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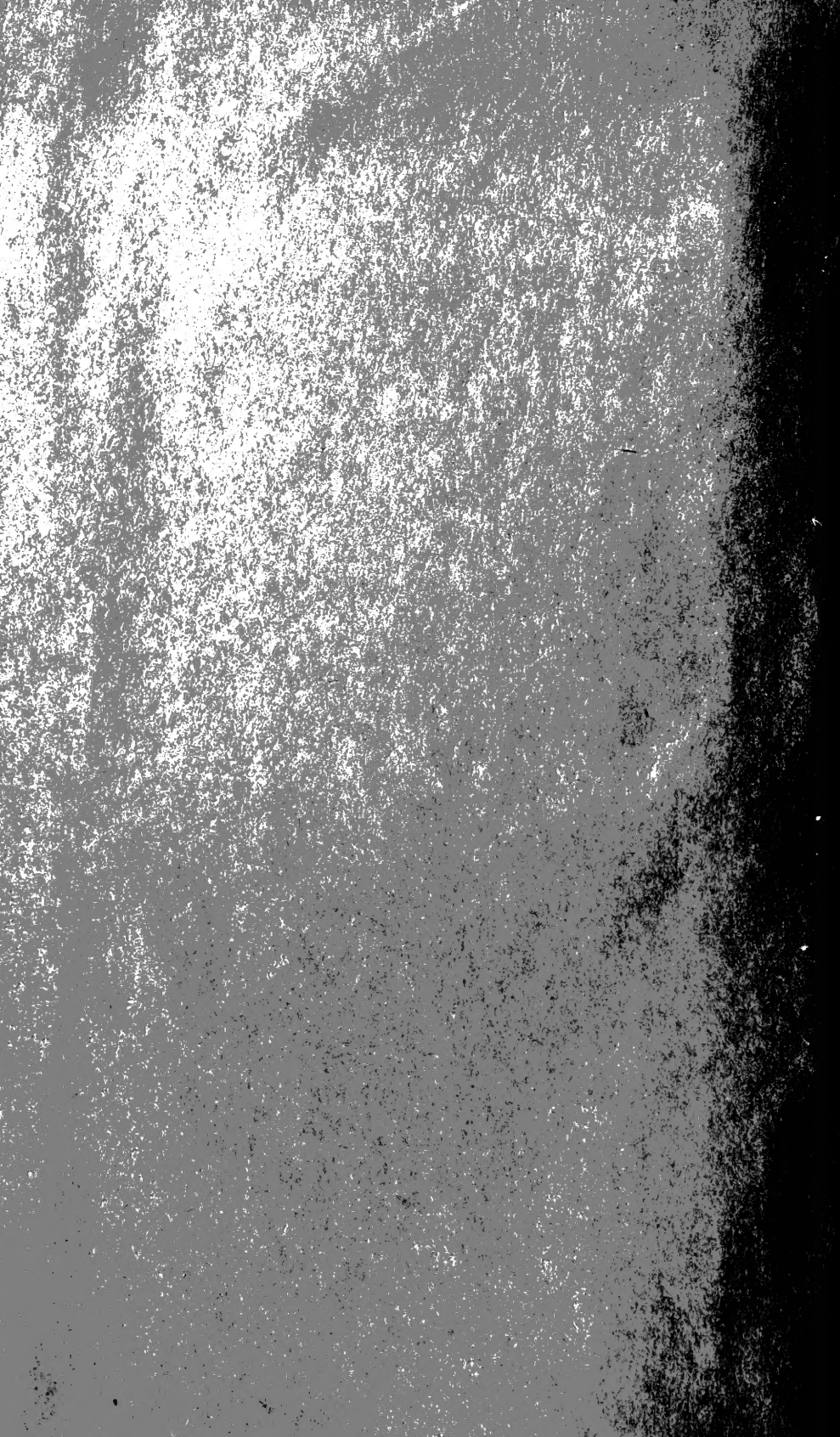
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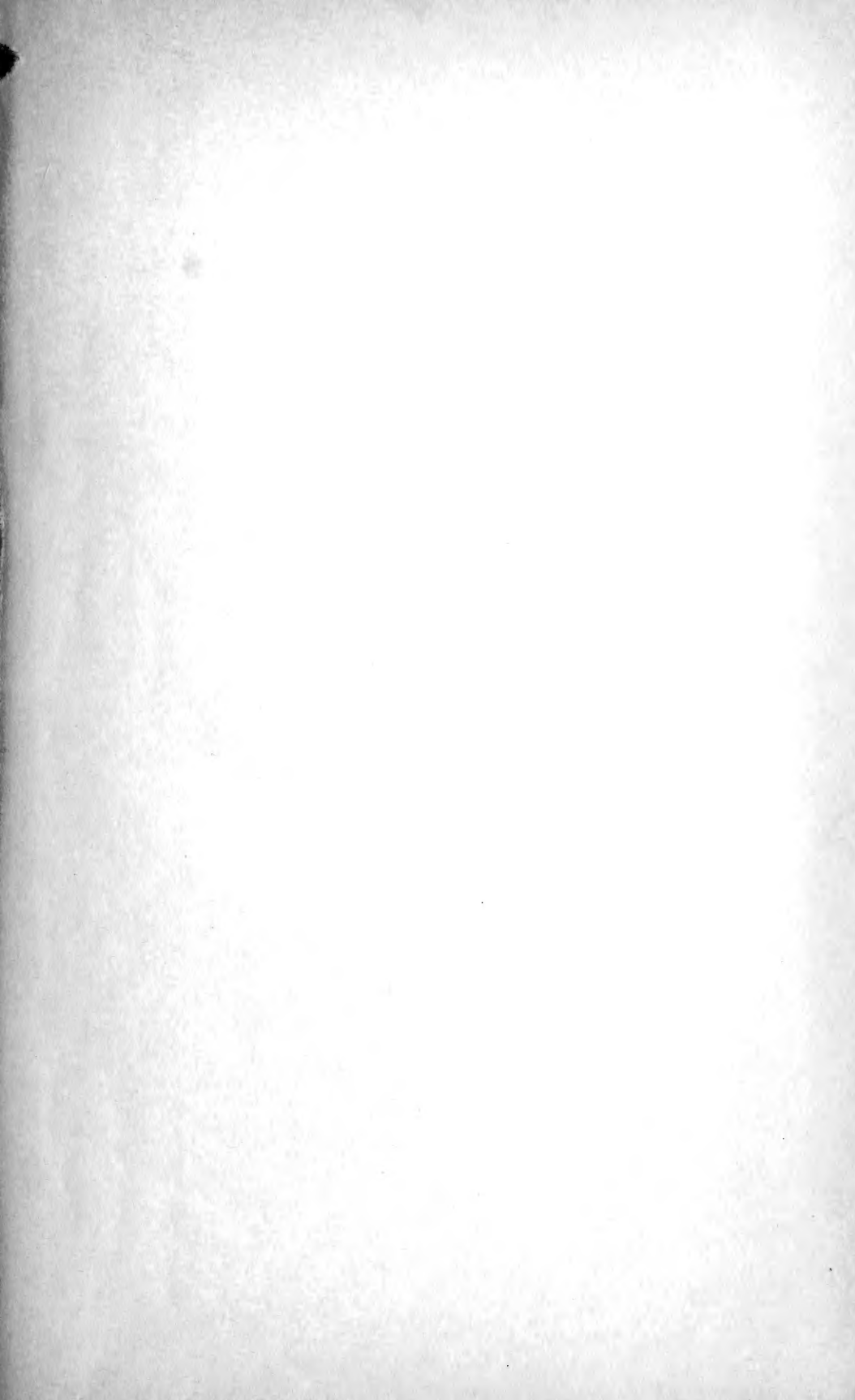
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CLARENCE BUCKINGHAM

In whose memory a hall in the Museum has been named due to the benefactions of his sister, Miss Kate Buckingham

FIELD MUSEUM OF NATURAL HISTORY

FOUNDED BY MARSHALL FIELD, 1893

PUBLICATION 336

REPORT SERIES

VOL. X, No. 2

ANNUAL REPORT OF THE DIRECTOR

TO THE
BOARD OF TRUSTEES

FOR THE YEAR 1934



CHICAGO, U. S. A.

JANUARY, 1935

BEQUESTS

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, _____

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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FREDERICK J. V. SKIFF*	1893-1921
D. C. DAVIES*	1921-1928

*DECEASED

LIST OF STAFF

STEPHEN C. SIMMS, *Director*

DEPARTMENT OF ANTHROPOLOGY.—Berthold Laufer,* *Curator*; Paul S. Martin, *Acting Curator*; A. L. Kroeber, *Research Associate in American Archaeology*. ASSISTANT CURATORS: Albert B. Lewis, *Melanesian Ethnology*; J. Eric Thompson, *Central and South American Archaeology*; Wilfrid D. Hambly, *African Ethnology*; Henry Field, *Physical Anthropology*; T. George Allen, *Egyptian Archaeology*.

DEPARTMENT OF BOTANY.—B. E. Dahlgren, *Curator*; Paul C. Standley, *Associate Curator of the Herbarium*; J. Francis Macbride, *Assistant Curator of Taxonomy*; Llewelyn Williams, *Assistant Curator of Economic Botany*; Samuel J. Record, *Research Associate in Wood Technology*; A. C. Noé, *Research Associate in Paleobotany*.

DEPARTMENT OF GEOLOGY.—Henry W. Nichols, *Curator*; Elmer S. Riggs, *Associate Curator of Paleontology*; Sharat K. Roy, *Assistant Curator of Geology*; Bryan Patterson, *Assistant in Paleontology*.

DEPARTMENT OF ZOOLOGY.—Wilfred H. Osgood, *Curator*. MAMMALS: Colin C. Sanborn, *Assistant Curator*; Julius Friesser, C. J. Albrecht, A. G. Rueckert, *Taxidermists*. BIRDS: C. E. Hellmayr, *Associate Curator*; Rudyerd Boulton, *Assistant Curator*; Boardman Conover, *Associate*; R. Magoon Barnes, *Assistant Curator of Birds' Eggs*; Ashley Hine, *Taxidermist*. AMPHIBIANS AND REPTILES: Karl P. Schmidt, *Assistant Curator*; Leon L. Walters, *Taxidermist*. FISHES: Alfred C. Weed, *Assistant Curator*; Leon L. Pray, *Taxidermist*. INSECTS: William J. Gerhard, *Associate Curator*; Emil Liljeblad, *Assistant*. OSTEOLOGY: Edmond N. Gueret, *Assistant Curator*; Dwight Davis, *Assistant*. ARTIST: Charles A. Corwin.

N. W. HARRIS PUBLIC SCHOOL EXTENSION.—Stephen C. Simms, *Acting Curator*; A. B. Wolcott, *Assistant Curator*.

JAMES NELSON AND ANNA LOUISE RAYMOND FOUNDATION.—Margaret M. Cornell, *Chief*; Franklin C. Potter, Miriam Wood, *Guide-lecturers*.

LIBRARY.—Emily M. Wilcoxon, *Librarian*; Mary W. Baker, *Assistant Librarian*.

ADMINISTRATION.—Clifford C. Gregg, *Assistant to the Director*; Benjamin Bridge, *Auditor*; Henry F. Ditzel, *Registrar*; Elsie H. Thomas, *Recorder—in charge of publication distribution*; H. B. Harte, *Public Relations*; Pearle Bilinske, *Memberships*; J. L. Jones, *Purchasing Agent*.

PRINTING.—Dewey S. Dill, *in charge*; Lillian A. Ross, *Editor and Proofreader*.

PHOTOGRAPHY AND ILLUSTRATION.—C. H. Carpenter, *Photographer*; Carl F. Gronemann, *Illustrator*; A. A. Miller, *Photogravurist*.

MAINTENANCE.—John E. Glynn, *Superintendent*; W. H. Corning, *Chief Engineer*; W. E. Lake, *Assistant Engineer*.

*DECEASED, 1934

ANNUAL REPORT OF THE DIRECTOR

1934

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, 1934.

The preparation of an operating budget for the year 1934, as for the two previous years, was most difficult, for the reason that a further decline in income from endowments, contributions, memberships, and tax collections was anticipated, and likewise a very marked decrease in revenue from paid admissions was expected. Consequently the budget adopted was again substantially reduced, and no expeditions or purchases of collections were provided for except where made possible by contributions for specific new research received during the year.

As anticipated, income from endowments and tax collections was less than in 1933; income from contributions was very much smaller; and, while the downward trend in income from memberships was greatly retarded, there was nevertheless a reduction of receipts from that source. Revenues from admissions and sundry receipts, which in 1933 were far above average, decreased in 1934 as a natural result of the smaller number of visitors, especially those from out of town, to A Century of Progress exposition in its second year. By rigid economies the Museum succeeded in keeping actual expenditures well within budget appropriations and was enabled without further reduction in salaries or personnel to cover its essential operating expenses, and to reduce notes payable caused by previous years' deficits from \$105,000 to \$95,000 (see financial statement, page 237).

Insofar as those activities directly connected with serving the public are concerned, the Museum, despite the severe economies which had to be instituted, managed to maintain its customary standards. The number of visitors received at the Museum was 1,991,469, which, while it represents a large decline from the attendance of 3,269,390 recorded in 1933, was nevertheless the second highest year's attendance in the history of the institution. The decline from the 1933 peak was a natural and expected consequence of the smaller attendance experienced by A Century of Progress.

Taking into consideration extra-mural activities, the Museum's educational influence was carried directly to a total of more than 2,650,000 persons during 1934. This figure includes the visitors

received in the Museum building itself, together with approximately 662,000 persons (chiefly children) reached by the outside work conducted by the institution through the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, and the Department of the N. W. Harris Public School Extension. As always, there were further numbers impossible to calculate, benefiting from the indirect influence of the Museum through the media of its publications and leaflets, *Field Museum News*, and information circulated through newspapers, magazines, radio broadcasts, correspondence, etc.

Only 99,553 persons, or approximately 5 per cent of the total attendance, paid the 25-cent admission fee. All the rest, numbering 1,891,916, either came on Thursdays, Saturdays, and Sundays when admission is free, or belonged to those classifications to whom admission is free on all days—Members of the Museum, children, teachers, students, etc. The highest attendance for a single day occurred on Sunday, September 2, when there were 55,548 visitors.

The extension lecturers sent by the Raymond Foundation addressed 162,360 children at 428 meetings in their school classrooms and assembly halls. The twenty motion picture entertainments presented by the Foundation in the James Simpson Theatre were attended by 27,653 children. The Foundation also conducted 404 guide-lecture tours of the exhibits for children, in which 14,759 young people participated. The total number of persons benefiting from these and other activities of the Raymond Foundation, both inside and outside the building, was 213,579.

Throughout the school year the traveling natural history exhibits circulated by the Department of the N. W. Harris Public School Extension were available in more than 400 schools and certain other institutions daily to approximately 500,000 children. Trucks from the Museum deliver and collect these cases on a regular schedule. This is so arranged that each public school, and numerous private schools, community centers, and other institutions, are provided with cases illustrating two new subjects every two weeks.

During March and April, and October and November, the Museum's annual spring and autumn courses of free illustrated lectures for adults on travel and science were presented on Saturday afternoons in the James Simpson Theatre. In addition, a lecture especially for Members of the Museum was presented on Sunday, November 25. The total attendance at the seventeen lectures was 24,326. Guide-lecture tours provided for groups of adults numbered

370, and the total number of participants in these was 8,807. Large numbers of people were served by the Library of the Museum, and the scientific study collections maintained in the various Departments.

A gratifying testimonial to the value of the traveling exhibits circulated among the schools by the N. W. Harris Public School Extension, and the extension lectures and other benefits provided by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, was received during the year. This came in the form of a large number of booklets prepared by the seventh and eighth grade pupils of the Mozart Public School, in which the children told in their own words of their appreciation of this Museum extension work. By their essays on various subjects which had been thus presented to them, the children showed that they had absorbed much information as a result of the exhibits and lectures. The booklets were forwarded to the Museum through the cooperation of Miss Myrtle McKellar, Science Teacher, and Miss H. Gertrude Jaynes, Principal of the school.

Dr. Carl Christensen, retired Curator of the Botanical Museum of Copenhagen, was elected a Corresponding Member of the Museum in recognition of his valuable services. Dr. Christensen, one of the world's two foremost authorities on ferns, enabled Field Museum to make photographs of extremely important type specimens of plants, in the course of the work of the Joint Botanical Project of the Rockefeller Foundation and Field Museum, and cooperated in every possible way to promote the success of that project.

Three names were added to the list of Contributors to the Museum:

Mrs. Sarah S. Straus, of New York, was elected a Contributor in appreciation of her generous contribution of funds which made possible the highly successful Straus West African Zoological Expedition of Field Museum. This expedition, which Mrs. Straus herself accompanied for several months, resulted in the acquisition of extremely important additions to the Museum's zoological collections.

Mr. Templeton Crocker, of San Francisco, became a Contributor as a result of his gift to the Museum of a valuable collection of more than 800 ethnological specimens from certain little-known islands of the Melanesian and Polynesian groups. This material was collected by an expedition to the South Pacific, made aboard Mr. Crocker's yacht and under his leadership.

Dr. Berthold Laufer, Curator of the Department of Anthropology, who died September 13, was posthumously elected a Contributor

in recognition of the bequest he made to the Museum of his personal library of some 5,000 volumes, many of them of great rarity and value.

The death of Dr. Laufer removed from the staff of the Museum one of its most distinguished members. In his memory the Board of Trustees, at its meeting held September 17, adopted the following resolution:

“Sorrowfully the Board of Trustees of Field Museum of Natural History has learned of the death, on September 13, 1934, of Dr. Berthold Laufer, for many years a member of the staff of the Department of Anthropology, and, since 1915, Curator of the Department. Dr. Laufer’s death removes from the personnel of this institution, and from the roster of the world’s scientists, one of the greatest of contemporary scholars.

“An eminent authority on the science of anthropology in general, Dr. Laufer had for many years specialized on researches in Oriental archaeology and ethnology, and had gained world-wide recognition for the unique and important work he achieved in his studies and writings in connection with the yellow race. It is doubtful if any other white man ever penetrated so deeply into the philosophies and the psychology of the peoples of China and Tibet. He understood the Mongolian peoples as few of their own race could, and he humanized our knowledge of them. He was steeped in their literature through all the centuries from their first discovery of means to record their thoughts. He was versed in all their arts—an unerring and incomparable judge of what was genuine and fine among their products, and what was dross. He was a vital influence in bringing about a more widespread appreciation in this country of the creations of Chinese genius, and in establishing a sympathetic understanding of the yellow race.

“In greatest degree to the work of Dr. Laufer does Field Museum owe its fame as a repository of one of the most extensive and valuable of Oriental collections. As leader of the Blackstone Expedition to China and Tibet (1908–10) and the Marshall Field Expedition to China (1923) Dr. Laufer gathered comprehensive collections of the finest treasures of those countries. His profound knowledge enabled him to arrange the display of these in the Museum in the most instructive and interesting manner, with informative labels written in genuine literary style. His contributions to the publications of the Museum were extensive in number and unique in character and scope. In addition, he wrote many other important works which were published elsewhere.

"So familiar was Dr. Laufer with the history of the peoples of the Far East, even in its most obscure chapters, that many things blazoned forth in the present-day world as strictly modern and original accomplishments of the twentieth century and western civilization were to him very old, and but a repetition or development of ideas first born in the minds of men hundreds and sometimes thousands of years ago. In his conversation, and in his voluminous writings, there was always present a delightful charm and an undercurrent of quiet humor as he drew striking parallels from ancient civilizations to show that much contemporary thought, invention and 'progress' was actually not new at all. From his vast store of knowledge he upset, with quaint narratives and facts gleaned from little-known sources, many a set and smug notion of a too self-satisfied generation.

"The loss of Dr. Laufer is keenly felt by the Trustees of the Museum, who recognize not only that a career of splendid intellectual achievements has sadly come to a close, but that a man of noble spirit and character has passed to the beyond.

"Therefore, be it resolved, that this expression of the Trustees' appreciation of Dr. Laufer's many years of loyal and valuable service to the Museum, and to science, be permanently preserved on the records of the Board;

"And be it further resolved that our deep sympathy be conveyed to his bereaved family, and that a copy of this resolution be transmitted to his widow."

News of two other deaths was received with regret during the year. Mr. Louis Charles Watelin, who had for several years been field director of the Field Museum-Oxford University Joint Expedition to Mesopotamia, died in July, while on his way to conduct an expedition on Easter Island. His services during the excavations at Kish were of great value to Field Museum and to the science of archaeology.

Dr. Davidson Black, a Corresponding Member of Field Museum, died on March 16. Dr. Black, a noted anatomist and anthropologist, was professor of anatomy at the Peking Union Medical College in China, and an authority on the "Peking man." He had rendered many valuable services to this institution.

At the Annual Meeting of the Board of Trustees, held January 15, all Officers of the Museum who had served in the preceding year were re-elected for 1934.

At a meeting of the Board held May 21, Mr. Leslie Wheeler and Mr. Joseph N. Field were elected Corporate Members of the Museum; and at a meeting held June 18 they were elected as Trustees. Messrs. Wheeler and Field fill the places on the Board which had been vacant since the deaths in 1932 of Trustees William V. Kelley and Martin A. Ryerson.

It is a pleasure to note that Professor Grafton Elliot Smith, famous British anthropologist, who is a good friend and a Corresponding Member of Field Museum, was knighted in 1934 by His Majesty King George V of England. Sir Grafton has performed many valuable services for Field Museum.

