Williams and Sons of New York. These form an attractive display of the chief types of this most important of all tropical American

woods, which serves as a standard for the comparison and estimation of fine woods generally. At present they are on exhibition in Stanley Field Hall.

The F. B. Williams Cypress Company, Limited, of Patterson, Louisiana, generously sent four boards of normal and pecky cypress lumber, part of which has been placed on exhibition in the new arrangement of the North American Wood Hall. The Pickrel Walnut Company of St. Louis, Missouri, donated three fine walnut boards which have served to complete the reinstallation of the walnut exhibit. The Panhandle Lumber Company of Spirit Lake, Idaho, contributed a large board of western pine which has been placed on exhibition in the same hall. From the American Walnut Manufacturers' Association of Chicago was received a desirable wheel section of black walnut which was needed to present a complete display of this important American wood.

Through the interest of Professor Emanuel Fritz of Berkeley, California, there was secured from the Sugar Pine Producers of California some desirable material for exhibition purposes. It consisted of five well-prepared sugar pine planks, and an extensive collection of the huge cones borne by this California tree.

The School of Forestry of Yale University, New Haven, Connecticut, donated a board of black willow which permitted the proper installation of a complete exhibit of the wood of this widely distributed tree. There was received directly from Professor Record a most unusual abnormal growth from a flowering dogwood tree, simulating in uncanny fashion the head of a chimpanzee.

The All-American Mohawk Radio Corporation of Chicago presented the Museum with three wood specimens, one of which was a handsome sheet of veneer of Australian silk-oak, such as is used for the finishing of radio cabinets. The firm of Bauer and Black of Chicago donated for use of the Marshall Field Botanical Expedition to the Amazon one of their airplane first aid kits.

Useful material for the completion of certain wood exhibits was supplied by T. W. Minton and Company, Barboursville, Kentucky, in the form of two samples of hickory wheel spokes. The Turner, Day and Woolworth Company of Louisville, Kentucky, contributed four examples of hickory ax and hammer handles and samples of hickory nuts.

The United Fruit Company, at the suggestion of Professor Record, sent to the Museum an eight-foot section of a trunk of the

Guatemalan cow-tree (*Couma guatemalensis* Standley), which was placed on exhibition in Hall 27, where it has attracted a great deal of attention.

Mr. Charles Westcott of River Forest, Illinois, presented a specimen of the wood of the beefwood tree (*Casuarina*), from Florida, accompanied by herbarium material of the tree from which the wood was taken.

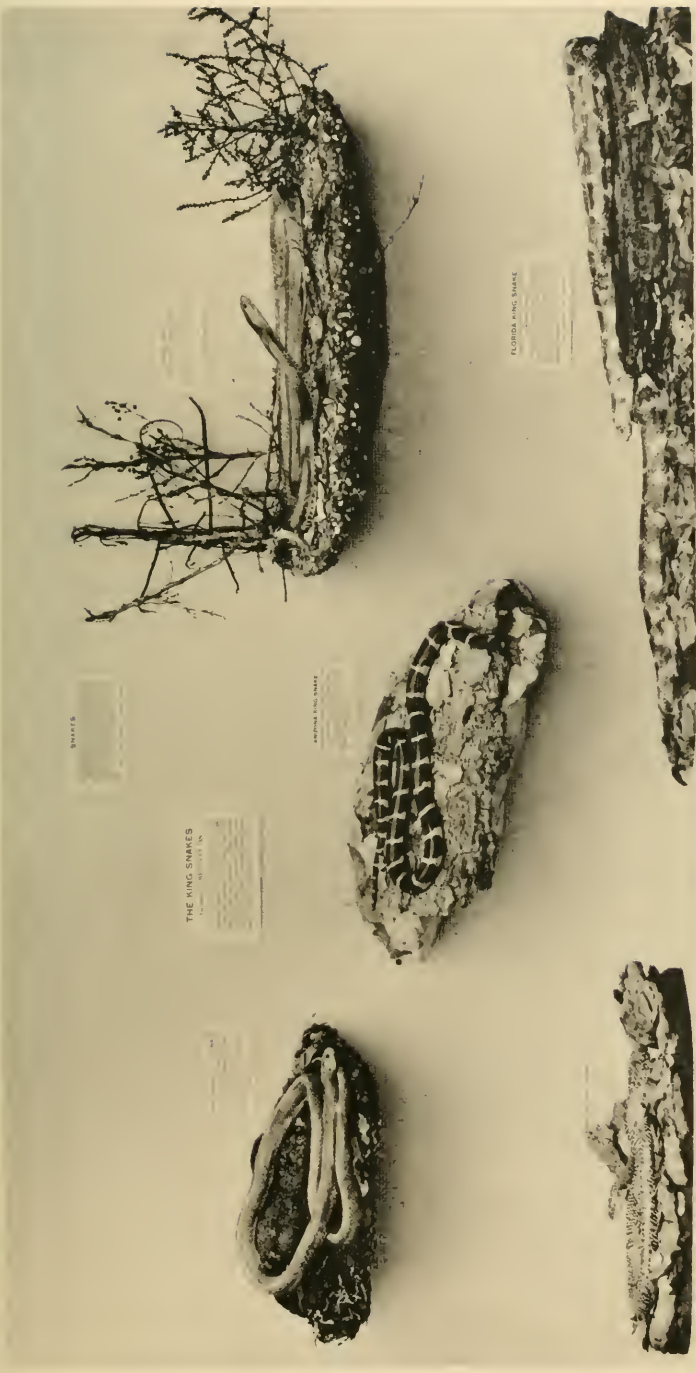
Mr. John A. Manley of New Brunswick, New Jersey, donated an unusual sample of apple wood, in which, through long years of growth of the surrounding woody tissue, there had become completely imbedded a horseshoe.

Captain Arthur Pay of Paramaribo, Surinam, presented the Museum with five samples of *Sickingia* wood from that colony. This wood is remarkable for its fine and compact grain and especially for its beautiful pink color.

Mr. H. C. Benke of Chicago, during a botanical collecting trip to Texas and New Mexico, obtained for the Museum thirty-eight specimens of wood of plants characteristic of that semi-desert region.

By exchange there were received from the United States National Museum, Washington, D.C., 144 hand samples of woods. These represent chiefly tropical American trees, and form a desirable addition to the Museum's rapidly growing study series of wood specimens.

Two years ago the economic collections of the Department of Botany received a unique and valuable addition through the finding of Babylonian wheat by the Field Museum-Oxford University Joint Expedition to Mesopotamia. This year there were received from the expedition four more samples of ancient grain (Plate VI) unearthed in January, 1928. Three of these were found in three separate jars in the ruins of the buried city of Kish, "the first city founded after the flood." The discovery was made by Mr. Henry Field, Assistant Curator of Physical Anthropology, who at that time was a member of the expedition. The jars containing the grain were found in rooms of two ancient buildings buried for thousands of years thirty-two and forty feet respectively below the original surface of the mounds covering eastern Kish. The lower building was in a stratum just above the level where traces of a flood were discovered which, according to the archaeological evidence obtained, occurred about 3200 B.C.



AMERICAN KING SNAKES  
 Section from Systematic Exhibit of Reptiles  
 Reproductions in cellulose-acetate by Leon L. Walters  
 About one-tenth natural size

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The grain in its present condition is practically pure charcoal and it is, perhaps, owing to this fact that it was not destroyed long ago by fungi, insects, or moisture. The grain has been examined by five experts of the United States Department of Agriculture, all of whom pronounced it to be barley. Mr. C. E. Leighty, one of the experts, reports that the samples are composed entirely of barley and that examination reveals no other cereal grain. Messrs. O. F. Phillips, Hazen P. English and Albert F. Nelson, three others of the experts, report jointly: "While time and the elements have charred and blackened the kernels to the extent that positive identification is rather difficult, we are of the opinion that each of the samples is of some form or type of barley. We are influenced in arriving at this conclusion by the appearance and shape of the crease (slightly twisted in some kinds), flattened backs, boat shape of kernels, and germ shape, all of which are more or less common to our modern barleys.

"Time, abrasion, and possibly method of threshing, all have had a part in accounting for the apparent absence of the outer husk or hull of the kernels.

"The grain from the upper levels is apparently a different type than that in the other two containers, as the kernels as a whole are much smaller. The barley characteristics are much more pronounced in the sample from the lower level, which has been dated at about 3500 B.C.

"There can be but little doubt, however, that each of the samples is of some species of barley."

Mr. H. V. Harlan, the fifth expert, states: "I am able to make only a partial determination of the barley in the samples which you recently forwarded. All three samples contained seeds of six-rowed hulled barleys. This does not preclude the possibility of there being hull-less or two-rowed sorts present. I could, however, find no kernels which could be identified as either. The grain seems to be slightly smaller than that coming from Egyptian excavations, and I think it is safe to say that it represents different varieties."

Modern grain is represented in the accessions of the year by four samples of prize wheat from Australia, grown in New South Wales, of the varieties *Cedar*, *Perfection*, *Comeback*, and *Cedrick*. These were obtained by the courtesy of the Chicago International Live Stock Exposition.

Some canna roots were obtained by purchase for the exhibit of starchy tubers, and several specimens of coontie, a starch-bearing

cycad native to southern Florida, were received from Professor A. H. Gilbert of the Department of Botany of the University of Miami at also Coral Gables, Florida.

A sample of Mexican crude guayule rubber, collected in Chihuahua, Mexico, by Mr. George Ewald of Chicago, was donated by him. This is the only authentic specimen of guayule rubber in the Museum's collection and is of interest as a sample of rubber which is also produced in the United States.

Four specimens of "rainbow" corn were donated by William Thuring of Chicago. These represent results of interbreeding Indian corn of various colors.

GEOLOGY.—The Department of Geology received during the year accessions from seventy individuals and institutions. Of these fifty were by gift, three by exchange, seventeen by purchase, and five from Museum expeditions. The total number of specimens thus received and catalogued is 1,480.

The large number of gifts shows that continued interest is being taken in the progress of the Museum by many donors. Mr. Richard T. Crane, Jr., presented three valuable specimens of cut gems. The most important of these was a large aquamarine from Brazil weighing  $341\frac{1}{2}$  carats. This is one of the largest aquamarines ever cut, and exceeds in size any previously in the Museum collection, although the series of these stones in the collection was already remarkable for the size and quality of each specimen. The Crane aquamarine is flawless and of a rich blue color. It is cut as an oval brilliant, and is two inches long, one inch wide, and one inch thick. The other two cut gems presented by Mr. Crane were a cabochon ruby weighing eight carats, and a chrysoberyl cat's-eye weighing six and one-tenth carats, both from the gem mines of Ceylon. As neither of these gem varieties had been well represented previously in the collection the addition of these is gratifying.

To Mr. William J. Chalmers of Chicago the Museum is indebted for continued additions to the collection of crystallized minerals. Thirty-four specimens of these were received during the year from Mr. Chalmers. One group consisted of minerals from Madagascar. These are all large specimens, and include a complete hexagonal prism of blue beryl with some gemmy spots, the crystal being seven inches in diameter and of equal length; a doubly terminated crystal of corundum, ten inches in length; a mass of rose quartz of fine color and transparency; and a semi-transparent, terminated crystal of

rubellite. Another group includes twenty-seven specimens of new and choice examples of species from localities not hitherto represented. Among these a beautifully terminated and transparent crystal of golden beryl from Serro in Brazil is especially important. A number of minerals from new localities in Africa in the same accession included fine groups of azurite and cerussite from Tsumeb, a series of corundums from the Transvaal, and vanadinite from the Abenab mine. The crystals of vanadinite are remarkable for their size, some being two inches in length. There was also included a prismatic crystal, two inches in length, of malachite after azurite. A large specimen of the recently discovered collinsite and quercyte from British Columbia was another valuable accession received from Mr. Chalmers.

A notable addition to the exhibit of gems was also received through the gift of forty-nine specimens from Mrs. Joseph W. Work of Evanston, Illinois. Of these, the series of opals received was especially large and valuable. These numbered twenty-nine stones, of which twenty were from Australia, seven from Mexico and two from Honduras. Of the Australian opals, fifteen were of the white variety, three blue-black, and two green. The gift also included seven star sapphires, two rhodolites, one kunzite, two mounted pieces of jade and a mounted blue pearl. These specimens were acquired during years of travel and collecting by Mrs. Work and her husband, the late Joseph W. Work. Mrs. Work's desire to have them placed where they would be visible to the public led her to present them to the Museum. In order that her gift might not include gems already well represented in the Museum, Mrs. Work very kindly allowed selections to be made from her entire collection.

A specimen of the newly described mineral collinsite from British Columbia was an appreciated addition presented by Mr. W. D. Lukens, a resident at the locality where it is found.

Orthoclase crystals from a new locality in Colorado were presented by Mr. W. F. Planer of Hammond, Indiana.

Mr. and Mrs. William and Toodie Bower and Mr. Franklin Bower generously presented a partial skeleton of a mastodon which was excavated on land owned by them at Argos, Indiana. The parts received include a nearly complete skull and lower jaws, twenty-two vertebrae, ten entire ribs with parts of others, about sixty foot bones, and several miscellaneous limb bones.

To Former Judge George Bedford of Morris, Illinois, the Museum is indebted for a number of remains of mammoth, mastodon, and moose of an extinct species, which represents practically the entire results of his recent exploration of a large deposit at Minooka, Illinois. Some specimens were obtained from this deposit a number of years ago, but excavation there was after a time suspended at the request of the landowner. During the year 1929, however, permission was given to Former Judge Bedford to continue excavation, and with great generosity he presented practically the entire results of his work to the Museum. A fine tusk and lower jaws of mammoth were important specimens found and received, also parts of skeletons of two individuals of mastodon, a skull and antlers of *Cervalces* and miscellaneous bones of bison.

A collection consisting chiefly of fossil invertebrates and plants, numbering altogether 393 specimens, was presented by Mr. Henry Gebauer of Chicago. Among the fossil plants were a number of fine specimens, especially a large one of Neuropteris. There were 380 specimens of invertebrate fossils and plants included, and most of these had been carefully identified and labeled. This collection also included seven specimens of minerals and one fossil fish from Syria.

Ritchie Brothers of Saratoga Springs, New York, gave five specimens of fossil algae from this well-known locality. These specimens of this early form of plant life are large and well-preserved. One of the group has a diameter of about two feet.

Two beautifully preserved fossil ammonites from County Antrim, Ireland, were presented by Mr. Bryan Patterson of the Department of Geology. The specimens were collected by his grandfather, the late William Gray, a British paleontologist. Mr. Patterson, together with Messrs. Paul Nieh of Chicago, F. H. Letl of the Department of Zoology, and Leroy Kranz and Clarence Lahde of Harvey, Illinois, also presented a number of fossil plants from Mazon Creek, Illinois. In Mr. Letl's donation were also included thirty-two specimens of invertebrate fossils from Amboy, Illinois.

A complete section, with crust, of the Lafayette stone meteorite was presented by Purdue University through the kindness of Professor H. E. Enders. This section, weighing 123 grams, represents about one-third of the entire specimen. It furnished sufficient material for analysis and a piece of good size for exhibition. Thus far it is the only portion of this meteorite that has been removed from the original.



BRANCH OF HONDURAS MAHOGANY

Stanley Field Hall, Case 21

A branch of the mahogany of the east coast of Mexico and Central America

Reproduced in Stanley Field Plant Reproduction Laboratories

One-tenth natural size

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In addition to the cast and specimen of the Tilden meteorite presented last year by the Illinois State Museum, a cast of the nine-pound meteorite from the same fall was given during the year by the same institution through Dr. A. R. Crook, Curator.

Sixty-four specimens of quartz crystals from a new locality in McCurtain County, Oklahoma, were presented by Mr. J. H. Keester, of Cicero, Illinois.

An interesting series of thirty-five geodes, showing various stages of transition of fossil crinoids into quartz geodes was presented by Mr. J. G. Prasuhn of the Department of Anthropology. These specimens were collected by him in Morgan County, Indiana. They show beyond question that the somewhat disputed view that geodes may be formed from fossil crinoids is, in one locality at least, correct.

From the Chicago, Milwaukee, St. Paul and Pacific Railroad a large sand-lime concretion, thirty inches in diameter and weighing 1,150 pounds, was received by gift. This concretion has an almost spherical form and affords a valuable exhibit to illustrate the size and shape in which such concretions may occur. This specimen was obtained from Mobridge, South Dakota.

Two sand-lime concretions from the Salton Sea, California, one of which is unusual in size, were an appreciated gift from Mrs. S. A. Williams of Chicago. Concretions from this locality are remarkable for their peculiar forms, and one of those presented by Mrs. Williams was much larger than any previously possessed by the Museum.

The Standard Oil Company (Indiana) gave 105 varieties of petroleum products which will enable a thorough revision to be made of the exhibit of petroleum products which this company previously provided. The specimens received in this gift were either entirely new to the collection, or replaced previous specimens that had deteriorated.

Another interesting contribution to the petroleum series was a specimen of crude petroleum from the world's deepest producing oil well. This was presented by Mrs. H. C. Morris, of Chicago. It was obtained from a depth of 8,523 feet in Reagan County, Texas. Besides the great depth of the well, it is interesting to note that the specimen is composed of 70.6 per cent gasoline.

By exchange with the University of Chicago, articulated skeletons of the fossil so-called "ruminating hogs," *Oreodon* and *Merychyus*, from Sioux County, Nebraska, were received. While single

bones of these animals are relatively common in some localities, complete skeletons are rare, so that these make an acquisition of much value.

From the Colorado Museum of Natural History, Denver, there was received, also by exchange, a completely prepared skeleton of *Trigonias*, the most ancient and primitive representative of the true rhinoceroses. This interesting form, characterized by having four toes on the front foot instead of three as in modern rhinoceroses, and by other peculiarities, will afford a valuable addition to the series illustrating the development of the rhinoceros in North America.

By exchange with Mr. Arthur Blocher of Amboy, Illinois, eighty-seven specimens were added to the collection of fossil invertebrates. These were chiefly from Illinois.

Some valuable additions were made to the gem collection by purchase. One of these was a cut black opal of unusual brilliance, weighing fourteen carats, from Australia. As this is a stone for which frequent inquiries are made, it is gratifying to have this fine specimen. Other cut stones added by purchase were one of the new and interesting gem "starlite," or blue zircon, weighing three and four-tenths carats, and a green garnet from South Africa weighing seven carats.

Since synthetic gems have become so widely known and used, it was deemed desirable to add a series of them to the gem collection for comparison with the natural stones. Accordingly, a series of thirty-five specimens of these was purchased. This series shows a boule and a cut stone of each variety. It contains synthetic sapphires of thirteen and rubies of three different colors. A synthetic blue spinel is also included.

To the meteorite collection several additions were made by purchase. One of these was an etched section of the Weekeroo, Australia, iron meteorite, weighing 6,465 grams. It represents a new type of meteorite, since it is intermediate between the iron-stones and the irons.

A portion of the stone meteorite from Troup, Texas, was also purchased, a full-sized section of forty-three and two-tenths grams being obtained. Specimens from this meteorite are extremely rare.

Another addition to the meteorite collection by purchase was an interesting series of fourteen specimens of the Brenham, Kansas, fall. These were individuals which had been found during 1929,

while the original fall had occurred previous to the year 1882. The long exposure to ground waters which the later-discovered individuals had undergone, produced peculiar alterations, a careful study of which, it is hoped, will make it possible to determine the nature of other similar objects of suspected meteoric origin.

A beautiful series, numbering eight specimens, of echinoids from Florida, was obtained by purchase. These echinoids are unusual because of their shape and complete preservation. Two specimens of fossil crinoids purchased are also notable for their perfection of form and preservation. Those obtained are from a locality in Bundenbach, Germany.

A valuable addition to the series of vertebrate fossils obtained by purchase was one of partial skeletons of several species of early Tertiary mammals from Utah. These included a skull and jaws, limb and foot bones of the primitive cursorial rhinoceros *Hyrachyus*, a similar series of remains of *Protoreodon*, the ancestor of *Oreodon*, and a partial skeleton of the so-called "short-faced pig," *Achaenodon*.

A beautifully executed model, six feet square, of Glacier Park, Montana, was added by purchase to the series of relief maps. This model has a horizontal scale of one inch to the mile and a vertical scale of one inch to a half-mile. Roads, trails, and various features of scenic interest in the area are fully and accurately represented on the model.

The most important accession from expeditions was that of 173 specimens of volcanic products collected by the Marshall Field Expedition to the Mount Taylor, New Mexico, region. Of these specimens about one hundred represent different forms of lavas. Two large masses, the surface of one of which covers about four square feet, represent in a striking way the stages of flow of viscid lava. Other forms include lava stalactites, volcanic bombs, scoria, lapilli, cellular basalts, and others. A series of thirty specimens shows interesting stages in the alteration of volcanic ash to bentonite. From the Cornelius Crane Pacific Expedition of the Department of Zoology there were received three specimens of volcanic rocks from the Fiji Islands, and from the Marshall Field North Arabian Expedition eleven specimens of desert sands and one specimen of loess.

ZOOLOGY.—Accessions of zoological specimens for the year reach the large and unprecedented total of 23,754, of which 14,468 are vertebrates. Moreover, this does not include some 12,000 fishes

received from the Cornelius Crane Pacific Expedition, which are temporarily in the custody of Stanford University. After being studied, at least half of these will be permanently accessioned. The large additions to the collections are due mainly to the success of various expeditions.

The accessions are distributed as follows: mammals, 2,662; birds, 7,055; reptiles and amphibians, 3,140; fishes, 1,611; insects, 9,286. The number obtained by Museum expeditions is 22,347; by gift, 1,024; by purchase, 271; and by exchange, 112.

Gifts of mammals were unusually few, altogether amounting to only fifteen specimens, including several local mammals obtained by members of the Staff. Lord Astor, of London, presented a British stoat and a wildcat, both welcome additions to the collections. A sea-elephant, received in the flesh from Hagenbeck Brothers, of Stellingen, Germany, yielded a skeleton of this animal, but the skin was not recoverable.

Among the mammals received from major expeditions were many rare and little-known species as well as a number which careful study will doubtless prove to be new to science. From the William V. Kelley-Roosevelts Expedition to Eastern Asia, the peculiar carnivore known as the giant panda is of first importance. The few specimens of this rare animal which have previously reached museums have been from native sources and are more or less incomplete. The specimen obtained by Messrs. Theodore and Kermit Roosevelt is perfectly prepared, accurately measured, and accompanied by a skull and a complete skeleton, the first ever to be preserved. The exact relationships of this animal are of much interest to technical zoologists, and the opportunity presented for study of an entire skeleton is indeed welcome. The acquisition of the giant panda, therefore, not only provides a rare and interesting specimen for public exhibition, but also furnishes material of high importance for scientific study.

As mentioned elsewhere, the Kelley-Roosevelts Expedition obtained an extensive and varied collection of mammals from southwestern China and northern Indo-China, altogether forming the largest and most important accession of Asiatic mammals ever received by the Museum. Among the small and medium-sized mammals are some of great rarity and a number not heretofore represented in any American institution. Of especial interest is a carnivore of the civet family which is the third known specimen of a genus (*Chrotogale*) only recently discovered. Another medium-

sized mammal obtained by the expedition is the rare and beautiful monkey known as the golden monkey (*Rhinopithecus*) or snub-nosed monkey. The larger mammals from this expedition are thirty to forty in number and fulfill, to a large extent, the remaining needs for the habitat groups of large Asiatic mammals which it is proposed to prepare for installation in William V. Kelley Hall. Most important are the Indian bison, the seladang or gaur ox, the banting, and the Indian water buffalo.

Mammals received from the Crane Pacific Expedition are mainly small and medium-sized, but are of great interest, representing many genera and species not heretofore possessed by the Museum. An especially fine series of bats was obtained, embracing two sub-orders, sixteen genera, and thirty-two species. A great many of these are large fruit-bats or "flying foxes," which are difficult to procure except by a privately organized expedition of this kind. A new species of rodent was discovered in the Galapagos Islands by the expedition, and has been described in the Museum's publications under the name *Nesoryzomys darwini* in honor of Charles Darwin who first discovered rodents in these islands. During the final work of the expedition in Borneo, an important collection of the mammals of that island was made, including five well-preserved orang-utans.

Accessions of mammals from the Harold White-John Coats Abyssinian Expedition of Field Museum are featured by material for two important habitat groups. One of these is a lion group for which five choice specimens were obtained, and the other is a very large water hole group, specimens for which include five reticulated giraffes, several Grevy's zebras, elands, gazelles, and a black rhinoceros. This expedition also collected certain other mammals, among them three aard-varks, the first well-prepared examples of this interesting animal ever received by the Museum.

Seven fine Pacific walrus and five Alaskan caribou were received from the Thorne-Graves Arctic Expedition of Field Museum. These were especially prepared for use in habitat groups, and reached the Museum in excellent condition. They form a notable part of the year's accessions of mammals.

Colonel J. C. Faunthorpe continued a limited amount of work in British India. Specimens of mammals received from him include a sloth bear, a spotted hyena, and a very fine adult male Indian lion, this last being a very scarce and desirable acquisition.

From the Third Asiatic Expedition of the American Museum of Natural History, in which Field Museum cooperated, 197 specimens of Asiatic rodents were received during the year.

Accessions of birds were very large, those entered on the records numbering 5,809, to which should be added 1,157 received too late for entry, making a total of 7,055. Most of these were obtained by expeditions, 5,194 being from the Kelley-Roosevelts Asiatic Expedition alone. Much time and study will be required to evaluate this superb collection, but preliminary examination indicates that it contains a considerable number of new and undescribed species, various little-known and rare species not heretofore brought to America, and a large, comprehensive representation of the avifauna of southeastern Asia, nearly all new to Field Museum.

Birds received from the Crane Pacific Expedition number 1,228 specimens, covering a wide variety of localities and including a very high percentage of unusual and desirable types to be seen only in a few of the largest museums in the world. Of especial interest are the flightless cormorant of the Galapagos Islands, the rare land birds of Cocos Island, certain petrels and other birds of the open sea, and various birds of exceptionally beautiful plumage—parrots, lorries, and pigeons from the South Sea Islands and hornbills, cockatoos, and birds of paradise from Borneo and New Guinea.

Birds were not an especial object of the Harold White-John Coats Abyssinian Expedition, and only a few specimens were taken, but among them was a very distinct new species of francolin, a pheasant-like game bird. A good series of the scarce Abyssinian blue goose was also secured by this expedition.

An important accession of birds was obtained in Arizona by Taxidermist Ashley Hine. This consisted of 323 specimens especially selected and prepared for mounting to fulfill needs in the Museum's systematic exhibit of North American birds.

By exchange and purchase a few scarce birds have been added to the collections, mainly from Neotropical America. Among them may be mentioned *Cossyphopsis reevei* from Ecuador, *Pyrrhura viridicata* from Colombia, and *Sapayoa aenigma*, *Manacus cirritus*, and *Tangara palmeri* from Panama.

A valuable gift was that of two paintings of American birds by the late Louis Agassiz Fuertes, presented by Colonel Albert A. Sprague. These are of large size (18" x 30") and are among the finest existing examples of Fuertes' work. The subjects are the American horned owl and the American goshawk.

The most important accessions of reptiles are those obtained by the Crane Pacific Expedition, numbering 2,006 specimens. Notable are well-preserved shells of the extinct tortoise of Charles Island, Galapagos; series of the reptile fauna of the Fiji Islands, Solomon Islands, and New Hebrides; an excellent series of the two species of crocodiles from New Guinea, including the recently discovered *Crocodylus novae-guineae*; and a representation of the faunas of New Guinea, Celebes, Borneo, and the Philippines, hitherto entirely wanting in the Museum's collections. Reptiles from the Kelley-Roosevelts Expedition consist of 228 specimens, mainly snakes, from northern Indo-China, and 300 specimens, including various amphibians, from western China in the provinces of Yunnan and Szechwan.

Two specimens of an extraordinary lizard (*Palmatogecko*) of the gecko group from the Kalahari Desert in southwestern Africa were received as a gift from Dr. W. J. Cameron of Chicago. This lizard is very pale, practically colorless, and has developed unusual, webbed feet such as might be expected in a swimming animal but which, in this case, appear to be adaptations for progression over loose sand. Ten snakes and frogs from British Guiana were presented by Dr. A. E. Emerson of the University of Chicago, and 295 specimens from Wisconsin by Mr. F. J. W. Schmidt of Stanley, Wisconsin.

The most important fish collection of the year is that made by the Crane Pacific Expedition. This will not be accessioned until it has been studied at Stanford University, but ultimately it will add some 6,000 specimens to the Museum. Preliminary examination by Dr. A. W. Herre of Stanford University, who made the collection, indicates that it contains twenty to thirty unknown species, the majority from New Guinea. Sixty-four plaster molds of fishes with detailed color notes for exhibition purposes accompany this collection.

Fresh-water fishes from western China were collected by Mr. Herbert Stevens of the Kelley-Roosevelts Expedition to the total of 438, a number which appears small but which really represents one of the largest collections of the kind ever made in this part of the world.

Six accessions of fishes were received as gifts during the year. Mr. Frederick H. Rawson of Chicago presented a mounted trunk-fish; Mr. Fred N. Peet of Chicago sent three Canadian brook trout; and Mr. E. L. Vacin of Chicago gave a very fine specimen of the northern muskalonge. The General Biological Supply House of

Chicago presented six specimens, including a very rare eel, of which only four or five had been seen previously by scientists. Dr. W. C. Kendall of Freeport, Maine, gave nineteen specimens of the eastern tomcod, a species not previously well represented in the Museum. Mr. Donald Bennorth of Elgin, Illinois, presented five interesting lampreys, a small trout, and a darter, all from Illinois.

The number of insects and their allies accessioned is 9,286, consisting of 520 donations and 8,766 specimens collected by Museum expeditions. Mr. E. B. Williamson of Bluffton, Indiana, showed his continued interest in the insect collection by presenting 106 named dragon flies from the Americas. Dr. A. E. Emerson, of the University of Chicago, presented 369 named termites representing fifty-one species and including sixteen paratypes of these interesting social insects. From the Crane Pacific Expedition were received 928 insects, scorpions, centipedes, millipedes, and spiders. A large collection of insects came from the Kelley-Roosevelts Expedition, reaching a total of 7,853 specimens, about two-thirds of which are butterflies and moths from western China. This collection, at present only roughly classified, forms a notable addition to the Museum's series of Asiatic insects and will doubtless serve to contribute many interesting additions to knowledge.

#### DEPARTMENTAL CATALOGUING, INVENTORYING AND LABELING

ANTHROPOLOGY.—Twenty-four of the fifty-four accessions in the Department of Anthropology during the year have been entered. Fourteen accessions from previous years were also entered.

The work of cataloguing has been continued as usual during the current year, the number of catalogue cards prepared totaling 10,742. The total number of catalogue cards entered since the opening of the first volume is 188,622. The 10,742 cards written during 1929 for accessions received during the year or in previous years are distributed according to subjects as follows: North American archaeology and ethnology, 2,232; Mexican, Central and South American archaeology and ethnology, 985; archaeology and ethnology of China, Indo-China, and Japan, 136; archaeology and ethnology of India, 16; ethnology of Persia, 2; ethnology of Polynesia, 16; ethnology of Melanesia, 18; ethnology of Malaysia, 1,565; archaeology and ethnology of Africa, 587; archaeology of Egypt, 101; archaeology of Mesopotamia, 7; prehistoric archaeology of Europe,



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5,077. Of these cards 7,463 have been entered in the inventory books, which now number fifty-three volumes.