Many new exhibits of importance were completed during 1934. Outstanding among these is the series of sculptures of champion domestic animals of Great Britain, for the exhibition of which a new hall, Hall 12, was especially prepared. These sculptures, of which there are nineteen, are a gift to the Museum from Trustee Marshall Field, and are the work of the noted sculptor, Mr. Herbert Haseltine, who visited the Museum for the purpose of making suggestions as to their installation. The sculptures are in marble and bronze, one-fourth life size. Types of horses, beef and dairy animals, sheep, and swine are included. The collection represents a new departure in the policy of the Museum, as hitherto all exhibits in the Department of Zoology had been limited to wild animals.

A number of new habitat groups of wild animals were added to the zoological exhibits. Especially striking is the group of the rare African antelope known as the bongo, installed in Carl E. Akeley Memorial Hall (Hall 22). This is an animal seldom seen either in museums or by hunters in its homeland. Specimens for this group were collected by the Harold White—John Coats African Expedition (1930) after one of the most difficult hunts in the career of Captain Harold A. White. The group was prepared by Staff Taxidermist C. J. Albrecht, and has a painted background by Staff Artist Charles A. Corwin. In the same hall there was installed also a group of aardvarks, composed of specimens collected by the Harold White—John Coats Abyssinian Expedition (1929), and mounted by Taxidermist Albrecht. Aardvarks are among the world's most peculiar animals, and because of their remarkable speed in burrowing it is difficult to obtain specimens.

In William V. Kelley Hall (Hall 17) four new habitat groups of Asiatic animals were installed. The two most important species of deer in Asia, the sambar deer, and the swamp deer or barasingha,



THE LATE DR. BERTHOLD LAUFER

A member of the staff of Field Museum since 1907, Dr. Laufer was for a number of years Associate Curator of Anthropology, and was Curator of the Department from 1915 until his death on September 13, 1934

are represented by adjacent groups. Both of these are composed of specimens collected by the James Simpson-Roosevelts Asiatic Expedition (1926), and the late Colonel J. C. Faunthorpe of Bombay. Preparation of both groups is the work of Staff Taxidermists Julius Friesser and Arthur G. Rueckert, assisted by Mr. W. E. Eigsti. The backgrounds are by Staff Artist Corwin, and are based on field studies furnished through the cooperation of the Bombay Natural History Society. The third new group in Kelley Hall is that of Bengal tigers, for which the specimens were obtained by the Simpson-Roosevelts Expedition. The tigers were mounted by Taxidermist Albrecht, and the background is by Mr. Corwin. Finally, there was installed in this hall a group of Asiatic sloth bears, for which specimens were collected by Colonel Faunthorpe, and by Mr. Dilipat Singh, of Singahi, Kheri District (Oudh), India. Staff Taxidermist Rueckert and Mr. Eigsti prepared this group, and Mr. Corwin painted the background from field studies furnished by the Bombay Natural History Society.

A notable reinstallation in Kelley Hall is that of the group of proboscis monkeys of Borneo. This group, originally prepared by the late Carl E. Akeley, has been completely rearranged and improved by Staff Taxidermist Leon L. Pray, assisted by Mr. Frank Letl. The group now has a painted background by Mr. Pray, as well as a foreground reproducing a treetop scene with artificial branches, leaves and vines. The animals were purchased for the Museum years ago by the late Martin A. Ryerson.

The installation of four new screens, and the reinstallation of several others, practically completed the systematic collection of North American birds in Hall 21. Nearly all of the work on these was done by Staff Taxidermist Ashley Hine. To the synoptic exhibit of foreign birds in the same hall was added a case of gallinaeous birds prepared by Assistant Taxidermist John W. Moyer.

Of special interest because of the use of the so-called "celluloid method" in its preparation, is a new specimen of the large flightless bird called cassowary, added to the foreign birds in Hall 21. The head and legs of the cassowary were reproduced in cellulose-acetate by the process developed in recent years for work on reptiles and hairless mammals. These are assembled with the original skin of the body. The mount is the work of Staff Taxidermist Leon L. Walters, originator of the celluloid process, and Mr. Edgar G. Laybourne.

The most notable addition to the exhibits of the Department of Anthropology consisted of eleven more sculptures in bronze of racial types, installed in Chauncey Keep Memorial Hall (Hall of the Races of Mankind). These, like the sculptures placed on view in the preceding year, are all the work of Miss Malvina Hoffman, noted sculptor. The new subjects include a full-length figure of a Navaho, and busts or heads of an Alpine Austrian, a Zulu woman, a Korean man, a Pueblo Indian woman, an Apache, a Carib, a Turk, an Igorot, a Berber, and a Toda. These brought the series practically to completion. Only a head of a Beduin remains to be added, and this is expected early in 1935. Altogether the hall now contains ninety studies (including several groups, which bring the number of individuals portrayed up to one hundred) of representative types of the races of the world.

In the east end of Chauncey Keep Hall there was installed a series of exhibits illustrating various phases of physical anthropology. These consist of transparent illuminated colored pictures on glass of racial types, charts pertaining to racial differences and racial distribution, casts of hands and feet illustrating differences among various peoples, skulls of different races, casts of brains, examples of head and body deformation practised by many peoples, samples of hair, casts showing types of ears, and many other exhibits pertaining to the subject.

At the entrance to the Hall of the Stone Age of the Old World (Hall C) there was installed an exhibit called "The Ancestry of Man." On the background of the exhibition case is represented a branching tree. Attached to the branches are reconstructions of the skulls of primitive monkeys and apes, of types of prehistoric men, and finally skulls of modern men of various races. The exhibit graphically illustrates the theory that man, while not the descendant of any living type of ape, has, from many lines of evidence accepted by scientists, a common ancestry with the apes; and that while apes were evolving from primitive types to those living today, a parallel evolution was taking place through various primitive human types and culminating in the present races of man.

Of great interest is an exhibit illustrating the method for determining the building dates of cliff houses and ruins in the southwestern United States by means of tree rings in the remains of wood used in the structures. This has been installed in Hall 7, devoted to archaeology and ethnology of the Southwest. This method of tree-ring chronology was developed by Dr. A. E. Douglass of the Uni-

versity of Arizona, and has been successfully used in connection with the excavations on Lowry ruin in Colorado by the Field Museum Archaeological Expeditions to the Southwest.

Two cases of artifacts, selected from the large collection of ethnological material from the islands of the Pacific, presented to the Museum during the year by Mr. Templeton Crocker, of San Francisco, were placed on exhibition in Joseph N. Field Hall (Hall A).

Seventeen exhibition cases of new ethnological material from Africa were installed in Halls D and E, and two in Alcove A1 near-by. The bulk of these new exhibits is from the collections made by the Frederick H. Rawson-Field Museum Ethnological Expedition to West Africa (1929-30).

In Stanley Field Hall there were installed a case of beautiful scarfs for women, from India; a fine collection of ancient lacquered vessels from Peru; and a case of remarkable Peruvian textiles made between A.D. 1000 and 1500. To the Mexican and Central American collections in Hall 8 there were added many excellent examples of ancient sculptures, pottery, textiles, and other archaeological material including some collected in British Honduras during 1934 by the Joint Expedition of the Carnegie Institution of Washington, D.C., and Field Museum.

Extensive reinstallations, along with additions of material not previously exhibited, were made in Halls 8 and 9 (archaeology of Mexico and Central and South America); Hall 32 (ethnology of China and Tibet); Hall D (West and Central African ethnology); Hall E (Madagascar, and East, South and North Africa); Edward E. and Emma B. Ayer Hall (Hall 2, archaeology of Italy, Etruria and Greece); and Joseph N. Field Hall (Hall A, ethnology of Melanesia and other South Pacific island groups).

Numerous additions were made to the exhibits in the Department of Botany. Among new reproductions of plants, prepared by the Plant Reproduction Laboratories of the Museum, and now on exhibition in the Hall of Plant Life (Hall 29) are one of an entire plant of the Panama hat palm of Central America and northern South America; a branch of the South American climber called guaraná, used by natives in making a beverage with the mildly stimulant properties of coffee; a fruiting branch of the jujube tree; a branch of the tropical American cupuassu tree, which is related to the cacao; a branch of jaboticaba, a curious plant from Brazil which has grape-like fruit growing directly from the stem; and a new species of *Heliconia*, from Mexico, which has been added to the

case containing representatives of the banana family. To the exhibit of foreign nuts forming a part of the exhibit of food plants in Hall 25 there was added a reproduction of a California-grown almond branch in fruit. Other additions to Hall 25 include a case of beverage plants such as coffee, maté, cassine tea, kola, guaraná, and cacao, and a case devoted to fermented and distilled beverages.

A variety of material was added also to the exhibits in Charles F. Millspaugh Hall (Hall 26, North American woods), Hall 27 (foreign woods) and Hall 28 (plant raw materials and products).

Most important new exhibit of the Department of Geology is a collection of culture pearls grown in Japan and presented to the Museum by Mr. Kokichi Mikimoto, of Tokyo, to whose years of experiment and study the commercial production of culture pearls is due. This collection, placed on exhibition in H. N. Higinbotham Hall (Hall 31), includes a group of five culture pearls illustrating range of color and luster; another group of six culture pearls with six natural Oriental pearls for comparison; a pearl oyster with one shell removed to show the mantle in which the pearl grows; a large shell which has a dark mother-of-pearl margin and a light center, with a black pearl on the dark portion and a white one on the light, showing the influence of the shell color on the color of the pearls; and two pearls cut in section, one a natural pearl and one of the culture variety, placed under a magnifying glass to show the nuclei and structure of each kind.

To the meteorite collection in Hall 34, fifteen new specimens representing eleven falls were added. The collection, which is the largest in the world as regards the number of falls represented, now contains specimens of more than two-thirds of all known meteorites, or 727 of the approximately 1,050 of which there is a record.

Fossil skulls of a sabertooth tiger, an Andean horse, and a giant species of turtle were added to the paleontological exhibits in Ernest R. Graham Hall (Hall 38).

Reinstallation to better advantage of the mineral collection in Hall 34 was completed, and great progress was made on exhibits requiring reinstallation in other halls of the Department of Geology.

As in the previous year, for reasons of economy, there were no budget appropriations for expeditions or field work, but a number of privately financed expeditions, organized on behalf of the Museum, were productive of great benefits to the institution.

The Straus West African Expedition of Field Museum, sponsored by Mrs. Sarah S. Straus, of New York, widow of the late Oscar

Straus, made large and valuable collections of zoological material in Senegal, the French Sudan, Nigeria, and Angola (Portuguese West Africa). It was led by Mr. Rudyerd Boulton, Assistant Curator of Birds. Mrs. Straus herself accompanied the expedition during several months of its work. Other members of the party were Mr. John F. Jennings, of Chicago, who was in charge of photography; Mr. Frank C. Wonder of the Museum's taxidermy staff, who collected mammals; and Mrs. Laura C. Boulton, who traveled with the expedition while engaged in ethnological work under a grant from the Carnegie Corporation, of New York. In addition to extensive general zoological collections, material was collected for several proposed habitat groups of birds.

The Leon Mandel Guatemala Expedition of Field Museum, continuing work begun in 1933, made a comprehensive collection of characteristic Central American fauna, and obtained important material for several habitat groups of birds. Mr. Mandel, the sponsor, participated in the work for a part of the time. The leader of the expedition was Mr. Karl P. Schmidt, Assistant Curator of Reptiles. The personnel included Mr. F. J. W. Schmidt, mammalogist; Mr. Emmet R. Blake, ornithologist; and Mr. Daniel Clark, general assistant.

Important new discoveries in connection with the history and culture of the ancient Mayas resulted from the excavations conducted by the Joint Archaeological Expedition of the Carnegie Institution of Washington, D.C., and Field Museum, to British Honduras. The expedition was led by Mr. J. Eric Thompson, Assistant Curator of Central and South American Archaeology. Much valuable material was collected for addition to the Museum's collections relating to the Mayas. The share of the finds assigned to the Belize Estate and Produce Company, owners of the land on which the excavated ruins are located, was purchased for Field Museum by means of a special grant of \$300 generously provided by the Carnegie Institution.

The Field Museum Archaeological Expedition to the Southwest, financed by the Julius and Augusta N. Rosenwald Fund of the Museum, carried on its fourth season of excavations on the Lowry ruin, a prehistoric Indian site in Colorado. As in its previous operations, the expedition was under the leadership of Dr. Paul S. Martin, Assistant Curator of North American Archaeology. The expedition brought back to the Museum a large collection of artifacts and human remains, and many important discoveries were made

regarding the history of the ancient inhabitants of Lowry pueblo. Work was expedited by a force of workmen furnished by the Montezuma County Emergency Relief Administration.

An anthropometric survey of Kurd, Arab, and Beduin populations was made by the Field Museum Anthropological Expedition to the Near East, sponsored by Mr. Marshall Field. The expedition was led by Mr. Henry Field, Assistant Curator of Physical Anthropology, who was accompanied by Mr. Richard A. Martin, of Chicago. In addition to collecting anthropological data and material, the Near East expedition made large collections for the Departments of Botany, Zoology, and Geology.

Paleontological field work was conducted in the Bad Lands of South Dakota by Mr. Elmer S. Riggs, Associate Curator of Paleontology; and in Nebraska and Pennsylvania by Mr. Sharat K. Roy, Assistant Curator of Geology.

The botanical project in Europe, in charge of Mr. J. Francis Macbride, Assistant Curator of Taxonomy, was in its fifth year of operations. This project, inaugurated jointly in 1929 by Field Museum and the Rockefeller Foundation, is still partially supported from the funds granted for the purpose by the latter institution. As a result of its operations some 28,000 photographic negatives of type specimens of plants in European herbaria have now been made, and through Field Museum prints of these are available, at cost of production, to botanists generally in this country and abroad. For the first time since the inception of this project, it was interrupted toward the end of the year by the return of Mr. Macbride to this country for a vacation of several months. It is planned to have him resume work in Europe early in 1935.

Grateful acknowledgment is hereby made to various contributors who have made gifts of funds to the Museum during the year. Among these may be mentioned the following:

Mr. Marshall Field made two gifts totaling \$26,140. One gift was of \$18,640, which was to meet an anticipated deficit of the Museum for 1934. The second gift, \$7,500, was made to defray the expenses of the Field Museum Anthropological Expedition to the Near East.

Mrs. Oscar Straus, of New York, contributed \$11,105.47 for expenses of the Straus West African Expedition of Field Museum.

Mrs. James Nelson Raymond, of Chicago, made gifts totaling \$4,000 toward the operating expenses of the James Nelson and

Anna Louise Raymond Foundation for Public School and Children's Lectures, which she founded in 1925, and to the support of which she has been contributing annually since that time.

Mr. Leslie Wheeler, of Lake Forest, Illinois, contributed \$500 to be devoted to the purchase of desirable bird specimens for addition to the Museum's collections.

Mr. Leon Mandel, of Chicago, gave an additional \$232.43 for expenses of the Leon Mandel Guatemala Expedition of Field Museum, which he originally financed for the Museum with a contribution in 1933 of \$4,351.30.

Mr. Henry J. Patten, of Chicago, is the donor of a total of \$500, one-half of which was for addition to the general operating funds of the Museum. The balance is to cover the cost of publication, in the *Survey of Persian Art*, of certain drawings, made by Mr. Rowland Rathbun, of Sasanian stucco found at Kish by the Field Museum-Oxford University Joint Expedition to Mesopotamia. This publication will be prepared at Oxford under the editorship of Mr. Arthur Upham Pope.

The American Friends of China, Chicago, contributed \$482 for the purchase of material for addition to the Museum's Chinese collections, and for books on China for addition to the Library.

From the Rosenwald Family Association the Museum received two payments totaling \$2,500, representing the interest from October 1, 1933, to October 1, 1934, on the bequest of the late Mrs. Augusta N. Rosenwald.

The will of the late Mrs. Abby K. Babcock provides a legacy of \$100,000, subject to the life interest of her husband, Mr. Frederick R. Babcock, formerly of Chicago.

The South Park Commission, and its successor, the Chicago Park District, turned over to the Museum \$101,226.19, representing the institution's share, as authorized by the state legislature, of collections made during 1934 under the tax levies for 1932 and previous years.

Friends of the Museum have continued, as in past years, to make generous gifts of material for addition to the collections of the various Departments. Some of these have already been noted in preceding pages in connection with their acquisition by expeditions or their installation among the exhibits. Details of the many gifts will be found in the departmental sections of this Report under the heading Accessions, and in the tabulated List of Accessions which

begins on page 238. It is fitting to mention here, however, a few of the gifts of outstanding importance:

Most noteworthy was the gift from Mr. Marshall Field, Trustee of the Museum, of the nineteen sculptures by Herbert Haseltine of champion domestic animals of Great Britain, which have been installed in Hall 12.

An interesting collection of fourteen Lamaist paintings was presented by Messrs. Leon Mandel and Fred L. Mandel, Jr., of Chicago, in memory of their deceased mother, Mrs. Blanche R. Mandel. Mr. Leon Mandel also presented 5,000 feet of motion picture film taken during the Leon Mandel-Field Museum Guatemala Expedition.

The American Friends of China, Chicago, gave the Museum a valuable brush-holder which belonged to the emperor K'ien-lung. It is made of Burmese padouk wood, and has inlaid inscriptions and designs in ivory, jade, and semi-precious stones. It bears the date A.D. 1736. The same society continued its generous contributions of books to the Museum Library.

Mr. William J. Chalmers, of Chicago, presented fifteen specimens of placer gold, of historic interest due to their having been mined during the great California gold rush of 1849.

From Mr. Frank Buck the Museum received gifts of a large king cobra, an East Indian monitor, and two iguanas.

An unusual collection of zinc and lead ores having the appearance of cave deposits, coming from the Embree Mines of Tennessee, was presented by Mr. Seymour Wheeler in the name of his father, the late Mr. Charles P. Wheeler, of Chicago.

From R. Bensabott, Inc., Chicago, there was received a most attractive statuette carved in the semi-precious stone called "tiger-eye" or crocidolite.

The bequest of Dr. Berthold Laufer's personal library of more than 5,000 volumes, to which reference has already been made, is one of the most important Library accessions in years.

A collection of snakes, lizards, frogs and turtles of Yucatan was received from Mr. E. Wyllys Andrews IV, of Chicago, and from Mr. H. St. J. Philby, of Mecca, Arabia, came a collection of 1,281 insects.

From the estate of the late Mr. and Mrs. Edward E. Ayer there was received, as a bequest, a collection of eighteen notable examples of North American Indian blankets. An excellent example of a Chinese mandarin coat was presented by Mrs. Frank S. Johnson, of Pasadena, California, daughter of the late Mr. and Mrs. Ayer.

Mr. Homer E. Sargent, of Pasadena, California, purchased a fine Tunisian blanket for addition to the collections of the Department of Anthropology.

As a result of the cordial relations maintained between the Chicago Zoological Society and Field Museum, the Department of Zoology received a number of specimens of small mammals of unusual interest, as well as five snakes and fifteen lizards, chiefly Australian species. The similar relationship existing between the John G. Shedd Aquarium and this institution brought a number of especially desirable fish specimens which were needed to fill gaps in the Museum collection.

Trustee Leslie Wheeler presented the Museum with its most important bird acquisitions of the year. Altogether his gifts amounted to 303 specimens, including birds of prey, and a collection of 248 miscellaneous birds from southwest Africa.

Dr. A. E. Douglass and Mr. Harry T. Getty, of the University of Arizona, presented material consisting of twenty polished cross sections of wooden beams from southwestern ruins of various dates, and various accessories. These were used in preparing an exhibit illustrating the method of dating ruins, known as "tree ring chronology," of which Dr. Douglass is the originator.

From Mr. Allyn D. Warren, of Chicago, an interesting Balinese carved wooden figure of the god Vishnu riding on a mythical bird, was received.

Mrs. Rudyerd Boulton, of Chicago, presented a collection of twenty-eight west African ethnological objects, principally musical instruments of the natives.

Among distinguished visitors entertained at the Museum during the year were His Highness Sultan Ibrahim of Johore, and the Sultana; Baron and Baroness Maurice de Rothschild, of Paris; Captain H. C. Brocklehurst, former Game Warden of the Sudan, and author of books on African animals; Captain Maurice Rossi and Lieutenant Paul Codos, French aviators who made a trans-Atlantic flight; Sir Henry Wellcome, distinguished scientist, Founder and Director of the Wellcome Historical Medical Museum in London; His Excellency Mr. Hiroshi Saito, Japanese Ambassador to the United States; Mr. Shane Leslie, noted Irish author; Mr. James Zetek, well-known entomologist of the Canal Zone; and Dr. E. P. Phillips, of the National Herbarium, Pretoria, South Africa.

The American Ornithologists' Union held its fifty-second annual meeting in the James Simpson Theatre and the small lecture hall

of Field Museum from October 22 to 25. The sessions, which comprised both technical and general discussions, were attended by nearly 200 leading ornithologists from all parts of the country. This was the second time the Union had held such a meeting at Field Museum, similar sessions having been held here twelve years previously. Members of the staff of Field Museum's Department of Zoology presented several important papers.

The Museum prepared for the visitors a special exhibition in Hall 20 of about one hundred original paintings made by the late Louis Agassiz Fuertes, noted naturalist and artist, during the course of the Field Museum—*Chicago Daily News* Abyssinian Expedition (1926–27). These paintings were received at the Museum several years ago as a gift from Mr. C. Suydam Cutting, of New York, who was also a member of the Abyssinian expedition.

As has been the experience in other years, the holding of the annual International Live Stock Exposition at the Union Stock Yards brought a large additional attendance to Field Museum during the period of the exposition, December 1 to 8. Besides the many persons from out-of-town who visited the Museum independently, two large groups of children were brought to the Museum under the auspices of the Four-H Clubs, an organization promoting the interests of young people on farms. There were a group of 540 girls, and one of 646 boys. They were given special service by the guide-lecturers of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

A party of delegates to the annual convention of the Chicago Dental Society spent a morning in the Department of Geology studying the metallurgy of metals used in their profession.

The International Exhibition of Taxidermic Art, sponsored by the technical section of the American Association of Museums, had its Chicago showing in Hall 20 of Field Museum from April 1 to 15. This exhibit, consisting of 473 photographs of animal groups, mounts, sculptures, and material illustrating taxidermic methods, comprised examples of the work of eighty of the world's most highly skilled taxidermists. The staff of Field Museum was well represented among these, the works shown including examples by Staff Taxidermists Julius Friesser, C. J. Albrecht, Leon L. Walters, Leon L. Pray, Ashley Hine, Arthur G. Rueckert; Assistant Taxidermists John W. Moyer and Frank Letl; and Staff Artist Charles A. Corwin.

There were received during the year from Miss Malvina Hoffman, and placed in storage in the Museum, plaster casts of all the sculp-

tures of racial types in Chauncey Keep Memorial Hall (Hall 3). These casts are being stored so that they may be available for filling any orders which may be received from other institutions, or from individuals, for duplicates of any of the sculptures. Some such duplicates have already been sold.

As in 1933, there were loaned to A Century of Progress exposition during its 1934 season twelve of the traveling exhibits of the Department of the N. W. Harris Public School Extension, for display in the Hall of Science. Likewise, from the Department of Zoology there were loaned to the exposition 116 specimens of birds and mammals, and ten fish models, which were used in the biological section of the Hall of Science to illustrate speciation.

The series of radio broadcasts on the Museum and its activities, begun in 1933 at the invitation of WGN, the *Chicago Tribune* station, was continued in the early part of 1934. The Director and Departmental heads of the Museum were the speakers.

The habitat groups of birds in Hall 20 were reproduced as illustrations in a book entitled *The Bird Kingdom*, published by the Orthovis Company, of Chicago, as a companion volume to *The Animal Kingdom*, which appeared in 1933 with pictures of many of the Museum's mammal groups. In these books the pictures are printed by a special process which gives an illusion of three dimensions when they are viewed through an optical device called the "ortho-scope" which accompanies each book. The same publisher issued also four smaller books, for children, illustrated with "three-dimensional" pictures of Field Museum mammal groups.

Among books written by members of the Museum staff and published outside in 1934 is *Homes and Habits of Wild Animals*, by Mr. Karl P. Schmidt, Assistant Curator of Reptiles. This is a companion volume to *Traveling with the Birds*, by Mr. Rudyerd Boulton, Assistant Curator of Birds, published late in 1933. Both books contain attractive colored illustrations by Walter A. Weber, an artist formerly on the staff of the Museum. These books are published by M. A. Donohue and Company, Chicago.

In recognition of the capable and efficient manner in which they have administered their respective Departments, the Board of Trustees at its meeting held September 17, approved the appointment of Acting Curator B. E. Dahlgren as Curator of the Department of Botany, and of Acting Curator Henry W. Nichols as Curator of the Department of Geology. These appointments became effective on October 1.

Dr. Paul S. Martin, formerly Assistant Curator of North American Archaeology, was appointed Acting Curator of the Department of Anthropology shortly after the death of Dr. Berthold Laufer, Curator. Dr. Martin has been on the staff since 1929, and has accomplished much work of importance, both at the Museum and in the field as leader of the Field Museum Archaeological Expeditions to the Southwest.

Dr. Charles Baehni, of the Conservatoire Botanique, Geneva, Switzerland, arrived in Chicago toward the end of July to begin a year of study at Field Museum, under a cooperative arrangement between the two institutions, initiated through the courtesy of Dr. B. P. G. Hochreutiner, director of the conservatory.

Under the provisions of the Field Museum Employes' Pension Fund, insurance amounting to \$6,000 was paid to Mrs. Berthold Laufer, widow of the late Dr. Laufer, whose death has been noted elsewhere in this Report.

Mr. Carl Neuberth, former Custodian of the Herbarium who, after many years of service, was retired in 1932, and pensioned in 1933, because of ill health, died during 1934. Under the provisions of the Field Museum Employes' Pension Fund insurance amounting to \$4,000 was paid to his widow. Also under the provisions of this fund, insurance of \$1,500 was paid to the widow of Mr. Joseph Zobay, carpenter, who died during the year; and \$3,000 insurance was paid to the widow of Mr. William C. Webster, pensioned member of the maintenance force.

Mr. Paul C. Standley, Associate Curator of the Herbarium, was honored during the year by an invitation from the International Botanical Congress to act as Vice-President of the Section for Taxonomy and Nomenclature when the Congress meets at Amsterdam in September, 1935.

Beginning in the last month of 1933, and continuing throughout 1934 on a greatly increased scale, Field Museum has been cooperating with the various relief agencies of the state and federal governments in providing useful employment for large numbers of the persons being assisted by those agencies. As a result, up to the end of 1934, approximately 350 unemployed men and women have had temporary employment for periods of various lengths at this institution. As the "work relief" wages are paid by the relief agencies, the Museum has, without cost except for materials used in the work, derived great benefits from the assignment of these workers. They have been useful in practically every Department and Division of

the Museum. The tasks to which they have been assigned are important ones, but of a character which would have required indefinite postponement if this additional personnel had not been available, because the regular staff of the Museum was fully occupied in still more important work.

The larger part of the relief workers has been assigned to the Museum by the Illinois Emergency Relief Commission, and paid through that agency. Many others, however, were assigned and paid by the Civil Works Service, Civil Works Administration, and Public Works of Art Commission, during the periods in which those federal government agencies were in operation. When the federal agencies were discontinued after the first quarter of 1934, their work was taken over by the state commission, which provided the Museum with assignees throughout the year.

The Museum in 1934 had as many as 86 relief workers assigned to it during a single period; the lowest number at any one time was eight; and the average number through the year was 40. The total number of working hours of the assignees to the Museum, in the aggregate, was 43,172; the average number of working hours per week was 830.

In the Department of Anthropology the work done by relief assignees included the mounting and captioning of some 6,000 photographs; mounting on linen of more than 800 ancient Peruvian fabrics; the washing and numbering of about 9,000 potsherds, and the classifying and mounting of 4,000 of them; and a great amount of typing, indexing, preparing of catalogue cards, and other clerical work.

In the Department of Botany relief workers have made 35,000 packets for plant specimens; mounted approximately 60,000 herbarium specimens of plants; prepared 35,000 index cards; made several thousand leaves in the Plant Reproduction Laboratories; and performed a large amount of work on the wood collections, in the preparation of dioramas, on drawings and lettering, on records, and in typing and clerical work of various kinds.

The relief workers assigned to the Department of Geology prepared more than 13,500 catalogue cards on the typewriter; numbered 1,600 specimens; copied extensive manuscripts; mounted a number of fossils; and in the case of some especially qualified workers were even able to undertake certain research projects.

Work done by relief assignees in the Department of Zoology comprises the preparation of 15,000 index cards, labels and other

typewriting items; the cataloguing of some 4,000 birds; the tagging of 8,000 fishes; the cleaning of more than 1,000 large and 3,000 small and medium-sized skulls; pinning of about 1,200 insects; and various routine tasks.

From two to twelve relief workers have been assigned to the Division of Printing where they assisted in the type composition and other work on publications, exhibition labels, etc. In the Division of Photography relief workers made 12,800 photographic prints, and prepared 30,500 catalogue cards. A vast amount of typing and clerical work of various kinds was performed by relief workers in the Library, the Division of Publications, Division of Public Relations, Division of Memberships, and the Raymond Foundation. In the Maintenance Division ten relief workers assisted the Museum forces in various tasks.

The Art Research Classes conducted at the Museum in cooperation with the Art Institute of Chicago were continued on the expanded and diversified plans inaugurated in 1933. This was the second year in which, in addition to the original class in drawing, painting and illustration with an enrollment of some fifteen students, there were conducted also a separate training class for art teachers with an enrollment of thirty students; and a summer class for teachers and others whose employment makes it impossible for them to attend the autumn, winter and spring courses, with fourteen students. Mr. John Gilbert Wilkins, of the faculty of the School of the Art Institute, who has been in charge of these classes since 1922, states that the students have produced much work of remarkably high quality in the various branches of art studied—drawing, painting, design and sculpture. The Museum exhibits are used as subjects by these students, and the Museum provides a classroom with working facilities to aid in their instruction and to give them a place for the development of their ideas. Many of the graduates, Mr. Wilkins reports, have met with notable success in professional art fields, some having attracted nationwide attention as creative artists, and others having reached a high pinnacle as teachers of art.

In addition to the classes in art research, which are composed of advanced students, the classes of young children inaugurated in 1932 by the Saturday School of the Art Institute have been continued at Field Museum. The enrollment in these in 1934 was 74, and included children ranging from fourth grade pupils to those of high school age.

Continuation of measures instituted several years ago to save expense connected with electric lighting again resulted in a worthwhile economy during 1934.

Maintenance of the building was given proper attention by the Superintendent of Maintenance, the Chief Engineer, and the working forces under their supervision. As usual, a number of improvements were made, of which some of the more important are detailed below:

To provide for the installation of the series of bronze and marble sculptures of British champion domestic animals presented by Mr. Marshall Field, it was necessary to remodel Hall 12 on the first floor completely. Ten walnut cases with individual illumination were built around the room. The floor, both inside and outside the cases, and the bases, were covered with rubber tiles of "Napoleon gray" color. The walls and illuminating hoods were finished in pure white paint, flat finish. The sculptures were installed on their original wooden pedestals. Three walnut benches were provided in the hall.

To provide additional space and afford a better arrangement of the bird and mammal storage cases in Rooms 76 and 77 on the third floor, the corridor walls formerly separating these two rooms were removed, and rooms and corridor were combined into a single room 43 feet wide and 143 feet long, making an area of 6,149 square feet, with better light and air. The total area of the two rooms when separated by the corridor was 5,005 square feet. The increase in area obtained by removal of the corridor is about 23 per cent, and results in much larger increase in storage capacity by making possible rearrangement of storage cases, and due to the fact that the center aisle can now be utilized by the workers both in the Division of Mammals and the Division of Birds. Twelve additional steel storage cabinets, 68 inches high, with removable center partitions, and 600 half length trays, were provided for storage of bird specimens.

At the north entrance to the building a new rack was provided for displaying stereoscopes, and stereoscopic photographs of Museum exhibits, which were placed on sale.

In Stanley Field Hall the walls, statuary, columns, and arches of the colonnades were vacuum cleaned.

At the east end of Chauncey Keep Memorial Hall (Hall 3) two new cases were built for exhibits pertaining to physical anthropology. In the main part of this hall seven new pedestals were built to provide for the installation of additional bronze figures of racial types received during the year from the sculptor, Miss Malvina Hoffman.

In William V. Kelley Hall (Hall 17), the maintenance division provided the ground framework for the new groups of sambar deer, swamp deer, proboscis monkeys, and sloth bears, and also for a group of snow-leopards not yet completed. The cases containing the first four of these groups, and also one containing the Bengal tiger group, were glazed and finished.

In Hall 20 (habitat groups of birds) the case in which the Bering Sea bird group has been reinstalled was glazed and finished. Two new floor cases with screens were provided for additions to the systematic exhibits of birds in Hall 21. In Carl E. Akeley Memorial Hall (Hall 22) the case containing the gorilla group was remodeled, ground framework was provided for the new aardvark group, and the cases containing the aardvark and bongo groups were glazed and finished.

In Hall 32 (ethnology of China and Tibet) thirty cases were refitted with a new shade of cloth on their backgrounds, and with Upson board floor lining and end panels. The interior fittings of 49 cases were repainted. A six-by-twelve foot floor case was built from salvaged material. The Tibetan temple bell was reinstalled on a new frame and placed in a separate case. Eleven Tibetan paintings were hung. In the north balcony of the second floor a sixteen-foot Chinese screen was installed to replace one which was removed and packed for shipping.

At the entrance to the Hall of the Stone Age of the Old World (Hall C) the case containing the new exhibit illustrating the ancestry of man was glazed and finished. In the east end of Hall F (Polynesian and Micronesian ethnology) a new wall case was provided for the installation of a large Marquesan feast bowl.

For the Division of Photography a washing box, accommodating 144 negatives, and two ten-drawer card-filing cabinets were made.

On the fourth floor forty shelves and runners were provided for the steel cabinets used for storage of bones. Two five-by-twelve foot glass cases were fitted with shelves for storage of leg bones and others in frequent use by the taxidermists. In the taxidermy shop a zinc-lined box for modeling clay was provided to take the place of stone jars formerly used.

Six corridors and twenty-one rooms on the third floor of the west half of the building were repainted, and three rooms were washed.

A large amount of work was done on the exterior of the windows of the building. On the ground floor 101 window sills were scraped,

repaired, and repainted. On the first floor 218 were similarly treated. On the second floor, in courtways, there were installed 58 new sills with water bars bedded in cement, 27 new transoms, 25 new jambs the full length of frames, and 33 new jambs of lengths varying from one to five feet. One hundred and twenty large upper panes of glass were reset in new putty. Ninety-six entire frames were scraped, caulked and painted.

On the roof a great amount of repair work was done, principally where seams had sprung. In three places at the east end where ice fell and punctured the rubberoid, allowing the insulation to get wet, repairs and replacements were made.

Among the tasks performed by the force under the supervision of the Chief Engineer were the following: All lighting fixtures in the exhibition halls were washed. Vacuum valves on all radiators were cleaned and adjusted. Combustion control apparatus was installed on the boilers, increasing the efficiency of the stokers. Forty buckets were made for the coal conveyor. The boilers were turbinized and all brick work was repaired. The work of painting the boiler walls and ceiling was begun (aluminum paint is being applied to all iron work as a rust preventive). In the new Hall 12, devoted to exhibition of sculptures of domestic animals, thirty-eight wall lights and nineteen case lights were installed. To provide more effective lighting of the systematic bird exhibits in Hall 21 the lights were lowered five feet. In William V. Kelley Hall (Hall 17) seven cases were equipped for concealed illumination of habitat groups of animals, and fourteen label reflectors were installed.

During the months when heat was required, the Museum continued, under its contract with the John G. Shedd Aquarium, to furnish steam from its plant to the aquarium.

In the following pages are detailed reports on the year's activities in each of the Departments and Divisions of the Museum:

DEPARTMENT OF ANTHROPOLOGY

EXPEDITIONS AND RESEARCH

Three expeditions operated in the interest of the Department of Anthropology during 1934. One of these, jointly sponsored by Field Museum and the Carnegie Institution of Washington, D.C., and led by Assistant Curator J. Eric Thompson, continued excavations at the Maya ruins of San José initiated by the Third Marshall Field Archaeological Expedition to British Honduras (1931). San

José is in the western part of British Honduras, near the Guatemalan frontier. The 1931 excavations revealed pottery of a non-Maya ceramic tradition, but yielded no information as to its position in a definite ceramic sequence. The principal object of the 1934 Field Museum-Carnegie Institution Joint Archaeological Expedition was to unearth additional information that would definitely establish this sequence, and perhaps shed light on the vexed question of the correlation of the Maya calendar with the Gregorian.

So far as the ceramic sequence is concerned, the objective was attained, for the non-Maya pottery was found to occur during the latest ceramic period. However, time has not yet been available for an intensive study of the sherds to determine what light may thereby be thrown on the correlation question. Preliminary investigations of the sherds collected would indicate five periods.

Among more spectacular finds was a unique ax, nearly ten inches long, the head and haft of which were chipped from a single block of obsidian. Associated with it was verdigris, all that remained of the first metal objects ever found under archaeological conditions in the southern Maya region. Both ax and copper remains had been deposited, apparently, during the last ceramic period. This period was also richest in trade pieces.

The few stone buildings at San José had been erected in a late period. Exterior sides of walls were faced with well-cut stone blocks, whereas interior sides were covered with irregular blocks haphazardly placed, the rough surfaces hidden by liberal coatings of plaster.

Many burials were uncovered, and in almost every case the skeleton was found lying on its side, in a flexed position, with head toward the south.

A new site, known locally as Mun Diego, was discovered southwest of San José about four miles, as the crow flies, although the circuitous route that had to be followed by the expedition was nearly eleven miles long. Mun Diego, a somewhat larger site than San José, is equipped with a ball court, and around the various mounds several plain stelae were found. Unusually large is the city's great plaza, flanked on all four sides by mounds. There are also three small sunken courts.

The expedition remained in the field from February to May. The share of the finds assigned to the Belize Estate and Produce Company, owners of the land on which the ruins are situated, was purchased for Field Museum by means of a special grant of \$300 generously provided by the Carnegie Institution of Washington.

The Fourth Field Museum Archaeological Expedition to the Southwest, under the leadership of Assistant Curator Paul S. Martin (who has since become Acting Curator of the Department) continued for fourteen weeks its archaeological investigations on the Lowry ruin in southwestern Colorado, about thirty-two miles northwest of Cortez, Montezuma County. As in the previous three years, the expedition was financed from the income of a fund donated by the late Julius and Augusta N. Rosenwald. The ruin was explored under a permit granted by the United States Department of the Interior.

The excavations were greatly expedited through the aid given by the Montezuma County Emergency Relief Administration, which furnished six to ten men for a period of nine weeks. Special thanks are due to Mrs. Alice Van Diest, Director of Colorado State Relief, and to Mr. Harry E. Kauffman, Administrator of the Montezuma County Emergency Relief Administration, and his associates, for their helpful cooperation.

With the force thus furnished, certain large excavations which had been deferred in previous years, were undertaken. The first digging was at the south end of the pueblo. It soon became apparent that this section was built late, and belongs to the period called "Mesa Verde," designating a culture characterized by a certain kind of masonry, by small, low-ceilinged rooms, and by a polished pottery decorated with vegetable paint in designs typical of the Mesa Verde region.

In this late addition eleven living rooms and one small kiva were excavated. The latter had been at one time a rectangular living room which later was converted into a crude ceremonial chamber, three sides of which were straight, and the fourth, curved. Then, in order to simulate a subterranean structure, an extra wall had been built about two feet from the south side, and the space thereby created was filled with earth.

A large refuse heap underlay the floors and the walls of the late rooms and extended beyond the outer walls for some thirty feet. In this were found fourteen burials, four of them under walls. This cemetery is the first and only one positively belonging to Lowry pueblo proper. Burials unearthed by the expedition in other years lay 500 feet or more from the main building and very likely belonged to near-by remains of small, crude, early houses.

Most of the summer was spent in excavating the Great Kiva, which lies approximately 300 feet east of the pueblo. When the

work was completed it was found that this large ceremonial structure was in some respects different from other Great Kivas which have been excavated. This kiva is forty-eight feet in diameter, has a stairway on the north side only, and is furnished with one low bench. A crude fire-pit, dug into the floor, is situated between the two south pillars. The kiva contains no *sipapu*; that is, the small hole usually found in the floor, through which spirits were believed to enter and through which priests talked to them.

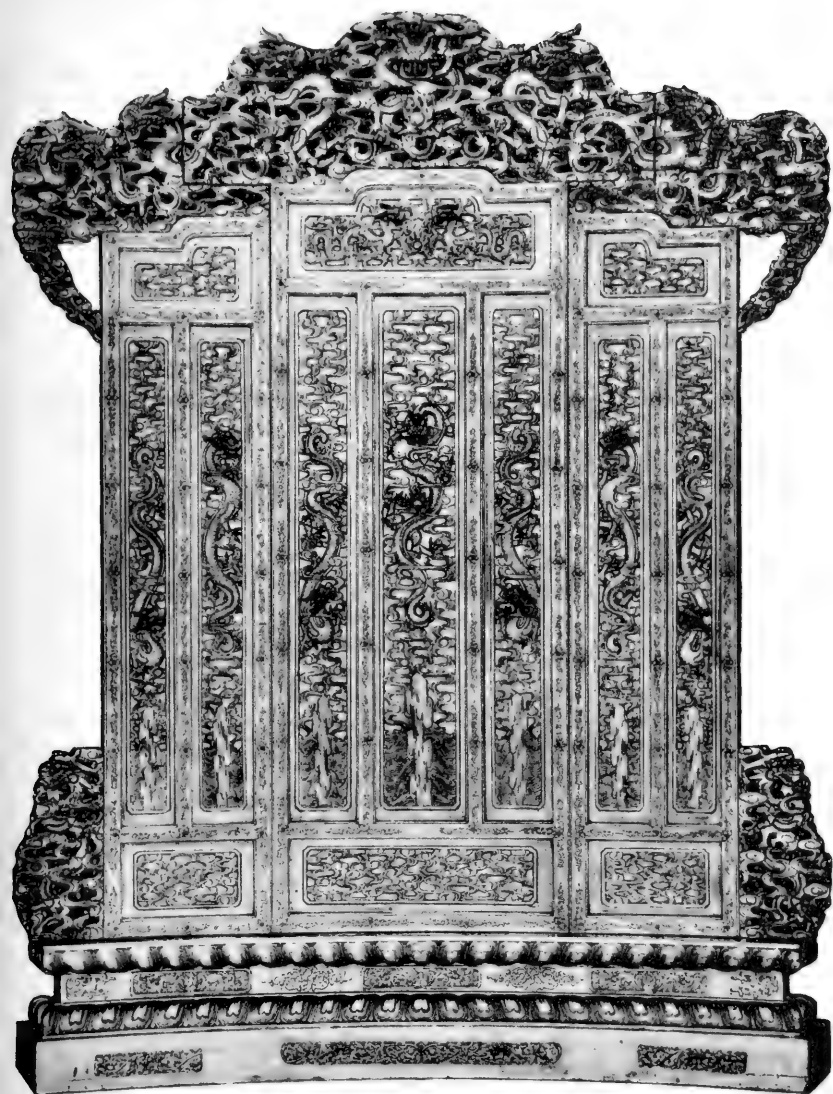
The roof pillars are of masonry, and stand thirty inches above the floor. All are the same height, and are level, smooth, and well finished on top; therefore, it seems evident that they never were built higher. Probably large upright poles stood on these pillar bases. Three pairs of niches were found in the outer wall, one above the other, on east, south, and west sides. A single niche was located in the northwest quadrant, making a total of seven. All were unsealed and empty.