About 3,000 labels were prepared by the Staff during the year, and 7,604 copies of them were supplied by the Division of Printing for use in exhibition cases. These labels are distributed according to subjects as follows: archaeology of Egypt, 1,226; archaeology of Hopewell Mounds, 543; ethnology of Plains Indians, 2,304; ethnology of California, 1,426; ethnology and archaeology of Mexico, 961; ethnology of South America, 399; archaeology of China, 99; ethnology of Japan, 216; ethnology of Malaysia, 354; ethnology of India, 26; archaeology of Kish, 45; Roman archaeology, 5. Sixty maps, 6,745 catalogue cards, and five miscellaneous impressions were also supplied by the Division of Printing.

The total number of photographs placed in the albums amounts to 3,501. Nine new albums were opened.

**BOTANY.**—Descriptive labels were written by Assistant Curator McNair during the year for additions to the exhibits of nuts, tubers, and starches in Hall 25. As mentioned elsewhere in this Report, he also prepared card catalogues of plants that contain large quantities of starch, sugar, gums, tannins, resins, drying oils, semi-drying oils, non-drying oils, fats, and waxes. These cards are of value in obtaining and arranging material for exhibits of varnish resins, edible oils, and paint oils. They have also been of use in writing scientific papers on the differential analysis of starches and the relation of various oils to specificity, environment, and origin of plants.

The additions to the records of the Herbarium during 1929 amounted to 19,979, the total of mounted specimens now being 600,336.

Labels were written for many thousands of herbarium specimens received during the year, particularly for the collections made in Brazil by Acting Curator Dahlgren and for those obtained in Peru by Mr. Williams. Several thousand labels were prepared, also, for the duplicate specimens distributed. Descriptive labels were written for several cases of the N. W. Harris Public School Extension of Field Museum.

About 1,900 index cards were received this year from the Institut Colonial de Marseille. They deal with the literature pertaining to tropical agriculture and give title of article, author's name, full

bibliographic reference, and classification. There are fifty-seven different subjects, such as cereals, edible legumes, and plants used for textiles, oils, perfumery, spices and condiments, gums and resins, medicine, and other purposes.

**GEOLOGY.**—The number of specimens catalogued during the year was 1,480, making the total number of catalogue entries 185,952. Of those entered during the year, the largest number in any single group was that of the Gebauer collection of fossil invertebrates and plants which totaled 393 specimens. Other large groups were 173 specimens of volcanic products, 105 specimens of petroleum products, and 73 additional specimens of invertebrate fossils. Altogether, 697 specimens of invertebrate fossils were catalogued, 259 of minerals, 250 of specimens illustrating physical geology, and 164 of economic specimens.

For greater convenience of reference, the records of the several collections of fossil vertebrates were copied from the older books and combined in a loose-leaf cover. To the card catalogue of vertebrate fossils fifty-seven cards were added. These cards give full descriptions of each specimen, including field number, name of collector, date of collection, locality, horizon, and reference to description of type specimen.

A total of 6,822 labels was received from the Division of Printing during the year, of which 3,659 related to paleontological exhibits and the remainder chiefly to the systematic mineralogical exhibit. Of these labels, 5,807 were installed in the cases. Illuminated labels were prepared for the Neanderthal Man exhibit in Ernest R. Graham Hall.

Copy for 4,388 labels was prepared and delivered to the Division of Printing. These included labels for the larger part of the meteorite collection and for the remainder of the systematic collection of minerals. Typewritten labels, 273 in number, were prepared and installed for temporary use with various exhibits, chiefly those of the silicas, petroleums, and gems.

Photographic prints, 369 in number, were mounted in the Department albums during the year. In addition, the series of 550 field negatives made by the Second Marshall Field Paleontological Expedition to Argentina and Bolivia was catalogued and labeled. The total number of prints now in the albums is 6,362.

ZOOLOGY.—Entries in the zoological catalogues were made for a total of 5,324 specimens. These were distributed, by divisions, as follows: mammals, 2,449; birds, 924; reptiles and amphibians, 1,951; skeletons, 10.

All specimens of mammals were numbered as catalogued, and new Museum labels were provided for 272 specimens. In addition, 950 labels for skins of large mammals were written and attached. About 250 skull bottles were labeled. Guide labels were typed and affixed to all the drawers of the new storage cases for mammals. An alphabetical index and guide to the mammal collection was prepared and bound in book form. Exhibition labels for all mammals in George M. Pullman Hall were prepared and printed and are awaiting installation. Transparent labels were prepared for five large habitat groups of mammals. All labels for the African groups in Carl E. Akeley Memorial Hall were revised, reprinted, and reinstalled. Distribution maps were prepared to accompany each of these labels.

In the reference collection of birds, rearrangement of a large amount of material in new steel cases necessitated labeling 842 separate trays and sixty cases and cans. The new exhibits of cranes, rails, and shore birds on two screens were supplied with seventy-four individual labels. In addition, eight wall labels were installed adjacent to cases of the systematic exhibit of North American birds. About 700 labels for the exhibit of foreign birds have been prepared and printed, and are to be installed when label-holders are available. These labels are printed in black on buff cards to replace the silver on black formerly used, and have been revised to bring all names down to date.

Cataloguing of reptiles and amphibians was kept abreast of accessions, and at the close of the year there was no uncatalogued material on hand. Thirty-seven labels were prepared and installed for exhibits of reptiles and amphibians.

In the Department photograph albums 555 prints were mounted and, so far as practicable, each was labeled as to subject.

The state of the catalogues at the end of the year is as follows:

	Number of record books	Total of entries to Dec. 31, 1929	Entries during 1929	Total of cards written
Department of Anthropology.....	53	188,622	7,463	193,175
Department of Botany.....	63	600,436	18,299	15,813
Department of Geology.....	26	185,952	1,480	6,930
Department of Zoology.....	41	145,919	5,324	40,821
Library.....	16	186,309	8,137	386,624

## INSTALLATIONS AND REARRANGEMENTS

ANTHROPOLOGY.—The principal efforts during the current year were concentrated on installing Egyptian material in a new type of illuminated case, and on installing the new buff-colored screens and labels in Hall 5.

A total of sixty-nine exhibition cases, including one life-size group, were installed during the year, located as follows:

Egypt (Hall J) .....	29
Frank W. Gunsaulus Hall (Hall C) .....	2
Arthur B. Jones Collection (Hall G) .....	1
Stanley Field Hall .....	4
Plains Indians (Hall 5) .....	28
North American Archaeology (Hall 4) .....	2
California Indians (Hall 6) .....	2
China (Hall 24) .....	1
Total .....	69

For the hall devoted to the archaeology of Egypt thirty-seven floor cases in walnut finish, seven feet high, were especially built. There are two types—a narrow case, twenty-one inches wide and five feet, eight and one-half inches long, and a larger one, thirty-two inches wide and seven feet long—both placed against the pilasters. These cases are illuminated by light boxes on top which insure an even diffusion of light over the exhibits. The ceiling lights have been cut off, the underlying principle being that the exhibits, not the hall, should be lighted.

After many experiments and trial installations extending over a period of two months a formula was found by which the greatest possible efficiency in displaying material in these new illuminated cases was achieved. This method of installation has met with universal approval, and has elicited many favorable comments both from experts and the general public. An example is shown in Plate IV. The material thus far installed comprises pottery (six cases), faïence and glass, ushebtis (two cases), alabaster vessels (four cases), canopic jars, stone vases (three cases), stone sculpture (three cases), bronze figures (two cases), mortuary wooden boxes, wooden models, wooden figures, and architectural models. It is hoped that the installation of the Egyptian Hall will be completed in the early part of the coming year. The installation of animal mummies in two cases is at present in actual progress.

The old case sheltering the mortuary boat of King Sesostris III has been renovated with a walnut finish, and by installation of a lighting system in conformity with the other cases in the hall.



IRON METEORITE FROM GLADSTONE, QUEENSLAND, AUSTRALIA  
(Hall 34)

Weight 1,240 pounds. About one-fifth actual size

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An old-type case containing limestone sarcophagus lids of the Ptolemaic period (fourth to first century B.C.) has been renovated in the same manner.

An illuminated wall case, twenty-six feet long, containing Egyptian papyri, was installed on the southeast wall of the hall, beneath the carved balcony fronts from Cairo. A new continuous built-in case, 108 feet long and two and one-half feet deep, divided into eight sections, has been erected along the central part of the south wall, and will be installed with Coptic garments and fabrics in the near future. Like the other built-in wall cases in the hall it is equipped with an upper compartment, twelve inches deep and thirty-two inches high.

The Japanese collections formerly in the southeast room of the second floor were transferred to Hall C on the ground floor, a portion of the west end of the hall being screened off for this purpose. The name, Frank W. Gunsaulus Hall, used in the old location, is now applied to the new one. The arrangement is practically the same as in the old quarters, save that the model of a pagoda occupies the center of the new room. Two of the six-foot cases were completely reinstalled, one of these, Case 7, with a light-colored screen, upon which has been added material not previously on exhibition. The lacquered saddle presented by Colonel A. A. Sprague was added to Case 4. This case also contains a complete suit of armor made in A.D. 1351 which was presented by Miss Adele Barrett of Chicago in 1924. All labels in this hall, with the exception of the two cases containing sword fittings, were thoroughly revised and reprinted in the newly adopted style, and improvements were made in all cases.

A life-size cast of a Dyak hunter of Borneo (Plate XIII) was added to the Arthur B. Jones Collection in Hall G. In the left hand is a shield used in warding off poison darts or parrying spears or knives. Suspended from the loin cloth is a long fighting knife. In the right hand is a blowgun, the principal weapon both for hunting and fighting. The darts used for the blowgun are carried in a quiver at the hunter's belt. Photographs and data for this figure were obtained by Dr. F. C. Cole in connection with the Arthur B. Jones Expedition to Malaysia in 1922-23. The casting and modeling of the figure was done by Modeler John G. Prasuhn. Six cases in Hall G were provided with labels, which makes the labeling of this hall complete.

In Stanley Field Hall three exhibits were withdrawn and the cases thus vacated were installed with new material. Case 4 now

contains a selection of embroidered articles, chiefly women's dresses, mostly of silk, from western India, presented by Messrs. Cyrus H. McCormick, Martin A. Ryerson, and Homer E. Sargent and collected by Dr. G. A. Dorsey in India in 1915. The exhibit illustrates well the picturesque styles of feminine apparel in vogue in India. A few selected objects from China were temporarily displayed in Case 12. These are a scepter of good luck carved from sandalwood with symbols of longevity in openwork, presented by the firm of Grow and Cuttle of Chicago, and a pair of old cabinet doors of black lacquer painted with scenes in gold lacquer. In the lower compartment of this case is shown a section of a paper roll, twenty-five feet long, painted in ink with a very fine brush. The picture represents one hundred ladies at a garden party, enjoying music, picking flowers, and even playing football. It is a work of the fifteenth century.

Reinstallations were made in Case 7 of Stanley Field Hall in order to make room for the inscribed fossil turtle presented in 1928 by Mrs. Chauncey B. Borland of Chicago (Annual Report for 1928, page 450) and the two polo figures presented by Mr. Earle H. Reynolds this year (see page 97). The old style black labels with aluminum print in this case were replaced by new buff labels with black type.

A temporary exhibition of material from the graves of Kish was placed in Case 11 of Stanley Field Hall in November. These objects belong to the earliest Sumerian period (about 3500 B.C.). The outstanding exhibit is a copper rushlight with a base in the shape of a frog whose eyes are of inlaid limestone. The frog serves as a support for a rod surmounted by five petals which contained the rushes used as a primitive means of illumination. The exhibit includes also fine bowls of alabaster and other stones; copper implements and vessels; shells used as lamps; necklaces of carnelian and quartz, and shell beads. The artistic quality and excellent workmanship of these objects testify to the high degree of cultural achievement attained by the early inhabitants of Kish.

The unique collection of archaeological material from the Hopewell Mounds of Ohio has been reinstalled in two standard cases on buff-colored screens, and is well illustrated by photographs, drawings, and maps. Despite the fact that one of these cases contains 475 and the other 371 objects, the installation is perfectly clear and easily comprehensible, the material being grouped in vertical panels. It conveys a vivid impression of the highly developed culture of the ancient mound-builders and their keen artistic sense, which

reveals itself particularly in their ornaments cut out of sheets of copper and mica, as well as in their admirable sculptures of birds and effigy pipes.

Much work was performed during the year in Hall 5 devoted to the ethnology of the Plains Indians. A total of twenty-eight exhibition cases in this hall have been reinstalled with buff-colored screens and numerous improvements in arrangement (see Plate IX). Labels were carefully revised and re-edited, and then reprinted in the newly adopted style.

Installation progressed in Hall 6, where one case of Californian feather baskets and another of Pomo baskets were placed on exhibition. Old labels were replaced with new ones in eight cases of this hall, and photographs were placed in seven cases. Twenty-five photographs were added to exhibits in five cases of Hall 9, and four cases in Halls 8 and 9 were provided with new labels. Rearrangements were made in three cases of the Gem Room (H. N. Higginbotham Hall).

The ceremonial silk robe presented last year by Messrs. Martin C. Schwab and Henry M. Wolf (Annual Report for 1928, page 451) has been added to the Chinese exhibits at the north end of Hall 24.

For use in the cases of Egyptian archaeology 198 bases and blocks, 337 walnut stands, and forty-six walnut label frames were made.

In the Modeling Section of the Department the life-size figure of a Dyak hunter of Borneo previously mentioned was modeled and cast by Modeler Prasuhn. A visit to the city by a Bushman from South Africa gave Mr. Prasuhn opportunity to make a complete plaster cast of his body, which will be utilized in the future in preparing a life-size Bushman group. The modeler also completed a miniature council house for a village group from Sumatra, and modeled and cast eight human figures for it. He treated 265 Egyptian bronzes by means of the electro-chemical process, retouched eleven casts of Maya monuments in Hall 8, made some repairs on the Maori council house from New Zealand in Hall F, and made a positive from a Chinese coin-mold.

Five hundred and eighty-four objects were treated, repaired or restored. These comprise 152 antiquities from Egypt, 141 from Mesopotamia, 13 from China, 5 from Japan, 15 from North America, 40 from Central and South America, 122 from Europe, 4 ethnological objects, and 92 skulls and bones from Kish.

Identification numbers marked on Museum objects during the year total 15,998.

Material in fifty-three exhibition cases was poisoned during the year. Material stored in the poison room was taken care of in the usual manner and is in good condition.

A new storage room with a floor space of 1,331 square feet has been set aside at the west end of Hall D on the ground floor for American archaeological material. It has been completely equipped with steel shelving. There are 124 bays of eight shelves each, making a total of 992 shelves. Each shelf is three feet long and one and one-half feet deep, making a total of 4,464 square feet of actual shelvage space, which is more than 1,000 square feet in excess of the space in the old storage room.

Dr. Paul S. Martin, who assumed his duties as Assistant Curator of North American Archaeology on October 1, commenced his work by cataloguing two large collections and formulating plans for moving the archaeological material into the new storage room and arranging it in proper order. The new shelvage space has been divided in such a manner that three-fourths of it is devoted to North American archaeology, and the remainder to Central and South American archaeology. About ten thousand objects were moved with the aid of two men in a fortnight. Each object was cleaned and checked with the inventory before its removal into the new quarters. The Hopi pottery was first cared for because it is the largest collection in number from any given area. All uncatalogued material was carefully segregated so that it can be easily located when the time for cataloguing comes.

Twenty-eight cabinets with steel doors, holding 417 wooden trays, were installed in Room 40 for the purpose of storing the material of prehistoric archaeology. The collections obtained by the Marshall Field Archaeological Expeditions to Europe and the Arabian Desert have been unpacked and carefully arranged in the trays in this room. The majority of specimens has been catalogued and numbered.

A new room, designated 36A, was added to the quarters of the Department on the third floor by building a partition wall in the southeast corner and thus screening off a portion of the south corridor. This room will be utilized for the storage of the archaeological material from Kish for which no adequate space was hitherto available. For lack of space a great part of the consignment received

from Kish this year had to be kept in the boxes in which it arrived, but will be unpacked, cleaned, and sorted as soon as racks are built in the new room.

**BOTANY.**—Owing to the work on material for the Carboniferous forest group for Ernest R. Graham Hall which during the past year occupied most of the time of the Stanley Field Plant Reproduction Laboratories, few new installations were made in the Hall of Plant Life. The many inquiries reaching the Museum about ragweeds, so abundant in this vicinity and important as a source of hay fever infection, led the Director to request that the most common species be represented in the botanical exhibits. Reproductions (see Plate XI), were therefore made of the great ragweed (*Ambrosia trifida*) and the smaller ragweed known as hogweed (*Ambrosia elatior*), which were completed late in the year and installed in Hall 29.

The splendid dried specimen of a sagebrush collected last year in Idaho by Assistant Curator Macbride, and presented by him, was installed in the same hall where it will, for a long time to come, serve as a sample of the most conspicuous element of the vegetation of large stretches of country in the semi-arid regions of the northwest.

Models of poppy and cleome flowers, in storage for some years awaiting related material with which to install them, were remounted and also placed on exhibition in the Hall of Plant Life, as was a model of a large, melonlike pod of an undetermined tropical vine of the milkweed family, the original of which was sent by Professor Record.

The most important recent change in the exhibits of the Department of Botany is the rearrangement of the wood halls which was begun early in the year. The Hall of American Woods has long been in an unsatisfactory condition. Some years ago Professor Record drew up a new plan for the exhibits eliminating a large mass of relatively unimportant material to make room for all of the most important North American timber trees. He also prepared new labels to take the place of the former ones. On the basis of this plan a complete reinstallation is now being effected. The lacking material is being supplied generously by individuals and concerns interested in various phases of the American lumber industries. Among those who have actively aided Professor Record in securing such new material, mention must be made of Professor Emanuel

Fritz of the University of California. Specific gifts are mentioned under the section of this Report devoted to ACCESSIONS.

New and more representative specimens of lumber have thus been secured to take the place of defective boards formerly included. Many of the former exhibits have been retired from exhibition and the former black background in the wood cases is being replaced by the light buff color adopted for all of the exhibits. It is hoped to replace the pictures of foliage with reproductions of branches so that finally the wood cases will present the appearance of the hickory case illustrated in last year's Report (Plate XLVI, Vol. VII).

The exhibit of various valuable and unusual tropical woods installed last year in Stanley Field Hall was removed to make place for an exhibit of American mahoganies. Three species are on display: Cuban mahogany (*Swietenia Mahagoni*), Mexican mahogany (*Swietenia humilis*) of the Pacific coast of Mexico and Central America, and Peruvian mahogany (*Swietenia Tessmanii*). The Cuban and Mexican mahogany boards are beautifully figured. The Peruvian mahogany is not figured, but is nevertheless of excellent quality and similar to the Honduras species. All were donated for the Museum's wood exhibits by Ichabod T. Williams and Sons of New York. With the boards are shown branches of West Indian and of Honduras mahogany (Plate XV) obtained in the American tropics by the Acting Curator and reproduced in the Stanley Field Plant Reproduction Laboratories of the Department of Botany.

An eight-foot length of the trunk of a Guatemalan cow-tree, sent to the Museum by the United Fruit Company at the request of Professor Record, was installed as an exhibit in a special case in Hall 27, together with a jar of the latex or "milk," a sample of the wood, and photographs showing the tree in its natural habitat. The cow-tree was discovered only a few years ago, and it is confined to a small region near the coast of Guatemala. The "milk" looks exactly like cow's milk. Being of agreeable flavor, it is sometimes drunk by natives as a beverage.

Installation of the economic botanical exhibits in Hall 25 has been continued by Assistant Curator McNair. Attention was given especially to plant products used as food by man—nuts, starchy tubers, starches of economic importance, spices and condiments.

The method of installation followed has been described in the Annual Reports of 1926 and 1927 (pages 87–88 and 272 respectively).

The exhibit of starchy tubers and starches of economic importance has been limited to thirteen representative specimens. There are seven principal commercial starches: rice, wheat, corn, sago, arrowroot, cassava, and potato. Of these corn, wheat, and rice starch are shown in their respective places in the exhibit of grains and therefore are not included with the other starches derived from very different sources. These sources represented with samples of their starches are: potato (*Solanum tuberosum*), sweet potato (*Ipomoea Batatas*), East Indian arrowroot (*Curcuma angustifolia*), roots of the North American cycad, coontie (*Zamia floridana*), roots of taro (*Colocasia antiquorum*), breadfruit (*Artocarpus incisa*), Tahiti arrowroot (*Tacca pinnatifida*), yam (*Dioscorea alata*), West Indian arrowroot (*Maranta arundinacea*), Queensland arrowroot (*Canna edulis*), banana and plantain (*Musa paradisiaca* and *M. sapientium*), sago (*Metroxylon Rumphii*), and cassava (*Manihot utilissima*).

The importance of cassava starch in Brazil, the Guianas, and other South American countries is fully equal to that of the cereal grains, and as an especially interesting source of starch it has been shown in greater detail than the other starches derived from roots or tubers. The cassava exhibit includes the implements usually employed in its preparation—the curious cassava squeezer of the South American Indians, made from strips of the reed-like stems of a marantaceous plant (*Ischnosiphon*), and a strainer of the same material. Also shown are a lump of the starch as it comes from the squeezer, another as subsequently smoked for preservation, the various grades of the starch prepared in various ways, and the curious commercial package in which it is marketed in quantities—an adaptation of the South American Indian storage basket lined with green leaves—of about seventy-five pounds weight. Tapioca, the only form in which this article of food is known in the United States, cassava cakes, and “biscoitos” complete the exhibit. Much of this material was obtained by the Marshall Field Botanical Expedition to the Amazon.

In the starch exhibit it has been found desirable to represent some of the large roots and tubers by casts or models of the originals, since some of these, unfortunately, shrink as much as 75 per cent, besides discoloring on drying. Casts of various starchy roots and tubers, difficult to preserve dry, e.g. cassava, potatoes, yams, and several kinds of taro or dasheen, and also a model of a breadfruit

were therefore produced in the Stanley Field Plant Reproduction Laboratories for the starch exhibits.

In the exhibit of edible nuts it has been possible to divide those of Old World origin from those of the New World, affording an interesting comparison, each lot occupying one-half of an exhibition case in Hall 25. One entire case was also employed for the exhibit of spices and condiments, including ginger, turmeric, cardamom, vanilla, nutmeg, mace, cinnamon, cassia, bay leaves, poppy seed, black and white pepper, long pepper, black and white mustard, horse-radish, savory, peppermint, thyme, sage, marjoram, chile pepper, paprika, coriander, caraway, anise, cumin, cloves, allspice, tonka beans, and garlic.

There remain in Hall 25 a few empty cases, one of which is reserved for an exhibit of the principal comestible vegetables; another for beverages, such as matte, cassine tea, guarana, and cacao; still another for fermented beverages, while the last case in the hall will be devoted to an exhibit showing which of the principal food plants are of American origin.

In Hall 28 an exhibit of the distillation products from hard woods was revised, brought up to date and reinstalled. This consists of cord lengths of the principal woods used for distillation, viz., birch, beech, maple, and white ash, charcoal and twenty-seven products of distillation. These products are arranged in the order of a flow sheet in three series: above, the gaseous product, in the middle an ascending row of the volatile liquids showing the means of separating wood alcohol from acetic acid, and in the lower portion of the case a descending row of tubes containing the tarry, non-alcoholic liquids. The exhibit gives a clear conception of the substances obtained in the destructive distillation of hardwood, and the means of separation and purification. It is the first reinstallation accomplished in Hall 28, which will be devoted to industrial raw materials of vegetable origin and their products.

The Herbarium has increased rapidly in size and scientific value during the past year, and now contains more than 600,000 mounted sheets of plants. There are also on hand about 100,000 unmounted specimens, chiefly from the Old World, which are awaiting the necessary preparation before incorporation into the Herbarium.

There were prepared for insertion in the Herbarium, by gluing and strapping, 17,000 specimens, an increase of approximately 50 per cent over the preceding year. The employment of an assistant

to the regular plant mounter for three and one-half months made possible the mounting of an important accumulation of material from Mexico and Central and South America.

The Custodian of the Herbarium was on leave of absence during half the year, but during his absence the position was temporarily filled. All currently mounted specimens have been distributed promptly into the Herbarium. In addition, as a result of space made available by the installation of three new steel unit cases, it has been possible to distribute and thus make available for study and reference purposes the valuable Jeanpert fern herbarium, purchased a few years ago, and a large accumulation of Old World specimens, which, although mounted, had been stored temporarily, and were not accessible for consultation.

The curatorial staff has determined several thousand mounted specimens, thus making it possible to distribute them in the Herbarium, and adding numerous species not previously represented in the collections. The determinations of many sheets already distributed have been corrected. All mounted plant specimens in the Museum have now been placed in the Herbarium, where they are available for consultation, the only exception being the Peruvian collections, which are kept apart for study by Assistant Curator Macbride until completion of the flora of Peru, upon which he is engaged.

More than 30,000 mounted sheets were added to the Herbarium during the year, with a consequent substantial increase in its permanent scientific value. More than 20,000 of these specimens were from Mexico and Central and South America, the regions from which material is most desired by the larger American herbaria. The South American collections of the Herbarium of Field Museum have increased with remarkable rapidity during the past few years, and are now surpassed by those of few other institutions of the United States.

**GEOLOGY.**—In Stanley Field Hall a case was installed exhibiting fifty specimens of the volcanic products collected by the Marshall Field Expedition to New Mexico. These specimens illustrate different varieties of lava surfaces, volcanic bombs, lapilli, cinders, and other characteristic products of the region. Colored photographs and outline maps included in the exhibit serve to illustrate the subject further. This exhibit replaced that of the Baffin Land fossils collected by the Rawson-MacMillan Subarctic Expedition which

had previously occupied the case, and which was moved to be installed with the systematic series.

The large aquamarine and other gems presented by Mr. Richard T. Crane, Jr., were installed in Higinbotham Hall. The specimens of black opal and synthetic minerals obtained by purchase were also installed in this hall.

In Hall 34 reinstallation and change of backgrounds has been carried on as opportunity permitted during the year, and has been completed for all but eight cases. The cases reinstalled during the year include sixteen slope top cases and two upright cases of systematic minerals, two cases of ornamental minerals and four cases of meteorites. The contents of all these cases were removed, the interiors relined where necessary, all were repainted, and the specimens were reinstalled. For the cases containing the Chalmers crystal collection, a cloth lining was adopted as comporting better with the nature of the contents. A pyramid, similar to those used in some of the other upright cases, was made for the case of micas, the visibility and attractiveness of the contents being much improved thereby. So far as labels printed on buff cards were available, these were installed during the reinstallation of the specimens. A total of 2,148 specimens was thus relabeled. A number of minerals received during the year or earlier were also added to the exhibited series during reinstallation. These included forty-five specimens added to the Chalmers crystal collection, a series of Brenham meteorites, and several meteorite sections.

In Clarence Buckingham Hall the specimens were removed from eight cases not previously reinstalled, and the case interiors relined and painted. Of these cases, six were reinstalled, some rearrangement and change of specimens being carried on at the same time. Two of the reinstalled cases are devoted to volcanic products, one to dendrites, and three to specimens illustrating physical features such as rock jointing, faulting, texture, and markings. Two cases were changed in position to allow a better grouping of their contents to be made. The installation of the two remaining cases will complete the case reinstallation of the hall. In the section of the hall devoted to relief maps the model of Glacier Park acquired during the year was installed, space for this installation being obtained by changing the position of some of the other models.

In Hall 36 the work of changing backgrounds and reinstallation has been completed. Advantage was taken of the opportunity to make extensive changes in some of the exhibits, although most of

them were reinstalled with only minor alterations. Altogether, twenty-four cases were vacated during the year in this hall, the interiors of the cases were relined and painted, and the contents reinstalled. The reinstalled cases included seven cases of petroleum from various oil fields, three cases of petroleum-bearing rocks and sands, three cases of manufactured products of petroleum, one case illustrating refining of petroleum, two cases of oil shales, one case of coal-tar products, five cases of coals and mineral fuels, and two cases of clays and fuller's earths.

The silica collection, which was new last year, has been revised and enlarged so that it now occupies three cases. Because silica is the most abundant mineral of the earth's crust, occurs in a great variety of forms which bear little superficial resemblance to one another, and has many and important uses, it deserves more space than has hitherto been assigned to it. Accordingly, a collection occupying three cases is now shown in the place of the single one previously exhibited. One of these cases is devoted to a synoptic collection of the numerous varieties. This includes such apparently unlike minerals as rock crystal, chalcedony, onyx, opal, tripoli, and common sand. This is followed by specimens showing how silica occurs in both free and combined states in the rocks. In the same case is shown a small collection of gem and ornamental silicas. Following this is a collection illustrating recent, curious, and obsolete uses, among which are a glass-like flask blown from pure silica, smoky quartz partially fabricated by the Chinese into "smoked" spectacles, gun flints and aboriginal flint weapons.

A second case illustrates the commoner uses of moderately pure forms of silica. For example, silicate of soda, the silica from which it is made, and the board for cartons in the manufacture of which so much silica is used, are shown. This is followed by a series showing the composition of glass. Following this is a collection of glass sands from many parts of the world. This is followed by a group of varieties of ground silica, with some indications of its extensive uses as filler, in paint and in other ways. After this is a collection of abrasive silicas, including sandpaper, silica for scouring soaps and polishing powders.

The third case includes collections of the more impure silicas, principally in the form of sands which are used for common purposes. The largest group shown is that of molding sands. This group is accompanied by a miniature mold for cast iron. Core sands are accompanied likewise by a specimen of a core as used in foundries.

Fire sands, sands for sand-lime brick, building sands and others complete the collection. It is realized that anything like a complete collection along these lines would occupy far more space than could possibly be provided, but the collection in its present form should give a good general idea of the usefulness of this commonest of all materials.

The exhibit of clays and clay-like minerals has also been reorganized. Since it was thought that the former synoptic clay collection presented too technical an aspect, it has been simplified and condensed to occupy one case instead of the four it formerly filled.

The cement collection has also been completely reorganized on new lines. It now presents in one case in a synoptic way examples of each class of structural mineral cementing material which is now or has been in the past used in an important way. These substances range all the way from the clay mortars of primitive peoples to the recently devised alumina cements. Another case presents in more detail a collection of natural cement rock and the materials of which portland cement is made. The stages of manufacture and the composition of concrete made from portland cement are also shown. In this case the series begins with specimens of clay suitable for making mud plasters, cements and bricks as used by primitive peoples. This is accompanied by photographs illustrating the manufacture of sun-dried brick or adobe and of a house with mud walls. This is followed by an example of fire clay of a grade suitable for mortar to bind fire brick in furnaces where ordinary cements fail. Then comes an example of the asphalt extensively used in ancient times and still employed in large quantities as the cementing material for road and roof construction. This is followed by limestone and lime made from it. A specimen of hydraulic limestone illustrates the source of hydraulic lime, a material intermediate in properties between lime and cement. A specimen of gypsum calls attention to the large class of gypsum cements, including plaster of Paris and wall plasters. These are illustrated in more detail elsewhere.

The class of puzzolan or Roman cements, formerly of great importance, is represented by specimens of two kinds of volcanic ash from which such cements are made. This is followed by a single specimen of natural cement rock representing the formerly important class of natural cements. This is more adequately illustrated in the following case. Also the portland cements, treated in greater detail elsewhere, are represented in this synopsis by single specimens of limestone and clay. The magnesia cements, which are now becom-

ing more important than formerly, are represented by a specimen of calcined magnesite, their principal component. A specimen of bauxite calls attention to the new class of alumina cements, in which alumina, usually in the form of bauxite, replaces the clay of portland cement.

Additions have been made to the bentonite collections and the two cases containing bentonite, fuller's earth, and talc have been completely revised.

Two cases containing a model of a peat bog and the sulphur and magnesia collections were moved from the bridge connecting Halls 36 and 37 to Hall 36. Three other cases, temporarily empty, which were on the bridges connecting these halls, were also moved to Hall 36. In several of the cases containing coals and petroleums, maps showing the location of the deposits represented have been prepared and installed.

The mineral fuel exhibits are so extensive that the general relations of these fuels are obscured by the mass of detail. Consequently, a small synoptic exhibit showing the origins and relations of the mineral fuels has been prepared and placed adjacent to these collections. This synoptic collection consists of single specimens each of peat, lignite, coal, petroleum, natural gas, asphalt, oil shale, and shale oil. The labels explain the origin of each fuel and its relation to the others.

Seventy additional specimens not hitherto exhibited on account of space limitations have been added to the petroleum collections. Room for these was secured by the removal of an obsolete collection of lubricating oils. An interesting addition to these collections is a specimen of petroleum from the deepest producing well in the world. This specimen is also of interest on account of its composition, which is nearly three-quarters gasoline and almost one-quarter kerosene.

The large central case of refined oils has been reinstalled with new material replacing the older specimens as the latter were showing deterioration from age. The large specimens illustrating the refining of petroleum have also been renewed.

The oil-well model (Plate XII), partially completed last year, has been finished and is now installed as a part of the petroleum collection in Hall 36. It occupies about one-third of the length of a standard twelve-foot case, the rest of which contains specimens of petroleum. It extends vertically the whole height of the case. The

lower part of the model, resting on the floor of the case, shows an oil-bearing sand with its layers of salt water, petroleum and natural gas. This is shown resting on a bed of limestone below and with an impervious cover of shale above. Above the shale, a sufficient number of layers of rock are shown to illustrate the relation of the oil sands to the general geology of the region. The oil sand and the other rock beds are shown compressed into the fold which provides the inverted trough structure necessary for the accumulation of petroleum in commercial quantities. These rock beds are modeled accurately to scale according to data provided from a study by the Illinois State Geological Survey of the chips of rock obtained during the drilling of a well in the region represented, which is Lawrenceville, Illinois. The fold of the rock is modeled so as to be consistent with studies of the same fold at another locality where it is better exposed for study. The face of the model represents a face of rock as it would appear in section at the plane of the well. The texture, structure, and color have been reproduced in miniature in portland cement in as truthful a manner as possible. The scale of the model is five feet to the inch.

Above the model of the bottom of the well, a space of four inches is left vacant. This serves to indicate an amount of rock passed through by the well on its way to the oil which would require an additional thirty feet in the height of the model if it were represented. As this rock is not related to the oil sands in any way it has been omitted in order to reduce the model to practical dimensions. Above this four-inch gap the model represents about fifty feet of soil and gravel passed through in drilling from the surface downward. The surface is represented as being of a grassy, somewhat rolling topography. It blends into a painted background. On the surface are shown models of a derrick, tank, pumps, and other machinery. These include a representation of a well being drilled, with its derrick, drills, boiler, and engine. The well is shown as having reached about three-quarters of the way to the oil.

The model is fully explained by two framed labels extending down one side of it. The upper label describes the surface features and contains a photograph on which the details are numbered to correspond with the description in the accompanying text. On the label of the lower portion of the model, numbers are given corresponding to numbers on the frame of the model. The model has been carefully designed to illustrate simply and graphically the geological features upon which the underground accumulation of petroleum depends,

as well as the machinery used in Illinois for exploiting it. The success of the model in these respects may be inferred from the fact that photographs illustrating it have already been incorporated in a chemistry textbook and in an encyclopedia.

In Frederick J. V. Skiff Hall all the specimens were removed from four wall cases and the cases were newly lined and painted. Three of these cases are devoted respectively to synoptic gold, silver and lead ores, gold, silver and lead ores of the northwestern United States and the Appalachian region, and salts of potash. The contents of these cases were reinstalled with only minor changes. In the remaining case, which is devoted to gypsum, the exhibit was revised in order to permit introduction of a collection of large, well-formed, selenite crystals collected by the Marshall Field Brazilian Expedition. These were mounted on individual stands. These crystals range from two to three feet in length and are beautifully transparent. A few additions were made to other cases in this hall, the more important of which resulted in enlargement of the nitrate and salt collections, and introduction into the mica collection of a vermiculite and its roasted product, zonite. This latter is an elastic, porous material recently devised for insulating purposes. Most of the cases in this hall are of a different type from those in the other halls of the Department, so that the work of changing backgrounds in them must proceed along somewhat different lines. Partly for this reason, work on the cases of this hall, except for the four mentioned, has been deferred until reinstallation of cases of the other type has been completed.

The extensive changes and rearrangements which were inaugurated last year in Ernest R. Graham Hall have been continued, and realization of the plans for the general arrangement of the hall is rapidly being approached. Early in the year the construction of six built-in cases, three of which are placed at each end of the hall, was completed. These cases are designed for groups now in process of preparation. The cases comprise two large ones, twenty-five by fifteen feet in area, and four smaller ones, approximately sixteen by ten feet in area. The large cases have a vertical clearance of eighteen feet, the smaller, of ten feet.

In one of the smaller cases at the end of the series the group of Neanderthal Man, which had been in preparation by Mr. Frederick Blaschke for more than a year past, was installed (Plate III). Mr. Ernest R. Graham furnished the funds for its construction. This group contains five human figures representing a family of

this race of early man. The individuals included are a man about fifty-five years of age, a young woman holding a child, an older woman, and a boy of about ten years of age. The interior of the case is carefully modeled after a shelter once occupied by people of this race at Le Moustier, France. The scenery about the cave is represented by a painted background showing the valley of the Vezère River as seen from the vicinity. The scene is based on sketches made at the locality, with such modifications as the climate of the glacial period during which this race existed might have produced. The flow of water from melting glaciers is represented as having raised the river above its present-day height. Beyond the river patches of snow on the hills and scrubby vegetation indicate a subarctic climate. The surface of the hills is broken by escarpments which are changed little in outline from those of the present day. A small herd of reindeer is represented as feeding in the vicinity.

The man of the family is shown just returned from a successful hunt. A reindeer which he has slain with a stone ax is lying at his feet. Emerging from an inner portion of the cave is seen the woman with the baby in her arms. A small fire of sticks occupies a central place in the shelter. Beside it the older woman is cleaning meat and fat from a reindeer skin with a stone scraper, and near her the boy is gnawing on a bone. Flint chips from the Le Moustier locality, which were undoubtedly made by the occupants of the actual cave thousands of years ago, are strewn about on the floor.

Both the figures and the shelter or cave were carefully modeled in Europe by Mr. Blaschke, who accompanied the Marshall Field Archaeological Expedition to Western Europe in 1927 for this purpose. The cooperation of several of the ablest students of early man was enlisted in carrying on the work of modeling. These included Professor Sir Arthur Keith, President of the Royal College of Surgeons, London, Professor G. Elliot Smith of University College, London, and Abbé Henri Breuil, of Paris. The modeling was carried on, as far as possible, over original skulls and skeletons of individuals of the Neanderthal race which are preserved in European museums, or over casts of these remains. The head of the male figure was modeled over a cast of the La Chapelle-aux-Saints skull, and that of the child from the calvarium of the Neanderthal (Mousterian) child from Devil's Tower, Gibraltar.

The fidelity to nature, both of the human figures and their surroundings, has been generally recognized as of the highest order.



PAINTED CLAY FIGURE OF A WOMAN PLAYING IN A POLO MATCH

Stanley Field Hall, Case 7

China, Eighth Century A.D. Presented by Earle H. Reynolds

About one-half actual size

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The group from the first has attracted wide attention and proved of great public interest. It is the first restoration of human figures of this race ever attempted, and its execution has won high praise. Photographs and descriptions of the group have appeared in newspapers and periodicals in nearly every country in the world, and its popularity and interest have been widespread.

Work on the Carboniferous forest group which is to occupy the large case at the south end of Graham Hall was carried forward during the year in the Stanley Field Plant Reproduction Laboratories of the Department of Botany. As expected, it has proved a large undertaking, but a gratifying amount of progress has been made. All the trunks of *Sigillaria*, seven in number, required for the group have been completed. Notable among them are two handsome restorations and a simpler stem, five feet or more in diameter at the base, which serve to give an idea of the great size attained by the dominant vegetation of the period. These *Sigillaria* trunks, together with the *Lepidodendron* stems completed last year, have been placed in the case provided for the group. Seven of the *Calamite* stems have also been placed in position in the group. Because of peculiarities of their construction, the latter had to be assembled in the places they are to occupy, being built up *in situ* from sections previously prepared.

One especially interesting feature recently completed for the group is an overturned stump of *Sigillaria* showing the dichotomous branching of the underground stems or *Stigmaria* with their processes. In point of volume and amount of labor expended on material for the group the foliage for the large fossil "horsetails" (*Calamites*) takes first place. This foliage was cut and pressed from sheet celluloid by means of steel dies made during the previous year. These leaves were then assembled on branches. A fragment of a branch of *Annularia* so prepared is probably the first attempt ever made at a three-dimensional restoration of this common fossil plant of the Carboniferous Period. Work on foliage for the *Lepidodendron* restorations is under way, as is also preparation of the fruiting cones, which in some species were borne at the tips of the branches, similarly to the small present-day representatives of this group, but in other species in clusters on the stem, as in some of the modern cauliflorous trees.

Of the series of mural paintings, presented by Mr. Graham, and designed and executed by Charles R. Knight for Graham Hall, six more were received and placed in position on the walls during the

year. The subjects of these paintings are: *The Great Irish Deer*, *The Mammoth and the Woolly Rhinoceros*, *The Great Ground Sloth and the Giant Armadillo* (Plate VIII), *The Great Dinosaur*, *The Primitive Whale*, *Zeuglodon* and *Marine and Flying Reptiles*. Four of these are twenty-five by nine feet in size; two are eleven by nine feet.

The construction of the large cases at the north end of Graham Hall required some readjustment of the cases and floor mounts previously occupying this space. For this purpose six cases and eight floor mounts at the north end of the hall were moved and rearranged. Three of the large floor mounts were transferred to the center of the hall, and iron railings were erected about them to prevent their being injured or handled by visitors. In two of the cases specimens, prepared during the year, of the South American fossil mammals collected by the Marshall Field Paleontological Expedition to Argentina and Bolivia were installed. Important among these are skulls of the great ground sloths from the Pliocene and the Pleistocene formations of Argentina and Bolivia. These skulls range from ten to thirty-five inches in length. Those now on exhibition are members of the genera *Mylodon*, *Scelidotherium*, *Glossotherium*, *Pronothrotherium*, *Megatherium*, and *Scelidodon*. A number of these skulls belong to individuals of which entire skeletons, or the greater parts of them, will later be assembled and exhibited. Additional notable specimens placed on exhibition in this series are skulls of other large South American mammals, including the *Toxodon* and *Astrapotherium* of lowland habits, the lesser *Adinotherium* and *Proadinotherium*, and the slender and agile *Theosodon*, progenitor of a strange, camel-like race which inhabited the more arid regions of South America.

Transfer of the invertebrate fossils from black to buff tablets has been carried on almost continuously through the year, a total of 7,956 specimens having been so transferred. This transfer involves careful removal of the specimens from the old tablets, cementing of the printed buff covers to the tablets, and refastening of the specimens upon them. As fast as the tablets were prepared they have been reinstalled in the cases, redecorating of the case interiors having meanwhile been carried on. From eleven cases of these fossils specimens were removed, the cases were painted, and eight cases have been reinstalled. These completed cases include one of Pennsylvanian plant fossils, three of Silurian, two of Ordovician, and two of Devonian age. In addition, about 800 Cretaceous and 2,500

Tertiary invertebrate fossils were remounted and installed in the cases devoted to those periods.

In connection with the remounting of the invertebrate fossils, careful identification of all specimens was carried on by Mr. Roy in order to provide the latest nomenclature. He revised the labeling of 8,000 specimens in this manner during the year.

A stump, eighteen inches in diameter, of the large Devonian seed-fern, *Eospermatopteris*, was installed on a base adjacent to one of the Devonian cases. Installation of labels has been carried on in the hall as fast as they were received from the printer, with the result that the relabeling of this hall is now nearly complete. The total number of labels installed in the hall during the year is 3,659.

A new form of labeling has been introduced which is of much service in indicating the geological period and stratigraphic position of the contents of each case. These labels show the life eras or geological periods in order, with estimates of their age and duration in years according to the eminent authority, the late Professor Joseph Barrell, of Yale University, and the characteristic forms of life which existed during each period. One such label is placed in each large case next the aisle, with the position in the geological series of the contents of the case indicated by a red star on the label. Another label, within the case, carries out the classification in further detail, giving the several subdivisions of the geological period, and the better known occurrences of the formations. The fossils recorded are designated first by the family name in common or descriptive terms, with the scientific name following in parenthesis. Under the family name are given names of the genera characteristic of the formation under which they are listed. The genera of fossils represented by specimens in the Museum collections are further designated by asterisks before the generic names.

In Room 107, adjacent to the paleontological laboratory, a series of twenty-four steel storage cabinets, designed in part to receive specimens of large size and great weight, was installed.

In order to complete the work of segregating and arranging the unprepared specimens or those reserved for study, the paleontological collections stored in Room 101 in some 600 trays were rearranged and condensed. The entire series was then relabeled according to number of specimen, year collected, geological age, and locality from which collected.

In the paleontological laboratory the work of preparing the collections of South American fossil mammals has gone forward as rapidly as possible. During the year four candidates were given trial as preparators, and two of them continued in service at the end of the year. Sixty-five specimens have been prepared, of which number twenty-one have been mounted and placed on exhibition.

Associate Curator of Paleontology Elmer S. Riggs has given much time and attention to a thorough revision of the field bundles and other specimens in storage in order to insure their preservation and make them readily accessible. The collection of fossil mammals from northern Argentina, amounting to more than 500 parcels, was removed from the storeroom on the ground floor, poisoned by the use of carbon tetrachloride, rewrapped in burlap applied with plaster of Paris, and rearranged in the storeroom.

The increase in the force of preparators necessitated devoting two additional rooms to their work. For this purpose Rooms 100 and 105 were diverted from previous uses, and some needed equipment was provided, including storage racks, a gas stove, a portable electric drill, tables and various hand tools. Room 105 was divided by a partition so as to provide an emergency exit from the Roentgenological Laboratory, and at the same time retain space for preparatory work and study of specimens of vertebrate fossils. The office of the Associate Curator of Paleontology and all of the work-rooms were cleaned and painted.

In the laboratory of invertebrate paleontology, Room 110, a motor-driven, combined rock-cutting and grinding machine was installed. This equipment enables the internal structures of fossils, upon which their classification is now so largely based, to be brought to view and Assistant Curator Sharat K. Roy has already obtained valuable results through its use. Preparation of the Frobisher Bay fossils collected by the Rawson-MacMillan Subarctic Expedition has been nearly completed, 290 specimens having been worked out. These are now being studied.

The chemical laboratory has been in use most of the year except for times when it was necessary to suspend operations pending necessary renovations of the walls, ceilings and ventilating systems. The ventilation of the hood and the removal of the fumes generated there have been improved by replacing corroded iron conduits and improving their design. A fan has been added to provide a mechanical exhaust, and additional equipment is being prepared which it is hoped will furnish further needed ventilation by means of the



GROUP OF INDIAN RHINOCEROS

William V. Kelley Hall of Asiatic Mammals

James Simpson-Roosevelts Asiatic Expedition

Reproduction in cellulose-acetate by Leon L. Walters. Background by Charles A. Corwin

About one twenty-second natural size

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same exhaust fan. Falling of rust from the iron roof of the hood, which had become so serious as to put the hood out of commission, has been temporarily remedied by a coat of tar. The walls and ceilings of the laboratory, which, owing to incomplete finishing, produced dust which interfered with accurate work of a delicate nature, have now been painted. Obsolete types of heating apparatus have been replaced by the addition of three electrical hot plates and an electric flask heater. These have much expedited the work of the laboratory. The instrument and control panel for the motor generator set used for the Fink treatment of bronzes have been remodeled so as to use the heavier currents required by the larger specimens that are now being treated.

Complete analyses have been made of three meteorites, two of which, the Lafayette and Tilden, were stone, and one, the Houck, was iron. Many partial qualitative determinations needed for identification of specimens have been made as occasion arose. Revision of the petroleum collections has necessitated much work in cleaning and refilling the bottles in which the oils are exhibited. This work has been done in the laboratory. Some experimental work also is being carried on in this laboratory to determine the best type of equipment for a proposed fluorescent mineral exhibit. This is being done by means of an iron spark-gap apparatus which has been assembled there.

One determination of the heat value of coal for the Museum boilers has been made. The value of ethylene dichloride-carbon tetrachloride as a disinfectant for Museum cases was also investigated. This work centered upon tests of inflammability and determination of such features as weight of vapor, speed of evaporation and similar properties as compared with those of the carbon disulphide formerly used. This investigation was necessary to prevent mistakes when its use was substituted for that of the insecticide earlier employed. Minor investigations, such as determining the strength of glycerine and alcohol solutions, have been made as occasion arose. An investigation was made into the probable durability of a new wall covering for use in the lavatories and in the boiler room.

Analyses were made of an ancient Egyptian medicine and of five Peruvian bronzes for the Department of Anthropology; also sixty-one ancient Egyptian weights were determined in terms of metric units. The treatment of ancient bronzes by the Fink process has been continued through the year and hundreds of bronzes have been

thus restored. This work has taken much of the time of Associate Curator Henry W. Nichols, but the situation seemed to require that it should be done at once since these bronzes are very valuable and many would be irreplaceable. The coating on many of them was of a corrosive character and was, slowly in some cases, and rapidly in others, destroying the bronze. Consequently, immediate treatment was called for. The Associate Curator was assisted in this work by Mr. John G. Prasuhn of the Department of Anthropology, upon whom also the preparation of the treated specimens for exhibition has devolved. The treatments have been uniformly successful. There are, however, a number of specimens in the last consignment from Kish which are in such condition that they will require the most careful attention. Before the Fink treatment was adopted no way was known to save such material.

In the employment of this process in the laboratory no important modifications have been made. Some additions to the equipment, however, have made the handling of the process more convenient. It has also been possible to speed up the treatment for certain classes of material which are not in too bad condition. On some classes of material it has been possible to preserve much of the original patina while destroying all malignant matter and removing the thicker incrustations. There has also been developed an after-treatment which provides the specimen with a thin, natural patina without the use of chemicals or electricity. This patina is sufficient to take away the new look of the treated bronze, and provides a base upon which a thicker patina may form in time.

Besides the use of the Fink process, a new, strictly chemical method of rendering malignant patina inert has been devised in this laboratory. It has been applied to a number of bronzes with apparently successful results, although five or ten years must elapse before it is positively known that the cure is permanent. This treatment is intended for those cases, which are frequent, in which the malignant patina is confined to the surface. The process is based upon reactions that, so far as is known, have never been employed for the purpose before. Since nearly, if not quite all, the corrosive patinas encountered owe their injurious action to some simple chloride compound which has the property of continuously renewing itself, the new process consists of fixing the chloride in inert form by treatment with a silver salt and then fixing and rendering inert any corrosive by-product of the first treatment. For this purpose a weak solution of sulphate of silver in distilled

water is prepared. The most suitable strength for this has not yet been determined, but the exact strength is not important. The solution is applied to corroded spots or spread over the affected area with a small camel's-hair brush. After about thirty seconds the surplus liquid is removed with blotting paper and a second solution is applied. This second solution consists of barium hydroxide dissolved in distilled water. It does not keep well and must be prepared freshly each time it is used. The barium hydroxide powder must also be kept at all times hermetically sealed. A thorough washing completes the treatment. It should be noted that where, as is the case with many of the bronzes, the malignant matter penetrates throughout the specimen, the above-described treatment will not suffice.

ZOOLOGY.—Further marked advance was made during the year in the preparation and installation of habitat groups of mammals. Five large groups with painted backgrounds were completed, and one of smaller size, open on four sides. Of the large groups, one was added to William V. Kelley Hall and four to the Hall of American Mammal Habitat Groups. The animals represented are the Indian rhinoceros, polar bear, Alaska Peninsula brown bear, American bison, and musk-ox. In addition, a small group of Abyssinian dassies or coneys was finished and placed in Carl E. Akeley Memorial Hall.

The Indian rhinoceros group (Plate XIX) is a large and striking group prepared from material obtained by the James Simpson-Roosevelts Asiatic Expedition of 1925-26. It includes two specimens, male and female, reproduced from animals shot in Nepal by Mr. and Mrs. Kermit Roosevelt after the main part of the expedition's work in Turkestan and the Himalayas had been concluded. They were prepared by Taxidermist Leon L. Walters, by means of the process originated by him of reproduction in cellulose-acetate. They furnish a further demonstration of the superiority of this process for the exhibition of large, practically hairless mammals. One animal is shown standing on the reedy bank of a river, while the other is wallowing in shallow water near-by. The painted background, executed by Staff Artist Charles A. Corwin, represents a sluggish river meandering through grassy swamps with low hills lightly clad with small trees and bushes in the distance.

Of the four large mammal groups added to the Hall of American Mammal Habitat Groups, two are wholly new and two are based on reinstallation of animals formerly exhibited in floor cases without

backgrounds. Their completion makes possible the opening of a part of the west half of the hall for which other groups are now in preparation. The brown bear of the Alaska Peninsula, giant among extant bears, is shown in a group representing a scene in Pavlof Bay, Alaska Peninsula. The specimens were obtained by the John Borden-Field Museum Alaska-Arctic Expedition and the Alexander H. Revell-Field Museum Alaska Expedition of 1927. A large male bear stands at one side, while his mate, with her back turned to him, is busily engaged in fishing for salmon in a small stream. Two partly grown cubs are playing with the fish which their mother has scooped out of the water. The background shows the symmetrical volcanic cone and snowy slopes of Mount Pavlof. The group was prepared by Taxidermists Julius Friesser and Arthur G. Rueckert, with painting by Staff Artist Corwin.

The polar bear group, presented by Mr. Frederick H. Rawson, stands opposite the group of brown bear, and completes a quadrangle with the earlier groups of glacier bear and grizzly bear, so that from the center of the hall four groups of American bear are seen at once. A magnificent male polar bear of exceptional size and quality, descending the inclined surface of a block of ice, forms the outstanding feature of the group. Below him a female is crouching on the ice and two small cubs are playing about her. An Arctic scene of snow and ice, painted by Mr. Corwin, rises behind. This group also was prepared by Messrs. Friesser and Rueckert.

The groups of bison and musk-ox (Plates V and X) stand opposite each other, occupying the largest spaces in the hall. Both were produced by using animals formerly in open four-sided floor cases. The group of musk-ox includes seven animals originally mounted by Carl E. Akeley. They stand variously disposed on moss-carpeted tundra. A bleak, treeless plain lies behind them, and low hills with light patches of snow rise in the distance. A large bull occupies a prominent position on a slight elevation, and females with younger animals are gathered near-by, among them two small calves idly nuzzling each other.

The bison group contains seven animals ranging from large bulls to partly-grown calves, all in the full, heavy coat of late fall or early winter. They are represented as coming down a clay embankment over well-trod trails to the bed of a prairie stream beside which a few small cottonwood trees stand. The effect of a large herd in the vicinity is given by numerous animals painted on the background by Mr. Corwin, some slowly fling over the prairie

as if leaving the watering place, and others crowding over the edge of the embankment on their way to it. The specimens were mounted and the reinstallation effected by Mr. Friesser. The group was presented by the late Arthur B. Jones, a former Trustee of the Museum.

In addition to the completion of these mammal groups, much progress was made with others which are under way. A group of the South American marsh deer is in the final stages of preparation at this writing. All the animals are mounted and only details of the accessories remain to be done. A group of the great anteater of tropical America also is well advanced, and preliminary sketches and models have been made for groups of tapir and guanacos. Progress on the sea lion group for the Marine Hall was interrupted by the absence of Taxidermist C. J. Albrecht in Africa, but several of the smaller animals have been completed, and the others are in such stages that the completion of the group in the coming year may be expected.

Taxidermist Walters has devoted himself during a large part of the year to a reproduction of a white rhinoceros from a specimen collected by the Conover-Everard African Expedition of 1926-27. This work is nearing completion and the finished product, which promises to be a magnificent piece, will doubtless be placed on exhibition early in 1930.

In the systematic exhibit of North American birds, one case with two screens was installed early in the year, showing marsh birds and shore birds, with seventy-six specimens of sixty-six species of cranes, rails, plovers, sandpipers, and their allies. These were the work of Taxidermist Ashley Hine, who has now finished many of the larger American birds and is beginning work with some of the numerous smaller forms. A few foreign birds from recent expeditions were mounted also, and are awaiting installation.

After the return of the Cornelius Crane Pacific Expedition, a temporary exhibit of some of the material obtained by it was installed in four cases and placed in Stanley Field Hall. This included specimens of mammals, birds, and reptiles, together with a series of water-color paintings by Mr. Walter A. Weber, artist of the expedition. The paintings have since been removed.

The west half of Albert W. Harris Hall, in which reptiles and amphibians have been exhibited, was completely reorganized during the year, mainly by Associate Curator William J. Gerhard with

the assistance of Mr. Walters and Mr. Emil Liljeblad. Material in old cases was reinstalled in six rectangular cases of medium height, two being devoted to crocodilians, two to turtles, and two to lizards and snakes. Great improvement was brought about by remounting specimens on suitable natural bases, corresponding to the practice in the halls of systematic mammals and birds.

One "A-case" was reinstalled, and a second, containing new models prepared in cellulose-acetate and cellulose-nitrate by the Walters process was put in place beside it. The new material represents twenty-seven forms, among which may be mentioned local salamanders, North American rattlesnakes, and an interesting demonstration of the poison mechanism of rattlesnakes shown by combining models and actual skeletal parts.

The work of reinstalling fish exhibits in the east half of Albert W. Harris Hall, begun in 1928, was completed, all backgrounds now being light green in color and the arrangement much improved. Nine cases were thus reinstalled.

Incoming material from the numerous expeditions occupied the Staff much of the time during the year. Although permanent arrangements were still impossible for some classes of specimens, the storage of new accessions was greatly facilitated by recent additions to equipment.

Sixteen new steel cabinets and fittings for mammals, and sixteen for birds, were received and immediately put into use. In the division of birds a very extensive rearrangement was made. All trays were labeled as to contents, and, so far as facilities would permit, related groups of birds were brought into proper sequence and juxtaposition. The same was done with mammals and, although it is still necessary to use many of the small cans, a general system is sufficiently established to make possible the addition of new steel cabinets in small numbers from year to year without serious disturbance of order.

Ninety-six steel cabinets fitted with shelves and, to some extent, with drawers on roller bearings, were placed in the west corridor of the fourth floor of the Museum for the storage of large skulls and other osteological material. These provide space for the systematic arrangement of this material which has been relatively inaccessible for some time. Much osteological material remains in rough, unprepared condition as received from the collectors. To care for this and to bring all collections of this kind into usable condition in

the new cases, a modern cleaning and degreasing plant was installed on the ground floor of the building. This is furnished with three seventy-gallon tanks of galvanized iron, having three large outlets, hot and cold water, thermometer, and electric lighting and ventilating equipment. A degreasing tank is being added, and it is hoped that in the near future a large accumulation of uncleaned skulls and skeletons may be prepared and made available for use.

The osteologist has cleaned skeletons of hippopotamus, elephant, seal, walrus, bison, and lion, and skulls of crocodiles, African antelopes, rhinoceros, brown and polar bear, and seals. In addition he has cleaned 578 skulls of small mammals, mainly those of very small size, such as bats and shrews, requiring especial care and skill. Six hundred and ninety-eight skulls of small mammals were cleaned by an outside concern.

Improvements involving extensive construction in the north end of the fourth floor of the building were completed, which greatly increased efficiency in the taxidermists' shop. A gallery was carried across the entire north gable and three spacious rooms constructed on it for the storage of the entire collection of skins of large mammals, previously stored in a special room on the ground floor. Below this, in the northwest corner, a room was built for the reception of heavy machines used in skin dressing, and east of this steel shelving was provided for taxidermists' supplies, tools, and miscellaneous storage. On the east wall a special fireproof room was built for chemicals and other materials requiring special protection. With these changes, the Museum's main taxidermists' studio becomes a model of comfort, convenience, and efficiency.

#### THE N. W. HARRIS PUBLIC SCHOOL EXTENSION

The Department of the N. W. Harris Public School Extension completed its seventeenth year of operation in 1929, continuing its work of extending the influence of the Museum into the schools of Chicago by furnishing them with cases containing economic and natural history exhibits. Since the establishment of the Department in 1912, there have been prepared 1,123 traveling exhibition cases. Fifty-three were completed in 1929 (examples—Plates VII, XVI).

In the preparation of these cases high standards have been maintained. They are made sturdy enough to stand frequent transportation and constant handling by children, and yet they are light enough for a child to carry. The cases must not only be true to nature but they must be attractive.

The collecting of the specimens used and the making of photographs for backgrounds, as well as the actual preparation of the cases, is done by the Staff of the Department. During the past year some particularly fine material has been collected for habitat groups of local birds. The type of case used is considered ideal for extension purposes and is widely copied by other museums. Some slight improvements in the structure of the case were made in 1929.

The regular service of two cases to each school, changed every two weeks, has been maintained for 408 institutions. The two motor trucks of this Department during 1929 traveled more than 12,000 miles in this service. As the drivers deliver the cases to the desired location within each building, a complete service is maintained entirely free of expense to the recipient institutions.

The Chicago public schools alone have more than 470,000 pupils and 13,000 teachers, and as thirty-three other institutions are on the regular routes of this Department, the daily attendance served by these cases is more than a half million people. Each case remains in each school two weeks and every student has the opportunity of seeing it. Forty different cases reach each school during the year.

In addition to this regular service, two cases were sent to the Ohio State Fair, and special displays of from ten to forty-three cases each were made in Marshall Field and Company's retail store, in the Outing and Recreation Bureau's Adams Street display windows, at the Boy Scout Exposition, the Flower Show at the Hotel Sherman, Camp Algonquin, the Navy Pier, the Illinois State Fair, and the International Live Stock Exposition. Each of these displays reached thousands of people.

During the period under review the Acting Curator, Mr. Cleveland P. Grant, visited 126 schools to obtain a better knowledge of the needs and desires of the schools for visual education in natural history, and to give instruction as to the better use of the cases.

#### ART RESEARCH CLASSES

The year 1929 was marked by further advance in the work of the art classes conducted in Field Museum in cooperation with the Art Institute of Chicago. A new classroom better suited to the work carried on was provided by the Museum. This room has all north light, which is the best light for an art studio. The instructor, Mr. John Gilbert Wilkins, now has a private office where materials



CASSAVA, A COMMON FOOD PLANT OF SOUTH AMERICA

Hall of Plant Life (Hall 29)

Reproduced in Stanley Field Plant Reproduction Laboratories

One-twelfth natural size

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and data may be kept, and adjacent to it is a large cloakroom for the students.

The Art Institute has given the class a complete motion picture outfit, making possible study of animals and birds in normal and slow motion pictures. This is a valuable supplement to the study of mounted specimens, giving opportunity to observe the action of body, limb, and muscle.

The Institute has also furnished modeling stands, where students may experiment with the animal in the round as well as in illustration and design. Students have already produced sculpture of high professional standards, and reproductions of some of their work are being sold by Marshall Field and Company Wholesale.