A number of small beam (?) holes (from one to two inches in diameter) were discovered in the outside kiva wall. These were at varying heights, from eight to thirty inches above the banquette. In each, burned or rotten ends of poles were found. Their function is unknown. The vaults were crudely constructed, with earthen floors and some masonry.

Two extensive secondary sections of masonry were found: one surrounding the two pillars and vault on the east side, and a similar one on the west. The purpose of these is unknown. The kiva floor, on east and west sides, is slightly higher than in the center, and the supplementary masonry may have served as a retaining wall for east and west platforms.

The arrangement of peripheral chambers at Lowry differs from that found in Great Kivas in New Mexico at Aztec and at Pueblo Bonito in Chaco Canyon, for instead of being surrounded by small rooms, there are only three peripheral chambers possessing masonry walls. A large alcove-chamber containing a fire-pit was discovered on the north side of the Great Kiva. The floor of this room is about eight feet above the kiva floor. Into this room the north door and stairway lead. Two more peripheral chambers were found, one on the east side and one on the west. These are built with low, fragile masonry walls and are smaller than the north alcove.

It was surprising to find no continuous band of peripheral chambers surrounding this Great Kiva. To be certain that no mistake had been made, trenches were cut across the outer kiva rim.



IMPERIAL DRAGON SCREEN

George T. and Frances Gaylord Smith Hall (Hall 24)

This screen was placed behind the throne in the Peking Palace
of the Manchu dynasty, K'ien-lung period (1736-95)

Presented by The Arts Club of Chicago

Had there been any masonry walls there, they would have been discovered; however, none were located.

But large pieces of charcoal were found in these trenches. Their presence suggested the possibility that a pole-and-brush structure had stood on the same level as the peripheral chambers. Therefore the trenches were widened, and the dirt banked up on the side of the extra-kiva rooms was removed. The expected evidence was found, and it now seems safe to say that the north, east, and west (and perhaps south, if it exists) peripheral chambers were joined by a series of rooms of jacal or pole-and-brush construction.

A closer inspection of the north, east, and west chambers was made, and it was observed that the masonry walls were crudely built. In fact, in many places large slabs took the place of coursed masonry. Also, the walls of these chambers were fragile. Because of this, they probably never were carried very high. Moreover, postholes were found in the corners. It was then concluded that the walls had been built with masonry bases and wattle-and-daub upper portions.

Heretofore, a block of four rooms in the center of the pueblo has been regarded as a nucleus of early Chaco construction. Investigations this season indicated that there was an earlier, more typical Chaco section. This is composed of walls of typical Chaco-like slab masonry, but, unfortunately, later dwellers tore out many walls and so modified this section that it is impossible to reconstruct the size or shape of the early building. The "Mesa Verde" people ingeniously bonded many of their walls to the Chaco ones in a manner that makes it often impossible to tell exactly where Chaco wall ends and Mesa Verde begins.

With the help and guidance of Mr. Lawrence Roys, a structural engineer of Moline, Illinois, who has studied Maya construction, an intense survey and analysis of masonry was begun. Heretofore, archaeologists have called certain walls "Mesa Verde" or "Chaco," but no criterion has existed for identifying many hybrid types. It is not certain that masonry can be classified so accurately as pottery, but some generalizations may be worked out.

The Museum gratefully acknowledges the assistance rendered the expedition by Mr. Robert Burgh, cartographer of the United States National Park Service, who, at his own expense, surveyed and mapped Lowry ruin and the surrounding area; by Dr. Pierce Butler, of the University of Chicago, who lent his surveying instruments; and by Mr. Roys, who spent a month in making a detailed analysis of pueblo masonry.

The Field Museum Anthropological Expedition to the Near East, 1934, sponsored by Trustee Marshall Field, began work in Iraq on April 2. Assistant Curator Henry Field, leader, was accompanied by Mr. Richard A. Martin, who was in charge of photography and zoological collecting. The expedition continued the somatological study of peoples of the Near East, begun by Mr. Field in 1925, and also collected ethnological, zoological, botanical, and geological specimens.

The anthropological work included measuring and photographing representative series of important racial elements of the Iraq population. During four months approximately 2,500 individuals were observed anthropometrically. These included 300 Marsh Arabs, 750 Kurds, 475 Shammar Beduins, 250 Assyrians, 175 Dulaim, 150 Jews, 100 Mandaeans, 300 Yezidis, 50 Sleyb, and 80 Turcomans. Forty standard observations and measurements were taken on each individual. Frontal and profile photographs, and hair and blood samples were obtained wherever possible. Dr. Carl Rassam, of the Royal Hospital, Bagdad, contributed records of his measurements on 500 men, women, and children.

Miss Winifred Smeaton, of Ann Arbor, Michigan, accompanied the expedition on its work in Iraq, joining the party at Bagdad about the middle of April and returning to Bagdad about July 15. Her work was the study of the women of each group. Her results should prove of scientific importance, as statistics on women have not been available from this area.

In Iraq several specialists collected data for the expedition. Mrs. E. M. Drower, of Bagdad, made ethnological and linguistic studies of the Marsh Arabs; Mrs. Donald Clawson, of Beirut, made a special study of the teeth of the Kurds and Shammar Beduins; Dr. Walter P. Kennedy, of the Royal College of Medicine, Bagdad, collected blood samples; Mr. Albert Meymourian, entomologist of the Rustam Agricultural Experimental Farm, collected insects in the Amara marshes; Mr. S. Y. Showket, of Basra, acted as interpreter and general assistant; Mr. Khedoory Muallim, whose services were lent by the Royal Hospital, Bagdad, collected birds in the Amara marshes; Mr. Yusuf Lazar, of Bagdad, collected plants in Iraq and Persia.

The expedition received unusual cooperation from Iraq officials, as well as from many private individuals. Outstanding among the many persons who rendered valuable assistance are the Prime Minister, Ali Jaudet Beg; the Minister of the Interior, Sir Kinahan

Cornwallis; Mr. C. Grice, of the Ministry of the Interior; Major W. C. F. Wilson, adviser to the Iraq government at Mosul; the Air Vice-Marshal; the American Minister, Mr. Paul S. Knabenshue; Squadron Leader A. R. M. Rickards, of the Royal Air Force; Dr. Walter P. Kennedy, of the Royal College of Medicine, Bagdad; Dr. T. H. McLeod, of the Royal Hospital, Mosul; and the Mutte-sarifs of the Mosul, Kirkuk, Erbil, and Amara Liwas.

Through the courtesy of Professor James H. Breasted, Dr. H. Frankfort, director of the Oriental Institute Expeditions of the University of Chicago, very kindly lent the expedition a motor-wagon for general use in Iraq; and Mr. Gabriel Malek also gave generous assistance to the expedition.

A search was made for archaeological sites in the North Arabian desert, lying in Iraq, Transjordan and Syria. Flint implements collected on the surface prove the former existence of paleolithic and neolithic man in that region. The Iraq Petroleum Company invited the members of the expedition to use their pipe-line stations and cooperated in every possible way.

In Kurdistan flint implements of upper paleolithic types were found in the gorges of Zakho, Aqra, Rowandiz, and Sulaimaniya, thus welding together a chain of evidence which proves that ancient man once roamed the territory between Kurdistan and the Mediterranean.

Kish was visited in order to ship to Chicago the antiquities left there by Mr. Louis Charles Watelin, late field director of the Field Museum-Oxford University Joint Expedition to Mesopotamia. The objects, contained in twenty-one cases, included many fine specimens belonging to the Sumerian, Babylonian, and Sasanian periods. There was also a series of human skulls.

At the end of July, Messrs. Field and Martin, accompanied by Dr. Walter P. Kennedy and Mr. Yusuf Lazar, proceeded to Persia. The members of the expedition were guests of Dr. and Mrs. Erich Schmidt for four weeks at Rayy, near Teheran, during work in that vicinity. At Isfahan Mr. and Mrs. Myron B. Smith cooperated with the expedition, and accompanied it to Persepolis, where Professor Ernst Herzfeld, field director of the Oriental Institute Expedition to Persia, cordially received the party. Anthropometric data were obtained on 50 Persians in the village of Kinareh, near Persepolis; 100 Jews in Isfahan; 50 Persians in Yezd-i-Khast; and 35 Persians at Rayy. Zoological, botanical, and geological specimens were also collected. Cordial cooperation was received from the Prime

Minister, the Minister of the Interior, the Chief of Police, the Governor of Isfahan, and the American Minister, Mr. William S. Hornibrook.

On September 14, Messrs. Field and Martin entered the Union of Soviet Socialistic Republics at Baku on the Caspian Sea. At the request of the United States Department of State and Ambassador William C. Bullitt, the Soviet officials allowed free entry into the Soviet Union for all the expedition equipment. Traveling was greatly facilitated by VOKS (the Society for Cultural Relations with Foreign Countries) and Intourist (the Soviet travel organization), whose representatives rendered every possible assistance. In Baku the Academy of Sciences, the University of Azerbaijan, and the Neft Geological Museum were visited. The collections of the Georgian Museum in Tiflis were studied. With the assistance of VOKS fifty male Yezidis were measured in the Kurd Club. These observations will form valuable comparative material with the data obtained on the two groups of Yezidis studied in northern Iraq. Ordzhonikidze was reached by automobile over the Georgian Military Highway. The peoples of northern Ossetia in the Caucasus have been little studied from the standpoint of physical anthropology. Through the assistance of Mr. T. Demurow, local chairman of Northern Ossetian Education, anthropometric observations, measurements, and photographs of 100 men and 50 women were compiled. In addition, a staff of medical assistants was provided by the Soviet government to obtain specimens of blood, hair samples, weight, pulse, temperature, and hand pressure of these individuals. The 150 blood samples were sent to Dr. Walter P. Kennedy, Royal Hospital, Bagdad, for study.

Messrs. Field and Martin visited the various academies of science, museums, universities, and libraries in Rostov-on-Don, Kharkov, Kiev, Moscow, and Leningrad. During the five weeks spent in the Soviet Union they were able to study many museum collections, visit sixty-eight institutions of various kinds, and meet the leading Soviet anthropologists and archaeologists. Plans for exchanging scientific material and publications were discussed.

Mr. Field returned to the Museum in December, preceded by Mr. Martin, who came back in November.

Classifying the data and photographs of the expedition has already begun, and the zoological, botanical, and geological specimens have been distributed to the various Departments.

News of the death of Mr. Louis Charles Watelin, late field director of the Field Museum-Oxford University Joint Expedition to Kish,

was received at the Museum with regret. Mr. Watelin died in July while on his way to Easter Island to examine newly discovered inscriptions. His death deprives Near Eastern archaeology of one of its foremost figures, and the Museum of a loyal friend and valuable scientific collaborator. Mr. Watelin had worked at Susa with de Morgan. His discoveries at Kish have thrown a flood of light on the ancient history of Mesopotamia.

The *Ovimbundu of Angola* by Assistant Curator Wilfrid D. Hambly was published in July. This report covers a portion of the research of the Frederick H. Rawson-Field Museum Expedition to Africa, 1929-30. The manuscript of Mr. Hambly's report on the same expedition's work in Nigeria is now completed.

Fourteen signed and thirty-three unsigned articles and brief items were contributed by the staff of the Department to *Field Museum News* during the year. The staff also supplied material for forty-four newspaper publicity stories during the same period.

ACCESSIONS—ANTHROPOLOGY

The number of accessions recorded during the year is forty-two. Of these, thirty are gifts, five result from expeditions, two are purchases, and five were obtained by exchange. The total number of objects received in these accessions is 17,538.

The American Friends of China, Chicago, presented an imperial brush-holder made of Burmese padouk wood, with inlaid inscriptions and designs in ivory, jade, and semi-precious stones. This belonged to the Emperor K'ien-lung and is dated A.D. 1736.

From the National Museum of Copenhagen, Denmark, there were acquired 170 archaeological and ethnological objects of southern and eastern Greenland. These are localities from which the Museum heretofore possessed but scanty material. The collection comprises fur and skin garments, bone and stone tools, fishing accessories, and toys. This material is especially valuable because it is now difficult to obtain such specimens from that region. In exchange for it, Field Museum sent ten archaeological objects from France, and eight from Mexico, and thirty-six ethnological objects from the Northwest Coast of America.

The collections made by Assistant Curator J. Eric Thompson, as leader of the Field Museum-Carnegie Institution Joint Archaeological Expedition to British Honduras, contain 6,199 archaeological objects gathered at the site of San José in the northern part of the Cayo district of British Honduras. This large and important collection consists of pottery vessels, pottery whistles and figurines,

potsherds, stone knives and spearheads, jade ornaments, two mirrors, one pearl, and a monolithic ax of obsidian.

The Fourth Field Museum Archaeological Expedition to the Southwest, under the leadership of Assistant Curator Paul S. Martin, obtained more than 3,600 archaeological objects from the Lowry ruin, near Ackmen, Colorado. This collection comprises pottery, potsherds, human skeletons, arrowheads, bone awls, and butts of roof beams, from which it is hoped dates may be obtained. One hundred and twenty-eight negatives were exposed.

Some of the roof logs obtained from Lowry ruin in 1932 and 1933 were sent for examination and possible dating to Dr. Emil W. Haury, Assistant Director, Gila Pueblo museum, Globe, Arizona. Dr. Haury assigned approximate cutting dates of A.D. 950 to two roof logs, and exact cutting dates of A.D. 1106 to two others. The figure A.D. 950 is only approximate because the outer rings from the logs in question are missing. Other roof beams were forwarded for study to Mr. W. S. Stallings, Jr., Dendrologist, Laboratory of Anthropology, Santa Fe, New Mexico, who reports that he has ascertained seven dates. Five of these were obtained from roof beams of one room and indicate that these logs were cut in A.D. 1090. Two other logs which served as door lintels are dated A.D. 1103.

Grateful acknowledgment is hereby made to Dr. Haury and Mr. Stallings for dating these log samples from Lowry ruin; and to Mr. Harold S. Gladwin, Director of Gila Pueblo museum, and Mr. Jesse L. Nusbaum, Director of the Laboratory of Anthropology, for placing the facilities of their respective institutions at the disposal of Field Museum.

The Field Museum Near East Expedition, 1934, sponsored by Trustee Marshall Field, and led by Assistant Curator Henry Field, brought back for the Department of Anthropology anthropometric data on 2,500 individuals; 5,000 photographs of racial types; 300 specimens of blood; 300 teeth smears; 800 hair samples; 500 flint implements of paleolithic and neolithic types from the North Arabian desert, Kurdistan, and Persia; Himyaritic inscriptions on ten basalt blocks from Transjordan; and two fragments of twelfth century Mohammedan vessels with unusual decorations. For other Departments this expedition collected 1,000 animals preserved in formalin, 750 insects, 40 birds and mammals, and 1,500 plants.

By exchange with Gila Pueblo museum, Globe, Arizona, Field Museum acquired thirty pieces of pottery from various ruins in New

Mexico and Arizona. This collection is especially valuable because it contains southwestern types which the Museum lacked. Noteworthy are seven pottery bowls from the Mimbres valley, a locality in New Mexico in which realistic art reached a high development. Likewise of interest are four pottery dishes from southern Arizona, the region in which flourished the famed Hohokam culture. In return for this material, Field Museum sent seventeen South American archaeological objects.

The Museum's South Pacific collections were enriched by a valuable gift from Mr. Templeton Crocker, of San Francisco, of 835 ethnographical objects, nine phonograph records, and 325 photographs. This was the more welcome as the major portion consisted of representative collections from the little-known islands of Anuda, Rennell, and Bellona, previously unrepresented in the Museum. There were also many objects from other islands, including a large, finely carved Marquesan bowl, ornamented mats from Puka Puka, and various objects from Samoa, Sikaiana, the eastern Solomons, and the Santa Cruz group.

Through an exchange with the Mexican National Museum of Archaeology, History and Ethnography it was possible to fill a number of gaps in the Museum's collections from Mexico. The most spectacular object thus acquired was a model of the very ornate Pyramid of Quetzalcoatl at San Juan Teotihuacan, Mexico. This, like the previously acquired models of a palace at Mitla and a pyramid at Uaxactun, is valuable in illustrating the architectural achievements of the aboriginal civilizations in Latin America. The new model measures more than six feet in length.

Among other objects acquired through this exchange were three fine funerary urns decorated with large seated deities in relief, belonging to the Zapotecan culture of Oaxaca, Mexico; a representative collection of Zapotecan pottery figurines; and several Maya pottery figurines from the island of Jaina, off the coast of Mexico. To the Mexican museum there were sent from Field Museum, in this exchange, seventeen archaeological objects of the southwestern United States, 104 European archaeological objects, and fifty-four from South America.

An important gift was received from Mr. Harry T. Getty and Dr. A. E. Douglass, both of the University of Arizona, at Tucson. This collection consists of twenty polished cross sections of wooden beams from various dated Southwestern ruins; a tubular borer, such as is used by dendrologists in obtaining small wood samples from

timbers still *in situ*; eleven photographs, and four charts. Some of the cross sections were presented jointly by Dr. Douglass and the National Geographic Society, Washington, D.C. This acquisition made possible an exhibit explaining the method used to obtain dates for prehistoric buildings in the Southwest.

In memory of their mother, Mrs. Blanche R. Mandel, Messrs. Fred L. Mandel, Jr., and Leon Mandel, of Chicago, presented fourteen choice Lamaist paintings dating from the eighteenth and nineteenth centuries.

Miss Grace Brewster Cross, of Chicago, gave the Museum five valuable specimens from Hawaii: two headbands, one of feathers and one of shell; two strings of seed beads; and one string of crabs'-eyes.

From Mr. T. Ito, of Chicago, the Museum received a Japanese reproduction (1807) of a series of Chinese wood-engravings illustrating agriculture and sericulture, in exchange for a Chinese painting on glass.

In exchange for a lapis-lazuli cylinder seal from Kish, Mr. Fahim Kouchakji, of New York, sent the Museum a most beautiful and rare Syrian glass pitcher of the fourth century A.D. It is hexagonal in shape, and the glass is an opaque blue-black.

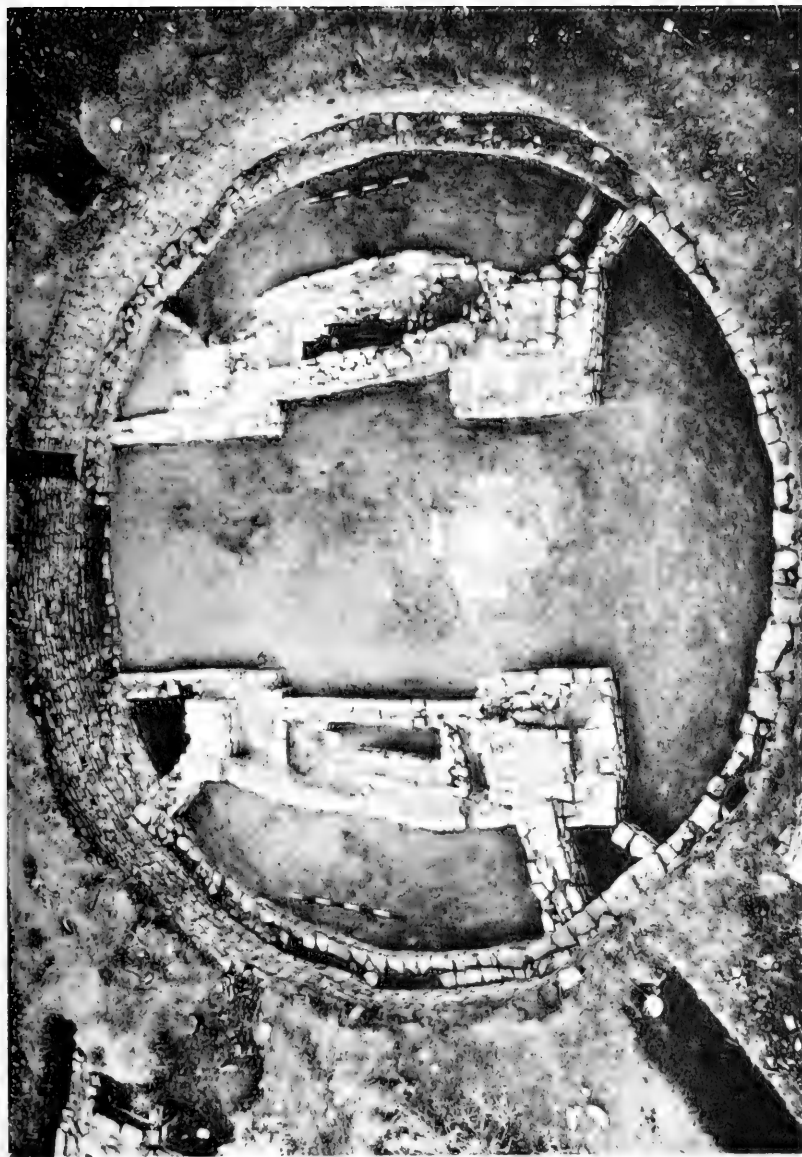
From Mr. Hubert Beddoes, of Chicago, the Museum received a gift of a very valuable folio album containing 134 large and most unusual photographs taken during the years from 1873 to 1876 in China, Japan, and Java.

Eleven more sculptures in bronze, the work of Miss Malvina Hoffman, were received, and installed in Chauncey Keep Memorial Hall (Hall of the Races of Mankind).

From the estate of the late Edward E. Ayer, Benefactor, former Trustee, and first President of the Museum, and the late Mrs. Ayer, eighteen Navaho blankets were received.

Professor Rowland Rathbun, of Chicago, presented the Museum with twenty-three of his carefully sketched and valuable drawings of Sasanian stucco-work taken from the frescoes of fifth century A.D. Sasanian buildings.

Two large aerial photographs of the Hopewell Mounds, Ohio, were presented by Captain Dache M. Reeves, of the United States Air Corps at Dayton, Ohio. These mounds were excavated in 1891-92 and the valuable archaeological material was later acquired by Field Museum. It is interesting to have an aerial view of mounds which were investigated some forty years ago.



GREAT KIVA OR CEREMONIAL CHAMBER

Lowry ruin, Colorado. Diameter 48 feet; depth 8 feet

Photographed from a 50-foot tower

Field Museum Archaeological Expedition to the Southwest, 1930-34

Mrs. Frank S. Johnson, of Pasadena, California, daughter of the late Edward E. Ayer, presented a beautiful mandarin coat from China.

An interesting figure of the god Vishnu riding on the mythical bird Garuda was given by Mr. Allyn D. Warren, of Chicago. This gift shows the fine wood-carving art of the modern Balinese.

From the Field Museum-Oxford University Joint Expedition to Mesopotamia twenty-one cases of Sumerian, Babylonian, and Sasanian objects excavated at Kish, Iraq, were received.

The African ethnological collections have been enriched by the addition of twenty-eight west African objects which are the gift of Mrs. Rudyerd Boulton, of Chicago. The objects are of particular value because they form a unit representing the musical skill of west African Negroes. Instruments of percussion, wind instruments, and those played by strings are all represented. A human figure, carved in wood, from Dahomey, is of especial value because such objects, associated with religious beliefs and practices, are difficult to obtain.

CATALOGUING, INVENTORYING, AND LABELING—ANTHROPOLOGY

Of the forty-two accessions received during the year, thirty have been entered. Seven accessions of previous years have also been entered.

Cataloguing has been continued as usual, the number of catalogue cards prepared during the year totaling 4,032. The total number of catalogue cards entered from the opening of the first inventory volume is 211,407.

The catalogue cards prepared are distributed as follows: archaeology and ethnology of North America, 1,771; archaeology and ethnology of Central and South America, 750; archaeology and ethnology of China, Tibet, and Japan, 126; ethnology of Africa, 24; ethnology of Melanesia, 858; ethnology of India, 489; ethnology of the Near East, 2; ethnology of Polynesia, 5; ethnology of Australia, 1; ethnology of Dutch East Indies, 1; ethnology of Europe, 1; physical anthropology, 4. Most of these cards have been entered in the inventory volumes, which number fifty-seven.

A total of 9,117 labels for use in exhibition cases was supplied by the Division of Printing. These labels are distributed among the collections as follows: Chauncey Keep Memorial Hall, 682; Indians of California, 18; Southwestern United States, 72; Central America, 762; South America, 1,477; China and Tibet, 3,485; Melanesia, 464; Hall of the Stone Age of the Old World, 6; Africa, 2,016; Malay

Archipelago, 102; and 33 hall labels. The Division of Printing also supplied 75 case numbers, 1,140 catalogue cards, and 5,500 index cards.

The number of photographs mounted in albums is 1,026. Five new albums were opened. To the label file 1,289 cards were added.

Assistant Curator Albert B. Lewis is preparing an index of material which is on exhibition in Joseph N. Field Hall (Hall A).

Assistant Curator Wilfrid D. Hambly devoted much time to classifying photographs secured by Miss Malvina Hoffman while fulfilling her commission to sculpture representative types of races.

INSTALLATIONS AND REARRANGEMENTS—ANTHROPOLOGY

The department has continued its work of installing new collections and of modernizing the older exhibits. Many old-style black labels have been replaced with shorter, more interesting statements printed on buff cards in black type. Ninety-seven cases were installed during the year.

In Stanley Field Hall a case of attractive scarfs such as are worn by all castes of Hindu women; a case of Peruvian textiles; and a case of rare and decorative lacquered wooden vessels from Peru have been placed on exhibition.

During the year, eleven more sculptures in bronze, the work of Miss Malvina Hoffman, have been added to Chauncey Keep Memorial Hall (Hall 3). These additions comprise heads or busts of a Berber, an Alpine Austrian, a Zulu woman, a Turk, a Toda, a Pueblo woman, a Jicarilla Apache, a Carib, a Korean, a Bontoc Igorot, and a life-size figure of a Navaho.

Assistant Curator Henry Field installed, also in Chauncey Keep Hall, seven cases of exhibits in physical anthropology. These show physical characters of various races; differences in hair forms; types of deformation and tattooing practised by various peoples; trepanning as practised by primitive peoples, and endocranial casts of various races and mammals; casts of hands and feet of different races; skeletons of anthropoid apes and man (for comparative purposes); and skeletons of the principal human races. The ten skeletons used were prepared by Assistant Curator Edmond N. Gueret, osteologist in the Department of Zoology.

An exhibit illustrating the Douglass method of dating prehistoric buildings of the Southwest by means of a tree-ring chronology was installed in Hall 7 by Assistant Curator Martin. This exhibit is of particular interest to many people because it shows how the tree-ring calendar was built up and how an ancient wooden roof beam is

actually dated. The specimens and photographs used in this installation were prepared by Mr. Harry T. Getty, and were jointly presented by Mr. Getty and Dr. A. E. Douglass, both of the University of Arizona, Tucson.

The reorganization of Halls 8 and 9 was continued during the year under the direction of Assistant Curator Thompson. Twelve cases of archaeological and ethnological material were placed on exhibition. Many of the objects, including pottery, textiles, and stone-work, had never before been displayed. Included is a case in Hall 8 of archaeological material obtained from the San José ruin in British Honduras, by the Field Museum-Carnegie Institution Joint Expedition, 1934.

Reinstallation of Hall 32, devoted to the ethnology of China and Tibet, proceeded with remarkable celerity. Forty-four cases were installed. These comprise sacred objects from a Lama temple, armor and weapons, women's costumes, masks used in Tibetan mystery plays, utensils and food, musical instruments, basketry, images, wood-carvings, and a temple bell from Tibet; and theatrical costumes, baskets, textiles, palace curtains, imperial costumes, Manchu dresses, armor, rugs, embroidery, printing and writing materials, tableware, musical instruments, and jewelry from China. At the north end of the hall, a group of nine painted, wooden panels showing the genealogy of the Pan-Chen lamas, and two portraits in oil, have been hung.

During the greater part of the year the work in Hall 32 was carried on under the personal supervision of Dr. Berthold Laufer, Curator of Anthropology. Since his death in September, the installation of this hall has been ably continued by Assistant Curator Thompson, in accordance with plans and notes which Dr. Laufer had prepared.

The passing of Dr. Laufer was a severe blow to his associates in the Department, of which he had been Curator since 1915, and in which he had worked in other capacities since 1907. While his scholarship achieved its summit in his researches in the realm of Oriental subjects, his brilliant mind encompassed vast knowledge of all branches of anthropology, and his keen, helpful suggestions were always appreciated by the younger men working with him. His staff held him in highest esteem and respect for the genius he displayed in his science, and beyond that, there was a strong bond of affection between him and his assistants.

In Joseph N. Field Hall (Hall A) twelve cases were reinstalled (some new objects being added), and two cases of entirely new

material were installed. This completes the rearrangement of the hall. One new case contains a representative collection from Rennell and Bellona Islands, including arrows and spears with sharp slender points of human bone, finely carved clubs, baskets, bags, mats, pillows, clothing, ornaments of various kinds, and some remarkable heavy wooden shark hooks. The other new case contains material from the Santa Cruz group, including the outlying island of Anuda. Of special interest are tortoise-shell ornaments and a loom on which ornamented bags and mats were woven.

In some of the reinstalled cases is shown material from the Admiralty Islands, including coiled baskets and oil vessels, finely carved wooden bowls, ornamented wooden beds, and large signal drums. Other reinstalled cases contain New Guinea material such as carved figures representing human beings, masks, ornamented canoe prows, and drums, beautifully decorated earthen bowls and pots, ornamented wooden bowls, a house ladder, carved wooden pillows, a drying box, and various other household objects.

An exhibit called *The Ancestry of Man* was installed at the entrance to the Hall of the Stone Age of the Old World (Hall C) by Mr. Bryan Patterson, Assistant in Paleontology. This exhibit, based on data obtained from Dr. W. K. Gregory, of the American Museum of Natural History, New York, is designed to show the relation of mankind to other primates, and particularly the inter-relationships of the various living and extinct races of the human family.

Seventeen newly installed cases of African ethnological material have been placed in Halls D and E. Most of the objects shown in these were collected by Assistant Curator Wilfrid D. Hambly, as leader of the Frederick H. Rawson-Field Museum Ethnological Expedition to West Africa (1929-30). Hall D now contains objects from west and central Africa only. The collection from Cameroon still occupies most of the north side of the hall, and several cases displaying leather goods, weaving, pottery, and metal work have been added. On the south side of Hall D, four cases showing weapons and raffia weaving from the Congo region, and six cases illustrating the arts, handicrafts, occupations, and magical rites of the tribes of Angola (Portuguese West Africa) have been installed.

Near the middle of Hall E, two cases of material from the Kabyles and Tuareg of north Africa have been placed on exhibition. Blankets and clothing woven by Kabyle women are the gift of Mr. Homer E. Sargent, of Pasadena, California. The Kabyle jewelry was presented by Miss Barbara Neff, of Chicago. Several musical instruments of

a north African type were the gift of Mr. H. G. Moore, of Peoria, Illinois. The west end of Hall E is now occupied by cases of material from south and northeast Africa, including Somaliland. Many of the exhibits from Somaliland and Kenya were collected by the late Carl E. Akeley about thirty years ago. Bushman material, including some exceptionally fine necklaces and girdles of ostrich eggshell beads (collected by Mr. Arthur S. Vernay, of New York, while leading the Vernay-Lang Kalahari Expedition of 1930) have been installed.

In alcove A1 two cases showing wood-carving and basketry from Nigeria have been installed. Reorganization of Halls D and E and Alcove A1 was directed by Assistant Curator Hambly.

Plans for Hall K (Japan, Korea, Siberia, and India) are being prepared. Assistant Curator Lewis has started sorting the East Indian material in storage, and two cases of Singhalese masks have been installed and await placement in the hall.

Much work, which could not ordinarily have been done because of lack of time by the regular Department staff, has been accomplished by workers assigned by the Illinois Emergency Relief Commission. These men and women have mounted and labeled some 6,000 photographs; made important subject indexes; typed 2,500 index and catalogue cards; washed and catalogued 9,000 potsherds, and mounted 4,000 of them; repaired and mounted 800 Peruvian textiles on linen; typed many pages of field notes; and performed general clerical work with neatness and dispatch. From one to eleven relief workers have served in the Department for periods of varying length during the greater part of the year.

DEPARTMENT OF BOTANY

EXPEDITIONS AND RESEARCH

The Department of Botany conducted no expeditions during 1934. However, Assistant Curator J. Francis Macbride continued his work in Europe, described in the Reports of 1929 to 1933 inclusive, of photographing type specimens of tropical American plants preserved in European herbaria. This project is still supported in part by a balance of funds furnished some years ago by the Rockefeller Foundation. About 2,000 new negatives were made and forwarded to the Museum, making the total now on file more than 28,000, representing almost as many plants, principally South American species.

The work in 1934 was conducted in the DeCandolle and Delessert herbaria of the Conservatory and Botanic Garden of Geneva. These well-known collections are so rich in type material that it was not possible during the year to complete the photography of their types. Mr. Macbride was aided most courteously by the director of the Geneva institution, Dr. B. P. Georges Hochreutiner, who provided every facility for successful prosecution of the task. Mr. Macbride returned to the United States on vacation in September, but is expected to sail for Europe early in 1935 to resume the work.

As additions to the Herbarium of prints of type specimens have continued, their great value for purposes of study and determination has become constantly more apparent. That they are invaluable for critical work upon the classification of tropical American plants is evident to all systematic botanists, many of whom have had occasion to study them. Prints from the type negatives are made available by Field Museum to botanists generally in the United States and other countries at the mere cost of production. During 1934 two American institutions purchased 1,609 prints from these negatives.

Partly as a result of this work, Dr. Charles Baehni, of the Botanic Garden of Geneva, came to Chicago in August, 1934, to spend approximately a year at Field Museum. His visit, at the invitation of the Museum, will enable this institution to make some definite return for the valuable material received in exchange from the Geneva herbaria, and for the many courtesies extended by Dr. Hochreutiner. Dr. Baehni is engaged in study of the Museum's herbarium material of certain groups of plants in which he is interested.

From the Field Museum Anthropological Expedition to the Near East, 1934, led by Assistant Curator Henry Field of the Department of Anthropology, there was received a collection of approximately 8,500 herbarium specimens of plants. These were obtained chiefly in Persia and Iraq. As these regions were previously almost without representation in the Museum Herbarium, this material will be exceptionally useful. Included are many duplicate specimens to be used for exchange purposes.

Throughout the year the Herbarium has been in constant use by members of the staff of the Department of Botany. It has been consulted also by a large number of visiting students from various parts of the United States and from several foreign countries. The Herbarium of Field Museum is the largest one west of the city of

Washington, D.C., and it is consulted especially by botanists of the numerous large universities within a few hundred miles of Chicago.

The preparation and determination of the extensive plant collections received during the year have fully occupied the time of the Herbarium staff. Through the employment during the year of a number of workers furnished by the Illinois Emergency Relief Commission, and, in the early months, of federal Civil Works Service assignees, it was possible to perform a large amount of clerical and other work that otherwise could not have been undertaken. Most important, it has been possible to mount and add to the Herbarium more than 60,000 sheets of specimens, an exceptionally high number in a single year for any herbarium in the world. Many collections of plants that had remained for years in storage were mounted during 1934, and it is expected that if similar assistance is continued, it will be possible to add to the Herbarium during the coming year all the stored collections, some of them of great scientific value.

There were submitted to the Herbarium for study and determination 190 lots of plants, comprising 13,285 specimens. Of these, 64 lots, consisting of 4,354 specimens, were named and returned to the senders, while 126 lots, amounting to 8,931 specimens, were retained by the Museum. In addition, there were determined, but not preserved for the collections, many plants from the Chicago region and elsewhere, brought to the Museum by visitors, teachers, and students, or forwarded by mail. Also, there were answered many inquiries by mail and telephone, requiring diverse information upon botanical subjects.

Through the courtesy of the Department of Botany of the University of Chicago, Assistant Curator Llewelyn Williams was afforded special facilities for the study of the woods of the family Caryocaraceae. This is a small group of tropical trees native in Central and South America, upon which he is engaged in research.

Associate Curator Paul C. Standley published eleven papers based more or less directly upon the Herbarium collections, several of them, dealing with American trees, in *Tropical Woods*. His most important publication consisted of 142 pages of descriptions of Rubiaceae, published in *North American Flora*, in continuation of former parts of the flora treating of the same family. He prepared also a leaflet, *Common Weeds*, issued by Field Museum as No. 17 of the Botanical Series of Leaflets. Assistant Curator J. Francis Macbride published in *Candollea*, issued by the Conservatory and Botanic Garden of Geneva, a paper of 57 pages devoted chiefly

to descriptions of new Peruvian plants, principally those obtained by the various Marshall Field Expeditions to Peru.

A guide book to the collection of North American trees exhibited in Charles F. Millspaugh Hall (Hall 26), was issued during the year. This publication was prepared by Professor Samuel J. Record, the Museum's Research Associate in Wood Technology, and Professor of Forest Products at Yale University School of Forestry. The text covers the same ground as the descriptive labels written by Professor Record for the woods displayed in this hall. Each of the eighty-four species included is described concisely as to appearance of the tree, botanical characters, geographic distribution, and characteristics and uses of its wood. Apart from its reference to the Museum's collection, this booklet, entitled *North American Trees*, with its numerous illustrations, constitutes a useful and instructive guide serviceable to all interested in our native trees and their woods.

Members of the Department staff prepared for *Tropical Woods* many abstracts and reviews of current literature relating to tropical trees and shrubs, and contributed twelve signed articles and twenty other items to *Field Museum News*. Twenty-four newspaper articles resulted from data supplied by the Department.

ACCESSIONS—BOTANY

During 1934 the Department of Botany received 226 accessions, consisting of 34,714 specimens. Thus, while the number of accessions is slightly smaller, the number of specimens is substantially larger than in 1933. The accessions comprised specimens for the Herbarium, for the exhibits, and for the wood and economic collections. Of the total number 6,655 were gifts, 8,132 were received through exchange, 14,858 were derived from Museum expeditions, 1,676 were purchased, and the rest obtained from miscellaneous sources.

Of the Department's total receipts of 34,714 specimens, those for the Herbarium amounted to 33,756 items—plant specimens, photographic prints, and negatives. The Herbarium has received an unusually large amount of particularly valuable material through gifts and exchanges. Among these may be selected for special mention 140 specimens of tropical American Rubiaceae, received in exchange from the Conservatory and Botanic Garden of Geneva, through the courtesy of the director, Dr. B. P. Georges Hochreutiner. These consisted chiefly of duplicate types or otherwise authentic material of historical importance. Another valuable sending, likewise in exchange, consisted of 270 specimens from the Botanic



JABOTICABA

Hall of Plant Life (Hall 29)

Part of a fruiting branch of a Brazilian tree, reproduced from nature in Plant Reproduction
Laboratories, Department of Botany of the Museum



Garden of Madrid. The majority of these were Peruvian plants, collected by Ruiz and Pavón, the famous Spanish botanists who were the first collectors in Peru, about 150 years ago. Most of the specimens represent species named by those authors. The remainder of the Madrid sending consists of plants obtained almost as long ago in Colombia by the famous botanist Mutis.

Among important gifts of herbarium specimens during 1934 may be mentioned the following: 2,702 plants of New Mexico, presented by the collector, Rev. Brother G. Arsène, of Santa Fe, New Mexico; 88 sheets of plants of the Mississippi Valley, given by Mr. Hermann C. Benke, of Chicago; 178 specimens from Bolivia, presented by Professor Martín Cardénas of Potosí, Bolivia, who has been engaged in making collections in the military zones of the Chaco region; 348 Colombian plants, presented by Rev. Brother Elias, of Barranquilla, Colombia; 68 Yucatan plants, from Dr. Román S. Flores of Progreso, Mexico, who accompanied his material with vernacular names and notes that greatly enhance their scientific value; 366 plants from Brazil and Amazonian Peru, collected by Mrs. Ynes Mexia, of San Francisco; 223 specimens from the State of Sinaloa, Mexico, presented by Mr. Jesús G. Ortega, of Mazatlán, Mexico; 160 Mexican plants presented by the veteran collector, Dr. C. A. Purpus, of Zacuapan, Veracruz, Mexico; 250 specimens of rare plants of British Honduras, many of them new species, collected by Mr. William A. Schipp, of Stann Creek, British Honduras; 411 specimens, chiefly Compositae from the Hawaiian Islands, presented by Dr. Earl E. Sherff, of Chicago; 344 plants from Barro Colorado Island, Canal Zone, contributed by Mr. James Zetek, of Balboa, Canal Zone; and an exceptionally valuable lot of 568 plants, chiefly trees of South America, presented by the School of Forestry of Yale University, through the courtesy of Professor Samuel J. Record.

Many of the most desirable contributions have been acquired in return for determination of the specimens. Especially noteworthy is a lot of 1,385 plants of Guatemala, British Honduras, and Mexico, sent for determination by Professor H. H. Bartlett, of the Department of Botany of the University of Michigan. Most of these were collected by Mr. C. L. Lundell, and they form a highly important addition to the Museum's already large representation of the flora of the Yucatan Peninsula.

Besides the collections specifically mentioned above, the Museum received through gifts and exchange much other valuable herbarium

material from tropical America, the United States, Asia, and other regions of the earth. Details will be found in the List of Accessions for the year (p. 238 of this Report).

While under existing financial conditions it has not been possible for the Museum to purchase many of the desirable series of tropical plants offered, there were purchased 1,675 specimens, chiefly from Brazil and Peru.

From the previously mentioned negatives of type specimens of tropical American plants made in European herbaria by Assistant Curator Macbride, there were added to the Herbarium about 3,400 prints, most of which represent species not previously available for comparison.

Of economic plant material, including woods, there were received in 1934 from scientific and commercial institutions, expeditions, and from individuals, as gifts or in exchange, 1,001 specimens. A few of these accessions deserve special mention. An extensive collection of the economic plant products of Persia, Syria, and Iraq were gathered by the Field Museum Anthropological Expedition to the Near East.