### DIVISION OF PUBLIC RELATIONS

The publicity obtained through various media for the activities of Field Museum has in 1929 again exceeded that of all previous years, continuing the increase which has been noted annually ever since the institution adopted a definite program for strengthening its relationships with the public.

The principal phase of the Museum's publicity efforts, that of distribution of information through the daily press, was developed in 1929 to the point where the number of articles prepared at the Museum and published in the newspapers averaged more than one for every day of the year, exclusive of articles coming from the pens of outside writers or prepared by members of newspaper staffs. As in the past, while concentrating chiefly on publicity in the papers of Chicago and vicinity, the Museum has obtained nationwide attention for its activities through the cooperation of news agencies, and the more important news of the institution has been internationally circulated. Clippings from all over the world, in many languages, have been received, testifying to the fact that Field Museum's accomplishments are known wherever people read.

In addition to newspaper publicity, many important magazines and other periodicals have devoted much space to the Museum. Still further publicity has been received through advertising space generously placed at the Museum's disposal by various organizations; through radio broadcasting; through motion picture newsreels; and through direct advertising efforts conducted by the Museum in distributing direction folders and other printed matter designed to attract visitors.

NEWSPAPER PUBLICITY.—The Division of Public Relations released a total of 375 news stories during 1929, or an average of more than seven each week. Also, by the inauguration of a new system of circulating very brief notes calling attention to older exhibits and other Museum matters, used in the newspapers as “fillers,” an additional 209 items were released and published. Thus the total of notices, including regular articles and short items obtained for the Museum by its own direct efforts, was 584.

Copies of this publicity matter were furnished to the seven principal daily newspapers of Chicago; to some sixty community and neighborhood papers published in the city; to more than fifty Chicago foreign language newspapers; to about sixty suburban newspapers covering the principal suburbs, cities and towns within a 100-mile radius of Chicago; to all the principal national and international news agencies; and to the Springfield bureau of the Associated Press for its special service to newspapers throughout the state of Illinois, which is in addition to the national distribution effected through the Chicago office of the same organization.

Photographs accompanied many of the stories, prints from 358 negatives having been released by the Museum. Copies of these photographs were furnished to a list of twenty-five leading newspapers and news photograph agencies, through which hundreds of additional copies were distributed to newspapers all over the world. A great amount of space has been given to Museum pictures in newspapers publishing rotogravure sections, and, as this type of reproduction is so far superior to ordinary news photographs, it has undoubtedly been of benefit in providing the public with a clearer idea of what the Museum is and what it does.

The contract with the *New York Times* and its subsidiary company, Wide World Photos, whereby the photographs resulting from certain Field Museum expeditions are syndicated nationally, was continued as in past years.

As usual, the news from the Museum has frequently provoked editorial comments in many important newspapers, including all those of Chicago, many in other American cities, and even some abroad, a notable instance being the *London Times*. One editorial feature column which is syndicated among newspapers from coast to coast with a total of about twenty million readers, has frequently given space to comments on Field Museum activities during 1929.

The Museum's releases ranged from the “filler” items above mentioned, of fifteen to twenty-five words, up to full column articles,

the majority of the regular news stories running from about one-half to two-thirds of a column. Every story released was printed in several Chicago newspapers, and many in all; and the majority received extensive space throughout the country. Frequently these releases have been expanded by newspaper staff writers for full-page Sunday feature articles.

For their generous cooperation which has contributed so greatly to the success of the Museum's publicity efforts, grateful recognition is herewith accorded the *Chicago Tribune*, *Chicago Daily News* and *Chicago Daily Journal*, which recently merged, *Chicago Evening Post*, *Chicago Herald and Examiner*, *Chicago Evening American*, *Chicago Daily Illustrated Times*, *Chicago Journal of Commerce*, and the national and international news agencies, such as the Associated Press, United Press, International News Service, Universal Service, and Science Service.

As an indication of the extent of the newspaper publicity received, the records show that an average of 2,038 clippings of articles mentioning the Museum was received each month in 1929. This number represents only a part of the space given the Museum, as no complete coverage of even the English language newspapers is available, and certain groups, such as the foreign language papers, are not covered at all by the clipping bureaus. The total number of clippings received for the year was 24,457.

**PUBLICITY IN PERIODICALS.**—The Museum and its activities have again been the subject of many special articles which have appeared in general and popular magazines, trade journals, scientific publications, and other periodicals. Some of these were prepared at the Museum on the request of editors, and others were written by outside writers, usually illustrated with photographs furnished by the Museum and based on data supplied by the Staff. Among the more important publications in which this material has appeared are *Scientific American*, *Chicago Commerce*, *Science*, *Popular Mechanics*, *Popular Science*, *Americana Annual*, *International Year Book*, *Science News Letter*, *Museums Journal* (London), *Chicago Visitor*, *Chicago Beautiful*, *Field and Stream*, *St. Nicholas*, and *Chicago* (a book).

**ADVERTISING.**—The Museum has been fortunate in receiving, free of charge, advertising space in various media, as in previous years. The Chicago Surface Lines continued its generous coopera-

tion by printing at its own expense, and displaying in the street cars, colored overhead posters calling the public's attention to some of the Museum's striking exhibits. The Chicago Rapid Transit Company and associated interurban lines, including the Chicago, North Shore and Milwaukee Railroad, the Chicago, South Shore and South Bend Railroad, and the Chicago, Aurora and Elgin Railroad, distributed some 65,000 Field Museum descriptive folders among their patrons, and displayed Museum posters in stations of the Elevated Lines. In the Outing and Recreation Bureau maintained in the "loop" district jointly by these and other interests, a large display window near a busy street corner was for several weeks devoted to an exhibition of Museum material and placards urging the public to visit the Museum. The Chicago, North Shore and Milwaukee Railroad again allotted space throughout the year to Museum exhibits and lectures in its "This Week's Events Along the North Shore Line" posters displayed at all stations between Chicago and Milwaukee. The Illinois Central Railroad and the Chicago and North Western Railway displayed at their city and suburban stations placards announcing Field Museum lecture courses. These posters were also displayed in Marshall Field and Company's retail store and in libraries, schools, and other institutions. Practically all railroads entering Chicago widely advertised the Museum in connection with excursion trips they conducted from various points in the middle west. Approximately 80,000 Field Museum descriptive folders (in addition to those distributed by the Rapid Transit and associated companies) were distributed by the Museum and cooperating agencies, including practically every railroad and lake steamship line entering the city, and the principal hotels, clubs, travel bureaus, and department stores. The officers and delegates to many of the important conventions held in the city were also furnished with supplies of these folders.

The Clyde W. Riley Advertising System, publishers of *The Playgoer*, the magazine-program used in practically all Chicago theatres (exclusive of motion picture houses) continued the courtesy it has extended for several years of giving the Museum from a half-page to a page of advertising space in each program. The Museum also received, as in previous years, a free page advertisement in the programs of the Chicago Civic Opera Company. The Museum was advertised also in the house organs for customers and employes published by the Stevens Hotel, Marshall Field and Company,

Commonwealth Edison Company, People's Gas Light and Coke Company, Montgomery Ward and Company, Illinois Bell Telephone Company, and other firms, and in folders and other advertising matter issued by many railroads, lake steamship companies, and hotels.

During the International Live Stock Exposition special cooperative publicity and advertising was arranged between the management of that enterprise and the Museum.

RADIO.—Further publicity for Field Museum was contributed by local radio stations which broadcast Museum news and arranged for talks by members of the Museum Staff. Among stations which cooperated were WLS, the *Prairie Farmer* station which in cooperation with the *Chicago Daily Journal* broadcast a series of talks by the Director and various members of the scientific staff; WCFL, the Chicago Federation of Labor station; WMAQ, the *Chicago Daily News* station, which broadcast several travelogue talks by Museum speakers, illustrated with pictures published in the roto-gravure section of the paper on simultaneous dates; and the radio stations operated in conjunction with various other Chicago newspapers or under the auspices of other organizations of various kinds.

NEWSREELS.—Field Museum activities were also brought before the public in motion picture newsreels. Among these were the newsreels of the Paramount Film Corporation, M-G-M-International Newsreel, *Chicago Daily News*-Universal Newsreel, and others.

EDITORIAL WORK.—A large amount of editorial work was performed by the Division of Public Relations. Plans were completed for a monthly bulletin which will announce, report and record all Museum activities. It will be distributed regularly to Members of the Museum, subscription being included as part of all memberships. Preparation of the first number of the paper, which is called *Field Museum News*, was under way at the close of the year, with publication scheduled for the first week of January. The Division also performed editorial work on new catalogues of the Museum's publications, which are soon to be issued, and on various other printed matter.

## DIVISION OF PRINTING

The output of the Division of Printing during 1929 exceeded by far that of any other year, both in publications and in labels and miscellaneous matter.

In order to replace more rapidly the black exhibition labels with the more legible new style of buff labels, three more printers were added to the Staff of the Division at the beginning of the year. As a result the Division turned out 15,000 more exhibition labels than in the previous year.

To make better progress on the publications for which manuscripts had accumulated, four additional printers were employed in September, three of them being assigned to night service. By means of this increase in the force the Division was able to issue 24,156 copies of books in the regular publication series, a number exceeding that of any other year, and double that of the preceding twelve months. There was also a substantial increase in the number of leaflets printed.

The quality as well as the quantity of work that could be done by the Division was given consideration. To make the Museum's printed matter as free of typographical errors as possible, an efficient proofreader was employed. A comparatively quiet working space being essential for the proofreader, the southeast corner of the room used by the Division on the third floor was partitioned off for office purposes.

The Miehle vertical press, which was installed a year ago, has proved to be a most valuable addition to the Division's equipment. It has been the means of turning out a better quality of printing, and has helped greatly to increase the production of the Division.

In 1929 the Division's equipment was enlarged by the addition of a combination type-cabinet unit needed to facilitate the work of the increased Staff.

The following publications, with contents totaling 1,726 pages, were printed and bound during the period under review:

Publication number	Number of copies
254—Contribution to Paleontology . . . . .	1,275
255—A Contribution to the Ornithology of Brazil . . . . .	1,016
256—Annual Report of the Director for the Year 1928 . . . . .	7,661
257—The Birds of the Neotropical Genus <i>Deconychura</i> . . . . .	1,068
258—Flora of Barro Colorado Island, Panama . . . . .	1,040
259—Spermatophytes, Mostly Peruvian . . . . .	1,100
260—The Mineral Composition of Sands from Quebec, Labrador and Greenland . . . . .	1,611

261—A New Rodent from the Galapagos Islands . . . . .	1,105
262—Contents and Index to Volume XII . . . . .	1,085
263—Birds of the James Simpson—Roosevelts Asiatic Expedition . . . . .	1,064
264—Studies of American Plants. Parts I and II . . . . .	1,051
265—The Land Mammals of Uruguay . . . . .	1,068
266—Catalogue of Birds of the Americas. Part VI . . . . .	1,530
267—Honduran Mosses . . . . .	992
268—Melanesian Shell Money in Field Museum Collections . . . . .	1,015
269—A Study of the Tooth-billed Red Tanager . . . . .	1,022
Anthropology, Memoirs—A Sumerian Palace and the "A" Cemetery at Kish, Mesopotamia, Part II . . . . .	1,472
Anthropology Leaflet 28—The Field Museum—Oxford University Expedition to Kish, Mesopotamia, 1923-1929 . . . . .	2,993
Geology Leaflet 10—Diamonds . . . . .	6,023
Geology Leaflet 11—Neanderthal (Mousterian) Man . . . . .	6,056
Geology Leaflet 12—Cement . . . . .	3,036
Zoology Leaflet 10—The Truth about Snake Stories . . . . .	3,045
Zoology Leaflet 11—Frogs and Toads of the Chicago Area . . . . .	3,002
Field Museum and the Child . . . . .	4,070
General Guide . . . . .	8,530
Field Museum News (January, 1930, issue) . . . . .	6,800
<b>Total . . . . .</b>	<b>69,630</b>

The number of labels and other impressions was as follows:

	Exhibition labels	Other impressions
Anthropology . . . . .	8,373	11,665
Botany . . . . .	1,398	42,943
Geology . . . . .	13,635	3,000
Zoology . . . . .	4,163	4,554
Harris Extension . . . . .	349	2,220
Raymond Division . . . . .		273,300
General . . . . .		537,286
Membership information folder . . . . .		5,527
Direction folder for Rapid Transit Company . . . . .		49,800
Direction folder for Division of Public Relations . . . . .		73,872
Publication price list . . . . .		550
Leaflet price list . . . . .		800
Miscellaneous post cards . . . . .		368,910
Miniature sets of exterior and interior views in Museum . . . . .		2,125
Pictorial post card album . . . . .		755
Large post card album . . . . .		115
<b>Total . . . . .</b>	<b>27,988</b>	<b>1,377,422</b>

### DIVISIONS OF PHOTOGRAPHY, ROENTGENOLOGY AND ILLUSTRATION

PHOTOGRAPHY.—The total number of lantern slides, negatives and prints made by the Division of Photography during 1929 was 35,602, an increase of more than 10,000 over that of the previous year. The following tabulation gives a summary of the work performed:

	Lantern slides made	Nega- tives made	Prints made	Enlarge- ments made	Negatives developed for expedi- tions	Trans- parent labels made	Trans- parencies made for exhi- bition
Anthropology.....	523	777	10,045	...	498	...	9
Botany.....	...	362	9,553	130	...	...	...
Geology.....	359	259	1,847	36	134	...	...
Zoology.....	577	249	3,802	45	229	8	...
Harris Extension...	...	35	47	76	88	...	...
Raymond Division .	783	34	581	...	...	...	...
Photogravure.....	...	470	290	...	...	...	...
Publicity.....	...	31	1,618	22	...	...	...
General.....	10	...	852	...	...	...	...
Gift.....	...	...	546	...	...	...	...
Sale.....	16	...	661	...	...	...	...
Total.....	2,268	2,217	29,842	309	949	8	9

ROENTGENOLOGY.—The scope of activities in the Division of Roentgenology has widened during the past year. The X-ray apparatus is being used to a greater extent, and is developing increased significance in the Museum's work.

Research by means of the X-ray in 1929 was carried on in connection with anthropological, geological, and zoological subjects.

An exhaustive study was made of Egyptian animal mummy-packs, resulting in some remarkably interesting revelations. Some of the most elaborately wrapped packages, it was found, contain no skeletons, and some of the carelessly prepared ones hold the finest specimens. One package, wrapped so as to represent a cat, contains, in the head of the bundle, a skull of an unidentified mammal and in the abdominal portion there is a collection of miscellaneous bones, including a cat's skull. One package has an exterior representing a crocodile, but a comparison of roentgenograms of it with recent crocodile skeletons, made by Mr. Karl P. Schmidt, Assistant Curator of Reptiles, indicates that the enclosed specimen may be a lizard.

Roentgenograms aided in the establishment of the identity of a small Egyptian mummy, seven inches long. There was a question as to whether it is human or ape. The X-ray determined definitely that it is a human embryo of three and one-half to four months' development.

Roentgenographic studies were made also of a series of ancient Peruvian babies and children. Very little apparent pathology was found to exist in these specimens.

The extent of ankylosis of the functional fang of a rattlesnake was determined from a roentgenogram, thereby making unnecessary dissection of the reptile's skull.

Radio-active minerals submitted by the Department of Geology were tested for radium content. Experiments were also made of the relative efficacy of ultra-violet and roentgen rays to produce radio-lucence with several different substances.

Paleontological specimens have been found to be surprisingly good subjects for X-ray examination. In most cases there is a marked difference in atomic density between the bony structure and the surrounding matrix, and therefore a satisfactory shadow of the skeleton can be produced.

Special articles on the Museum's roentgenological work appeared during the past year in *Victor News*, *Tiles and Tile Work*, and *Hygeia* magazines.

PHOTOGRAVURE.—Following is a summary of the photogravures produced during the year 1929:

	Number of prints
Leaflet illustrations.....	108,000
Publication illustrations.....	172,000
Memoirs Series, illustrations.....	21,000
Poster headings.....	4,575
Post cards.....	214,000
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Total.....	519,575

ARTIST.—The following is a record of the work accomplished during 1929 by this Division:

Large Peruvian frescoes.....	4
Pen and wash drawings.....	132
Maps drawn and lettered.....	25
Plans drawn and lettered.....	22
Lantern slides colored.....	562
Photographs retouched.....	34
Photographs tinted.....	12
Negatives blocked.....	33
Large transparencies colored.....	6
Meteorites colored.....	2
Negatives lettered for copyright.....	8
Street car posters drawn.....	2
Book covers lettered.....	4
Wood engraving repaired.....	1
Miscellaneous items.....	40
	<hr/>
Total.....	887

### DIVISION OF MEMBERSHIPS

The membership of Field Museum continues to grow encouragingly, evidencing the increased interest which the institution's activities are attracting among public-spirited citizens.

The number of new names added to the Museum's membership during 1929 was 1,363. The names of all Members on the rolls as of December 31, 1929, will be found elsewhere in this Report. Following is a classified list of the total number of memberships:

Benefactors . . . . .	17
Honorary Members . . . . .	22
Patrons . . . . .	34
Corporate Members . . . . .	53
Life Members . . . . .	357
Non-resident Life Members . . . . .	7
Associate Members . . . . .	2,105
Non-resident Associate Members . . . . .	1
Sustaining Members . . . . .	312
Annual Members . . . . .	2,873
Total Memberships . . . . .	5,781

### CAFETERIA

During the year 96,505 Museum visitors were furnished refreshments in the cafeteria located on the ground floor, an increase of 10,197 over the number served in 1928. The cafeteria is not operated by the Museum, but is under the management of a concessionaire.

In the pages which follow are submitted the Museum's financial statements, lists of accessions, names of Members, *et cetera*.

STEPHEN C. SIMMS, *Director*.

### ATTENDANCE STATISTICS AND DOOR RECEIPTS

FROM JANUARY 1, 1929 TO DECEMBER 31, 1929

Total attendance.....		1,168,430
Paid attendance.....	151,595	
Free admissions on pay days:		
Students.....	16,650	
School children.....	124,935	
Teachers.....	1,396	
Members.....	1,581	
Admissions on free days:		
Thursdays (52).....	139,341	
Saturdays (52).....	251,643	
Sundays (52).....	481,289	
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Highest attendance on any day (May 24, 1929).....	59,843	
Lowest attendance on any day (December 18, 1929).....	81	
Highest paid attendance (September 2, 1929).....	7,268	
Average daily admissions (365 days).....	3,200	
Average paid admissions (209 days).....	725	
Number of guides sold.....	11,653	
Number of articles checked.....	19,987	
Number of picture post cards sold.....	161,226	
Sales of publications, leaflets, handbooks, and photographs	\$4,915.76	

## GENERAL AND SPECIAL FUNDS

## STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS

AT DECEMBER 31, 1929

Balance, December 31, 1928.....	\$	41,719.84
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## RECEIPTS

Income—Endowment, General, Miscellaneous and Door Receipts.....	\$	332,510.64	
South Park Commissioners.....		222,220.52	
Sundry receipts.....		31,537.33	
Memberships.....		85,660.00	
Contributions.....		301,069.24	
Securities sold and matured.....		260,580.17	1,233,577.90
			<u>\$1,275,297.74</u>

## DISBURSEMENTS

Operating expenses.....	\$	613,957.32	
Expeditions.....		112,327.56	
Collections purchased.....		53,291.59	
Furniture, fixtures and equipment.....		74,586.55	
Securities purchased.....		298,734.42	
Annuities on contingent gifts.....		41,665.00	
Bank loans repaid and interest.....		17,756.27	
		<u>\$1,217,318.71</u>	
Transferred to Sinking Fund.....		10,000.00	1,227,318.71
Balance, December 31, 1929.....	\$		<u>47,979.03</u>

THE N. W. HARRIS PUBLIC SCHOOL EXTENSION

STATEMENT OF INCOME AND EXPENSES FOR THE YEAR 1929

Interest and dividends on investments.....	\$ 20,637.36
Operating expenses.....	19,888.87
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Balance, December 31, 1929.....	\$ 798.49

STANLEY FIELD PLANT REPRODUCTION FUND

STATEMENT OF INCOME AND EXPENSES FOR THE YEAR 1929

Balance, December 31, 1928.....	\$ 650.48
Contributions by Stanley Field during 1929.....	14,527.50
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Operating expenses—1929.....	\$ 15,177.98
	15,200.51
	<hr/>
Deficit, December 31, 1929.....	\$ 22.53

## LIST OF ACCESSIONS

## DEPARTMENT OF ANTHROPOLOGY

- ANDRAU, DR. E. W., The Hague, Holland.  
4 flint flakes—Muaishir near Rutba Wells, North Arabian Desert, Irak (gift).
- ARMSTRONG, JULIAN, Chicago.  
1 felt door decorated with painted appliqué designs of cotton—India (possibly Burma) (gift).
- BODE, MRS. CLARA V., Sheboygan Falls, Wisconsin.  
3 ethnological objects: 1 netted scarf (belt), 1 chocolate whisk, and 1 mosquito whisk—Isthmus of Tehuantepec, Veracruz, Mexico (gift).
- BURT, MRS. WILLIAM G., Old Lyme, Connecticut (donor's father, collector).  
31 ethnological objects: 1 fabric, 2 wooden masks, 2 pairs of leather sandals, 5 decorated gourds, 1 bow, 2 swords, 3 spears, 3 carved wooden paddles, 1 bottle, 1 fur-covered staff, 1 wooden staff, 1 wooden stool, 1 leather pouch—Sierra Leone, Africa (gift).
- CARPENTER, MRS. JOHN ALDEN, Chicago (Mrs. Z. K. Heidary, collector).  
2 marionettes representing a priest and a soldier — Teheran, Persia (gift).
- CUNNINGHAM, ROMEO, Mountainair, New Mexico.  
11 objects: 1 skull, 1 hammerstone, and 9 potsherds — Mountainair, New Mexico (gift).
- DEBUC, G., Gauties-les-Bains, Haute Garonne, France.  
13 original copies of prehistoric sketches of animals engraved on walls of cave of Montespan—Southwest France (gift).
- DEVINE, HERBERT J., New York.  
1 dry lacquer head of a Buddhistic statue—Peiping (Peking), China (gift).
- DRUMMOND, DR. I. W., New York.  
1 mounted beak of hornbill (Buceros) with frontal carving of scenery and six figures. Seventeenth century—Canton, China (gift).  
2 objects: 1 carved hornbill buckle and 1 pudding-stone vase of K'ienlung period (1736-95) — China (gift).
- EULASS, WALTER L., Chicago.  
1 flint arrowhead—Calumet Country Club Golf Course, Illinois (gift).
- EVANS, MRS. LYNDEN, Evanston, Illinois.  
1 otter skin medicine bag, feet and tail covered with purple flannel decorated with beadwork designs—Potawatomi, northern Wisconsin (gift).
- FIELD MUSEUM OF NATURAL HISTORY.  
Collected by Alonzo W. Pond (Central Asiatic Expedition of American Museum of Natural History with Field Museum cooperating):  
72 packages of prehistoric stone implements and fragments—Gobi Desert, Inner Mongolia.  
Collected by J. Eric Thompson (Second Marshall Field Archaeological Expedition to British Honduras):  
352 objects: 182 archaeological specimens, 21 lots of type sherds and 39 ethnological objects from British Honduras; 1 lot of type sherds from Honduras; 54 archaeological objects, 54 ethnological objects, and 1 lot of type sherds from Guatemala — British Honduras, Republic of Honduras, and Guatemala.  
Collected by Karl P. Schmidt (Crane Pacific Expedition of Field Museum):  
8 ethnological objects: 1 decorated tapa—Fiji; 2 hornbill ornaments, 1 decorated bag with hornbill, 4 feather head ornaments — Sepik River, New Guinea.

Collected by E. S. Riggs (Marshall Field Paleontological Expedition to Argentina and Bolivia):

- 2 stone disks—Barancas (bad lands) of river valley, Tarija, Bolivia.

Collected by Harold J. Coolidge, Jr. (William V. Kelley-Roosevelts Expedition to Eastern Asia for Field Museum):

- 4 articles: 2 women's dresses of White Tai, Tonkin; 2 women's dresses with head-dresses and jewelry, Phunoi and Khakho tribes, Laos—Indo-China.

Collected by W. D. Hambly (Frederick H. Rawson-Field Museum Ethnological Expedition to West Africa):

- 470 objects: wood carvings, decorated gourds, pottery, weapons, implements, musical instruments, ornaments and other ethnographical material—Ovimbundu tribe, Portuguese Angola.

Collected by Field Museum-Oxford University Joint Expedition to Mesopotamia (Marshall Field Fund):

- About 2,000 objects: pottery, alabaster and other stone vessels, flint and copper implements, cylinder seals, beads, necklaces, etc.—Kish, Mesopotamia.

Purchases:

- 62 objects: 49 painted pebbles, 2 casts, 11 skeletons of French paleolithic period—Mas d'Azil, France, from Professor Henri Breuil.
- 1 necklace of grizzly-bear claws—Winnebago, northern Wisconsin, from Oliver LaMere, collector.
- 1 chief's coat of ermine—Haida, Tadgilanas division, Kasaan, Prince of Wales Island, Alaska, from Paul Warner.
- 1 colored cast of tooth of *Sinanthropus pekinensis*—China, from R. F. Damon and Company, London.
- 1 medicine otter, with medicine and appliqué work—Potawatomi, Phlox, Wisconsin, from Julius and August Rosenwald Fund (Paul Warner, collector).
- 120 prehistoric implements of stone and antler, and sherds of pottery

—Neuchatel (Swiss lake dwellings), Switzerland, from Dr. P. Vouga, collector.

- 172 archaeological objects: 20 complete pottery vessels, 4 half complete pottery vessels, 78 figurines, 4 stone and 5 obsidian objects, 10 jade beads, 1 jade and shell necklace, 5 shell objects, 41 type potsherds, 3 pieces of marble vessels—Republic of Honduras, from Dr. Wilson Popenoe, collector.

- 31 objects: pottery, pipe-bowl, arrow and spear points, ornaments and ceremonial implements excavated in Scott, Greene, Schuyler, Sangamon, and Calhoun Counties, Illinois, from Julius and Augusta Rosenwald Fund (J. Merrill, collector).

FUCHS, MRS. F., Johannesburg, Transvaal, South Africa (Arthur Fuchs, collector).

- 3 pairs and one single copper bracelet—Maxosa, South Africa (gift).

HANSEN, ERICH, Chicago.

- 9 objects: model of kayak; model of wooden water-bucket, with dipper; model of drying rack; lamp pot, stand, 3 bone wound plugs, small skin pouch—Angmagsalik Eskimo, Ditridas, East Greenland (gift).

KENNEDY, KEITH, Sydney, Australia.

- 47 aboriginal stone implements—Kitchen middens near Sydney, Australia (exchange).

KENYON, A. S., Melbourne, Australia.

- 38 stone and wooden implements—Australia (exchange).

KERCHEK, DR. JOHN, Chicago.

- 8 objects: models of kayak and sledge, 2 traps, iron adze, 2 pairs of children's boots, and wooden mask—Eskimo, Golovnin Bay District, Alaska (gift).

LAUGHLIN, R. M., Havana, Illinois.

- 1 fragmentary lower mandible, with teeth, from Indian burial—Fulton, Illinois (gift).

MACKAY, MRS. ERNEST, Dokri, Sindh, British India.

- 1 coup-de-poing of Acheulean type—Karyatein, Syria (gift).

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- MELDRUM, DR. A. M., Spokane, Washington.  
2 skulls of aborigines — Australia (gift).
- MÖLLER, J. A., New York (A. W. Bahr, collector).  
1 archaic white jade spike, carved with human figure, Chou period — China (gift).
- MOON, H. F., Bagdad, Irak.  
23 mosaic fragments from the tessellated pavement of a Roman fort at Samra on the Hejaz Railway — Samra, Transjordan (gift).
- NELSON, MURRY, Chicago (donor's father, collector).  
1 red flannel coat, with green and blue edgings, decorated with beadwork — East Woodland tribe of Chicago area (gift).
- QUARRIE, S. W., Royston, Herts, England.  
13 flint flakes from east end of Wadi Meir — North Arabian Desert, Irak (gift).
- REES, GROUP CAPTAIN, V. C., London, England.  
32 objects: 2 arrowheads and 30 flint flakes — near Qase Hallabat, North Arabian Desert, Transjordan (gift).
- REYNOLDS, EARLE H., Chicago (Herbert J. Devine, collector).  
2 painted mortuary clay figures of horsewomen playing polo — China (gift).
- ST. PÉRIER, COUNT DE, Morigny par Etampes, Seine-et-Oise, France.  
1 cast of female figure (so-called Venus) of the Lespuge-Aurignacian period — Southwest France (gift).
- SARGENT, HOMER E., Pasadena, California.  
46 baskets — Pomo, Mono, Kern, Paiute, Yokut, Louiseño, Panamint, and Washo, California (gift).
- SCHMERSE, PAUL, Edison Park, Illinois.  
1 flint arrowhead — Desplaines Golf Road, Illinois (gift).
- SCHMIDT, KARL P., Chicago.  
10 objects: 1 carved coconut bottle, lime gourd and stick, 3 spinning tops, 1 tobacco-pipe, 2 puberty covers, 2 spears — Upper Sepik River, New Guinea (gift).
- SETON-KARR, H. W., London, England.  
58 paleolithic and neolithic knives, scrapers, arrowheads and other implements — England, Belgium, Egypt, India, and Ceylon (gift).
- SHELDON, THEODORE, Chicago.  
1 kris with carved wooden handle and metal sheath — Java (gift).
- SPRAGUE, COLONEL A. A., Chicago.  
1 black and gold lacquered saddle dated 1863 — Japan (gift).
- TROMBE, FELIX, Gauties-les-Bains, Haute Garonne, France.  
1 plaster impression of a prehistoric footmark from cave of Montespain, and plan of cave drawn to scale — Southwest France (gift).
- UNIVERSITY MUSEUM (Department of Human Anatomy), Oxford, England.  
4 casts of frontal and left parietal bones, temporal, maxilla and mandible of Mousterian child's skull — Gibraltar, Spain (exchange).
- VONDRASEK, FRANK, Cicero, Illinois.  
23 quartz arrowheads and spear points — Magnet Cove, Arkansas (gift).
- WHITE, MRS. ALEXANDER, Chicago.  
2 wooden panels lacquered red and gold, carved with undercut reliefs — China (gift).
- WICKER, MISS CAROLYN, Chicago.  
18 objects: 8 mandarin cap-buttons, fish emblem, bone emblems of authority, fan, lacquered cover, 4 baskets, 2 strings of beads, hide sandals, pottery wine-jar; also picture post cards — China, Japan, Annam, Philippines, Burma, Ceylon, Greece, Italy, and Mexico (gift).
- YAMAGATA, MR. AND MRS. S., Chicago.  
1 ceremonial battledore used as a New Year's gift — Japan.