A small collection of rare vegetable waxes was received as a gift from S. C. Johnson and Son, Inc., of Racine, Wisconsin. Included are sugar cane wax, tea wax, coffee wax, rose, orange blossom, and mimosa wax. These will form an interesting addition to the exhibit of waxes of vegetable origin displayed in Hall 28.

Through the courtesy of Dr. T. H. Kearney and Mr. C. J. King, of the United States Bureau of Plant Industry, Washington, D. C., the Museum received two fine specimens of cotton plants typical of upland and lowland cotton grown at the United States Field Station at Sacaton, Arizona.

To the collections of domestic and foreign woods there were added 325 numbers. Some of these were accessioned for exhibition purposes, but the majority are to augment the reference collection.

In continuation of contributions made in previous years, Yale University School of Forestry, through the courtesy of Professor Samuel J. Record, contributed 131 specimens of woods, mostly from Central and South America. Through the cooperation of the same institution the Museum received 105 samples of woods collected in Canton and Hainan Islands by Professor F. A. McClure, of the Department of Biology, Lingnan University, Canton, South China.

From the Forest Economist, Forest Research Institute, Dehra Dun, India, there was received a set of hand samples, comprising

thirty species, collected in northern India. Professor Walter W. Tupper, of the Department of Botany, University of Michigan, Ann Arbor, Michigan, furnished several microscopic slides of tropical woods for study purposes.

For the exhibit of osage orange installed in Charles F. Millsbaugh Hall (Hall 26) Mr. Hermann C. Benke, of Chicago, donated several negatives and prints of the tree in summer and winter condition; the Von Platen-Fox Company, of Iron Mountain, Michigan, furnished a board of tamarack; and Mr. O. G. Moore of Brownsboro, Alabama, donated a sample of chittam wood. For use in conjunction with the exhibits of American woods the Museum obtained, through the efforts of Professor Emanuel Fritz, of the University of California at Berkeley, California, cone-bearing branches of several Pacific Coast species, viz. redwood, incense cedar, western red cedar, Port Orford cedar and Monterey cypress.

Through the generosity of Mr. W. E. Bletsch, of Highland Park, an Associate Member of the Museum, the services of several men were furnished for cutting a large number of North American woods into hand specimens of a size suitable for distribution among scientific institutions and forestry schools. These woods were not needed for exhibition purposes, and had been kept in storage for a number of years.

The Department distributed through exchanges 1,038 herbarium specimens and photographs to fifteen institutions and individuals in North and South America, Europe, India, and Australia. Thirty-six lots of plants were lent for study to various institutions, and sixty-four lots were received on loan, for study or determination.

CATALOGUING, INVENTORYING, AND LABELING—BOTANY

During 1934 the permanent study collections of the Herbarium have been increased by 61,379 sheets of plants and photographs, besides several thousand sheets bearing original printed or type-written descriptions of new species, or other published matter useful for study purposes. The total number of mounted specimens now in the Herbarium is 735,237. During the year there were removed from the Herbarium 47 duplicate specimens.

The collections of woods and economic plant material were increased by 1,001 items.

With the assistance obtained from the workers furnished by the Illinois Emergency Relief Commission and the federal Civil Works Service, much of the reference and duplicate economic material,

including woods, was overhauled, and rearranged for more orderly and economical storage. Typewritten labels were provided for thousands of such specimens placed in storage, as well as for the material accessioned. About 9,000 cards for the index files were also prepared for the economic reference collections. The albums of photographs which constitute the Department's key to the botanical subjects in the Museum collection of negatives, were brought up to date with numerous additions, and many of the old volumes were reclassified and indexed.

From the Division of Printing the Department received a large quantity of buff labels for new exhibits, as well as for replacement of a large proportion of the black labels which are being eliminated as rapidly as possible from the exhibition halls.

In continuation of the index of new species of American plants there were added to the Museum's file 4,914 cards received from the Gray Herbarium of Harvard University.

INSTALLATIONS AND REARRANGEMENTS—BOTANY

Various additions were made to the exhibits in the Hall of Plant Life (Hall 29) during the year. One resulted from the receipt of a fine *Heliconia* from Mexico, obtained near Veracruz by the well-known botanical collector, Dr. C. A. Purpus, and subsequently grown in the conservatory at Garfield Park. At maturity it was sent by Mr. August Koch, chief florist of the conservatory, to the Museum for determination. It proved to be a new, undescribed, exceptionally handsome species of this tropical genus, which constitutes the American branch of the otherwise Old World banana family. In honor of the capable horticulturist under whose direction Garfield Park Conservatory has become one of the finest institutions of its kind in the United States, the new plant was named *Heliconia Kochiana*. A reproduction of the plant was prepared for the exhibits and placed in the case devoted to the banana family near the north end of Hall 29, while the dried remains of the original have been placed with the numerous other type specimens of tropical American plants in the Herbarium.

A branch of the jujube tree, an Asiatic buckthorn which produces one of the important fruits of northern India and China, was received through the courtesy of Professor Guy L. Philp, of the University of California at Davis, California. Reproduced for the exhibits, this fruiting branch illustrates the botanical characters of the family to which it belongs, and serves as an example of a notable Old World fruit tree which, despite its having been in cultivation

for thousands of years over an area extending from China and India to the south of Europe, still remains almost unknown in the United States. It has been installed together with other material of the buckthorn family, which thus becomes represented for the first time in the Hall of Plant Life.

To the exhibit devoted to the soapberry family has been added a reproduction of the Amazonian guaraná plant, a luxurious tropical vine cultivated in a few localities for its small scarlet, chestnut-like fruits. These, or rather their shiny black seeds, are the source of the stimulating beverage known to the Amazon Indians as guaraná, now extensively used in the manufacture of a carbonated kola-like beverage. The material for this interesting item was obtained by the Marshall Field Botanical Expedition to the Amazon in 1929, as was that for another addition made to the exhibits this year—a fruiting branch of lucuma, reproduced for the exhibits and installed with the sapote family to which it belongs.

The jaboticaba, another fruit, tropical to semitropical in range, but of a very different character, is represented in another new exhibit added to the case devoted to the myrtle family. It comes from southeastern Brazil. Grape-like in appearance, spherical and somewhat larger in size than large Concord grapes, this fruit grows abundantly, in small clusters of half a dozen or less, directly from the bark of the trunk and branches. The jaboticaba has a tough skin and one or more large seeds, but its juicy pulp of wine-like flavor makes it one of the most popular of fruits wherever it is known.

Among minor additions to the exhibits in the same hall are a number of reproductions of fruits secured in Pará in 1929 by the expedition mentioned above. These include several types of sapodillas; taperibá, or golden-apple; the famous Brazilian mango, "manga rosa" of Pernambuco; and the handsome cubú of the Amazon which obviously is related to the tomato, and combines in its shape and coloring features suggestive also of a huge Japanese persimmon.

Various other exhibits for the Hall of Plant Life are under way, one of which, a reproduction of an acanthus plant, will be of particular interest when completed.

In Hall 25 some important additions were made to the exhibit of food plants. In conjunction with the coffee and tea exhibits, two further cases have been given to a display of beverage plants. One is devoted to a display of the botanical features of coffee, maté, cassine tea, kola, guaraná and cacao. A branch of an Arabian coffee

tree, which formerly was a part of the exhibit of Rubiaceae in Hall 29, has been transferred to this new case together with the model of the enlarged flower and sections of the fruit. A small flowering and fruiting branch of the Liberian lowland coffee tree has been reproduced for this exhibit, together with a branch of maté (*yerba mate* or Paraguay tea) from the region of the Paraguay River and adjoining parts of southern Brazil and northern Argentina. There is also included, from the southeastern United States, a branch of cassina, one of several shrubs of the holly family known to the North American Indians as a beverage plant, though never in such general use among them as was the Paraguayan holly among the southern aborigines of South America. A cluster of the fruit of guaraná is shown with the seeds which furnish the beverage, as in the case of the African kola. Cacao is represented by pods of various species and varieties, together with the seeds or "beans." The only very important beverage plant lacking in this display is tea, and to supply this deficiency a reproduction of an entire teabush is to be provided.

The case given to the second group of beverages includes a wide range of fermented drinks with a relatively low alcohol content, and also the more potent fermented liquors of diverse origin. Among the most primitive of fermented beverages shown are palm wine, made from the rapidly fermenting sap obtained by tapping the trunk or the cut stem of an unopened flower cluster of various palms of the Old World tropics; and Mexican pulque, similarly obtained by tapping the flower stem of a large century plant. Wines obtained by the fermentation of the juice of a large variety of fruits, chief of which is of course the grape, seem almost natural and simple plant products compared with the "piwarri" made by the South American Indians by fermentation of the masticated tubers of cassava, the "awa" of the South Sea Islanders from the macerated roots and stems of a pepper plant, or the "chicha" of the Peruvian Andes from macerated plantains. The more common as well as a few unusual distilled liquors occupy one-half of this case. With each is shown the respective plant material from which it is prepared. Specimens for this exhibit were contributed by several individuals, and firms. Among them may be especially mentioned Mr. W. T. Pope, of Hawaii Agricultural Experiment Station at Honolulu, Hawaii; Mr. D. J. Steinheimer, of St. Louis, Missouri; Messrs. I. Lenard, Robert Yule, and John Mangelsen, of Chicago; Lionel Distilled Products, Inc., Atlas Brewing Company, and Paramount Liquor Company, Chicago.

In the coffee exhibit several samples which had been on display for many years were replaced by new specimens of the exchange standards of Brazilian and Colombian coffee furnished by the New York Coffee and Sugar Exchange.

Further additions were made to the North American trees in Charles F. Millspaugh Hall (Hall 26). At the northwest end of the hall there was installed an exhibit, occupying one entire case, of sugar pine. The material used for this installation was obtained through the cooperation of Professor Emanuel Fritz, of the University of California at Berkeley, and was in part contributed by him personally. Other new exhibits completed are of ponderosa pine, the gift of Edward Hines Lumber Company, Chicago; of southern white cedar, material for which was furnished by the Richmond Cedar Works, Richmond, Virginia; and of Osage orange.

An attractive addition to the foreign woods in Hall 27 is a group of seven boards representing important timbers of the Republic of Honduras, a gift from the United Fruit Company of Boston. Of the large collection of Japanese woods, which have been on exhibition for several years, one case was refinished and reinstalled.

To the plant raw materials and products in Hall 28 there was added a case displaying specimens of the principal species of rubber obtained from widely separated regions of the world. These are arranged in two groups: one showing the steps in the production of smoked and vulcanized sheets from latex of the Para rubber trees; the other including samples of various other species, mostly of lesser commercial importance, or of more restricted industrial application, such as hule or guayule rubber from Mexico, balata from Peru, Ceará rubber from northeastern Brazil, Accra or African rubber, gutta-percha and Jelutong rubber from Malaya, Assam rubber, and finally a Colorado rubber plant as a representative of the various North American species which yield latex containing rubber.

DEPARTMENT OF GEOLOGY

EXPEDITIONS AND RESEARCH

Collecting for the Department of Geology in 1934 was limited to short expeditions by members of the staff, which were conducted without appropriation by the Museum for expenses.

Associate Curator Elmer S. Riggs spent sixteen days in Nebraska and South Dakota collecting vertebrate fossils and examining prospects for future collecting. He also made two short trips within Illinois for the same purpose. Mr. Phil C. Orr spent a day

and a half in Kentucky collecting cave material. Assistant Curator Sharat K. Roy spent five weeks in the field at Peru, Nebraska, and near Lancaster, Pennsylvania. He carefully avoided collecting material which would duplicate any already in the Museum and collected only specimens to fill gaps in the present collections. Eighty-two specimens were gathered: twenty-one from the Pennsylvanian of Nebraska, and sixty-one trilobites from the Lower Cambrian of Pennsylvania. Three of the specimens from Nebraska represent a hitherto unknown crustacean. The Cambrian collection from Pennsylvania has not yet been worked over but it is known to include several perfectly preserved trilobites.

Studies and descriptions of specimens collected by the Marshall Field Paleontological Expeditions to South America were continued through the year by Associate Curator Riggs and Assistant Bryan Patterson. Some of the results were incorporated in a memoir on a new marsupial sabertooth by Messrs. Riggs and Patterson, which was published in the *Transactions of the American Philosophical Society*. Other results appeared in four octavo papers written by Mr. Patterson and published by the Museum.

Assistant Curator Roy wrote a memorial of the late Dr. Oliver Cummings Farrington, former Curator, with a complete bibliography, which was published in the *Proceedings of the Geological Society of America*. He also prepared or worked on the preparation of five other papers during the year. Three of these, *New Silurian Phyllopodous Crustaceans*, *A Silurian Conularia with Internal Septa*, and *The Grinnel Glacier*, are to be published by the Museum early in 1935. Mr. Roy has also continued work on his *Geology and Paleontology of Southeastern Baffinland*.

Research by Assistant Curator Roy intended to refute or confirm the reported discovery of living bacteria in stony meteorites by Dr. Charles B. Lipman of the University of Southern California, was continued through the year and is now nearly finished. Unforeseen delay in completing this work was caused by difficulty in verifying the sterilization of the external surface of the meteorites. A peculiar precipitate which simulated bacterial growth appeared on the surfaces. This growth is now known to be a chemical precipitate derived from a mineral peculiar to meteorites, so that the work is now nearing completion. As usual, thin and polished sections of fossils for identification and research were made in the laboratory.

Miss Elizabeth Oliver, volunteer assistant in paleobotany, began the identification and classification of the collection of fossil leaves



PANAMA HAT PALM

Hall of Plant Life (Hall 29)

Reproduced in Plant Reproduction Laboratories, Department of Botany of the Museum,
from material collected in South America by the Stanley Field
Guiana Expedition, 1926



of Mesozoic Age. This is a collection of approximately a thousand excellently preserved specimens obtained at different times from several sources. The best part of it, recently collected by Assistant Patterson, has never been named, and for much of the older material identification is doubtful or absent.

Dr. Alfred Walcott, working in the Department under a special arrangement, began a detailed study of a peculiar deposit of diamond in a hard matrix of lazulite and cyanite on specimens collected by Dr. B. E. Dahlgren, Curator of Botany, in Brazil. This is an important research as it may throw some light on the puzzling question of the origin of the diamond.

During an extended leave of absence Assistant Patterson made studies of vertebrate fossils in the British Museum of Natural History and the Museum of the Royal College of Surgeons in London for comparison with specimens now being studied in the Department.

Tests and analyses required for identifications of minerals, alloys, and glazes were conducted in the chemical laboratory as usual. In addition many such identifications were made by Dr. Walcott by microscopic and optical methods. Possible solvents for matter which was clogging the downspouts from the Museum roof were investigated and a suitable solvent found. There was carried on in the laboratory an investigation of a proposed degreasing method for use in the preparation of zoological specimens. The alcohol used to preserve specimens of fish and reptiles had become muddy and much discolored so that it was no longer suitable for use. An elaborate study was made of possible methods of purifying the alcohol enough to allow its continued use. The result of the investigation showed that the only practical means was redistillation. A still of six gallons' capacity was installed in the laboratory and has been in constant operation since July. As the odor of the alcohol which has been for years in contact with dead fish and reptiles was exceedingly offensive, equipment was devised which traps this odor and conducts it out of the building. The product of the still is a clear, colorless liquid entirely suited for its intended use although not sufficiently pure for many other purposes. Towards the close of the year the laboratory, except for the still, was entirely dismantled for repainting, but it is expected that it will again be in use by the beginning of 1935.

Recording a collection of culture and Oriental pearls, received from Japan, in such a way that the individual pearls could be surely identified if they should become separated from their labels, presented

something of a problem, as it is impossible to paint identifying numbers on them without destroying their value. The problem was solved by carefully measuring each pearl and weighing it on the chemical balance, so that if the pearls ever became mixed they could be sorted out by re-measuring and re-weighing.

Members of the Department staff contributed eleven signed articles and twenty-seven other notes to *Field Museum News*; and supplied data used in thirty newspaper publicity articles. Requests from correspondents and visitors for information and identification of specimens came in larger numbers than usual. There were 443 visitors and 296 correspondents referred to the Department for these and similar services.

ACCESSIONS—GEOLOGY

During the year the Department of Geology received seventy accessions comprising 1,458 specimens. Of this number 1,178 were gifts, 105 were received through exchanges, six were purchased, and 169 came from Museum expeditions or were collected by members of the staff. Specimens received by gift included many above average in quality and value.

The most important gift of the year was a collection of culture and Oriental pearls presented by Mr. Kokichi Mikimoto, of Tokyo, Japan. This consists of thirteen culture pearls artificially propagated in pearl oysters and selected to show a range in color and size. For comparison the culture pearls are accompanied by six natural Oriental pearls. Included in the gift is a partially dissected pearl oyster, and several pearl oyster shells with brilliant mother-of-pearl interior surface.

An important and attractive addition to the collection of ornamental minerals is a statuette, nine inches high, presented by R. Bensabott, Inc., of Chicago. This figure of a man in Japanese costume is carved from a block of crocidolite, or tiger-eye, a mineral noted for its brilliancy and the glowing golden silky sheen of its polished surface.

Gifts of ores and minerals exhibited at A Century of Progress exposition were received from four of the exhibitors. The largest of these was a collection of thirty-two ores and industrial minerals of Alaska presented by the Alaska Museum, of Juneau. These specimens, representing a widely diversified range of mineral resources in the territory, are a valued addition to the economic collections as Alaska had been represented mostly by gold and tin ores. The Luray Caverns Corporation presented two large stalactites and three

stalagmite formations from the Luray Cave, in Virginia. The specimens were accompanied by six large colored transparencies which adequately represent the peculiar and beautiful scenery of the caverns.

The United States Potash Company, New York, selected from its exhibit at A Century of Progress and presented to the Museum two large blocks of the potash salts from its mine near Carlsbad, New Mexico. This important newly found deposit which extends over parts of Texas and New Mexico had hitherto been represented only by a few small specimens. As the deposit, which resembles the celebrated deposit at Stassfurt, Germany, is of a kind not hitherto exploited in this country, its adequate representation in the collections is important. The Missouri Commission to A Century of Progress presented good examples of the curious blossom rock found in Missouri, and some iron ores.

The large collection of ores of the state of Washington presented last year by the Northwest Mining Association, which was loaned back to the association for exhibition during the second season of A Century of Progress, was returned and is now included in the economic collections.

Many visitors to A Century of Progress brought material from home to be identified, and they presented many of the specimens which proved to be good museum material. Some visitors presented specimens to improve the showing from their home towns, and exchanges were arranged with other visitors.

Mr. William J. Chalmers, of Chicago, presented fifteen specimens of gold ore and nuggets which are of historical interest because they were collected during the gold rush to California in 1849. Mr. Franklin G. McIntosh, of Beverly Hills, California, presented a large, well-crystallized colemanite from Nevada and seven California minerals.

A large block of wood opal from a petrified forest in Oregon, the gift of Messrs. Robert Sloane and A. R. Renner, of Klamath Falls, Oregon, is a striking addition to the opal section of the mineral collection. Although this specimen, which weighs fifty pounds, lacks the fire of precious opal, the wide range of colors it displays and its soft luster make it a most attractive product of the fossilization of wood. Four wood opal specimens of a different kind, presented by Mr. Thomas A. Carney, of Portland, Oregon, display some features of unusual interest. Another example of fossil wood and five fossils were presented by Mr. L. W. Buker, of Provo, South

Dakota. Another wood opal from Texas, and a smaragdite, were obtained from Mr. C. S. Brock, of Houston, Texas, in exchange for wood opal from another locality.

A specimen of the unusual agate of Datil, New Mexico, was given by Mr. Edward M. Brigham, of Battle Creek, Michigan, and a good group of the Arkansas rock crystals was presented by Mr. J. A. Bauer, of Hot Springs, Arkansas.

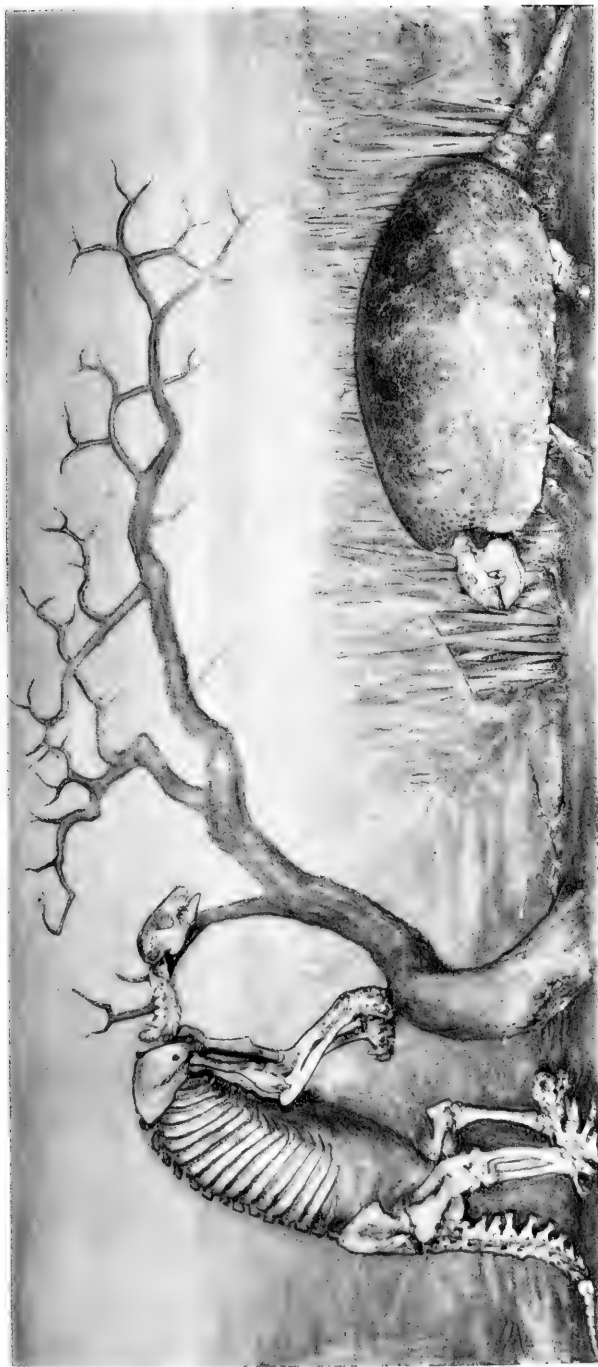
Mr. Frank Von Drasek, of Cicero, Illinois, added to his gifts of previous years a collection of thirty-three minerals from Hot Springs, Arkansas. Mr. William Gardner, of Chicago, presented a collection of twenty-seven minerals and forty-five fossils from various localities, which contains much material of interest.

Twenty-seven choice minerals were added to the Museum collections in Hall 34 through two exchanges with mineral collectors. Twenty-one of these came from Mr. E. Mitchell Gunnell, of Galesburg, Illinois, in return for fourteen minerals from the Museum, and six from Mr. Fred Pough, of St. Louis, Missouri, were received in exchange for eight from the Museum.

Twelve specimens were added to the meteorite collection by exchange. Specimens of six falls not hitherto represented were obtained from Professor H. H. Nininger, of Denver, Colorado, in return for ten meteorite specimens from the Museum. Better representation of meteorites from the craters of South Australia and of the great Hoba Farm meteorite were secured from the Kyancutta Museum, of South Australia, which received in exchange four meteorite specimens.

Additions by gift and exchange to the collections in Clarence Buckingham Hall (Hall 35) illustrating structural and dynamical geology were greater in value but fewer in number than usual. The two accessions of most importance were the collection of cave products of the Luray Cavern already mentioned, and a collection of Hawaiian lavas. These lavas and volcanic products, which will effect a great improvement in the appearance and interest of the exhibits, were obtained from Mr. Edward Brigham, of Battle Creek, Michigan, as an exchange for a small selection of minerals. They form a large collection, unusually well selected, representing all phases of the lavas of the Hawaiian Islands, including such features as peculiar lava surfaces, lava stalactites, and the fibrous Pele's hair.

The claystone collection was enlarged by a gift from Mr. Charles Marriott, of Sault Ste Marie, Michigan, of forty-eight claystones selected for their imitative shapes. Miss Virginia Lee, of Ableman,



GROUP OF FOSSIL EDENTATES FROM THE PLIOCENE OF ARGENTINA

Ernest R. Graham Hall (Hall 38)

This exhibit includes skeletons of the ground sloth *Pronothotherium*, and of the glyptodont *Scleroctylphus* mounted with accessories and background

Prepared by Phil C. Orr

Wisconsin, presented a collection of fulgurites from Wisconsin. From Mr. J. O. Shead, of Norman, Oklahoma, was received a gift of nine of the curious barite roses found in his state. Mrs. T. R. Jones, of Ashland, Nebraska, presented examples of dendrite tracings on novaculite, and Mr. John A. Manley, of New Brunswick, New Jersey, presented two limonite geodes of an unusual kind.

The most important addition to the economic collections was a series of thirty-seven specimens from an unusual lead and zinc deposit of Embreeville, Tennessee, the gift of Mr. Seymour Wheeler to be credited to his father, the late Mr. Charles P. Wheeler, of Chicago, who discovered and developed the deposit. These specimens of ore have the appearance of stalactites, stalagmites and various cave floor and wall deposits which in ordinary caves are composed of carbonates of lime and gypsum. Because of their interest and beauty they have been exhibited by themselves in an individual case in Frederick J. V. Skiff Hall (Hall 37).

Three specimens of the radium and silver ores of Great Bear Lake, Canada, the gift of the El Dorado Gold Mines, Ltd., permit for the first time a representation of this important radium deposit.

Mr. Jack Weil, of Chicago, presented sixteen specimens of miscellaneous ores from Colorado. A typical specimen of rich telluride gold ore, the gift of Wright-Hargreaves Mines, Ltd., Kirkland Lake, Ontario, Canada, permits a better representation of the unusual ores of that district.

A polished slab of Mexican onyx from Wisconsin, the gift of Mr. Edward B. Sylvanus, of Chicago, is an interesting addition to the marble collection as it is from a quarry much nearer Chicago than the usual sources of this ornamental stone.

Mr. Henry Field, of Chicago, presented a collection of sixty fossils from Germany and England. Numerous examples of the well-preserved fossil fish of Solenhofen were included, as well as excellent examples of English invertebrates. The fossils were accompanied by a collection of English ores and rocks.

An interesting addition to the fossil collection was a group of twelve fossils of pre-Cambrian age which Mr. Carroll Lane Fenton, of West Liberty, Iowa, collected in Glacier National Park and presented to the Museum. Fossils of so early an age are necessarily poorly preserved but they are very rare and come from a time nearer the beginnings of life than do the fossils usually seen in collections. These fossils were accompanied by twenty-seven other specimens of geological interest, such as impressions left on the

beach sands by the raindrops and hailstones of storms of this remote period.

Mr. Floyd Markham, of Chicago, and Messrs. J. Mann and J. Lee, of Oak Lawn, Illinois, presented twenty-one fossils which they collected in recently discovered beds in Blue Island. These specimens include new species and specimens which disclose unknown or obscurely known features of other species. Several of them have already been described in Museum publications. Messrs. A. G. and Raymond B. Becker, of Clermont, Iowa, presented a collection of eighty-one fossils from Florida.

Additions to the collection of vertebrate fossils resulted from gifts, exchanges, and collecting by individuals of the staff. One skull each of the large Cretaceous dinosaurs, *Anchiceratops* and *Edmontosaurus*, were received by exchange with the Royal Ontario Museum of Toronto, Canada, in return for a miscellaneous collection of South American fossils.

A specimen of the swimming reptile, *Tylosaurus*, was presented by Mr. G. M. Barber, of Hot Springs, Arkansas. A specimen of *Elephas boreus*, from Alaska, was the gift of Mr. George W. Robbins, of Valdez, Alaska. Mr. Henry Field, of Chicago, presented vertebra, jaws, and teeth of *Ichthyosaurus*, from England.

A collection of eleven specimens of fossil mammals and reptiles from South America was contributed by the Standard Oil Company of New Jersey. A skull of *Caenopus* and half a skeleton of *Metamyndon* were collected in South Dakota by Associate Curator Riggs. The Straus West African Expedition of the Department of Zoology collected five specimens of African lavas.

An iron ore from the Fiji Islands, collected by the Cornelius Crane Pacific Expedition, was received, as well as a bentonite (used as a cosmetic by the Arabs) collected by the Field Museum Anthropological Expedition to the Near East.

Mr. Roy collected, on two field trips, eighty-three fossil invertebrates and plants of Nebraska and Pennsylvania. Mr. Phil C. Orr collected sixty-two specimens of cave products and fossils from the cave region of Kentucky.

CATALOGUING, INVENTORYING, AND LABELING—GEOLOGY

New entries recorded in the Department catalogues, now comprising twenty-six volumes, numbered 1,458. These, added to previous entries, give a total of 193,278. As copy for several thousand labels already had been sent to the Division of Printing, preparation

of copy for new and replacement labels was not as actively pushed as was the case last year. However, copy for 170 labels was prepared and sent to the Division of Printing. In order to afford information regarding the exhibits before permanent labels are ready, 455 temporary typewritten labels were prepared and installed. Labels totaling 1,812, received during the year from the Division of Printing, were installed. Two hundred thirty-eight photographic prints were added to the Department albums, bringing the total number in them to 7,736. Labels for all prints were made and filed with them. Three hundred eighty-four United States Geological Survey maps were received, filed and labeled, making the number of these maps now available 4,232.

It has become increasingly evident during the past few years that a classified catalogue of at least some of the collections is a necessity. When arranging exchanges or purchases, planning improved or new exhibits, or answering questions from scientific workers, it is often necessary to know whether the collections include a certain kind of specimen. The regular catalogue is useless for this purpose because in it entries are necessarily chronological in order, and only the broadest classification is possible. In the past, dependence has been upon memory supplemented by an orderly arrangement of both exhibited and reserve collections. The collections are now so large that memory is no longer dependable, and a search of even a well-classified reserve collection often involves the expenditure of a prohibitive amount of time. The preparation of the most necessary of these catalogues, now well under way, has absorbed much of the Department staff's time. The work has been facilitated by the use of clerical assistants, assigned by the Illinois Emergency Relief Commission, who have been able to do much of the typing and routine work. A card catalogue, arranged alphabetically, of all meteorites received since the date (1916) of the last printed catalogue, has been completed and is in use. A catalogue of the mineral collection, arranged in the order of the Dana system numbers, has been started, and 2,810 cards have been made, checked, and filed. These cards tell the Dana number, catalogue number, name and locality of each specimen, and when, how and from whom it was acquired. They also give the approximate size and such other description as the cataloguer is able to supply. As the catalogue, when complete, will contain at least 16,000 cards, it will be a matter of some years before it is finished. There is special need for a catalogue of the nearly 8,000 geological photographs in the Depart-

ment albums. Most of the data concerning these photographs have never been recorded, and exist only in the memory of the staff. Each photograph may be used to illustrate a number of geological subjects. A laborious search of the albums to find a suitable illustration for some subject is often necessary. The catalogue begun this year, now nearly finished, contains this hitherto unrecorded data and is thoroughly cross-indexed for geological subjects. In some cases as many as five cards have been written for a single print and most of the prints are represented by at least two cards, one geographical and one or more geological. The standard Dewey decimal classification was used and found satisfactory. A quick reference to the card index shows at once what photographs are available from any country and what illustrations there may be of any geological feature such as jointing or lava flows.

A catalogue of all exhibited invertebrate fossils and plants has been completed and is in use. The cards give the Museum number of each specimen, with its name, horizon, and geographical location. They are grouped by geological periods and under each period the cards are filed alphabetically by genera. This catalogue contains 5,378 cards. A similar catalogue for the reserve fossil specimens has been started and some 700 cards written.

A catalogue of approximately two-thirds of the specimens of vertebrate fossils, which was already in existence, was enlarged by the addition of forty-nine cards. This catalogue is on larger cards than the other catalogues, and is much more detailed. It contains the entire history of each specimen and such other information as may be considered pertinent.

The steady growth of the library of pamphlets and separates on the subject of vertebrate paleontology made it necessary to provide better means of preserving and using this literature. Accordingly 2,100 pamphlets and unbound volumes were filed in 133 covers made in the Department and arranged and marked alphabetically by authors. A catalogue of 1,641 cards was made for this library. A similar catalogue of cards was prepared for the literature on invertebrate paleontology, and a special catalogue for a special bibliography of paleontology and geology of Baffinland. All catalogue cards except those of vertebrate paleontology specimens are on standard library size cards. To accommodate them five small filing cabinets to fit in spaces in the Department bookcases were made in the Department workrooms. These cabinets are twenty-two inches long, fourteen inches high and twelve inches deep. Each



CRYSTAL OF BERYL

Stanley Field Hall

This large crystal weighs 950 pounds

Gift of William J. Chalmers



contains six drawers. These small cabinets are found more convenient in use than a single large one and obviate the necessity of providing filing capacity long before it is needed.

Illinois Emergency Relief workers assigned to the Department prepared more than 13,500 catalogue cards, numbered more than 1,600 specimens, and completed large amounts of typing on work of various kinds. From two to six of these workers served the Department during about thirty weeks of the year.

INSTALLATIONS AND REARRANGEMENTS—GEOLOGY

As was the case last year, exhibits in the Department were disturbed as little as possible during the period of A Century of Progress exposition, and there were no major changes.

The change in the method of mounting minerals in the tall cases of Hall 34, inaugurated last year, was finished by the complete reinstallation of six more cases, and reinstallation of the minerals on the top shelves of ten others. Eighteen hundred of the new type wooden specimen mounts, made in the Department workshops, were employed in this hall, and in similar work in progress in Clarence Buckingham Hall (Hall 35). The new installation is so much more economical of space that several hundred specimens, partly from reserves and partly new accessions, have been added to the exhibits without producing a crowded effect.

The four cases near the center of Hall 34 which contain the William J. Chalmers Crystal Collection, the amber collection, and the ornamental minerals, are equipped with narrow glass shelves on which it has been difficult to maintain the installation in good shape, as any vibration moved both specimens and labels out of position. The specimens have all been remounted and the pedestals have been attached to the glass shelves by a touch of adhesive, invisible and easily removed. The special wire label holders formerly used were somewhat unsightly and never held the labels securely. A new type of steel label holder, which is practically invisible and holds the label firmly, was designed and built in the Department workrooms. One thousand of these were used in the reinstallation.

In Clarence Buckingham Hall (Hall 35) three cases of concretions and four cases illustrating various phases of structural geology were reinstalled. Here it was not possible to use the new type of mounts for all specimens, and many were therefore remounted on types of supports already in use, while some of the larger specimens required special treatment. As in the mineral collection, the new installation

proved more economical of space, and several hundred additional specimens were placed on view. A new exhibit, consisting of specimens collected by the Marshall Field North Arabian Desert Expedition, was installed in this hall to illustrate the destructive action of the sun on rock surfaces. The collection illustrating such surface desert phenomena as desert varnish, sand polish, and erosion by wind-blown sand, was revised and greatly enlarged by the addition of specimens from the Marshall Field North Arabian Desert Expedition and the Marshall Field Brazilian Expeditions. The exhibits of claystones and barite roses were enlarged by the addition of specimens received during the year.

Work on the collections in Frederick J. V. Skiff Hall (Hall 37) was confined to such cleaning as was necessary and the addition of a few specimens received during the year. The appearance of the hall has been improved by replacing 1,743 of the old black labels with new buff labels matching the background of the cases. The collection of unusual zinc and lead ores from Embreeville, Tennessee, was installed in a case formerly occupied by a collection of zinc ores from Greece, now transferred to another part of the hall. The new collection, which occupies a whole case, is unusually attractive because the specimens take the form of cavern deposits such as stalactite and stalagmite.

Two large blocks of the potash ores of New Mexico are an important addition to the potash collections, as they show the nature of this deposit better than the drill cores formerly shown.

In Ernest R. Graham Hall (Hall 38) fossil skulls of the saber-tooth tiger, *Smilodon*, the Andean horse, and a giant turtle were added to the collections. Further changes were confined to minor readjustments such as replacing inferior specimens, and rearranging specimens that were not in proper geological sequence.

Preparation of specimens for exhibition continued through the year in the laboratories of vertebrate paleontology. The working force of this laboratory was increased during part of the year by the re-employment of Mr. James H. Quinn as preparator for eight months, and by the attachment of Mr. Robert Witter as volunteer helper for four months. Specimens prepared for exhibition, and in process of preparation, in these laboratories, while few in number are of great importance. A skeleton of the large South American mammal, *Astrapotherium*, has been reconstructed from a poorly preserved specimen and for the first time the entire bony structure of this rare animal has been shown. Another rare skeleton, of a

kind never before exhibited in any North American museum, is that of the great sloth, *Megatherium americanum*, which has been prepared and is nearly ready for exhibition. An entire skeleton of the rare Paleocene mammal, *Titanoides faberi*, was removed from a stony matrix of great hardness and prepared for study and for mounting later as an exhibit. Two fine specimens of great tortoises, consisting of the shell and large parts of the skeleton, have been prepared and mounted for exhibition.

In H. N. Higinbotham Hall (Hall 31) there was installed a collection of specimens of culture and Oriental pearls, the gift of Mr. Kokichi Mikimoto, of Tokyo, Japan. Materially enlarging the pearl exhibit, this collection contains culture pearls of the kind grown artificially in pearl oysters in Japan, along with a number of Oriental or natural pearls for comparison. It is accompanied by a pearl oyster with one shell removed to show the interior where pearls grow.

Two gold nuggets received during the year were added to the native gold collection, and some inferior jade was replaced by specimens of better quality.

The rearrangement of the mineral and economic reserve and study collections in trays in Room 120, which was undertaken last year, has already proved its worth. Use during the year of the reorganized collection indicated that a closer geographical classification of some sections of the economic collection would facilitate ready reference to them. The geographical classification of the gold, silver, and lead ores was already sufficiently detailed. All the other ore and non-metallic mineral collections now have been rearranged in as close geographical sequence as the nature of the material will permit. As the specimens in this room are reserve and study collections, not merely storage material, and are frequently referred to, the new arrangement has effected a worth-while economy of the time of the staff.

DEPARTMENT OF ZOOLOGY

EXPEDITIONS AND RESEARCH

Two important zoological expeditions, organized and initiated near the close of 1933, were in the field during 1934. These were the Straus West African Expedition of Field Museum and the Leon Mandel Guatemala Expedition of Field Museum, both of which were mentioned in the Annual Report for 1933.

The Straus West African Expedition was accompanied during February, March, and April by its patroness, Mrs. Oscar Straus, of

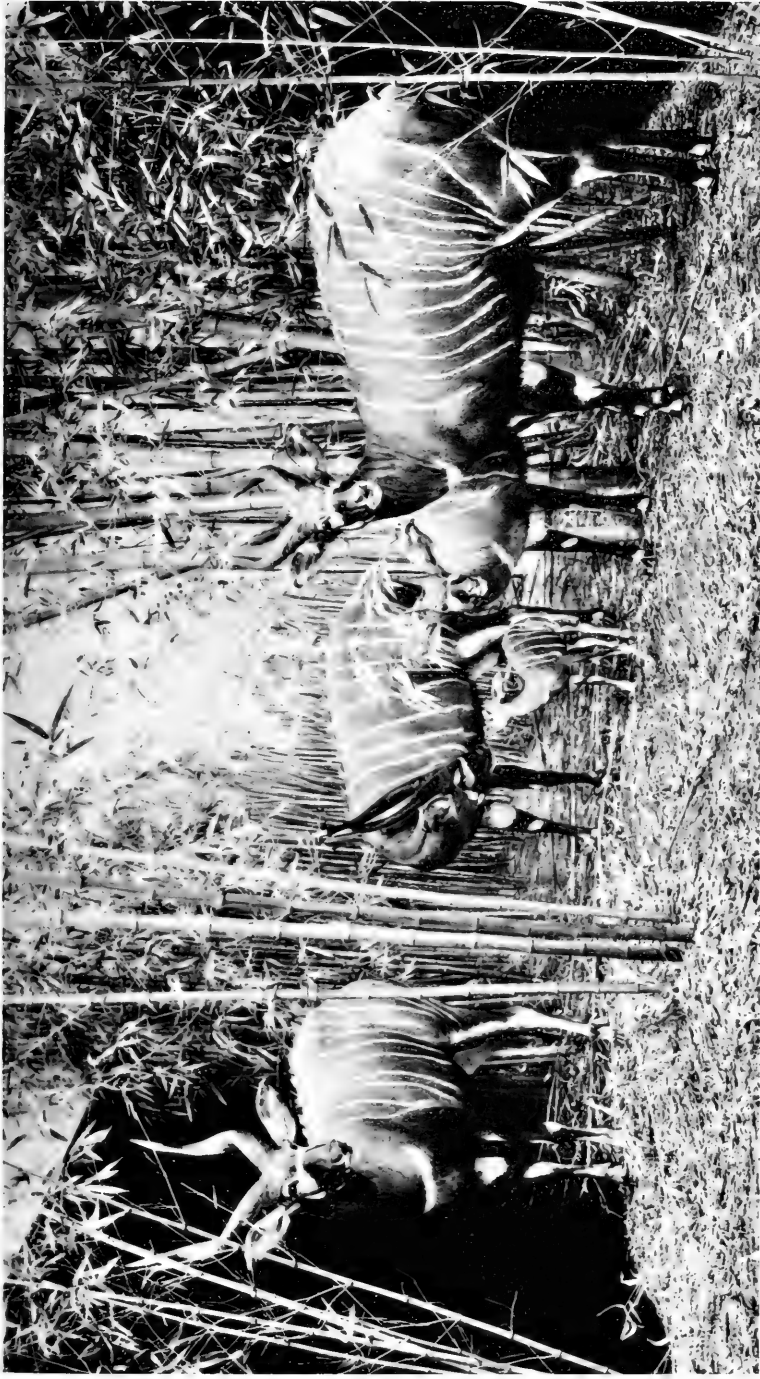
New York. The expedition was under the leadership of Mr. Rudyerd Boulton, Assistant Curator of Birds. It sailed from New York in January direct for Dakar, Senegal, on the west coast of Africa. In addition to Mrs. Straus and Mr. Boulton, the party included the following: Mr. Frank C. Wonder, of the Museum's taxidermy staff, who collected mammals; Mr. John F. Jennings, of Chicago, who was in charge of photography; and Mrs. Rudyerd Boulton, who made studies of African native music under a grant from the Carnegie Corporation of New York.