## DEPARTMENT OF BOTANY

- ALL-AMERICAN MOHAWK RADIO CORPORATION, Chicago.  
1 specimen of veneer of Australian silk-oak (gift); 2 wood specimens (gift).
- AMERICAN WALNUT MANUFACTURERS' ASSOCIATION, Chicago.  
1 wheel section of black walnut (gift).
- ARNOLD ARBORETUM, Jamaica Plain, Massachusetts.  
785 specimens of plants (exchange).
- ARSÉNE, REV. BROTHER G., Las Vegas, New Mexico.  
1 plant specimen (gift).
- BAILEY, DR. L. H., Ithaca, New York.  
1 specimen of plant from Cuba (gift).
- BALL, DR. C. R., Washington, D.C.  
12 specimens of willows (gift).
- BANGHAM, WALTER N., Forest Hills, Massachusetts.  
1 specimen of plant from the Canal Zone (gift).
- BARTRAM, EDWIN B., Bushkill, Pennsylvania.  
75 specimens of mosses from Arizona (gift).
- BAUER AND BLACK, Chicago.  
1 airplane first aid case (gift).
- BEATTY, LESTER A., Gary, Indiana.  
1 specimen of cinchona bark (gift).
- BENKE, H. C., Chicago.  
517 specimens of plants (gift); 38 wood specimens (gift); 140 packets of seeds (gift).
- BOTANICAL MUSEUM OF HARVARD UNIVERSITY, Cambridge, Massachusetts.  
1 plant specimen (gift).
- BOTANICAL GARDEN AND MUSEUM, Berlin-Dahlem, Germany.  
50 specimens of plants from Peru (exchange).
- BOTANISKA INSTITUTIONEN, Upsala, Sweden.  
450 specimens of plants from Brazil (exchange).
- BREMER, MISS MARY, Crown Point, Indiana.  
18 specimens of plants from Indiana (gift); 18 packets of seeds (gift).
- BREMER, MISS SOPHIA, Crown Point, Indiana.  
2 specimens of mosses from Indiana (gift).
- BRITISH MUSEUM (NATURAL HISTORY), London, England.  
1,034 specimens of plants from South America (exchange).
- BRYAN, PROFESSOR G. S., Madison, Wisconsin.  
3 palm fruits from Africa (gift).
- BUCHER, G. C., Santiago de Cuba, Cuba.  
1 specimen of a Cuban plant (gift).
- BUSH, B. F., Courtney, Missouri.  
9 specimens of plants from Missouri (gift).
- BUTLER, ALFRED F., Tela, Honduras.  
3 specimens of plants from Honduras (gift).
- CALDERÓN, DR. SALVADOR, San Salvador, Salvador.  
238 specimens of plants from Salvador (gift).
- CALIFORNIA ACADEMY OF SCIENCES, San Francisco, California.  
2 specimens of plants (exchange).
- CARTER, J. D., Deerfield, Illinois.  
1 specimen of Aesculus fruits (gift).
- CELOTEX COMPANY, Chicago.  
27 photographs (gift); 10 specimens of celotex (gift).
- CHAMBERLAIN, DR. C. J., Chicago.  
2 specimens of cycads (gift).
- CHAPMAN, DR. F. M., New York.  
1 specimen of plant from the Canal Zone (gift).

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- CHATEAU, REV. FATHER I., Mission, Texas.  
37 specimens of plants from Texas (gift).
- CHICAGO INTERNATIONAL LIVE STOCK EXPOSITION.  
4 specimens of Australian wheat (gift).
- CLARKSON, MRS. RALPH, Chicago.  
2 specimens of plants (gift); 1 specimen of seeds of *Zamia* (gift).
- CLEMENS, MRS. JOSEPH, Manila, Philippine Islands.  
3 specimens of plants (gift).
- COMMERCIAL SOLVENTS CORPORATION, Terre Haute, Indiana. 1 wall chart (gift).
- COOK, G. M., Chicago.  
1 specimen of plant from Texas (gift).
- COOPER, PROFESSOR W. S., Minneapolis, Minnesota.  
349 specimens of plants from Alaska and British Columbia (gift).
- CROSBY, MISS GRACE, Providence, Rhode Island.  
1 specimen of plant from Connecticut (gift).
- DEAM, C. C., Bluffton, Indiana.  
1 packet of seeds (gift).
- DEGENER, PROFESSOR OTTO, Honolulu, Hawaii.  
5 specimens of Hawaiian plants (gift).
- DIRECCIÓN DE ESTUDIOS BIOLÓGICOS, Chapultepec, Mexico.  
1 specimen of *Ochroma* fiber (gift).
- DIRECCIÓN GENERAL DE AGRICULTURA, Guatemala City, Guatemala.  
189 specimens of Guatemalan plants (gift).
- DOOLITTLE, MRS. HAROLD M., Onkama, Michigan.  
1 specimen of plant from Michigan (gift).
- DOUBLEDAY, ARNOLD, Chicago.  
12 specimens of mosses from Illinois (gift).
- EIFRIG, G., River Forest, Illinois.  
56 specimens of plants from the United States (gift).
- ENLOW, C. R., Gainesville, Florida.  
2 specimens of plants from Florida (gift).
- EWALD, GEORGE, Chicago.  
1 specimen of guayule rubber (gift).
- FARLOW HERBARIUM OF HARVARD UNIVERSITY, Cambridge, Massachusetts.  
141 specimens of cryptogamic plants (exchange).
- FIELD MUSEUM OF NATURAL HISTORY.  
Collected by B. E. Dahlgren and Emil Sella (Marshall Field Botanical Expedition to the Amazon):  
2,500 herbarium specimens from Brazil.  
Collected by Henry Field (Field Museum-Oxford University Joint Expedition to Mesopotamia):  
3 specimens of barley from Kish; 1 specimen of charred grain from Jemdet Nasr.  
Collected by Herbert Stevens (William V. Kelley-Roosevelts Expedition to Eastern Asia for Field Museum):  
2,403 specimens of plants from China.  
Collected by J. Eric Thompson (Second Marshall Field Archaeological Expedition to British Honduras):  
5 specimens of plants from British Honduras.  
Collected by F. Kingdon Ward (William V. Kelley-Roosevelts Expedition to Eastern Asia for Field Museum):  
400 specimens of plants from Burma and Indo-China.  
Collected by August Weberbauer (Marshall Field Expedition to Peru, 1929):  
888 herbarium specimens from Peru.  
Collected by Llewelyn Williams (Marshall Field Botanical Expedition to the Amazon):  
9,500 herbarium specimens from Peru; 1,088 wood specimens from Peru.  
Rockefeller Foundation Fund for Photographing Type Specimens:

- 819 negatives of type specimens in the herbarium of the Museu Goeldi; 13 photographic prints of type specimens in the Berlin Herbarium.
- Transferred from the Division of Photography:  
5,599 photographic prints.
- Purchases:
- 300 specimens of plants, 4 wood specimens, collected in Trinidad by W. E. Broadway.
- 342 specimens of plants collected in Ecuador by Brother Gemel-Firmín.
- 623 specimens of Mexican plants collected by M. E. Jones.
- 962 specimens of British Honduras plants collected by C. L. Lundell.
- 320 specimens of Venezuelan plants collected by Henry Pittier.
- 1,079 specimens of plants collected in Bolivia by José Steinbach.
- 500 specimens of Argentine plants collected by S. Venturi.
- 331 specimens of Argentine plants collected by W. Lossen.
- 100 specimens of plants collected in Chile by Professor Montero.
- 100 specimens of cryptogamic plants from Europe.
- 53 photographs of Mexican plants; 6 canna roots; 6 specimens of chile peppers; 1 specimen of bay leaves; 1 specimen of garlic; 1 specimen of horse-radish.
- FLAUTT, J. L., Chicago.  
2 specimens of plants from Georgia (gift).
- FRIESSER, JULIUS, Chicago.  
1 specimen of an Illinois plant (gift).
- FRITZ, PROFESSOR EMANUEL, Berkeley, California.  
6 sugar pine cones (gift).
- FROST, S. W., Arendtsville, Pennsylvania.  
251 specimens of plants from the Canal Zone (gift).
- GARFIELD PARK CONSERVATORY, Chicago.  
3 specimens of cycads (gift).
- GARRETT, PROFESSOR A. O., Salt Lake City, Utah.  
700 specimens of plants, chiefly from Utah (gift).
- GILBERT, A. H., Coral Gables, Florida.  
5 plants of *Zamia* (gift).
- GLYNN, JOHN E., Chicago.  
1 specimen of gourd (gift).
- GRANT, CLEVELAND P., Chicago.  
1 specimen of an Illinois oak (gift).
- GRAY HERBARIUM OF HARVARD UNIVERSITY, Cambridge, Massachusetts.  
92 specimens of plants from tropical America (exchange).
- GRISCOM, LUDLOW, Cambridge, Massachusetts.  
119 specimens of plants (exchange).
- GRONEMANN, CARL E., Elgin, Illinois.  
6 specimens of Illinois plants (gift).
- HAPEMAN, DR. HARRY, Minden, Nebraska.  
2 specimens of plants from Nebraska (gift).
- HAUGHT, OSCAR L., Negritos, Peru.  
259 specimens of plants from Peru (gift).
- HAYNIE, NELLIE V., Oak Park, Illinois.  
13 specimens of Illinois and Colorado plants (gift).
- HELLMAYR, DR. C. E., Chicago.  
14 specimens of European orchids (gift).
- HERRERA, PROFESSOR FORTUNATO L., Cuzco, Peru.  
551 specimens of Peruvian plants (gift).
- HOLMAN, JOHN P., Phoenix, Arizona.  
2 specimens of plants from Arizona (gift).
- INSTITUTO BIOLÓGICO DE DEFESA AGRÍCOLA E ANIMAL, Rio de Janeiro, Brazil.  
20 specimens of plants from Brazil (gift).

- JANSSON, K. P., Groton, Connecticut.  
2 specimens of plants from Connecticut (gift).
- JARDIN BOTANIQUE DE L'ETAT, Brussels, Belgium.  
200 specimens of plants from tropical America (exchange).
- JARDIN BOTANIQUE PRINCIPAL, Leningrad, U.S.S.R.  
130 specimens of plants from Mexico and northern South America (exchange).
- JOHANSEN, DR. HOLGER, La Lima, Honduras.  
52 specimens of plants from Honduras (gift).
- KANEHIRA, PROFESSOR R., Fuka, Japan.  
206 specimens of Peruvian plants (gift).
- KAUFFMANN, EMILIO, Belem, Brazil.  
81 specimens of plants from Brazil (gift).
- KENDALL, MRS. B. A., Elburn, Illinois.  
1 specimen of an Illinois plant (gift).
- KENOYER, PROFESSOR L. A., Kalamazoo, Michigan.  
150 specimens of plants from Michigan (gift).
- KOEPKE, ANTON, Chicago.  
1 pine cone from California (gift).
- LANCETILLA EXPERIMENT STATION, Tela, Honduras.  
101 specimens of Honduras plants (gift); 12 photographs of plants (gift).
- LANKESTER, C. H., Cartago, Costa Rica.  
17 specimens of plants (gift).
- LUNDELL, C. L., New York.  
210 specimens of plants from British Honduras (gift).
- MACBRIDE, J. FRANCIS, Chicago.  
10 specimens of plants from Idaho and Indiana (gift); 1 large sagebrush bush for exhibition purposes (gift).
- MACKAY, E. K., San Francisco, California.  
1 specimen of Jacquinia from Ecuador (gift).
- MANLEY, JOHN A., New Brunswick, New Jersey.  
1 horseshoe imbedded in apple wood (gift).
- MARIE-VICTORIN, PROFESSOR, Montreal, Canada.  
46 specimens of Canadian plants (exchange).
- MARTIN, MISS ELLA M., Greensboro, North Carolina.  
59 specimens of plants from North Carolina (gift).
- MARTINEZ, PROFESSOR MAXIMINO, Mexico City, Mexico.  
15 specimens of Mexican plants (gift).
- MATHIAS, MISS MILDRED E., St. Louis, Missouri.  
4 specimens of mosses from Indiana (gift).
- MERRILL, DR. ELMER D., Berkeley, California.  
2 specimens of plants from the Philippine Islands (gift).
- MEXIA, MRS. YNES, Berkeley, California.  
8 specimens of Mexican plants (gift).
- MINTON, T. W., AND COMPANY, Barbourville, Kentucky.  
2 samples of hickory wheel spokes (gift).
- MOSELEY, E. L., Bowling Green, Ohio.  
196 specimens of plants from Ohio (gift).
- MOXLEY, GEORGE L., Los Angeles, California.  
1 specimen of a cultivated plant (gift).
- NATURHISTORISCHES MUSEUM, BOTANISCHES ABTEILUNG, Vienna, Austria.  
671 specimens of European plants (exchange).

- NATURHISTORISKA RIKSMUSEET, BOTANISKA AFDELNING, Stockholm, Sweden.  
257 specimens of plants, chiefly from Cuba (exchange).
- NEVERMANN, FERDINAND, San José, Costa Rica.  
10 specimens of fungi from Costa Rica (gift).
- NEW YORK BOTANICAL GARDEN, New York.  
94 specimens of plants, chiefly from tropical America (exchange).
- NICHOLS, HENRY W., Chicago.  
1 packet of seeds (gift).
- OBERLIN COLLEGE, DEPARTMENT OF BOTANY, Oberlin, Ohio.  
480 specimens of plants, chiefly from California (gift).
- PANHANDLE LUMBER COMPANY, Spirit Lake, Idaho.  
1 pine board for exhibition purposes (gift).
- PARKS, H. B., San Antonio, Texas.  
1 specimen of plant from Texas (gift).
- PAY, CAPTAIN ARTHUR, Paramaribo, Surinam.  
5 specimens of *Sickingia* wood (gift).
- PICKREL WALNUT COMPANY, St. Louis, Missouri.  
3 walnut boards for exhibition purposes (gift).
- PITTIER, PROFESSOR H., Caracas, Venezuela.  
2 specimens of plants from Venezuela (gift).
- PLATANIA, PROFESSOR GAETANO, Catania, Italy.  
6 specimens of seaweeds (gift).
- POMONA COLLEGE, DEPARTMENT OF BOTANY, Claremont, California.  
915 specimens of plants of the United States and Mexico (exchange).
- PURPUS, DR. C. A., Zacuapam, Mexico.  
443 specimens of Mexican plants (gift).
- RAWSON, DR. VANCE, Chicago.  
1 specimen of seeds of *Pyrularia* from Kentucky (gift).
- RICHTER, CONRAD, Albuquerque, New Mexico.  
3 specimens of plants from New Mexico (gift).
- RIDGWAY, ROBERT, Olney, Illinois.  
1 specimen of an Illinois plant (gift).
- RIDGWAY, ROBERT, ESTATE OF.  
4,000 specimens, comprising the Robert Ridgway Herbarium of Illinois plants (bequest).
- ROYAL BOTANIC GARDENS, Kew, England.  
676 specimens of plants from tropical America (exchange).
- ROYAL BOTANIC GARDENS, Edinburgh, Scotland.  
401 specimens of plants from Paraguay (exchange).
- ST. CLAIR EXPERIMENT STATION, Port-of-Spain, Trinidad.  
1 plant specimen (gift).
- SALGUES MUSEUM, Brignoles, France.  
2 specimens of plants (gift); 1 packet of seeds (gift).
- SCHIPP, WILLIAM A., Belize, British Honduras.  
466 specimens of plants (gift).
- SCHRAMM, REV. E. E., Cabo Gracias a Dios, Nicaragua.  
56 specimens of plants from Nicaragua (gift).
- SHERFF, Dr. E. E., Chicago.  
33 specimens of plants (gift).
- SMITH, F. W., Guasave, Mexico.  
14 specimens of Mexican plants (gift).
- STANDLEY, MRS. FLORENCE A., Fort Myers, Florida.  
9 specimens of plants from Florida (gift); 4 packets of seeds (gift).
- STANDLEY, PAUL C., Chicago.  
471 specimens of plants of Illinois and Indiana (gift); 289 packets of seeds (gift).

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- STANDLEY, PAUL C., and DOUBLEDAY, ARNOLD, Chicago.  
420 specimens of plants, chiefly mosses, of Illinois and Indiana (gift).
- STANDLEY, PAUL C., and MACBRIDE, J. FRANCIS, Chicago.  
105 specimens of plants from Indiana (gift).
- STEVENSON, NEIL, Belize, British Honduras.  
5 specimens of palms from British Honduras (gift).
- STOKES, PROFESSOR W. E., Gainesville, Florida.  
1 specimen of plant from Florida (gift).
- STORK, PROFESSOR H. E., Northfield, Minnesota.  
668 specimens of plants from Costa Rica (gift).
- SUGAR PINE PRODUCERS OF CALIFORNIA (through Professor Emanuel Fritz), Berkeley, California.  
5 planks of sugar pine lumber (gift); collection of sugar pine cones (gift).
- TAPL, A., Elmhurst, Illinois.  
1 wood specimen (gift).
- TAYLOR, MRS. H. E., Kankakee, Illinois.  
1 specimen of an Illinois plant (gift).
- THOMPSON, J. W., Seattle, Washington.  
12 specimens of plants from Oregon (gift).
- THURING, WILLIAM, Chicago.  
4 ears of corn (gift).
- TURNER, DAY AND WOOLWORTH HANDLE COMPANY, INC., Louisville, Kentucky.  
4 specimens of ax and hammer handles (gift); samples of hickory nuts (gift).
- UNITED FRUIT COMPANY, Boston, Massachusetts.  
1 trunk of a cow-tree (*Couma guatemalensis*) from Guatemala (gift).
- UNITED STATES DEPARTMENT OF AGRICULTURE, OFFICE OF FOREIGN PLANT INTRODUCTION, Washington, D.C.  
1 specimen of plant from Colombia (gift).
- UNITED STATES DEPARTMENT OF AGRICULTURE, OFFICE OF SYSTEMATIC AGROSTOLOGY, Washington, D.C.  
312 specimens of grasses (exchange).
- UNITED STATES NATIONAL MUSEUM, Washington, D.C.  
1,001 specimens of plants (exchange); 144 hand specimens of woods (exchange).
- UNIVERSITY OF MICHIGAN HERBARIUM, Ann Arbor, Michigan.  
9 specimens of plants from the Canal Zone (gift).
- UNIVERSITY OF TEXAS, DEPARTMENT OF BOTANY, Austin, Texas.  
11 specimens of plants (gift).
- UPHOF, DR. J. C. T., Winter Park, Florida.  
4 specimens of Florida plants (gift).
- VAUGHAN'S SEED STORE, Chicago.  
8 samples of leguminous seeds (gift).
- VINCENT, MISS EDITH M., Chicago.  
8 specimens of mosses of Illinois and Indiana (gift).
- WALKER, E. T., Chicago.  
1 specimen of *Mucuna* seeds (gift).
- WALTHER, ERIC, San Francisco, California.  
1 specimen of a cycad (gift).
- WESTCOTT, CHARLES, River Forest, Illinois.  
1 specimen of wood of *Casuarina* (gift); 1 herbarium specimen (gift).
- WESTFALL, REV. FRED G., Greesham, Wisconsin.  
1 specimen of plant from Wisconsin (gift).

- WET MORE, R. H., Cambridge, Massachusetts.  
77 specimens of plants from the Canal Zone (gift).
- WILLIAMS, F. B., CYPRESS COMPANY, LTD., Patterson, Louisiana.  
4 cypress boards for exhibition purposes (gift).
- WILLIAMS, ICHABOD T., AND SONS, New York.  
3 panels of Cuban, Peruvian, and Mexican mahogany (gift).
- WILLIAMS, R. O., Port-of-Spain, Trinidad.  
3 seed pods of mahogany (gift).
- WITTE MEMORIAL MUSEUM, San Antonio, Texas.  
392 specimens of plants, chiefly from Texas (gift).
- WITTROCK, G. L., Chicago.  
121 specimens of mosses of Illinois (gift).
- WOLCOTT, A. B., Downers Grove, Illinois.  
1 specimen of an Illinois plant (gift).
- YALE UNIVERSITY, SCHOOL OF FORESTRY, New Haven, Connecticut.  
183 herbarium specimens, chiefly from tropical America (gift); 1 pod of milkweed from British Honduras (gift); 1 black willow board (gift); 17 specimens of crude gums (gift); 1 fruit of African mahogany (gift); 1 abnormal wood growth (gift).
- ZETEK, JAMES, Ancon, Canal Zone.  
1 specimen of plant from the Canal Zone (gift).

## DEPARTMENT OF GEOLOGY

- ACKERMAN, CHARLES N., Chicago.  
1 specimen fossil wood—Antioch, Illinois (gift); 1 specimen shell marl—Grass Lake, Illinois (gift); 1 specimen wood cut by fossil beaver—Grass Lake, Illinois (gift).
- ADAMSON, GEORGE H., Chicago.  
6 specimens serpentine—Havana, Cuba (gift).
- BAHR, A. W., New York.  
1 specimen fossil teleost fish—China (gift).
- BEDFORD, GEORGE, Morris, Illinois.  
Parts of skeletons of two individuals of mastodon, tusk and lower jaws of mammoth, skull and antlers of *Cervalces*, bones of bison—Minooka, Illinois (gift).
- BILHARZ, O. M., St. Louis, Missouri (deceased).  
4 teeth and 2 tusks of young mastodon—Flat River, Missouri (gift).
- BLOCHER, ARTHUR, Amboy, Illinois.  
87 specimens invertebrate fossils—Inlet, Lee County, Illinois (exchange).
- BOWER, WILLIAM, TOODIE and FRANKLIN, Argos, Indiana.  
Partial skeleton of *Mastodon americanus*—Argos, Indiana (gift).
- BREECE, RAYMOND, St. Louis, Missouri.  
1 polished moss agate—near Miles Canyon, Montana (gift).
- BRYANT, E. R., Osceola, Missouri.  
1 specimen weathered encrinal limestone—Osceola, Missouri (gift).
- BUHLIS, RICHARD, Little Rock, Arkansas.  
1 specimen gold in mariposite—Mariposa, California (gift).
- CHALMERS, WILLIAM J., Chicago.  
1 specimen collinsite—British Columbia (gift); 8 specimens crystallized minerals—Madagascar (gift); 26 specimens crystallized minerals—various localities (gift).
- CHERONIS, NICHOLAS, Chicago.  
7 specimens fluorescent and phosphorescent compounds (gift).

CHICAGO, MILWAUKEE, ST. PAUL  
AND PACIFIC RAILWAY,  
Chicago.

1 specimen sand concretion—  
Mobridge, South Dakota (gift).

CHRISTENSON, ARTHUR, Des-  
plaines, Illinois.

1 specimen eroded limestone—Des-  
plaines, Illinois (gift).

COLORADO MUSEUM OF NATU-  
RAL HISTORY, Denver, Colo-  
rado.

Prepared fossil skeleton of *Trigonias*  
*hypostylus* (exchange).

## CRANE, RICHARD T., JR., Chicago.

1 cabochon ruby—Ceylon (gift); 1  
chrysoberyl cat's-eye—Ceylon  
(gift); 1 cut aquamarine—Minas  
Geraes, Brazil (gift).

DOORENBOS, GARRETT G., Kala-  
mazoo, Michigan.

1 specimen oil sand—Jefferson  
County, Colorado (gift); 1 speci-  
men sand-lime concretion—  
Adams County, Colorado (gift).

DVORAK, JOSEPH, JR., Downers  
Grove, Illinois.

1 specimen fossil sponge—Downers  
Grove, Illinois (gift).

EASTER, DR. MABEL B., Portland,  
Oregon.

1 upper molar of *Elephas Columbi*—  
Port Townsend, Washington (gift).

## FEINBERG, A., Chicago.

1 specimen cave deposit—Chicago  
(gift).

FIELD MUSEUM OF NATURAL  
HISTORY.

Collected by O. C. Farrington:

1 specimen feldspar—West Paris,  
Maine.

1 specimen diabase—Medford, Mas-  
sachusetts.

Collected by the Crane Pacific Expedi-  
tion of Field Museum:

3 specimens rock—Suva, Fiji  
Islands.

Collected by the Marshall Field North  
Arabian Desert Expedition:

11 specimens desert sands—North  
Arabian Desert.

1 specimen loess—North Arabian  
Desert.

Collected by the Marshall Field Expedi-  
tion to Newfoundland:

24 specimens of minerals and ores—  
Newfoundland.

Collected by the Marshall Field Expedi-  
tion to New Mexico:

173 specimens volcanic products—San  
Mateo and Zuñi Mountains, New  
Mexico.

Prepared in Museum laboratory:

Model of an oil well—Lawrence-  
ville, Illinois.

Purchases:

8 specimens fossil echinoids—Levy  
County, Florida.

2 specimens sand concretions—Im-  
perial Valley, California.

2 specimens illustrating wind ero-  
sion—Indio, California.

1 specimen tourmaline—California.

1 specimen lodestone—Wasatch  
Mountains, Utah.

1 cut black opal—Australia.

2 specimens fossil crinoids—Bund-  
enbach, Germany.

35 specimens synthetic gems.

1 specimen garnet (cut).

1 specimen blue zircon (cut).

Portion of stone meteorite with crust  
—Troup, Texas.

14 specimens altered meteorites—  
Brenham, Kansas.

Etched section of Weekeroo meteor-  
ite—Weekeroo, South Australia.

2 skulls and jaws of *Protoreodon* sp.  
—Ouray, Utah.

Skull and jaws and other bones of  
*Achaenodon robustus*—Uintah  
Basin, Utah.

Partial skeleton of *Hyrachyus*—  
Utah.

Relief map of Glacier Park.

## FREDERICK, F. G., Chicago.

1 human skull—Montana (gift); 1  
specimen Baculites—Montana  
(gift); 1 specimen limonite and  
quartz—Brazil (gift); 1 specimen  
flint nodule—Montana (gift).

## FRISZ, J. W., Waveland, Indiana.

1 specimen calcareous tufa with  
sphagnum—Waveland, Indiana  
(gift).

- GARDEN, FRANK M., Lake Forest, Illinois.  
1 specimen Lorraine quartzite—Searchmont, Canada (gift).
- GEBAUER, HENRY, Chicago.  
7 specimens minerals—various localities (gift); 4 specimens clay stones—Middletown, Connecticut (gift); 1 specimen fossil fish—Lebanon, Syria (gift); 381 specimens invertebrate fossils and fossil plants—various localities (gift).
- GRAMS, WILLIAM F. C., Desplaines, Illinois.  
4 specimens fossil coral and 3 photographs—Cato, Wisconsin (gift).
- HALVORSEN, E. E., Coalinga, California.  
73 specimens invertebrate fossils—San Benito County, California (gift).
- HARBICHT, DARWIN, Ingomar, Montana.  
1 jaw of fossil fish, 1 vertebra of fossil fish, 1 specimen fossil gastropod—Grand View, Idaho (gift).
- HUBBARD, F. N., Homewood, Illinois.  
2 specimens hematite geodes—near Murfreesboro, Arkansas (gift).
- ILLINOIS STATE MUSEUM, Springfield, Illinois.  
1 cast of the 9-pound individual of the Tilden meteorite—Tilden, Illinois (gift).
- JENNINGS, A. A., Chicago.  
1 specimen dendrites—Bisbee, Arizona (gift).
- JOHNSTON, W. J., Ingomar, Montana.  
2 specimens fossil Baculites—Ingomar, Montana (gift).
- KEESTER, LIEUTENANT-COMMANDER W. J., Curtis Bay, Maryland.  
5 specimens volcanic dust—Katmai volcano, Alaska (gift).
- KEESTER, J. H., Cicero, Illinois.  
1 specimen quartz crystals in quartz, 62 specimens quartz crystals, 2 specimens quartz crystals in matrix—McCurtain County, Oklahoma (gift).
- KOELNAU, LUDWIG A. VON GLAENTZKE, Chicago.  
17 specimens agate and concretions—Wisconsin and Chicago (gift).
- KRANZ, LEROY, Harvey, Illinois.  
7 specimens fossil plants—Mazon Creek, Illinois (gift).
- LAHDE, CLARENCE, Harvey, Illinois.  
7 specimens fossil plants—Mazon Creek, Illinois (gift).
- LETL, FRANK H., Chicago.  
33 specimens invertebrate fossils—Amboy, Illinois (gift); 5 specimens fossil plants—Mazon Creek, Illinois (gift); 3 specimens fossil plants—near Coal City, Illinois (gift).
- LOVE, CHARLES A., Aurora, Illinois.  
3 teeth of fossil shark, 3 teeth of modern shark (gift).
- LUKENS, W. D., British Columbia.  
1 specimen collinsite—British Columbia (gift).
- MACDAIRMID, MRS. FLORENCE, Isle of Wight, England.  
4 specimens invertebrate fossils—Isle of Wight, England (gift).
- MILLAR, JOHN R., Chicago.  
15 specimens fossil plants—Moore Mine, Terre Haute, Indiana (gift).
- MORRIS, MRS. H. C., Chicago.  
1 specimen crude petroleum—Reagan County, Texas (gift).
- NICHOLSON, VICTOR, Chicago.  
1 specimen glauconite—New Jersey (gift).
- NIEH, PAUL S., Chicago.  
1 specimen sphalerite in a concretion, 1 specimen double concretion, 8 specimens fossil plants—Mazon Creek, Illinois (gift).
- PATTERSON, BRYAN, Chicago.  
6 specimens invertebrate fossils—various localities (gift); 8 specimens fossil plants—Mazon Creek, Illinois (gift).
- PATTERSON, COLONEL J. H., Cairo, Egypt.  
9 specimens invertebrate fossils—Ghizeh, Egypt (gift).

- PCH, MRS. MARY, Chicago.  
2 specimens fossil coral—Indiana (gift).
- PETERSMEYER, E. C., Oklahoma.  
1 specimen hematite concretion—Breckenridge, Texas (gift).
- PETERSON, WILLIAM A., Chicago.  
Tusk of fossil mammoth—Yukon River, Alaska (gift).
- PFEIFER, MRS. H., Des Moines, Iowa.  
1 specimen azurite, 1 specimen quartz colored by copper compound—Arizona (gift).
- PITTS, WILLIAM B., Sunnyvale, California.  
5 specimens jasper, chalcedony and priceite, 4 polished stones, 1 specimen tooth of fossil horse—Barstow, California (gift).
- PLANER, W. F., Hammond, Indiana.  
7 specimens orthoclase crystals—Bowie, Colorado (gift).
- PRASUHN, JOHN G., Chicago.  
25 specimens crinoid geodes, 6 specimens chalcedony geodes, 5 specimens quartz geodes—Morgan County, Indiana (gift).
- PURDUE UNIVERSITY, West Lafayette, Indiana.  
Portion of stone meteorite with crust—Lafayette, Indiana (gift).
- RASSWEILER, AUGUST, Chicago.  
1 specimen limonite concretion—Idar, Germany (gift).
- RITCHIE BROTHERS, Saratoga Springs, New York.  
5 specimens fossil algae—Saratoga Springs, New York (gift).
- SCHERNIKOW, ERNEST, San Francisco, California.  
16 specimens crystallized minerals—California (gift).
- SCOTT, PROFESSOR W. B., Princeton University.  
9 drawings of extinct animals from the Santa Cruz formation—Patagonia (gift).
- SELLA, EMIL, Chicago.  
4 specimens fossil plants—Scranton, Pennsylvania (gift).
- SOSNOVEC, V., St. Louis, Missouri.  
3 specimens fossil coral, 5 specimens concretions—St. Louis, Missouri (gift).
- STANDARD OIL COMPANY (Indiana), Chicago.  
1 chart of oil refinery, 105 specimens products of petroleum—Whiting, Indiana (gift).
- STEWART, H. D., Galesburg, Illinois.  
5 specimens invertebrate fossils—near Galesburg, Illinois (gift).
- STOCKON, ALEX, Allegan, Michigan.  
1 specimen conglomerate—Allegan, Michigan (gift).
- THOMAS, E. T., Wayne, West Virginia.  
4 specimens casts of concretions—Tennessee (gift).
- TINSLEY, MRS. JAMES H., Chicago.  
1 specimen fluorite—Rosiclare, Illinois (gift).
- UNIVERSITY OF CHICAGO, Chicago.  
Articulated skeleton of *Oreodon gracilis*; articulated skeleton of *Merychylus*; articulated skull and jaws of *Poebrotherium*—Nebraska (exchange).
- VONDRASEK, FRANK, Cicero, Illinois.  
6 specimens minerals—Arkansas (gift).
- WALKER, DR. JAMES W., Chicago.  
1 specimen of fossil cephalopod—Whitby, England (gift).
- WANDT, CARL, Hazelcrest, Illinois.  
6 specimens fossil plants—Mazon Creek, Illinois (gift).
- WILLIAMS, MRS. S. A., Chicago.  
2 sand-lime concretions—El Centro, California (gift).
- WINHOLTZ, JERRY E., Chicago.  
1 specimen fossil mollusk—Dupage County, Illinois (gift).
- WORK, MRS. JOSEPH W., Evanston, Illinois.  
45 specimens cut and mounted gems, 4 specimens quartz crystals—various localities (gift).

## DEPARTMENT OF ZOOLOGY

- AMERICAN MUSEUM OF NATURAL HISTORY, New York.  
2 birdskins—Ecuador (exchange).
- ASTOR, LORD, London, England.  
1 stoat skin and skull—England (gift); 1 wildcat skin and skull—Scotland (gift).
- BENNORTH, DONALD, Elgin, Illinois.  
7 fishes—Elgin, Illinois (gift).
- BERBRICH, M., Chicago.  
1 salamander—Algonquin, Illinois (gift).
- BIEDERMAN, CHARLES R., Hereford, Arizona.  
3 camel crickets—Huachuca Mountains, Arizona (gift).
- BOOTH, O. E., Des Moines, Iowa.  
1 moth—Des Moines, Iowa (exchange).
- BUREAU OF SCIENCE, Philippine Islands.  
60 snakes—Philippine Islands (gift).
- BURT, CHARLES E., New York.  
20 frogs, 8 lizards, 5 snakes—various localities (exchange).
- CAMERON, DR. WILL J., Chicago.  
2 lizards—Namib Desert, southwest Africa (gift).
- CHICAGO ACADEMY OF SCIENCES, Chicago.  
1 blue goose—Louisiana (gift).
- CLARK, E. W., Detroit, Michigan.  
5 Butler's garter snakes (gift).
- COCKERELL, PROFESSOR T. D. A., Boulder, Colorado.  
1 set scale-insects—Feernza, Central Asia (gift).
- CONOVER, H. B., Chicago.  
1 pink-footed goose—Cambridge, England (gift); 1 cinnamon teal—Brigham, Utah (gift); 1 ring-necked duck—Swan Lake, Illinois (gift).
- CROOK, DR. R. L., Yachow, China.  
1 snake, 1 giant salamander—Yachow, China (gift).
- DICK, J. H., Chicago.  
1 small gecko (gift).
- EMERSON, DR. ALFRED E., Chicago.  
2 frogs, 8 snakes—Kartabo, British Guiana (gift); 369 named termites—mostly British Guiana (gift).
- ERWIN, RICHARD P., Boise, Idaho.  
2 scorpions, 2 pseudoscorpions, 1 spider, 5 toad bugs—Idaho (gift).
- FALK, MARTIN, Chicago.  
1 prairie rattlesnake—Crane, Texas (gift).
- FARLEY, R. B., Philadelphia, Pennsylvania.  
1 blue goose egg—Gull Lake, Michigan (gift).
- FELGER, JESSE L., West Point, Mississippi.  
1 horn snake skin—Mississippi (gift).
- FELLIPONE, FLORENTINO, Montevideo, Uruguay.  
15 birdskins—Montevideo, Uruguay (gift).
- FIELD, HENRY, Chicago.  
15 mollusks—Plymouth, England (gift).
- FIELD MUSEUM OF NATURAL HISTORY.  
Collected by George K. Cherrie (James Simpson—Roosevelts Asiatic Expedition):  
30 shells—Chinese Turkestan.  
Collected by Colonel J. C. Faunthorpe (Marshall Field Expedition to British India):  
3 mammal skins, skulls and skeletons—India.  
Collected by Ashley Hine (Field Museum Arizona Expedition):  
323 birds, 3 mammals—Arizona and British Columbia, Canada.  
Collected by Colonel Theodore Roosevelt, Kermit Roosevelt, C. Suydam Cutting, Harold Coolidge, Jr.,

- Russell Hendee, Josselyn Van Tyne, Ralph Wheeler, Herbert Stevens (William V. Kelley-Roosevelts Expedition to Eastern Asia for Field Museum):
- 1,479 mammal skins and skulls, 4,037 birds, 453 reptiles and batrachians, 438 fishes, 7,833 insects—Yunnan and Szechwan, China; French Indo-China, Siam, Philippine Islands, Borneo.
- Collected by Karl P. Schmidt, A. W. Herre, Walter A. Weber and Frank C. Wonder (Crane Pacific Expedition of Field Museum):
- 881 mammal skins and skulls, 1,200 birds, 2,008 reptiles and batrachians, 686 fishes, 928 insects, 368 crustaceans, 132 mollusks, 100 worms, 25 echinoderms—Haiti, Panama, Pacific Islands, East Indies.
- Collected by J. Eric Thompson (Second Marshall Field Archaeological Expedition to British Honduras):
- 4 mammal skins and skulls, 17 birds—Arenal, British Honduras.
- Collected by Bruce Thorne and George Coe Graves II (Thorne-Graves Arctic Expedition of Field Museum):
- 7 walrus, 5 caribou—Alaska.
- Collected by Third Asiatic Expedition of American Museum of Natural History with Field Museum cooperating:
- 197 mammals—China.
- Collected by Harold A. White, John Coats, C. J. Albrecht, George E. Carey, Jr. (Harold White-John Coats Abyssinian Expedition of Field Museum):
- 85 mammals, 73 birds, 22 reptiles and batrachians, 4 insects—Abyssinia and Tanganyika Territory.
- Collected by J. E. Williamson and L. L. Pray (Field Museum-Williamson Undersea Expedition to the Bahamas):
- 97 fishes, 1 frog, 502 crabs, shells, corals and sea fans—Bahamas.
- Purchases:
- 4 giant frogs—Cameroon, Africa.  
1 Gila monster—Globe, Arizona.  
12 mammals—Bolivia.
- 14 frogs, 126 lizards—St. Thomas and British Virgin Islands.  
4 peripatus—Trinidad, British West Indies.  
1 Rodgers's fulmar—Samoa, California.  
2 paroquets—Santa Marta, Colombia.  
4 birds—Ecuador.  
45 mammal skins and skulls—Ecuador.  
6 rodents—Grafton, North Dakota.  
3 least weasels—Grafton, North Dakota.  
44 birds—various foreign localities.  
1 ibis—Merida, Venezuela.  
6 fishes.  
1 dogfish.  
1 large cod.
- FRANZEN, A. J., Chicago.  
2 Brewer's blackbirds—Richmond, Wisconsin (gift); 25 bird lice—Michigan (gift).
- FRIESSER, JULIUS, Chicago.  
4 polar bears, 1 leopard—Alaska and Abyssinia (exchange); 1 toad—Schreiber, Ontario (gift).
- GENERAL BIOLOGICAL SUPPLY HOUSE, Chicago.  
6 fishes—Fort Myers, Florida (gift); 1 salamander, 2 turtles—various localities (gift).
- GRANT, CLEVELAND P., Chicago.  
1 bald eagle—Michigan City, Indiana (gift).
- GRONEMANN, CARL F., Elgin, Illinois.  
1 frog—Elgin, Illinois (gift).
- HAGENBECK BROTHERS COMPANY, Stellingen, Germany.  
1 sea elephant skeleton (gift).
- HIXON, G. C., Chicago.  
2 mammals—Lake Forest, Illinois (gift).
- JONSTO, MRS. AGNES, Chicago.  
1 marsh hawk—Willow Springs, Illinois (gift); 1 Tennessee warbler—Chicago (gift).
- KELLEY, J. M., Chicago.  
1 spotted salamander—Adams, New York (gift).

- KELLOGG, W. K., Battle Creek, Michigan.  
1 trumpeter swan, 3 greater snow goose eggs—Augusta, Michigan (gift).
- KENDALL, DR. W. C., Freeport, Maine.  
19 tomcod—Casco Bay, Maine (gift).
- KENTUCKY GAME AND FISH COMMISSION, Louisville, Kentucky.  
1 spotted tinamou—Kentucky (gift).
- LAMB, E. WENDELL, Bunker Hill, Indiana.  
2 water snakes—Bunker Hill, Indiana (gift).
- LETL, FRANK H., Chicago.  
2 small mammal skins and skulls, 1 snake—Illinois (gift).
- LEWY, DR. A. M., Chicago.  
1 bat, 4 lizards, 2 snakes, 1 frog—Tucson, Arizona (gift).
- LINDAHL, SETH, Chicago.  
5 gross shell vials (gift).
- LUNQUIST BROTHERS, Chicago.  
1 spider (gift).
- MEDCALF, FRANK, Seattle, Washington.  
1 mounted red squirrel—Suffolk, England (gift).
- MOONEY, JAMES, Deerfield, Illinois.  
11 salamanders, 1 snake—Deerfield, Illinois (gift).
- MOSELEY, E. L., Bowling Green, Ohio.  
2 least weasels—Ohio (gift).
- MUSEUM OF COMPARATIVE ZOOLOGY, Cambridge, Massachusetts.  
3 birds—Panama (exchange); 1 bird—Cameroon, Africa (exchange); 2 caecilians—Tanganyika Territory, Africa (exchange).
- MUSSELMAN, T. E., Quincy, Illinois.  
1 albino mallard—Quincy, Illinois (gift).
- NEUMANN, OSCAR, Charlottenburg, Germany.  
66 birds—South America, Europe, and Asia (exchange).
- NEUSIUS, WILLIAM, Yorkville, Illinois.  
1 albino crow—Yorkville, Illinois (gift).
- PALMER, JESSE T., Bocas del Toro, Panama.  
1 lizard skin, 1 iguana—Panama (gift).
- PARRISH, LEE H., Tulsa, Oklahoma.  
3 rhinoceros iguanas—Haiti (gift).
- PATTERI, ANTHONY, Chicago.  
1 belted kingfisher—Chicago (gift).
- PEET, FRED N., Chicago.  
3 Canadian brook trout—Canada (gift).
- PETERSEN, MRS. LINA, Ocean Springs, Mississippi.  
2 hermit crabs—Horn Island, Mississippi (gift).
- PORTER, F. M., Gladstone, Illinois.  
1 woodchuck—Gladstone, Illinois (gift).
- PRAY, L. L., Homewood, Illinois.  
1 jumping mouse—Porter County, Indiana (gift).
- RAKLIOS, JOHN, Chicago.  
1 small boa constrictor—Chicago (gift).
- RAWSON, FREDERICK H., Chicago.  
1 mounted trunkfish (gift).
- REED, C. J., Maywood, Illinois.  
1 goldfinch—Nugard, Illinois (gift).
- RUSSELL, J. W., Chicago.  
1 old squaw duck—Ravinia, Illinois (gift).
- SCHMIDT, F. J. W., Stanley, Wisconsin.  
2 mammal skins and skulls—Clark County, Wisconsin (gift); 2 wood turtles—Waupaca, Wisconsin (gift); 20 salamanders, 128 frogs, 12 turtles, 12 turtle eggs, 17 lizards, 104 snakes—Wisconsin (gift).
- SPLAYT, LOUIS J., Chicago.  
1 red-tailed hawk—Channon, Illinois (gift).

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- SPRAGUE, COLONEL A. A., Chicago.  
2 framed paintings of birds by Louis Agassiz Fuertes (gift).
- STEVENS, MISS ETHEL ELIZABETH, Zamboanga, Philippine Islands.  
1 crocodile — Zamboanga, Philippine Islands (gift).
- STUIVE, DERK, Momence, Illinois.  
1 snake—Momence, Illinois (gift).
- SVIHLA, A. and R. D., Ann Arbor, Michigan.  
2 pikas—Daggett County, Utah (gift).
- VACIN, E. T., Chicago.  
1 muskalonge—Moose Lake, Wisconsin (gift).
- WEED, ALFRED C., Chicago.  
1 snake—Chicago (gift).
- WILLIAMSON, E. B., Bluffton, Indiana.  
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- WOLCOTT, A. B., Downers Grove, Illinois.  
1 small rodent—Downers Grove, Illinois (gift).
- WOOD, D. D., Sandakan, British North Borneo.  
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- WYATT, ALEX. K., Chicago.  
5 insects—Illinois and Wisconsin (gift).

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From Division of Photography: 783 slides for extension lectures; 34 negatives for extension lectures; 581 prints for files.

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FIELD MUSEUM OF NATURAL HISTORY.

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Made by Karl P. Schmidt: 200 negatives of natives, landscapes and general views taken on Cornelius Crane Pacific Expedition.

Made by J. Eric Thompson: 458 negatives of natives, landscapes, seascapes and general views in British Honduras.

Made by Llewelyn Williams: 129 negatives of natives and general views in Peru and Brazil.

HANSEN, ERIK K., Chicago.

1 enlarged print of Eskimos in house, Angmagsalik, East Greenland (gift).

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 Royal Society of South Africa, Cape Town.  
 Société d'Histoire Naturelle de l'Afrique du Nord, Algiers.  
 Société de Géographie d'Alger, Algiers.  
 Société des Sciences Naturelles du Maroc, Rabat.  
 South African Association for the Advancement of Sciences, Cape Town.  
 South African Department of Agriculture, Pretoria.  
 South African Museum, Cape Town.

#### ARGENTINA:

Academia Nacional de Ciencias, Cordova.  
 Instituto Geográfico Argentina, Buenos Aires.  
 Ministerio de Agricultura, Buenos Aires.  
 Sociedad Argentina de Ciencias Naturales, Buenos Aires.  
 Sociedad Ornitológica del Plata, Buenos Aires.  
 Sociedad Physis, Buenos Aires.  
 Universidad Nacional de Tucumán, Tucumán.

#### AUSTRALIA:

Australian Museum, Sydney.  
 Botanic Gardens and Government Domains, Sydney.  
 Commonwealth of Australia, Melbourne.  
 Department of Agriculture, Adelaide.

Department of Agriculture, Queensland.  
 Department of Agriculture, Sydney.  
 Department of Agriculture, Wellington.  
 Department of Agriculture of Western Australia, Perth.  
 Department of Fisheries, Sydney.  
 Department of Mines, Brisbane.  
 Department of Mines, Sydney.  
 Department of Public Health, Canberra.  
 Field Naturalists' Club, Melbourne.  
 Forestry Commission, Sydney (gift).  
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 Melbourne University, Melbourne.  
 Ornithological Society of South Australia, Adelaide.  
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 Royal Society of South Australia, Adelaide.  
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 South Australian Museum, Adelaide.  
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 Naturhistorisches Museum, Vienna.  
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 Zoologisch-Botanische Gesellschaft, Vienna.

## BELGIUM:

Académie Royale de Belgique, Brussels.  
 Académie Royale des Sciences, Brussels.  
 Direction d'Agriculture, Brussels.  
 Institut Botanique Léo Errera, Brussels.  
 Jardin Botanique de l'Etat, Brussels.  
 Musée Royal d'Histoire de Belgique, Brussels.  
 Musées Royaux du Cinquentaenaire, Brussels.  
 Nederlandsch. Phytopathologische (Plantenziekten) Vereenigen, Ghent.  
 Société Belge de Géologie, Brussels.  
 Société de Botanique, Brussels.  
 Société Royale de Sciences, Brussels.  
 Université de Louvain, Louvain.

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 Ministerio de Agricultura, Rio de Janeiro.  
 Museo Nacional, Rio de Janeiro.  
 Secretaria de Agricultura, Comercio e Obras Publicas, Sao Paulo.  
 Serviço Geologico e Mineralogico, Rio de Janeiro.

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Board of Agriculture, Georgetown.  
 Forestry Department, Georgetown.  
 Royal Agricultural and Commercial Society, Demara.

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Department of Agriculture, Bridgetown, Barbados.  
 Trinidad and Tobago Department of Agriculture, Port of Spain, Trinidad.

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 Department of Agriculture, Victoria, British Columbia.  
 Department of Mines, Ottawa, Ontario.  
 Department of Mines, Toronto, Ontario.  
 Department of the Interior, Geological Survey, Ottawa, Ontario.  
 Entomological Society of Ontario, Toronto, Ontario.  
 Geological Survey, Ottawa, Ontario.

Horticultural Societies, Toronto, Ontario.  
 McGill University, Montreal, Quebec.  
 National Museum, Ottawa, Ontario.  
 Nova Scotian Institute of Natural Sciences, New Brunswick, Nova Scotia.  
 Provincial Museum, Toronto, Ontario.  
 Provincial Museum, Victoria, British Columbia.  
 Royal Canadian Institute, Toronto, Ontario.  
 Royal Society of Canada, Ottawa, Ontario.  
 Université de Montreal, Montreal, Quebec.  
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Colombo Museum, Colombo.  
 Department of Agriculture, Colombo.

## CHILE:

Revista de bibliografía, Santiago.  
 Sociedad Nacional de Minería, Santiago.

## CHINA:

Fan Memorial, Institute of Biology, Peiping.  
 Geological Society, Peiping.  
 Geological Survey, Peiping.  
 Metropolitan Library, Peiping.  
 National Research Institute, Shanghai.  
 Peiping Union Medical College, Department of Anatomy, Peiping.  
 Royal Asiatic Society of North China, Shanghai.  
 Science Society of China, Shanghai.  
 University of Nanking, Nanking.

## COLOMBIA:

Ministerio de Industrias, Bogotá.  
 Sociedad Colombiana de Ciencias Naturales, Bogotá.

## CUBA:

Academia Nacional de Artes y Letras, Havana.  
 Universidad de Habana, Havana.

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Académie Tchèque des Sciences, Prague.  
 Deutscher Naturwissenschaftlich-Medizinischer Verein für Böhmen "Lotos," Prague.

## DENMARK:

- Dansk Botanisk Forening, Copenhagen.
- Dansk Geologisk Forening, Copenhagen.
- Dansk Naturhistorisk Forening, Copenhagen.
- Dansk Ornithologisk Forening, Copenhagen.
- Société Royale des Antiquaires du Nord, Copenhagen.
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- Biblioteca Nacional, Quito.

## FEDERATED MALAY STATES:

- Federated Malay States Museums, Kuala Lumpur.
- Malayan Agricultural Society, Kuala Lumpur.
- Royal Asiatic Society, Malayan Branch, Singapore.

## FIJI ISLANDS:

- Department of Agriculture, Suva.
- Department of History and Ethnology, Suva.
- Fijian Society, Suva.

## FINLAND:

- Societas pro Fauna et Flora Fennica, Helsingfors.
- Suomen Museo, Helsingfors.

## FRANCE:

- Académie des Sciences, Paris.
- Ecole d'Anthropologie, Paris.
- Musée Guimet, Paris.
- Muséum d'Histoire Naturelle, Lyons.
- Muséum National d'Histoire Naturelle, Paris.
- Nature, Paris.
- Société Botanique de France, Paris.
- Société Dauphinoise d'Ethnologie et d'Anthropologie, Grenoble.
- Société d'Histoire Naturelle d'Ardenne, Ardennes.
- Société d'Histoire Naturelle, Toulouse.
- Société de Géographie, Paris.
- Société des Américanistes, Paris.
- Société Linnéenne, Bordeaux.
- Société Nationale d'Acclimatation de France, Paris.
- Société d'Agriculture, Sciences et Arts, Angers.
- Société Nationale d'Horticulture de France, Paris.

Société Scientifique du Bourbonnais et du Centre de France, Moulins.

## GERMANY:

- Akademie der Wissenschaften, Berlin.
- Akademie der Wissenschaften, Heidelberg.
- Akademie der Wissenschaften, Leipzig.
- Bayerische Akademie der Wissenschaften, Munich.
- Bayerische Botanische Gesellschaft, Munich.
- Bayerische Staatsbibliothek, Munich.
- Botanischer Garten und Botanisches Museum, Berlin.
- Botanischer Verein der Provinz Brandenburg, Berlin.
- Deutsche Dendrologische Gesellschaft, Bonn-Poppelsdorf.
- Deutsche Entomologische Gesellschaft, Berlin.
- Deutsche Gesellschaft für Anthropologie, Ethnologie und Urgeschichte, Berlin.
- Deutsche Morgenländische Gesellschaft, Leipzig.
- Deutscher Seefischerei Verein, Berlin.
- Deutsches Entomologisches Institut, Berlin.
- Frankfurter Gesellschaft für Anthropologie, Ethnologie und Urgeschichte, Frankfurt on the Main.
- Geographische Gesellschaft, Hamburg.
- Georg-August-Universität, Göttingen.
- Gesellschaft für Erdkunde, Berlin.
- Gesellschaft für Erdkunde, Leipzig.
- Hamburgische Universität, Hamburg.
- Historischer Verein für Schwaben und Neuburg, Augsburg.
- Mineralogisch-Geologisches Museum, Dresden.
- Museum für Tierkunde und Völkerkunde, Dresden.
- Museum für Völkerkunde, Berlin.
- Museum für Völkerkunde, Hamburg.
- Naturforschende Gesellschaft, Göttingen.
- Naturforschende Gesellschaft, Nuremberg.
- Naturhistorischer Verein der Preussischen Rheinlande und Westfalens, Bonn.

Naturhistorischer Verein für Naturkunde, Wiesbaden.  
 Naturwissenschaftlicher Verein, Bremen.  
 Ornithologische Gesellschaft in Bayern, Munich.  
 Sächsische Akademie der Wissenschaft, Leipzig.  
 Senckenbergische Naturforschende Gesellschaft, Frankfurt on the Main.  
 Thüringischer Botanischer Verein, Weimar.  
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 Universitäts Bibliothek, Marburg.  
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 Universitäts Bibliothek, Tubingen.  
 Verein für Vaterländische Naturkunde, Württemberg.  
 Verein für Volkskunde, Berlin.  
 Zoologisches Museum, Berlin.

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 Ashmolean Museum, Oxford.  
 Ashmolean Natural History Society, Oxford.  
 Birmingham Natural History and Philosophical Society, Birmingham.  
 Brighton and Hove Natural History and Philosophical Society, Brighton.  
 Bristol Museum, Bristol.  
 British Library of Political Science, London.  
 British Museum, London.  
 British Museum (Natural History), London.  
 Cambridge Philosophical Society, Cambridge.  
 Cambridge University, Cambridge.  
 Dove Marine Laboratory, Cullercoats.  
 Fisheries Board, Edinburgh.  
 Geological Society, Liverpool.  
 Geological Survey of England and Wales, London.  
 Geological Survey of Scotland, Edinburgh.  
 Geologists' Association, London.  
 Hull Museum, Hull.  
 Japan Society of London.  
 Lancashire Sea Fisheries Laboratory, Liverpool.  
 Leicester Museum, Art Gallery and Library, Leicester.  
 Linnean Society, London.  
 Liverpool Biological Society, Liverpool.

Liverpool Free Public Museum, Liverpool.  
 London School of Economics and Political Science, London.  
 Manchester Literary and Philosophical Society, Manchester.  
 Manchester Museum, Manchester.  
 Marine Biological Association, Plymouth.  
 National Indian Association, London.  
 National Museum of Wales, Cardiff.  
 Oriental Ceramic Society, London (gift).  
 Royal Anthropological Institute of Great Britain and Ireland, London.  
 Royal Asiatic Society of Great Britain and Ireland, London.  
 Royal Botanic Gardens, Kew.  
 Royal Colonial Institute, London.  
 Royal Geographical Society, London.  
 Royal Horticultural Society, London.  
 Royal Society, London.  
 Royal Society of Arts, London.  
 Royal Society of Edinburgh.  
 School of Oriental Studies, London.  
 South London Entomological and Natural History Society, London.  
 Speleological Society, Bristol.  
 Tring Zoological Museum, Tring.  
 Victoria and Albert Museum, London.  
 Wellcome Research Laboratories, London.  
 Zoological Society, London.

## GUATEMALA:

Sociedad de Geografía é Historia, Guatemala City.

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 Musée National e Hongrois, Budapest.  
 Royal Hungary School of Engineering, Mines and Forests, Budapest.

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 Archaeological Department, Hyderabad.  
 Archaeological Survey, Allahabad.  
 Archaeological Survey, Burma, Rangoon.  
 Archaeological Survey, Calcutta.  
 Archaeological Survey, Madras.  
 Asiatic Society of Bengal, Calcutta.  
 Bihar and Orissa Research Society, Patna.  
 Botanical Survey, Calcutta.  
 Department of Agriculture, Bombay.

Department of Agriculture, Madras.  
 Department of Agriculture, Poona.  
 Department of Agriculture, Pusa.  
 Geological, Mining and Metallurgical Society of India, Calcutta.  
 Geological Survey, Calcutta.  
 Government Cinchona Plantations, Calcutta.  
 Government of India, Calcutta.  
 Government Museum, Madras.  
 Indian Botanical Society, Calcutta.  
 Indian Museum, Calcutta.  
 Mining and Geological Institute of India, Calcutta.  
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 Royal Botanic Garden, Calcutta.  
 University of Calcutta, Calcutta.  
 Zoological Survey of India, Calcutta.

## IRELAND:

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 National Museum, Dublin.  
 Royal Irish Academy, Dublin.  
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## ITALY:

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 Museo Civico di Storia Naturale, Genoa.  
 R. Accademia delle Scienze, Naples.  
 R. Accademia delle Scienze, Turin.  
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 R. Orto Botanico Giardino Coloniale, Palermo.  
 R. Scuola Superiore di Agricoltura, Portici.  
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 Società dei Naturalisti, Naples.  
 Società di Scienze Naturali ed Economiche, Florence.  
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 Società Toscana di Scienze Naturali, Pisa.

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 Deutsche Gesellschaft für Natur- und Völkerkunde Ostasiens, Tokyo.  
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 Imperial Geological Society, Tokyo.

Imperial Geological Survey, Tokyo.  
 Imperial Household Museums, Tokyo.  
 Imperial University, Tokyo.  
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 Ornithological Society, Tokyo.  
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 Tokyo Botanical Society, Tokyo.

## JAVA:

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 Department of Agriculture, Buitenzorg.  
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 K. Natuurkundige Vereeniging in Nederlandsch-Indie, Weltevreden.

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Cawthron Institute, Nelson.  
Department of Agriculture, Wellington.  
Department of Mines, Geological Survey, Wellington.  
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New Zealand Institute, Wellington.
- NORWAY:**  
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Norsk Geologisk Forening, Oslo.  
Tromsø Museum, Tromsø.  
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Palestine Oriental Society, Jerusalem.
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Musei Polonici Historiae Naturali, Warsaw.  
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Universidade de Lisboa, Lisbon.
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Sociedad Espanola de Historia Natural, Madrid.
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Naturforschende Gesellschaft, Zürich.  
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- UNION OF SOCIALISTIC SOVIET REPUBLICS:**  
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Botanical Garden, Leningrad.  
Latvijos Universitales Sistematiska Zoologijos Institutam, Riga.  
Musée d'Anthropologie, Leningrad.  
Musée Géologique de Minéralogie Pierre le Grand, Leningrad.  
Russian Zoological Journal, Moscow.  
Société des Amis des Sciences Naturelles, d'Anthropologie et d'Ethnographie, Moscow.  
Société Ouralienne d'Amis des Sciences Naturelles, Ekaterinberg.  
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Zoological Museum, Moscow.

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## VENEZUELA:

Cultura Venezolana, Caracas.

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Geological Survey, University.

## ARIZONA:

Arizona Museum, Phoenix.

## CALIFORNIA:

Agricultural Experiment Station, Berkeley.

Balboa Park Museum, San Diego.

California Academy of Sciences, San Francisco.

Cooper Ornithological Club, Hollywood.

Los Angeles Museum, Los Angeles.

Natural History Museum, San Diego.

Scripps Institution of Biological Research, La Jolla.

Southern California Academy of Sciences, Los Angeles.

Southwest Museum, Los Angeles.

Stanford University, Palo Alto.

State Mining Bureau, Sacramento.

University of California, Berkeley.

University of Southern California, Los Angeles.

## COLORADO:

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Bureau of Mines, Denver.

Colorado College, Colorado Springs.

Colorado Scientific Society, Denver.

State Agricultural College, Fort Collins.

State Historical and Natural History Society, Denver.

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Connecticut Academy of Arts and Sciences, New Haven.

Hartford Public Library, Hartford.

Osborn Botanical Laboratory, New Haven.

State Geological and Natural History Survey, Hartford.

Yale University, New Haven.

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## FLORIDA:

State Geological Survey, Tallahassee.

## GEORGIA:

Geological Survey, Atlanta.

## HAWAII:

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Agricultural Experiment Station, Honolulu.

Bernice Pauahi Bishop Museum, Honolulu.

Hawaiian Historical Society, Honolulu.

Hawaiian Volcano Observatory, Honolulu.

University of Hawaii, Honolulu.

## IDAHO:

Inspector of Mines, Butte.

University of Idaho, Moscow.

## ILLINOIS:

Agricultural Experiment Station, Urbana.

Art Institute of Chicago.

Avicultural Society of America, Chicago.

Board of Education, Chicago.

Chicago Academy of Sciences, Chicago.

Chicago Public Library, Chicago.

Division of Natural History Survey, Urbana.

Forestry Service, Urbana.

Geographic Society, Chicago.

Hardwood Record, Chicago.

Inland Printer, Chicago (gift).

Izaak Walton League of America, Chicago (gift).

John Crerar Library, Chicago.

Loyola University, Chicago.

Morton Arboretum, Lisle.

Newberry Library, Chicago.

Northwestern University, Evanston.

Open Court Publishing Company, Chicago.

State Board of Agriculture, Springfield.

State Geological Survey, Springfield.

State Historical Library, Springfield.

State Water Survey, Urbana.

University of Chicago.

University of Illinois, Urbana.

## INDIANA:

Academy of Sciences, Indianapolis.

Agricultural Experiment Station, Indianapolis.

Indiana Department of Conservation, Indianapolis.

Indiana University, Bloomington.

John Herron Art Institute, Indianapolis.  
 Purdue University, Lafayette.  
 University of Notre Dame, Notre Dame.

IOWA:

Agricultural Experiment Station, Ames.  
 Historical, Memorial and Art Department, Des Moines.  
 Iowa Academy of Science, Des Moines.  
 Iowa Geological Survey, Des Moines.  
 Iowa Horticultural Society, Des Moines.  
 Iowa State College of Agriculture, Ames.  
 University of Iowa, Iowa City.

KANSAS:

Academy of Science, Topeka.  
 State Board of Agriculture, Lawrence.  
 University of Kansas, Lawrence.

KENTUCKY:

Agricultural Experiment Station, Louisville.  
 Kentucky Geological Survey, Frankfort.

LOUISIANA:

Department of Conservation, Baton Rouge.  
 Tulane University, New Orleans.

MAINE:

Agricultural Experiment Station, Orono.

MARYLAND:

Academy of Science, Baltimore.  
 Enoch Pratt Free Library, Baltimore.  
 Johns Hopkins University, Baltimore.  
 Maryland Institute, Baltimore.  
 Maryland State Board of Forestry, Baltimore.

MASSACHUSETTS:

Agricultural Experiment Station, Amherst.  
 American Academy of Arts and Sciences, Boston.  
 American Antiquarian Society, Worcester.  
 Boston Public Library, Boston.  
 Clark University, Worcester.  
 Essex Institute, Salem.  
 Harvard College, Museum of Comparative Zoology, Cambridge.

Harvard University, Arnold Arboretum, Jamaica Plain.  
 Harvard University, Gray Herbarium, Cambridge.  
 Horticultural Society, Boston.  
 Museum of Fine Arts, Boston.  
 New Bedford Public Library, New Bedford.  
 Peabody Institute, Salem.  
 Peabody Museum, Cambridge.  
 Salem Public Library, Salem.  
 Springfield City Library Association, Springfield.  
 Williams College, Williamstown.

MICHIGAN:

Agricultural Experiment Station, Agricultural College.  
 Detroit Institute of Art, Detroit.  
 Grand Rapids Public Library, Grand Rapids.  
 Michigan State Library, Lansing.  
 State Board of Library Commission, Lansing.  
 Edward K. Warren Foundation, Three Oaks.  
 University of Michigan, Ann Arbor.

MINNESOTA:

Agricultural Experiment Station, University Farm.  
 Minneapolis Institute of Arts, Minneapolis.  
 Minnesota Historical Society, St. Paul.  
 University of Minnesota, St. Paul.

MISSISSIPPI:

Agricultural Experiment Station, Agricultural College.  
 Mississippi Plant Board, Agricultural College.

MISSOURI:

Agricultural Experiment Station, Columbia.  
 Bureau of Geology and Mines, Rolla.  
 City Art Museum, St. Louis.  
 Missouri Botanic Garden, St. Louis.  
 Missouri Historical Society, Columbia.  
 St. Louis Public Library, St. Louis.  
 University of Missouri, School of Mines, Rolla.  
 Washington University, St. Louis.

NEBRASKA:

State University, Lincoln.

NEVADA:

Nevada University, Agricultural Experiment Station, Carson City.

## NEW JERSEY:

Agricultural Experiment Station,  
Trenton.  
Newark Museums Association,  
Newark.  
Princeton University, Princeton.

## NEW MEXICO:

Agricultural Experiment Station,  
Santa Fe.  
Historical Society, Santa Fe.  
New Mexico Museum, Santa Fe.

## NEW YORK:

Agricultural Experiment Station,  
Geneva.  
American Academy of Rome, New  
York.  
American Geographical Society,  
New York.  
American Museum of Natural His-  
tory, New York.  
American Polish Chamber of Com-  
merce, New York (gift).  
Bingham Oceanographic Collection,  
New York (gift).  
Brooklyn Botanic Garden, Brooklyn.  
Brooklyn Institute of Arts and  
Sciences, Brooklyn.  
Buffalo Society of Natural Sciences,  
Buffalo.  
Columbia University, New York.  
Cornell University, Ithaca.  
Garden Club of America, New York  
(gift).  
Italy-American Society, New York  
(gift).  
Japan Society, New York.  
Metropolitan Museum of Art, New  
York.  
Municipal Museum, Rochester.  
Museum of the American Indian,  
New York.  
New York Academy of Sciences,  
New York.  
New York Botanical Garden, New  
York.  
New York Historical Society, New  
York.  
New York State Library, Albany.  
New York University, New York.  
Plastic Publications, New York  
(gift).  
Pratt Institute, New York.  
Public Library, New York.  
Rockefeller Foundation, New York  
(gift).  
State College of Forestry, Syracuse.  
State Museum, Albany.  
Staten Island Institution of Arts  
and Sciences, New York.

Stone Publishing Company, New  
York (gift).  
Tompkins-Kiel Marble Company,  
New York (gift).  
United Fruit Company, New York  
(gift).  
University of the State of New York,  
Albany.  
Vanderbilt Marine Museum, New  
York (gift).  
Vassar College, Poughkeepsie.  
Zoological Society, New York.

## NORTH CAROLINA:

Duke University, Durham.  
Elisha Mitchell Scientific Society,  
Chapel Hill.

## NORTH DAKOTA:

State Historical Society, Bismarck.  
University of North Dakota, Uni-  
versity.

## OHIO:

Agricultural Experiment Station,  
Wooster.  
Cincinnati Museums Association,  
Cincinnati.  
Cleveland Museum of Art, Cleve-  
land.  
Cleveland Museum of Natural His-  
tory, Cleveland.  
Cleveland Public Library, Cleve-  
land.  
Denison University, Granville.  
Oberlin College, Oberlin.  
Ohio Academy of Science, Columbus.  
Ohio Archaeological and Historical  
Society, Columbus.  
Ohio State Museum, Columbus.  
Ohio State University, Columbus.  
University of Cincinnati, Cincinnati.  
Wilson Ornithological Club, Oberlin.

## OKLAHOMA:

Oklahoma Academy of Sciences,  
Norman.  
Oklahoma Geological Survey, Nor-  
man.  
University of Oklahoma, Norman.

## OREGON:

Agricultural Experiment Station,  
Corvallis.  
State College, Corvallis.  
University of Oregon, Eugene.

## PENNSYLVANIA:

Academy of Natural Sciences, Phila-  
delphia.  
Agricultural Experiment Station,  
Harrisburg.

- American Philosophical Society, Philadelphia.  
 Antivenin Institute of America, Philadelphia.  
 Bureau of Topographical and Geological Survey, Harrisburg.  
 Carnegie Institute, Pittsburgh.  
 Carnegie Museum, Pittsburgh.  
 Department of Agriculture, Harrisburg.  
 Department of Forests and Waters, Harrisburg.  
 Engineers' Society of Western Pennsylvania, Pittsburgh.  
 Erie Public Museum, Erie.  
 Franklin Institute, Philadelphia.  
 Pennsylvania Museum and School of Industrial Art, Philadelphia.  
 Philadelphia College of Pharmacy, Philadelphia.  
 Sullivant Moss Society, Pittsburgh.  
 University of Pennsylvania, Philadelphia.  
 University of Pennsylvania, Museum, Philadelphia.  
 Wagner Free Institute of Science, Philadelphia.  
 Wistar Institute of Anatomy and Biology, Philadelphia.
- PHILIPPINE ISLANDS:**  
 Bureau of Education, Manila.  
 Bureau of Science, Manila.  
 Department of Agriculture and Natural Resources, Manila.  
 Department of Interior, Manila.
- RHODE ISLAND:**  
 Roger Williams Park Museum, Providence.
- SOUTH DAKOTA:**  
 State School of Mines, Rapid City.
- TENNESSEE:**  
 Agricultural Experiment Station, Nashville.
- TEXAS:**  
 Agricultural Experiment Station, College Station.  
 Baylor University, Waco.  
 Scientific Society, San Antonio.  
 University of Texas, Austin.
- UTAH:**  
 Agricultural Experiment Station, Logan.  
 University of Utah, Salt Lake City.
- VERMONT:**  
 Agricultural Experiment Station, Burlington.
- Geological Survey, Burlington.
- VIRGINIA:**  
 State Library, Richmond.  
 University of Virginia, Charlottesville.
- WASHINGTON (State of):**  
 Agricultural Experiment Station, Seattle.  
 Mountaineer Club, Seattle.  
 Pacific Northwest Bird and Mammal Society, Seattle.  
 Puget Sound Biological Station, Seattle.  
 Washington University, Seattle.  
 Washington University, Historical Society, Seattle.
- WASHINGTON, D.C.:**  
 American Association for the Advancement of Science.  
 American Association of Museums.  
 American Mining Congress.  
 Archaeological Institute of America.  
 Carnegie Institution of Washington (gift).  
 Library of Congress.  
 National Academy of Science.  
 National Parks Bulletin.  
 National Research Council.  
 Pan-American Union.  
 Science Service.  
 Smithsonian Institution.  
 Tropical Plant Research Foundation.  
 United States Government.  
 United States National Museum.
- WEST VIRGINIA:**  
 Academy of Science, Morgantown.  
 Geological Survey, Morgantown.  
 State Department of Agriculture, Charleston.  
 West Virginia University, Morgantown.
- WISCONSIN:**  
 Agricultural Experiment Station, Madison.  
 Beloit College, Beloit.  
 Logan Museum, Beloit.  
 Public Museum of Milwaukee.  
 State Horticultural Society, Madison.  
 University of Wisconsin, Madison.  
 Wisconsin Academy of Arts, Sciences and Letters, Madison.  
 Wisconsin Archaeological Society, Madison.
- WYOMING:**  
 Wyoming University, Laramie.

## INDIVIDUALS

(Accessions are by gift unless otherwise designated)

- Aldrich, J. M., Washington, D.C.  
 Allen, T. George, Chicago.  
 Ames, Oakes, Cambridge, Massachusetts.  
 Baker, Frank C., Urbana, Illinois.  
 Barnes, R. Magoon, Lacon, Illinois.  
 Bassler, R. S., Washington, D.C.  
 Beaux, Oscar de, Geneva, Switzerland (exchange).  
 Bennett, Neville, London, England.  
 Birkel, Emil, Stavanger, Norway (exchange).  
 Blake, S. F., Washington, D.C. (exchange).  
 Boas, Franz, New York (exchange).  
 Boerschmann, Ernst.  
 Bokor, Michael, Chicago.  
 Borden, John, Chicago.  
 Borodin, Nichols, Cambridge, Massachusetts.  
 Braschi Silvio, A., Caracas, Venezuela.  
 Brown, Charles E., Madison, Wisconsin (exchange).  
 Buscaloni, Luigi, Bologna, Italy (exchange).  
 Cockerell, T. D. A., Boulder, Colorado (exchange).  
 Codazzi, Ricardo L., Bogotá, Colombia (exchange).  
 Cook, Harold J., Agate, Colorado.  
 Coolidge, Harold J., Jr., Cambridge, Massachusetts.  
 Crane, Cornelius V., Chicago.  
 Dickey, Donald R., Pasadena, California (exchange).  
 Dohmen, U. A., Chicago.  
 Domin, Karel, Prague, Czechoslovakia (exchange).  
 Emerson, Alfred E., Chicago.  
 Farley, M. F., Foochow, China (exchange).  
 Farwell, Oliver A., Detroit, Michigan.  
 Field, Henry, Chicago.  
 Field, Stanley, Chicago.  
 Frankfort, H., London, England.  
 Friedlander und Sohn, Berlin, Germany.  
 Garvin, Mr. and Mrs. Francis P., Roslyn, Illinois.  
 Gerhard, William J., Chicago.  
 Gillette, G. F., Boston, Massachusetts.  
 Gladwin, Harold S., Pasadena, California.  
 Gleerup, C. W. K., Lund, Sweden.  
 Hartert, Ernst, Berlin, Germany (exchange).  
 Herter, Guillermo, Montevideo, Uruguay.  
 Hicken, C. M., Buenos Aires, Argentina (exchange).  
 Hinsdale, Wilfert D., Ann Arbor, Michigan (gift).  
 Hobbs, William H., Ann Arbor, Michigan.  
 Hubbs, Carl L., Ann Arbor, Michigan (exchange).  
 Hungerford, H. B., Lawrence, Kansas.  
 Jijon y Camaanano, J., Quito, Ecuador.  
 Jillson, Willard R., Frankfort, Kentucky.  
 Jones, David T., Marietta, Ohio.  
 Judd, Neil M., Washington, D.C. (exchange).  
 Kellogg, John P., Chicago.  
 Kenyon, A. S.  
 Kinghorn, J. R., Sydney, Australia.  
 Krenner, Josef, Budapest, Hungary.  
 Kukenthal, Willy, Coburg, Germany.  
 Lahille, F., Buenos Aires, Argentina.  
 Landis, D. H., Windom, England.  
 Langdon, Stephen, Oxford, England.  
 Laufer, Berthold, Chicago.  
 Lewis, A. B., Chicago.  
 Love, Charles A., Aurora, Illinois.  
 Meek, Alexander, Durham, England.  
 Mertens, Robert, Frankfort on the Main, Germany.  
 Mexia, Ynes, Berkeley, California.  
 Meylan, O., Geneva, Switzerland.  
 Moorehead, Warren, Andover, Massachusetts (exchange).  
 Morrison, J. P. E., Madison, Wisconsin.  
 Müller, Lorenz, Munich, Germany (exchange).  
 Nichols, H. W., Chicago.  
 Oliveira, Euzebio Paulo de, Rio de Janeiro, Brazil.  
 Osgood, Wilfred H., Chicago.  
 Outes, Felix F., Buenos Aires, Argentina.  
 Penrose, R. A. F., Jr., Philadelphia, Pennsylvania (exchange).  
 Peters, James L., Cambridge, Massachusetts (exchange).  
 Peterson, O. A., Pittsburgh, Pennsylvania (exchange).  
 Pittier, Henry, Caracas, Venezuela (exchange).

- Pollock, James B., Ann Arbor, Michigan.
- Pospisil, Frantisek, Brünn, Austria.
- Prater, S. H., Bombay, India.
- Proctor, William, Philadelphia, Pennsylvania.
- Prout, A. E., London, England.
- Putnam, Edward R., Davenport, Iowa.
- Riggs, Elmer S., Chicago.
- Rivet, Paul, Paris, France (exchange).
- Roberts, George, Lake Forest, Illinois.
- Roddy, H. Justin, Lancaster, England.
- Roth, Walter E., Christianburg, Sweden (exchange).
- Rusconi, Carlos, Buenos Aires, Argentina.
- St. John, Harold, Seattle, Washington.
- Schinz, Hans, Zürich, Switzerland (exchange).
- Schlaginhaufen, Otto, Zürich, Switzerland (exchange).
- Schmidt, Karl P., Chicago.
- Schuller, Rudolph, San José, Costa Rica.
- Sergi, Giuseppe, Rome, Italy (exchange).
- Sherff, Earl E., Chicago.
- Simms, Stephen C., Chicago.
- Staley, Forest H., St. Louis, Missouri.
- Standley, Paul C., Chicago.
- Strand, Embrik, St. Riga, U.S.S.R.
- Sushkin, Alexander, Detroit, Michigan.
- Talbot, G.
- Tanaka, Shigeho, Tokyo, Japan (exchange).
- Thalbitzer, W., Copenhagen, Denmark.
- Thelen, Rolf, Madison, Wisconsin.
- Thompson, J. Eric, Chicago.
- Todd, W. E. Clyde, Pittsburgh, Pennsylvania (exchange).
- Voborsky, Josef K., Chicago.
- Walsh, George B., Scarborough, England (exchange).
- Watson, Elba E., East Lansing, Michigan.
- Weeks, A. G., Jr., Boston, Massachusetts.
- Winsor, Henry, Philadelphia, Pennsylvania.
- Wood, F. E., Chicago.
- Zimanyi, Karl, Budapest, Hungary (exchange).
- Zimmer, John T., Chicago.

## ARTICLES OF INCORPORATION

## STATE OF ILLINOIS

DEPARTMENT OF STATE

WILLIAM H. HINRICHSEN, *Secretary of State*

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETING:

Whereas, a Certificate duly signed and acknowledged having been filed in the office of the Secretary of State, on the 16th day of September, A.D. 1893, for the organization of the COLUMBIAN MUSEUM OF CHICAGO, under and in accordance with the provisions of "An Act Concerning Corporations," approved April 18, 1872, and in force July 1, 1872, and all acts amendatory thereof, a copy of which certificate is hereto attached.

Now, therefore, I, William H. Hinrichsen, Secretary of State of the State of Illinois, by virtue of the powers and duties vested in me by law, do hereby certify that the said COLUMBIAN MUSEUM OF CHICAGO is a legally organized Corporation under the laws of this State.

In Testimony Whereof, I hereto set my hand and cause to be affixed the Great Seal of State. Done at the City of Springfield, this 16th day of September, in the year of our Lord one thousand eight hundred and ninety-three, and of the Independence of the United States the one hundred and eighteenth.

W. H. HINRICHSEN,

*Secretary of State.*

[SEAL]

TO HON. WILLIAM H. HINRICHSEN,

SECRETARY OF STATE:

SIR:

We, the undersigned citizens of the United States, propose to form a corporation under an act of the General Assembly of the State of Illinois, entitled "An Act Concerning Corporations," approved April 18, 1872, and all acts amendatory thereof; and that for the purposes of such organization we hereby state as follows, to-wit:

1. The name of such corporation is the "COLUMBIAN MUSEUM OF CHICAGO."

2. The object for which it is formed is for the accumulation and dissemination of knowledge, and the preservation and exhibition of objects illustrating Art, Archaeology, Science and History.

3. The management of the aforesaid museum shall be vested in a Board of FIFTEEN (15) TRUSTEES, five of whom are to be elected every year.

4. The following named persons are hereby selected as the Trustees for the first year of its corporate existence:

Edward E. Ayer, Charles B. Farwell, George E. Adams, George R. Davis, Charles L. Hutchinson, Daniel H. Burnham, John A. Roche, M. C. Bullock, Emil G. Hirsch, James W. Ellsworth, Allison V. Armour, O. F. Aldis, Edwin Walker, John C. Black and Frank W. Gunsaulus.

5. The location of the Museum is in the City of Chicago, County of Cook, and State of Illinois.

*(Signed)*

George E. Adams, C. B. Farwell, Sidney C. Eastman, F. W. Putnam, Robert McCurdy, Andrew Peterson, L. J. Gage, Charles L. Hutchinson, Ebenezer

Buckingham, Andrew McNally, Edward E. Ayer, John M. Clark, Herman H. Kohlsaas, George Schneider, Henry H. Getty, William R. Harper, Franklin H. Head, E. G. Keith, J. Irving Pearce, Azel F. Hatch, Henry Wade Rogers, Thomas B. Bryan, L. Z. Leiter, A. C. Bartlett, A. A. Sprague, A. C. McClurg, James W. Scott, Geo. F. Bissell, John R. Walsh, Chas. Fitzsimmons, John A. Roche, E. B. McCagg, Owen F. Aldis, Ferdinand W. Peck, James H. Dole, Joseph Stockton, Edward B. Butler, John McConnell, R. A. Waller, H. C. Chatfield-Taylor, A. Crawford, Wm. Sooy Smith, P. S. Peterson, John C. Black, Jno. J. Mitchell, C. F. Gunther, George R. Davis, Stephen A. Forbes, Robert W. Patterson, Jr., M. C. Bullock, Edwin Walker, George M. Pullman, William E. Curtis, James W. Ellsworth, William E. Hale, Wm. T. Baker, Martin A. Ryerson, Huntington W. Jackson, N. B. Ream, Norman Williams, Melville E. Stone, Bryan Lathrop, Eliphalet W. Blatchford, Philip D. Armour.

STATE OF ILLINOIS }  
 COOK COUNTY } ss.

I, G. R. MITCHELL, a NOTARY PUBLIC in and for said County, do hereby certify that the foregoing petitioners personally appeared before me and acknowledged severally that they signed the foregoing petition as their free and voluntary act for the uses and purposes therein set forth.

Given under my hand and notarial seal this 14th day of September, 1893.

[SEAL] G. R. MITCHELL,  
 NOTARY PUBLIC, COOK COUNTY, ILL.

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CHANGE OF NAME

Pursuant to a resolution passed at a meeting of the corporate members held the 25th day of June, 1894, the name of the COLUMBIAN MUSEUM was changed to FIELD COLUMBIAN MUSEUM. A certificate to this effect was filed June 26, 1894, in the office of the Secretary of State for Illinois.

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CHANGE OF NAME

Pursuant to a resolution passed at a meeting of the corporate members held the 8th day of November, 1905, the name of the FIELD COLUMBIAN MUSEUM was changed to FIELD MUSEUM OF NATURAL HISTORY. A certificate to this effect was filed November 10, 1905, in the office of the Secretary of State for Illinois.

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CHANGE IN ARTICLE 3

Pursuant to a resolution at a meeting of the corporate members held the 10th day of May, 1920, the management of FIELD MUSEUM OF NATURAL HISTORY shall be invested in a Board of TWENTY-ONE (21) TRUSTEES, who shall be elected in such manner and for such time and term of office as may be provided for by the By-Laws. A certificate to this effect was filed May 21, 1920, in the office of the Secretary of State for Illinois.

## AMENDED BY-LAWS

JANUARY 1930

## ARTICLE I

## MEMBERS

SECTION 1. Members shall be of eleven classes, Corporate Members, Honorary Members, Patrons, Benefactors, Fellows, Life Members, Non-Resident Life Members, Associate Members, Non-Resident Associate Life Members, Sustaining Members, and Annual Members.

SECTION 2. The Corporate Members shall consist of the persons named in the articles of incorporation, and of such other persons as shall be chosen from time to time by the Board of Trustees at any of its meetings, upon the recommendation of the Executive Committee; provided, that such person named in the articles of incorporation shall, within ninety days from the adoption of these By-Laws, and persons hereafter chosen as Corporate Members shall, within ninety days of their election, pay into the treasury the sum of Twenty Dollars (\$20.00) or more. Corporate Members becoming Life Members, Patrons or Honorary Members shall be exempt from dues. Annual meetings of said Corporate Members shall be held at the same place and on the same day that the annual meeting of the Board of Trustees is held.

SECTION 3. Honorary Members shall be chosen by the Board from among persons who have rendered eminent service to science, and only upon unanimous nomination of the Executive Committee. They shall be exempt from all dues.

SECTION 4. Patrons shall be chosen by the Board upon recommendation of the Executive Committee from among persons who have rendered eminent service to the Museum. They shall be exempt from all dues, and, by virtue of their election as Patrons, shall also be Corporate Members.

SECTION 5. Any person contributing or devising the sum of One Hundred Thousand Dollars (\$100,000.00) in cash, or securities, or property to the funds of the Museum, may be elected a Benefactor of the Museum.

SECTION 6. Any person contributing the sum of Five Thousand Dollars (\$5,000.00) in cash or securities to the funds of the Museum, may be elected a Fellow of the Museum, who after being so elected shall have the right in perpetuity to appoint the successor in said Fellowship.

SECTION 7. Any person paying into the treasury the sum of Five Hundred Dollars (\$500.00), at any one time, shall, upon the unanimous vote of the Board, become a Life Member. Life Members shall be exempt from all dues, and shall enjoy all the privileges and courtesies of the Museum that are accorded to members of the Board of Trustees. Any person residing fifty miles or more from the city of Chicago, paying into the treasury the sum of One Hundred Dollars (\$100.00) at any one time, shall, upon the unanimous vote of the Board, become a Non-Resident Life Member. Non-Resident Life Members shall be exempt from all dues, and shall enjoy all the privileges and courtesies of the Museum that are accorded to members of the Board of Trustees.

SECTION 8. Any person paying into the treasury of the Museum the sum of One Hundred Dollars (\$100.00), at any one time, shall, upon the unanimous vote of the Board, become an Associate Member. Associate Members shall be entitled to: tickets admitting member and members of family, including non-resident home guests; all publications of the Museum, if so desired; reserved seats for all lectures and entertainments under the auspices of the Museum, provided reservation is requested in advance; and admission of holder of membership and accompanying party to all special exhibits and Museum functions day or evening. Any person residing fifty miles or more from the city of Chicago, paying into the treasury the sum of Fifty Dollars (\$50.00) at any one time, shall, upon the unanimous vote of the Board, become a Non-Resident Associate Life

Member. Non-Resident Associate Life Members shall be exempt from all dues, and shall enjoy all the privileges and courtesies of the Museum that are accorded to Associate Members.

SECTION 9. Sustaining Members shall consist of such persons as are selected from time to time by the Board of Trustees at any of its meetings, and who shall pay an annual fee of Twenty-five Dollars (\$25.00), payable within thirty days after notice of election and within thirty days after each recurring annual date. This Sustaining Membership entitles the member to free admission for the member and family to the Museum on any day, the Annual Report and such other Museum documents or publications as may be requested in writing. When a Sustaining Member has paid the annual fee of \$25.00 for six years, such member shall be entitled to become an Associate Member.

SECTION 10. Annual Members shall consist of such persons as are selected from time to time by the Board of Trustees at any of its meetings, and who shall pay an annual fee of Ten Dollars (\$10.00), payable within thirty days after each recurring annual date. An Annual Membership shall entitle the member to a card of admission for the member and family during all hours when the Museum is open to the public, and free admission for the member and family to all Museum lectures or entertainments. This membership will also entitle the holder to the courtesies of the membership privileges of every Museum of note in the United States and Canada, so long as the existing system of co-operative interchange of membership tickets shall be maintained, including tickets for any lectures given under the auspices of any of the Museums during a visit to the cities in which the cooperative museums are located.

SECTION 11. All membership fees, excepting Sustaining and Annual, shall hereafter be applied to a permanent Membership Endowment Fund, the interest only of which shall be applied for the use of the Museum as the Board of Trustees may order.

## ARTICLE II

### BOARD OF TRUSTEES

SECTION 1. The Board of Trustees shall consist of twenty-one members. The respective members of the Board now in office, and those who shall hereafter be elected, shall hold office during life. Vacancies occurring in the Board shall be filled at a regular meeting of the Board, upon the nomination of the Executive Committee made at a preceding regular meeting of the Board, by a majority vote of the members of the Board present.

SECTION 2. Regular meetings of the Board shall be held on the third Monday of each month. Special meetings may be called at any time by the President, and shall be called by the Secretary upon the written request of three Trustees. Five Trustees shall constitute a quorum, except for the election of officers or the adoption of the Annual Budget, when seven Trustees shall be required, but meetings may be adjourned by any less number from day to day, or to a day fixed, previous to the next regular meeting.

SECTION 3. Reasonable written notice, designating the time and place of holding meetings, shall be given by the Secretary.

## ARTICLE III

### HONORARY TRUSTEES

SECTION 1. As a mark of respect, and in appreciation of services performed for the Institution, those Trustees who by reason of inability, on account of change of residence, or for other cause or from indisposition to serve longer in such capacity shall resign their place upon the Board, may be elected, by a majority of those present at any regular meeting of the Board, an Honorary Trustee for life. Such Honorary Trustee will receive notice of all meetings of the Board of Trustees, whether regular or special, and will be expected to be present at all such meetings and participate in the deliberations thereof, but an Honorary Trustee shall not have the right to vote.

## ARTICLE IV

## OFFICERS

SECTION 1. The officers shall be a President, a First Vice-President, a Second Vice-President, a Third Vice-President, a Secretary, an Assistant Secretary and a Treasurer. They shall be chosen by ballot by the Board of Trustees, a majority of those present and voting being necessary to elect. The President, the First Vice-President, the Second Vice-President, and the Third Vice-President shall be chosen from among the members of the Board of Trustees. The meeting for the election of officers shall be held on the third Monday of January of each year, and shall be called the Annual Meeting.

SECTION 2. The officers shall hold office for one year, or until their successors are elected and qualified, but any officer may be removed at any regular meeting of the Board of Trustees by a vote of two-thirds of all the members of the Board. Vacancies in any office may be filled by the Board at any meeting.

SECTION 3. The officers shall perform such duties as ordinarily appertain to their respective offices, and such as shall be prescribed by the By-Laws, or designated from time to time by the Board of Trustees.

## ARTICLE V

## THE TREASURER

SECTION 1. The Treasurer shall be custodian of the funds of the Corporation except as hereinafter provided. He shall make disbursements only upon warrants drawn by the Director and countersigned by the President. In the absence or inability of the Director, warrants may be signed by the Chairman of the Finance Committee, and in the absence or inability of the President, may be countersigned by one of the Vice-Presidents, or any member of the Finance Committee.

SECTION 2. The securities and muniments of title belonging to the corporation shall be placed in the custody of some Trust Company of Chicago to be designated by the Board of Trustees, which Trust Company shall collect the income and principal of said securities as the same become due, and pay same to the Treasurer, except as hereinafter provided. Said Trust Company shall allow access to and deliver any or all securities or muniments of title to the joint order of the following officers, namely The President or one of the Vice-Presidents, jointly with the Chairman, or one of the Vice-Chairmen, of the Finance Committee of the Museum.

SECTION 3. The Treasurer shall give bond in such amount, and with such sureties as shall be approved by the Board of Trustees.

SECTION 4. The Harris Trust & Savings Bank of Chicago shall be Custodian of "The N. W. Harris Public School Extension of Field Museum" fund. The bank shall make disbursements only upon warrants drawn by the Director and countersigned by the President. In the absence or inability of the Director, warrants may be signed by the Chairman of the Finance Committee, and in the absence or inability of the President, may be countersigned by one of the Vice-Presidents, or any member of the Finance Committee.

## ARTICLE VI

## THE DIRECTOR

SECTION 1. The Board of Trustees shall elect a Director of the Museum, who shall remain in office until his successor shall be elected. He shall have immediate charge and supervision of the Museum, and shall control the operations of the Institution, subject to the authority of the Board of Trustees and its Committees. The Director shall be the official medium of communication between the Board, or its Committees, and the scientific staff and maintenance force.

SECTION 2. There shall be four scientific Departments of the Museum—Anthropology, Botany, Geology and Zoology; each under the charge of a

Curator, subject to the authority of the Director. The Curators shall be appointed by the Board upon the recommendation of the Director, and shall serve during the pleasure of the Board. Subordinate staff officers in the scientific Departments shall be appointed and removed by the Director upon the recommendation of the Curators of the respective Departments. The Director shall have authority to employ and remove all other employees of the Museum.

SECTION 3. The Director shall make report to the Board at each regular meeting, recounting the operations of the Museum for the previous month. At the Annual Meeting, the Director shall make an Annual Report, reviewing the work for the previous year, which Annual Report shall be published in pamphlet form for the information of the Trustees and Members, and for free distribution in such number as the Board may direct.

## ARTICLE VII

### AUDITOR

SECTION 1. The Board shall appoint an Auditor, who shall hold his office during the pleasure of the Board. He shall keep proper books of account, setting forth the financial condition and transactions of the Corporation, and of the Museum, and report thereon at each regular meeting, and at such other times as may be required by the Board. He shall certify to the correctness of all bills rendered for the expenditure of the money of the Corporation.

## ARTICLE VIII

### COMMITTEES

SECTION 1. There shall be five Committees, as follows: Finance, Building, Auditing, Pension and Executive.

SECTION 2. The Finance Committee shall consist of five members, the Auditing and Pension Committees shall each consist of three members, and the Building Committee shall consist of five members. All members of these four Committees shall be elected by ballot by the Board at the Annual Meeting, and shall hold office for one year, and until their successors are elected and qualified. In electing the members of these Committees, the Board shall designate the Chairman and Vice-Chairman by the order in which the members are named in the respective Committee; the first member named shall be Chairman, the second named the Vice-Chairman, and the third named, Second Vice-Chairman, succession to the Chairmanship being in this order in the event of the absence or disability of the Chairman.

SECTION 3. The Executive Committee shall consist of the President of the Board, the Chairman of the Finance Committee, the Chairman of the Building Committee, the Chairman of the Auditing Committee, the Chairman of the Pension Committee, and three other members of the Board to be elected by ballot at the Annual Meeting.

SECTION 4. Four members shall constitute a quorum of the Executive Committee, and in all standing Committees two members shall constitute a quorum. In the event that, owing to the absence or inability of members, a quorum of the regular elected members cannot be present at any meeting of any Committee, then the Chairman thereof, or his successor, as herein provided, may summon any members of the Board of Trustees to act in place of the absentee.

SECTION 5. The Finance Committee shall have supervision of investing the endowment and other permanent funds of the Corporation, and the care of such real estate as may become its property. It shall have authority to invest, sell, and reinvest funds, subject to the approval of the Board.

SECTION 6. The Building Committee shall have supervision of the construction, reconstruction, and extension of any and all buildings used for Museum purposes.

SECTION 7. The Executive Committee shall be called together from time to time as the Chairman may consider necessary, or as he may be requested

to do by three members of the Committee, to act upon such matters affecting the administration of the Museum as cannot await consideration at the Regular Monthly Meetings of the Board of Trustees. It shall, before the beginning of each fiscal year, prepare and submit to the Board an itemized Budget, setting forth the probable receipts from all sources for the ensuing year, and make recommendations as to the expenditures which should be made for routine maintenance and fixed charges. Upon the adoption of the Budget by the Board, the expenditures as stated are authorized.

SECTION 8. The Auditing Committee shall have supervision over all accounting and bookkeeping, and full control of the financial records. It shall cause the same, once each year, or oftener, to be examined by an expert individual or firm, and shall transmit the report of such expert individual or firm to the Board at the next ensuing regular meeting after such examination shall have taken place.

SECTION 9. The Pension Committee shall determine by such means and processes as shall be established by the Board of Trustees to whom and in what amount the Pension Fund shall be distributed. These determinations or findings shall be subject to the approval of the Board of Trustees.

SECTION 10. The Chairman of each Committee shall report the acts and proceedings thereof at the next ensuing regular meeting of the Board.

SECTION 11. The President shall be ex-officio a member of all Committees and Chairman of the Executive Committee. Vacancies occurring in any Committee may be filled by ballot at any regular meeting of the Board.

## ARTICLE IX

### NOMINATING COMMITTEE

SECTION 1. At the November meeting of the Board each year, a Nominating Committee of three shall be chosen by lot. Said Committee shall make nominations for membership of the Finance Committee, the Building Committee, the Auditing Committee, and the Pension Committee, and for three members of the Executive Committee, from among the Trustees, to be submitted at the ensuing December meeting and voted upon at the following Annual Meeting in January.

## ARTICLE X

SECTION 1. Whenever the word "Museum" is employed in the By-Laws of the Corporation, it shall be taken to mean the building in which the Museum as an Institution is located and operated, the material exhibited, the material in study collections, or in storage, furniture, fixtures, cases, tools, records, books, and all appurtenances of the Institution and the workings, researches, installations, expenditures, field work, laboratories, library, publications, lecture courses, and all scientific and maintenance activities.

SECTION 2. These By-Laws may be amended at any regular meeting of the Board of Trustees by a two-thirds vote of all the members present, provided the amendment shall have been proposed at a preceding regular meeting.

FOUNDER

\*MARSHALL FIELD

BENEFACTORS

*Those who have contributed \$100,000 or more to the Museum*

- |                          |                           |
|--------------------------|---------------------------|
| *AYER, EDWARD E.         | HARRIS, ALBERT W          |
| BUCKINGHAM, MISS KATE S. | *HARRIS, NORMAN W         |
| CRANE, CORNELIUS         | *HIGINBOTHAM, HARLOW N.   |
| CRANE, RICHARD T., JR.   | KELLEY, WILLIAM V.        |
|                          | *PULLMAN, GEORGE M.       |
| *FIELD, JOSEPH N.        | RAYMOND, MRS. ANNA LOUISE |
| FIELD, MARSHALL          | *RAYMOND, JAMES NELSON    |
| FIELD, STANLEY           | SIMPSON, JAMES            |
| GRAHAM, ERNEST R.        | *STURGES, MRS. MARY D.    |
| *DECEASED                |                           |

HONORARY MEMBERS

*Those who have rendered eminent service to Science*

- |                              |                               |
|------------------------------|-------------------------------|
| AYER, MRS. EDWARD E.         | LUDWIG, H. R. H. GUSTAF ADOLF |
| BREASTED, PROFESSOR JAMES H. | CROWN PRINCE OF SWEDEN        |
| CHALMERS, WILLIAM J.         | MCCORMICK, STANLEY            |
| CRANE, CHARLES R.            | RAWSON, FREDERICK H.          |
| CRANE, RICHARD T., JR.       | ROOSEVELT, KERMIT             |
| CUTTING, C. SUYDAM           | ROOSEVELT, THEODORE           |
| FIELD, MARSHALL              | ROSENWALD, JULIUS             |
| FIELD, STANLEY               | RYERSON, MARTIN A.            |
| GRAHAM, ERNEST R.            | SARGENT, HOMER E.             |
| HARRIS, ALBERT W.            | SIMPSON, JAMES                |
| KELLEY, WILLIAM V.           | SPRAGUE, ALBERT A.            |
|                              | DECEASED, 1929                |
| KEEP, CHAUNCEY               | ROSENWALD, MRS. AUGUSTA N.    |

PATRONS

*Those who have rendered eminent service to the Museum*

- |                              |                            |
|------------------------------|----------------------------|
| ARMOUR, ALLISON V.           | KNIGHT, CHARLES R.         |
| BORLAND, MRS. JOHN JAY       | KUNZ, GEORGE F.            |
| CHADBOURNE, MRS. EMILY CRANE | LANGDON, PROFESSOR STEPHEN |
| CHERRIE, GEORGE K.           | MARKHAM, CHARLES H.        |
| COATS, JOHN                  | MOORE, MRS. WILLIAM H.     |
| COLLINS, ALFRED M.           | PAYNE, JOHN BARTON         |
| CONOVER, BOARDMAN            | PROBST, EDWARD             |
| CUMMINGS, MRS. ROBERT F.     | RAWSON, FREDERICK H.       |
| CUTTING, C. SUYDAM           | ROOSEVELT, KERMIT          |
| DAY, LEE GARNETT             | ROOSEVELT, THEODORE        |
| ELLSWORTH, DUNCAN S.         | SARGENT, HOMER E.          |
| FAUNTHORPE, J. C.            | SMITH, MRS. GEORGE T.      |
| FIELD, MRS. EVELYN           | STRAWN, SILAS H.           |
| FIELD, MRS. STANLEY          | STRONG, WALTER A.          |
| INSULL, SAMUEL               | VERNAY, ARTHUR S.          |
| KENNEDY, VERNON SHAW         | WHITE, HAROLD A.           |
|                              | WHITE, HOWARD J.           |

## CORPORATE MEMBERS

ARMOUR, ALLISON V.

BORDEN, JOHN

BORLAND, MRS. JOHN JAY

BYRAM, HARRY E.

CHADBOURNE, MRS. EMILY CRANE

CHALMERS, W. J.

CHATFIELD-TAYLOR, H. C.

CHERRIE, GEORGE K.

COATS, JOHN

COLLINS, ALFRED M.

CONOVER, BOARDMAN

CRANE, RICHARD T., JR.

CUMMINGS, MRS. ROBERT F.

CUTTING, C. SUYDAM

DAY, LEE GARNETT

EASTMAN, SIDNEY C.

ELLSWORTH, DUNCAN S.

FAUNTHORPE, COLONEL J. C.

FIELD, MARSHALL

FIELD, MRS. EVELYN

FIELD, STANLEY

FIELD, MRS. STANLEY

GRAHAM, ERNEST R.

HARRIS, ALBERT W.

INSULL, SAMUEL

KELLEY, WILLIAM V.

KENNEDY, VERNON SHAW

KNIGHT, CHARLES R.

KUNZ, GEORGE F.

LANGDON, PROFESSOR STEPHEN

MCCORMICK, CYRUS H.

MARKHAM, CHARLES H.

MITCHELL, WILLIAM H.

MOORE, MRS. WILLIAM H.

PAYNE, JOHN BARTON

PROBST, EDWARD

RAWSON, FREDERICK H.

RICHARDSON, GEORGE A.

ROOSEVELT, KERMIT

ROOSEVELT, THEODORE

RYERSON, MARTIN A.

SARGENT, HOMER E.

SIMMS, STEPHEN C.

SIMPSON, JAMES

SMITH, MRS. GEORGE T.

SMITH, SOLOMON A.

SPRAGUE, ALBERT A.

STRAWN, SILAS H.

STRONG, WALTER A.

VERNAY, ARTHUR S.

WHITE, HAROLD A.

WHITE, HOWARD J.

WRIGLEY, WILLIAM, JR.

DECEASED, 1929

KEEP, CHAUNCEY

STONE, MELVILLE E.

## LIFE MEMBERS

*Those who have contributed \$500 to the Museum*

- ABBOTT, JOHN JAY  
 ABBOTT, ROBERT S.  
 ADLER, MAX  
 ALDIS, ARTHUR T.  
 ALEXANDER, WILLIAM A.  
 ALLERTON, ROBERT H.  
 AMES, JAMES C.  
 AMES, KNOWLTON L.  
 ARMOUR, ALLISON V.  
 ARMOUR, A. WATSON  
 ARMOUR, LESTER  
 AUSTRIAN, ALFRED S.  
 AVERY, SEWELL L.
- BABCOCK, FREDERICK R.  
 BACON, EDWARD RICHARDSON, JR.  
 BANKS, ALEXANDER F.  
 BARRETT, MRS. A. D.  
 BARRETT, ROBERT L.  
 BARTLETT, MISS FLORENCE DIBELL  
 BASSFORD, LOWELL C.  
 BAUR, MRS. JACOB  
 BENDIX, VINCENT  
 BENSABOTT, R.  
 BERMINGHAM, EDWARD J.  
 BILLINGS, C. K. G.  
 BILLINGS, DR. FRANK  
 BLAINE, MRS. EMMONS  
 BLAIR, CHAUNCEY B.  
 BLAIR, HENRY A.  
 BLAIR, MRS. WATSON F.  
 BLOCK, L. E.  
 BLOCK, PHILIP D.  
 BOOTH, W. VERNON  
 BORDEN, JOHN  
 BORDEN, MRS. WALLER  
 BORLAND, CHAUNCEY B.  
 BREWSTER, WALTER S.  
 BROWN, CHARLES EDWARD  
 BUCHANAN, D. W.  
 BUDD, BRITTON I.  
 BUFFINGTON, EUGENE J.  
 BURNHAM, JOHN  
 BURT, WILLIAM G.  
 BUTLER, JULIUS W.  
 BUTLER, RUSH C.  
 BYRAM, HARRY E.
- CARR, ROBERT F.  
 CARTON, L. A.  
 CASALIS, MRS. MAURICE  
 CHALMERS, WILLIAM J.  
 CHALMERS, MRS. WILLIAM J.  
 CHANDLER, REUBEN G.  
 CHATFIELD-TAYLOR, WAYNE  
 CLARK, EUGENE B.  
 CLAY, JOHN  
 CLEGG, MRS. HENRY G.  
 CLEGG, WILLIAM G.  
 CLEGG, MRS. WILLIAM G.  
 CLINCH, R. FLOYD  
 CLOW, WILLIAM E.  
 CONOVER, BOARDMAN  
 COPLEY, IRA CLIFF (N.R.)  
 CORLEY, F. D.  
 COWLES, ALFRED  
 CRAMER, CORWITH  
 CRAMER, E. W.  
 CRAMER, MRS. KATHARINE S.  
 CRANE, CHARLES R.  
 CRANE, RICHARD T., JR.  
 CROSSETT, EDWARD C.  
 CROSSLEY, SIR KENNETH  
 CROSSLEY, LADY JOSEPHINE  
 CROWELL, H. P.  
 CUDAHY, EDWARD A.  
 CUDAHY, EDWARD A., JR.  
 CUDAHY, JOSEPH M.  
 CUMMINGS, D. MARK  
 CUNNINGHAM, FRANK S.  
 CUNNINGHAM, JAMES D.  
 CUSHING, CHARLES G.  
 CUTEN, ARTHUR W.
- DAU, J. J.  
 DAVIES, MRS. D. C.  
 DAVIS, LIVINGSTON (N.R.)  
 DAWES, CHARLES G.  
 DAWES, HENRY M.  
 DAWES, RUFUS C.  
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 DECKER, ALFRED  
 DELANO, FREDERIC A.  
 DEWOLF, WALLACE L.  
 DICK, ALBERT BLAKE  
 DIERSSEN, FERDINAND W.  
 DIXON, GEORGE W.  
 DIXON, HOMER L.  
 DONNELLEY, THOMAS E.
- CARPENTER, AUGUSTUS A.  
 CARPENTER, MRS. HUBBARD

DOUGLAS, JAMES H.  
DOYLE, EDWARD J.  
DRAKE, JOHN B.  
DRAKE, TRACY C.  
DREYFUS, MOÏSE

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FARRINGTON, DR. OLIVER C.  
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FARWELL, FRANCIS C.  
FARWELL, JOHN V.  
FARWELL, WALTER  
FAY, C. N.  
FELT, DORR E.  
FENTON, HOWARD W.  
FENTRESS, CALVIN  
FERGUSON, LOUIS A.  
FERNALD, CHARLES  
FERRY, MRS. ABBY FARWELL  
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FIELD, MARSHALL  
FIELD, NORMAN  
FIELD, MRS. NORMAN  
FIELD, STANLEY  
FIELD, MRS. STANLEY  
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FLORSHEIM, MILTON S.  
FORGAN, DAVID R.  
FYFFE, COLIN C. H.

GARDNER, PAUL E.  
GARDNER, ROBERT A.  
GARTZ, A. F.  
GARTZ, A. F., JR.  
GARY, MRS. JOHN W.  
GETZ, GEORGE F.  
GILBERT, HUNTLY H.  
GLESSNER, JOHN J.  
GLORE, CHARLES F.  
GODDARD, LEROY A.  
GOODMAN, WILLIAM O.  
GOODRICH, A. W.  
GOODSPEED, CHARLES B.  
GOWING, J. PARKER  
GRAHAM, ERNEST R.  
GRIFFITHS, JOHN  
GRISCOM, CLEMENT A.

HACK, FREDERICK C.  
HAMILL, ALFRED E.  
HAMILL, MRS. ERNEST A.  
HARRIS, ALBERT W.  
HARRIS, NORMAN W.  
HASKELL, FREDERICK T.  
HASTINGS, SAMUEL M.  
HAYES, WILLIAM F.  
HECHT, FRANK A., JR.  
HIBBARD, FRANK  
HILL, LOUIS W.  
HINDE, THOMAS W.  
HINKLEY, JAMES OTIS  
HIPPOCH, LOUIS A.  
HIXON, FRANK P.  
HOPKINS, J. M.  
HOPKINS, L. J.  
HOROWITZ, L. J.  
HOYT, N. LANDON  
HUGHES, THOMAS S.  
HURLEY, EDWARD N.  
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INSULL, MARTIN J.  
INSULL, SAMUEL  
INSULL, SAMUEL, JR.

JARNAGIN, WILLIAM N.  
JELKE, JOHN F.  
JELKE, JOHN F., JR.  
JOHNSON, MRS. ELIZABETH AYER  
JOINER, THEODORE E.  
JONES, MRS. ARTHUR B.  
JONES, MISS GWETHALYN  
JONES, THOMAS D.

KELLER, THEODORE C.  
KELLEY, MRS. DAPHNE FIELD  
KELLEY, RUSSELL P.  
KELLEY, WILLIAM V.  
KELLY, D. F.  
KIDSTON, WILLIAM H.  
KING, CHARLES GARFIELD  
KING, FRANCIS  
KING, JAMES G.  
KIRK, WALTER RADCLIFFE  
KNICKERBOCKER, CHARLES K.  
KUPPENHEIMER, LOUIS B.

LAMONT, ROBERT P.  
LANDON, MRS. JESSIE SPALDING  
(N.R.)  
LEGGE, ALEXANDER  
LEHMANN, E. J.  
LEONARD, CLIFFORD M.

LEOPOLD, MRS. HAROLD E.  
 LEVY, MRS. DAVID M.  
 LINN, W. R.  
 LOGAN, SPENCER H.  
 LORD, JOHN B.  
 LOWDEN, FRANK O.  
 LYTTON, GEORGE  
 LYTTON, HENRY C.

MACDOWELL, CHARLES H.  
 MACLEISH, JOHN E.  
 MACVEAGH, EAMES  
 MACVEAGH, FRANKLIN  
 MADLENER, MRS. ALBERT F.  
 MARK, CLAYTON  
 MARKHAM, CHARLES H.  
 MARSHALL, BENJAMIN H.  
 MASON, WILLIAM S.  
 MCCORMICK, CYRUS H.  
 MCCORMICK, MRS. CYRUS, JR.  
 MCCORMICK, MRS. EDITH  
 ROCKEFELLER  
 MCCORMICK, HAROLD F.  
 MCCORMICK, STANLEY  
 MCCUTCHEON, JOHN T.  
 MCGANN, MRS. ROBERT G.  
 MCILVAINE, WILLIAM B.  
 MCINNERNEY, THOMAS H.  
 MCKINLAY, JOHN  
 MCKINLOCK, GEORGE A.  
 MCLAUGHLIN, FREDERIC  
 MCLAUGHLIN, GEORGE D.  
 MCLENNAN, D. R.  
 MCLENNAN, HUGH  
 MCNULTY, T. J.  
 MEYER, CARL  
 MEYNE, GERHARDT F.  
 MINER, W. H.  
 MITCHELL, WILLIAM H.  
 MOORE, EDWARD S.  
 MORSE, CHARLES H., JR.  
 MORTON, JOY  
 MORTON, MARK  
 MUNROE, CHARLES A.  
 MURPHY, WALTER P.

NEWELL, A. B.  
 NIKOLAS, G. J.  
 NOEL, JOSEPH R.

O'BRIEN, JOHN J.  
 ORMSBY, DR. OLIVER S.  
 ORR, ROBERT M.

PAESCH, CHARLES A.  
 PALMER, HONORE

PALMER, POTTER  
 PATTEN, HENRY J.  
 PATTEN, MRS. JAMES A.  
 PATTERSON, JOSEPH M.  
 PAYNE, JOHN BARTON  
 PAYSON, GEORGE S.  
 PEABODY, AUGUSTUS S.  
 PEABODY, STUYVESANT  
 PERKINS, HERBERT F.  
 PICK, ALBERT  
 PIEZ, CHARLES  
 PIKE, CHARLES B.  
 PIKE, EUGENE R.  
 POPPENHUSEN, CONRAD H.  
 PORTER, FRANK W.  
 PORTER, GILBERT E.  
 PORTER, H. H.

RAWSON, FREDERICK H.  
 RAYMOND, MRS. JAMES NELSON  
 REA, MRS. ROBERT L.  
 REVELL, ALEXANDER H.  
 REYNOLDS, ARTHUR  
 REYNOLDS, EARLE H.  
 REYNOLDS, GEORGE M.  
 RILEY, HARRISON B.  
 RIPLEY, ROBERT H.  
 ROBINSON, THEODORE W.  
 ROBSON, MISS ALICE  
 RODMAN, MRS. KATHERINE FIELD  
 RODMAN, THOMAS CLIFFORD  
 ROSENWALD, JULIUS  
 ROSENWALD, LESSING J. (N.R.)  
 ROSENWALD, WILLIAM  
 RUNNELLS, CLIVE  
 RUSSELL, EDMUND A.  
 RUSSELL, EDWARD P.  
 RYERSON, MRS. CARRIE H.  
 RYERSON, EDWARD L., JR.  
 RYERSON, MARTIN A.

SARGENT, FRED W.  
 SCHWEPPE, CHARLES H.  
 SCOTT, FRANK HAMLINE  
 SCOTT, GEORGE E.  
 SCOTT, HAROLD N.  
 SCOTT, JOHN W.  
 SEABURY, CHARLES W.  
 SHAFFER, JOHN C.  
 SHIRK, JOSEPH H.  
 SIMPSON, JAMES  
 SIMPSON, WILLIAM B.  
 SMITH, ALEXANDER  
 SMITH, SOLOMON A.  
 SOPER, JAMES P.

SPALDING, KEITH  
 SPALDING, VAUGHAN C.  
 SPAULDING, MRS. HOWARD H., JR.  
 SPRAGUE, ALBERT A.  
 STERN, MRS. ALFRED K.  
 STERN, MRS. EDGAR B. (N.R.)  
 STEVENS, CHARLES A.  
 STEVENS, EUGENE M.  
 STEWART, ROBERT W.  
 STIRTON, ROBERT C.  
 STOREY, W. B.  
 STUART, H. L.  
 STUART, JOHN  
 STUART, R. DOUGLAS  
 STRAWN, SILAS H.  
 STUDEBAKER, CLEMENT, JR.  
 STURGES, GEORGE  
 SUNNY, B. E.  
 SWIFT, CHARLES H.  
 SWIFT, EDWARD F.  
 SWIFT, G. F., JR.  
 SWIFT, HAROLD H.  
 SWIFT, LOUIS F.

THORNE, CHARLES H.  
 THORNE, ROBERT J.  
 TRAYLOR, MELVIN A.  
 TREE, RONALD L. F.  
 TYSON, RUSSELL

UIHLEIN, EDGAR J.  
 UNDERWOOD, MORGAN P.

VALENTINE, LOUIS L.  
 VEATCH, GEORGE L.  
 VERNAY, ARTHUR S. (N.R.)  
 VILES, LAWRENCE M.  
 WANNER, HARRY C.  
 WARD, P. C.  
 WARNER, EZRA JOSEPH  
 WEBER, DAVID  
 WELCH, MRS. EDWIN P.  
 WELLING, JOHN P.  
 WETMORE, FRANK O.  
 WHEELER, CHARLES P.  
 WHITE, F. EDSON  
 WHITNEY, MRS. JULIA L.  
 WICKWIRE, MRS. EDWARD L.  
 WIEBOLDT, WILLIAM A.  
 WILLARD, ALONZO J.  
 WILLITS, WARD W.  
 WILSON, JOHN P., JR.  
 WILSON, OLIVER T.  
 WILSON, THOMAS E.  
 WILSON, WALTER H.  
 WINSTON, GARRARD B.  
 WINTER, WALLACE C.  
 WOOLLEY, CLARENCE M.  
 WRIGLEY, PHILIP K.  
 WRIGLEY, WILLIAM, JR.

YATES, DAVID M.

DECEASED, 1929

BRANNAN, GEORGE E.  
 BROWN, WILLIAM L.  
 CARRY, EDWARD F.  
 DEFREES, JOSEPH H.  
 DONNELLEY, REUBEN H.  
 KEEP, CHAUNCEY  
 MARTIN, WILLIAM P.

OAKLEY, HORACE S.  
 PIERCE, CHARLES I.  
 RUNNELLS, JOHN S.  
 STOUT, FRANK D.  
 SULLIVAN, MRS. ROGER C.  
 WACKER, CHARLES H.

## ASSOCIATE MEMBERS

*Those who have contributed \$100 to the Museum*

AARON, CHARLES  
 ABBOTT, DONALD P., JR.  
 ABBOTT, GORDON C.  
 ABBOTT, W. R.  
 ABBOTT, WILLIAM L.  
 ABRAMS, PROFESSOR DUFF A.

ACKERMAN, CHARLES N.  
 ACOMB, JESSE P.  
 ADAMICK, GUSTAV H.  
 ADAMS, BENJAMIN STEARNS  
 ADAMS, MRS. FRANCES SPROGLE  
 ADAMS, JOHN Q.

- ADAMS, JOSEPH  
 ADAMS, MRS. SAMUEL  
 ADAMS, MRS. S. H.  
 ADAMS, WILLIAM C.  
 ADCOCK, MRS. BESSIE  
 ADDLEMAN, SAMUEL W.  
 ADLER, DAVID  
 ADLER, MRS. MAX  
 AFFLECK, BENJAMIN F.  
 AHSCHLAGER, WALTER W.  
 ALBEE, MRS. HARRY W.  
 ALLBRIGHT, WILLIAM B.  
 ALLEN, MRS. FRED G.  
 ALLING, MRS. C. A.  
 ALLING, CHARLES  
 ALLING, MRS. VAN WAGENEN  
 ALMES, DR. HERMAN E.  
 ALSBERG, LEWIS  
 ALSCHULER, ALFRED S.  
 ALSIP, CHARLES H.  
 ALTER, HARRY  
 ANDERSON, ARTHUR  
 ANDREWS, ALFRED B.  
 ANDREWS, MILTON H.  
 ANNAN, MRS. MIRIAM ORMSBY  
 ANTISS, GEORGE P.  
 APPELT, MRS. JESSIE E.  
 ARMBRUST, JOHN T.  
 ARMBRUSTER, C. A.  
 ARMOUR, PHILIP D.  
 ARMSTRONG, ARTHUR W.  
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 WHITE, SELDEN FREEMAN  
 WHITING, LAURENCE H.  
 WILSON, MORRIS KARL  
 WOOD, KAY, JR.  
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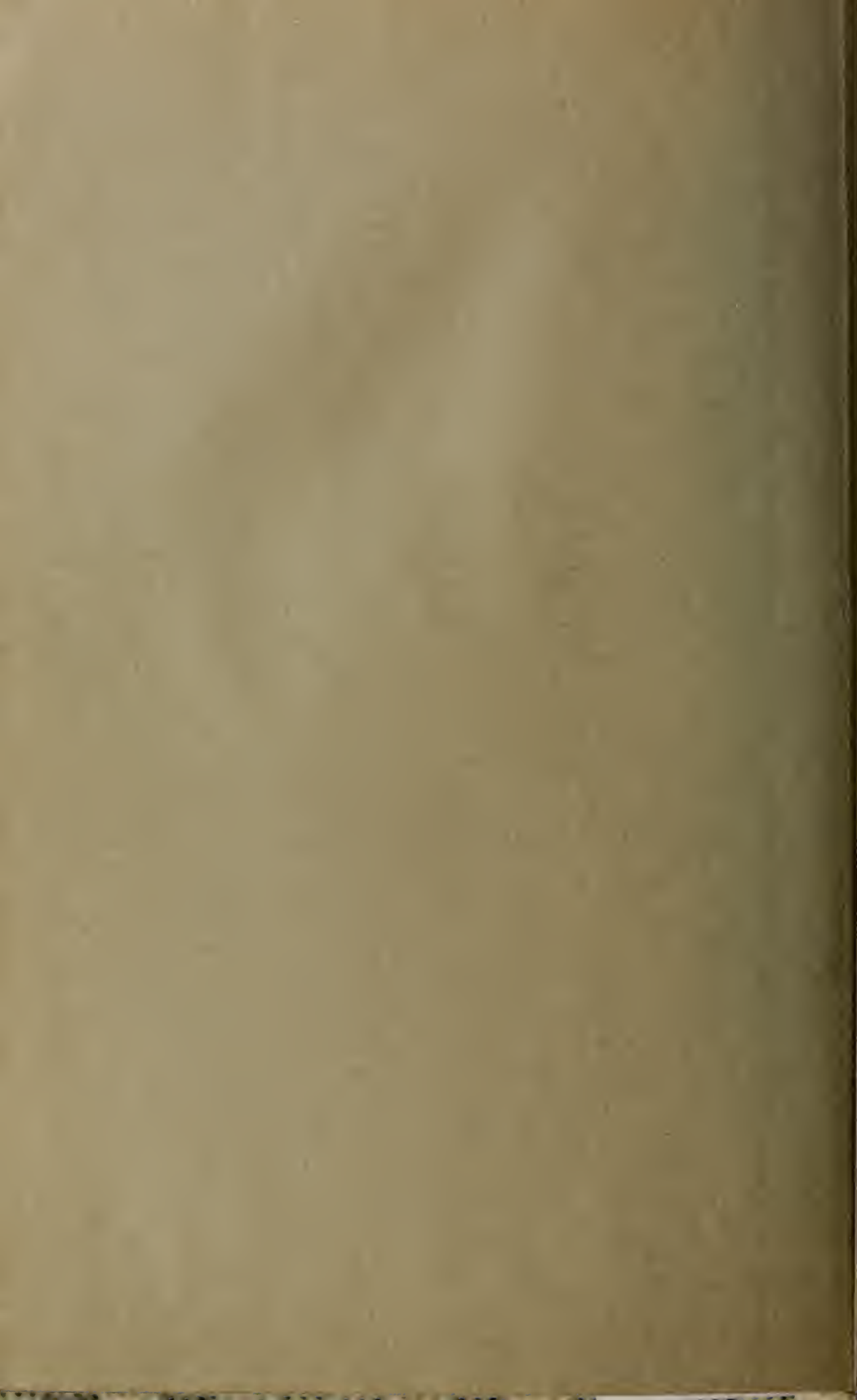
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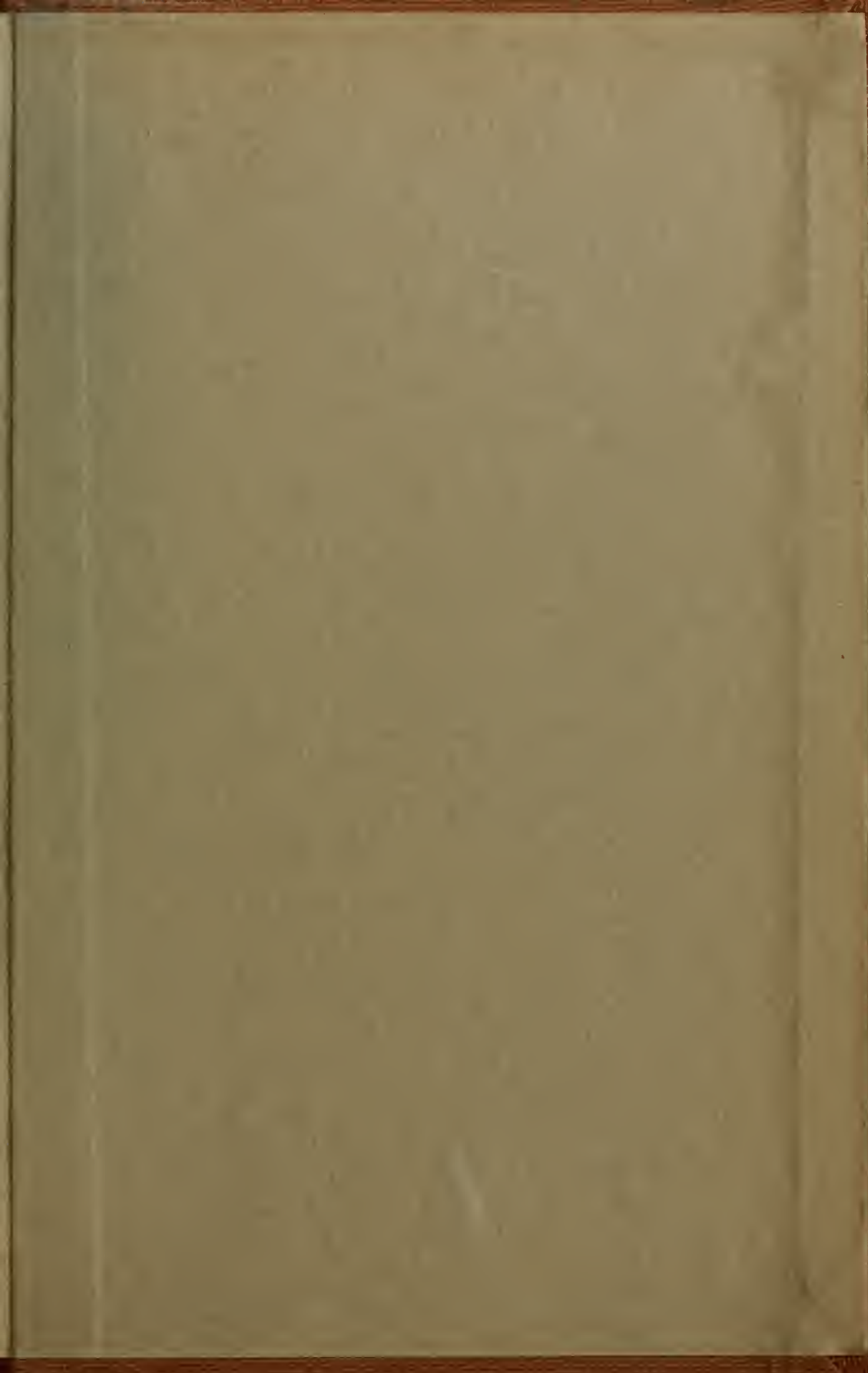


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