The expedition left Dakar by motor early in February and made its first camp at Fatick, about 100 miles inland on a brackish arm of the sea. Thence it moved on about 700 miles to Bamako, capital of the French Sudan. Mr. Wonder, at this point, began working back to the coast, collecting mammals and birds, while the rest of the party continued to Mopti, on the Niger River, where a great abundance of water birds was found. The expedition then moved to Sangha and to Gao. From there Mrs. Straus and Mr. Boulton motored across the Sahara Desert to Oran, Algeria, whence Mrs. Straus returned to the United States. The journey to Oran and the return to Gao, some 3,000 miles largely over waterless, uninhabited desert, was a difficult one.

After a trip to Timbuktu, the expedition journeyed south through Dahomey and Nigeria to Mount Cameroon, a 13,000-foot, isolated peak near the coast, where several weeks were spent in intensive collecting and in making ecological and zonal studies from sea level to the treeless summit. Later, a stop was made in lowland forests of southern Nigeria.

Results from this expedition include much material new to the Museum, since the route traveled was wholly in a part of Africa little represented in American collections. The material obtained comprises specimens and accessories for two habitat groups of birds, one of a nesting colony of weaver-birds, and one of the curious plantain-eaters or turacos of the mountain forest; and general collections of 641 mammals, 650 birds, 1,000 reptiles and fishes, 2,000 insects, 1,000 still photographs, and 15,000 feet of motion pictures.

The work of the Leon Mandel Guatemala Expedition of Field Museum, which was well under way in 1933, and of which a preliminary account appeared in last year's Report, was carried to a successful conclusion. In December, 1933, the field party (consisting of Mr. Karl P. Schmidt, Assistant Curator of Reptiles and Amphibians; Mr. Emmet R. Blake, of Pittsburgh; Mr. F. J. W.



BONGO ANTELOPE

Carl E. Akeley Memorial Hall (Hall 22)

Specimens collected by Harold White John Coats African Expedition, 1930

Taxidermy by C. J. Albrecht. Background by Charles A. Corwin



Schmidt, of Madison, Wisconsin; and Mr. Daniel Clark, of Chicago) had established headquarters at Tiquisate, a plantation of the United Fruit Company, on the Pacific plain of Guatemala. There they were joined by Mr. Leon Mandel, of Chicago, sponsor of the expedition; Dr. M. G. Kral, accompanied by Mr. Henri Bogner-Mayr as general assistant, both of Chicago; and Mr. Richard Madler, of New York, photographer. The main party was engaged in hunting, in collecting birds and reptiles, and in photography for ten days on the seacoast below Tiquisate, while Mr. F. J. W. Schmidt collected mammals and reptiles at Olas de Moca, the coffee plantation of Mr. Teodoro Englehardt, where later the entire party was cordially entertained.

After arranging for the shipment of a number of live animals obtained for the Chicago Zoological Society, the party returned to Guatemala City, and Mr. Mandel visited the highland village of Chichicastenango. He was recalled to Chicago on account of the sudden death of his mother on January 20.

Messrs. Karl P. and F. J. W. Schmidt, and Mr. Blake collected at Santa Elena, a high mountain station near Tecpam, in January and early February. They were entertained by Mr. Axel Pira, whose sawmill, in the cypress forest at an altitude of 9,500 feet, had been a collecting station for Field Museum collectors in 1905 and 1906. From Santa Elena, they traveled by motor truck over the highland to San Marcos, where they had been invited by Mr. H. Goebel, of the Central American Plantations Corporation, to make the great coffee plantation "El Porvenir" their base for the zoological exploration of the Volcan Tajumulco, the highest mountain in Guatemala. Collections from El Porvenir, made at 3,400 feet, and from camps at 7,000, 10,400 and 13,000 feet, will form the basis for detailed studies of the extremely interesting and well-defined life zones of this great mountain.

Subsequent collecting stations, chosen to represent the diverse environmental regions of Guatemala, were at El Rancho, in the desert along the Motagua River; Salama, the high desert of Baja Vera Paz; the limestone cave region of Alta Vera Paz, in the vicinity of Coban; and the lowland forest on the Caribbean side, revisited before sailing from Puerto Barrios to New Orleans.

Notable among results of the Leon Mandel Guatemala Expedition is the exhibition material collected for three groups of birds for the proposed Hall of Foreign Birds. Two species of toucan, representing one of the most distinctive groups of birds in tropical Amer-

ica, were found feeding in great numbers on a forest tree with small blue fruits in the lowland forest near Puerto Barrios, and an ample series of specimens, together with photographs and plant accessories, was obtained. In the cloud-forest zone of Tajumulco, the rare and exceptionally brilliant trogon called quetzal was collected. This is the national bird of Guatemala, now protected by the government, and special permission was granted the expedition to take specimens for exhibition in Field Museum. These will be mounted in association with a branch hung with orchids and other epiphytic plants, and shown against a background of tree ferns, representing the typical habitat of the quetzal. The third group will demonstrate the nesting habits of the giant oriole of Central America whose hanging nests, from four to six feet in length, are grouped in colonies of hundreds in the tallest, most conspicuous trees, forming one of the characteristic elements in the tropical landscape.

Scientific collections obtained by the expedition will make possible important contributions to the knowledge of Guatemalan mammals, birds, reptiles, and amphibians. The total collections include 523 mammals, 876 birds, 1,003 amphibians, 844 reptiles, 125 fishes, and 1,621 insects and other invertebrates. Mr. Clark, who contributed his own time and expenses to the expedition, presented to Field Museum the 176 birds he collected.

The Field Museum Anthropological Expedition to the Near East, conducted by Mr. Henry Field, Assistant Curator of Physical Anthropology, and Mr. Richard Martin, in addition to its work for the Department of Anthropology, made valuable zoological collections, including 142 mammals, some 50 birds, and 559 amphibians and reptiles.

A limited amount of research was carried on, but this was curtailed by absences in the field and increased curatorial requirements.

Assistant Curator Colin C. Sanborn made a preliminary study of the mammals obtained by the Leon Mandel Guatemala Expedition, among which several new forms were discovered and, throughout the year, from time to time, he made additions to an index of the literature pertaining to the bats of the suborder Microchiroptera.

Associate Curator Charles E. Hellmayr, working in Vienna and elsewhere in Europe, made much progress with the large work *Catalogue of Birds of the Americas*. Part VII, a book of some five hundred pages, was corrected and published, the manuscript for Part VIII was finished and sent to press, and preparation of Part IX was concluded.

After his return from Guatemala, Assistant Curator Schmidt engaged in research on Chinese amphibians and reptiles, continuing a collaboration begun in May with Dr. C. C. Liu, of Soochow University, China. The gift of an especially valuable series of snakes from Yucatan, by Mr. E. Wyllys Andrews IV, of Chicago, made possible a comparative study of Yucatecan and Guatemalan species, and a report on the collection made in Yucatan by Mr. Andrews was drawn up for publication. Mr. Schmidt also prepared a short paper on the breeding behavior of lizards and another describing a new crocodile from the Philippines.

Except for the important addition mentioned above to the series on birds of the Americas, the only other publication of the Department of Zoology during the year was Zoology Leaflet No. 13, *Sculptures by Herbert Haseltine of Champion Domestic Animals of Great Britain*, in which are illustrated and described the sculptures presented by Trustee Marshall Field and installed in the new Hall 12 during the year.

Members of the Department staff contributed eleven signed articles and twenty-two other articles and items to *Field Museum News* during the year, and supplied data for thirty-six newspaper articles.

A few publications of members of the staff appeared under other than Museum auspices. Most important of these are the *Genera and Subgenera of South American Canids*, by Dr. Wilfred H. Osgood, Curator of the Department of Zoology, published in February in the *Journal of Mammalogy*, Vol. 15, pp. 45-50; and *Notes on the Sea Trouts of Labrador*, by Assistant Curator Alfred C. Weed, printed in *Copeia*, 1934, pp. 127-133.

As in 1933, the work of the Department of Zoology was somewhat affected by A Century of Progress exposition and the unusual attendance resulting from it. The number of visitors of a professional character or coming with special introductions and requests for service from members of the staff was less than in 1933, but still large, and much time was unavoidably devoted to them.

The association of Mr. Leslie Wheeler, a Trustee of the Museum, with the Department of Zoology during the year made a gratifying addition to the personnel. Mr. Wheeler has found an especial interest in the Museum's collection of birds of prey, which has been segregated and especially indexed. Preparations have been made for amplifying it and studying it along systematic lines.

The year was marked especially by activities connected with the employment of numerous assistants provided by relief agencies

—the Federal Civil Works Service, the Illinois Emergency Relief Commission, etc. Although many of these men and women were inexperienced and without especial qualifications, they were assigned to work in which they could be trained and they soon became able to render valuable service to the institution. In all cases they were given work which had fallen behind or which the regular staff had been unable to undertake for lack of time. They were not used to relieve the regular staff of any of its usual duties. Through their assistance large numbers of specimens hitherto in storage were prepared, catalogued, labeled, and numbered. General efficiency throughout the Department was greatly stimulated and much substantial progress was made in the care and use of the collections. Supervision of their work occupied much of the time of the regular staff, but the net gain was very large.

ACCESSIONS—ZOOLOGY

Accessions for the year total 10,951, which is about double the number received in 1933. The increase is due, mainly, to more results from Museum expeditions. By zoological groups, the accessions classify as follows: mammals, 1,405; birds, 1,947; amphibians and reptiles, 3,370; fishes, 578; insects, 3,651. The number obtained by Museum expeditions is 7,923; by gift, 2,730; by exchange, 266; by purchase, 32.

Foremost among gifts are the bronze and marble sculptures of British champion domestic mammals, presented by Trustee Marshall Field. These consist of nineteen pieces by the well-known artist Mr. Herbert Haseltine. Their special installation in a new hall (Hall 12) has been mentioned elsewhere.

Gifts of mammals include a small number of especial interest received from the new zoological gardens at Brookfield, Illinois, through the cordial relations maintained between the Museum and the Chicago Zoological Society. Dr. L. C. Sanford, of New Haven, Connecticut, presented the skin of a bear from Mexico to match a skull given to the Museum in 1902 and used as the basis of the description of a new form (*Ursus machetes*). This, therefore, is a type specimen and the preservation of both skin and skull together is important. Dr. G. W. D. Hamlett, of the Harvard Medical School, presented twenty-three specimens of bats collected in Brazil.

The principal gifts of birds were those received from Mr. Leslie Wheeler, of Lake Forest, Illinois, from time to time, amounting to 303 specimens. Among them were some fifty-five birds of prey and a collection of 248 miscellaneous birds from southwest Africa.



OSTRICHES AND THEIR ALLIES

Hall 21

Type of installation in systematic exhibit of foreign birds

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Notable among gifts of amphibians and reptiles, during 1934, are thirty-eight specimens of snakes, lizards, frogs, and turtles from Yucatan, from Mr. E. Wyllys Andrews IV, of Chicago; forty specimens of frogs and lizards from north China, from Dr. C. C. Liu, Soochow University, China; seven snakes from Brazil and Central America, from Mr. R. Marlin Perkins, of the St. Louis Zoological Park, including a rare genus of boa, *Ungaliophis*; a king cobra and an exceptionally large East Indian monitor lizard from Mr. Frank Buck, well-known dealer in live animals; and five snakes and fifteen lizards, chiefly Australian, from the Chicago Zoological Society.

As in previous years, a number of desirable fishes were received from the John G. Shedd Aquarium. The continued friendly cooperation of the aquarium staff has resulted in the selection of especially needed specimens, from time to time, which have filled many gaps in the Museum's collections. A specimen of great interest is an east African lungfish, given by the General Biological Supply House, of Chicago. The Charleston Museum, Charleston, South Carolina, continued to add to its gifts of fishes, especially pickerels, from that state.

The insect acquisitions were unusual in that more than two-thirds of them were specimens from foreign countries such as Guatemala, Colombia, Ecuador, and Arabia. A notable and important gift from Mr. H. St. J. Philby, of Mecca, Arabia, consisted of 1,281 specimens of various insects (particularly small moths and grasshoppers) from Hejaz, Arabia, a country which previously was poorly represented in the insect collection. A welcome addition to the Museum's series of local insects was a donation of 427 specimens, including 327 bees and wasps, received from Mr. Albert B. Wolcott, of Downers Grove, Illinois.

CATALOGUING, INVENTORYING, AND LABELING—ZOOLOGY

The number of zoological specimens catalogued was 15,042, a rather large total as compared with recent years. The entries were divided as follows: mammals, 1,187; birds, 3,416; amphibians and reptiles, 1,772; fishes, 8,667. One thousand skins in the reference collection of mammals were labeled and 300 skulls of mammals were numbered, labeled, and boxed or bottled. Some 8,000 cards were added to the index of mammal specimens, including new cards for all type specimens and all mammals on exhibition. This work was participated in by Illinois Emergency Relief workers and by one volunteer assistant, Mr. Douglas Bruce, who was in regular attendance for seven weeks during the summer months.

Although more than three thousand birds were catalogued, this was incidental to a thorough rearrangement of the collection made possible by the acquisition of new storage cases delivered late in 1933. This rearrangement involved the overhauling of the entire collection, which now numbers more than 100,000 specimens. Everything was placed in systematic order with the exception of several uncatalogued collections which were segregated to be classified and later incorporated in the general collection. Cases containing the birds of prey—eagles, hawks, falcons, owls, and vultures—were arranged so as to be readily accessible and convenient for the studies undertaken by Trustee Leslie Wheeler, whose interest in this subject resulted in his associating himself with the Department of Zoology, taking active charge of this section of the bird collections.

All collections of amphibians and reptiles received during the year were catalogued and much progress was made in the labeling and shelving of identified material. The number of entries made was 1,776, of which 206 were for osteological specimens which were catalogued and placed in order by Assistant D. Dwight Davis. Much help was received from relief workers.

The assistance of relief workers made it possible to catalogue large accumulations of fishes that had been in storage and unavailable for many years. The largest group so handled was the remainder of the extensive collection from Panama and the Canal Zone made in 1911 and 1912. A total of 8,667 entries was made and all specimens catalogued were correctly labeled and assigned to their proper places on the shelves of the reference collection.

Another project carried out in the Division of Fishes was the preparation of a card index of colored plates of fishes contained in the Museum Library. Cards to the number of 7,243 were written, and it is estimated that 1,200 more will complete the index, which will save much time in answering the many calls for information on this subject.

As in the past, for convenience in the Division of Insects, the preceding year's accessions were recorded and indexed for reference by locality, collector, and donor. For the permanent arrangement of the North American beetles, on which the work of assembling, determining, and repinning specimens was continued, 908 name labels were written, and, by means of thirteen new drawers, four families of these insects were made more accessible and useful.

Most of the accessioned insects that required such attention, as well as a number of butterflies that were stored away in papers

for many years, were pinned or spread, and most of them pin-labeled. The number of specimens thus pinned was 2,885. Much appreciated help on this routine work was given in the latter half of the year by a volunteer assistant, Mr. Rupert L. Wenzel, and by Illinois Emergency Relief workers. By means of relief assignments, the Museum's accumulated series of bees, wasps, and parasites were also separated into their proper families, determined specifically in part, and arranged in sixteen new containers.

Entries of skeletal material numbered 367, distributed among mammals, birds, and reptiles. All material of this kind, excepting a few bird skeletons, was catalogued, labeled, and carded so that the records, so far as possible, are up to date. For the first time the individual bones of all disarticulated skeletons were separately numbered. This insures permanent proper association of the bones and avoids troublesome transpositions in handling.

Extraordinary progress was made in cleaning skulls and bones, largely through assistance provided through federal relief agencies. This work had fallen far behind and much valuable material was inaccessible. Most important was the cleaning of more than 1,000 skulls of large mammals which had accumulated over a period of years during which accessions were at a rate higher than the regular staff could meet successfully. In addition, 3,056 small and medium-sized skulls were cleaned and bottled.

A skeleton of a spectacled bear was cleaned by maceration and two other large mammal skeletons were prepared by other methods. Many smaller skeletons were cleaned by dermestids in the dermestid room. Three frog skeletons were prepared from alcoholic specimens.

An echidna, a young orang, and a large Australian tree frog, which were received in the flesh, were prepared for anatomical study by embalming and by injecting the arteries and veins with colored masses. An opossum was embalmed and stored. This highly desirable material forms a nucleus for a synoptic series of vertebrate types, preserved for study of the soft anatomy, which will be an extremely important addition to the collections.

A detailed study was made of the so-called Schultze method of clearing and staining smaller vertebrates to render the skeleton visible without destroying the surrounding tissues. Through specially qualified assistants assigned by relief agencies, much progress was made in applying this process to Museum material. A total of sixty-one excellent preparations, mostly amphibians and reptiles, was made.

To supply the need of specimens to illustrate certain biological facts, there were again loaned to A Century of Progress exposition 116 mounted and unmounted specimens of birds and mammals, and ten fish models. For the duration of the exposition, these specimens were displayed in the biological section of the Hall of Science, where they were used to exemplify speciation, and in exhibits showing world-wide ecological association and undersea life.

INSTALLATIONS AND REARRANGEMENTS—ZOOLOGY

A new hall (Hall 12) was opened in the Department of Zoology for a novel exhibit of nineteen sculptured champion British domestic animals, one-quarter life size. These were modeled from the living animals by the noted sculptor, Mr. Herbert Haseltine. The collection is a gift from Trustee Marshall Field. Among the animals depicted are many of international fame. Notable are the Shire stallion, *Field Marshal V*, from the stables of King George V of England, and the great thoroughbred sire *Polymelus*. The Suffolk Punch breed is represented by *Sudbourne Premier*, the Percheron by the stallion *Rhum*, the polo pony by *Perfection*, and the steeple-chaser by *Sergeant Murphy*, winner of the Grand National in 1923. Cattle are represented by an Aberdeen Angus bull, a Shorthorn bull, a Hereford bull, and a Dairy Shorthorn cow. Sheep and pigs include two Lincoln rams, a Southdown ewe, Middle White boar and sow, and a Berkshire boar. A varied technique adds greatly to the attractiveness of the figures. Some are cast bronze, others chiseled bronze, bronze plated with gold, bardiglio marble, black Belgian marble, Burgundy limestone, and rose St. Georges marble. Although highly realistic, they are also endowed with great artistic feeling.

Unusual progress was made in the production of new exhibits, principally of mammals and birds. Seven large habitat groups of mammals were completed and opened to public view. Much advance was made, also, in the systematic exhibits of birds, five new screens being finished and two others rearranged and transferred to new positions. One bird group, the birds of Bering Sea, was reinstalled with a new background. Of the new mammal groups, five are Asiatic and two African. The addition of the five Asiatic groups to William V. Kelley Hall (Hall 17) nearly doubles the display in that hall, which contained only six finished groups at the beginning of the year. It now has eleven, with space for ten more, five of which are well on the way toward completion. The new Asiatic groups are those of the sambar deer, the swamp deer,



AMERICAN ALLIGATOR AND NEST

Albert W. Harris Hall (Hall 18)

Reproduction in cellulose-acetate by Leon L. Walters

Original specimen and accessories collected by Leon L. Walters and Herbert L. Stoddard



the proboscis monkey, the sloth bear, and the Bengal tiger. The two African groups are those of the aardvark and the bongo, installed in Carl E. Akeley Memorial Hall (Hall 22).

The sambar deer group includes a large stag, a female, and a half-grown young deer in an open space in heavy forest where they are engaged in licking the exudate of the soil at a so-called "salt-lick," a practice common with nearly all deer. The specimens were obtained by the James Simpson-Roosevelts Asiatic Expedition and the late Colonel J. C. Faunthorpe. The group was prepared by Staff Taxidermists Julius Friesser and Arthur G. Rueckert. The background was painted by Staff Artist Charles A. Corwin from original studies made in India by artists employed for the purpose through the cooperation of the Bombay Natural History Society.

The swamp deer group adjoins the sambar, making comparison easy, and emphasizing the contrast in the appearance and habits of the two largest species of Indian deer. Its setting is an open swamp where tall grass in autumn color harmonizes with the brown coats of the animals. A bugling stag stands at one side and three demure females are shown near-by at the edge of a stretch of water. This group also was produced by Messrs. Friesser and Rueckert and the background is by Mr. Corwin. Three of the specimens were taken by the Simpson-Roosevelts Asiatic Expedition and the fourth by Colonel Faunthorpe.

A group of proboscis monkeys, originally prepared by the late Carl E. Akeley and installed in a plain floor case, was successfully rearranged and placed in a large alcove space adjoining the west entrance to William V. Kelley Hall. This was done by Staff Taxidermist Leon L. Pray, who regrouped the animals, painted a suitable background, and, with Assistant Taxidermist Frank Letl, reproduced a treetop scene with artificial branches, leaves, and vines.

The sloth bear group occupies one of the four enclosures which face the center of Kelley Hall. It is the second of four groups of carnivorous mammals planned for these spaces, the first, installed several years ago, being the giant panda group. A family of the curious, long-snouted sloth bears is shown busily engaged in searching for insects among loose stones, roots, and debris of a dry stream-bed or "donga." Included are two adult animals, and a young cub which rides on its mother's back in the fashion habitual with this species. The specimens for the group were received from Colonel Faunthorpe, the grown animals having fallen to his own rifle, and the cub being contributed by an East Indian friend, Mr.

Dilipat Singh. The production of the group was executed by Staff Taxidermist Rueckert, assisted by Mr. Wilmer E. Eigsti. The background is by Artist Corwin.

Of unusual interest is the group of Bengal tigers, opened in Kelley Hall. It occupies one of the larger spaces and makes an imposing appearance. In reference to the character of the animal, the treatment is somewhat dramatic, with the male tiger in a tense and startled position, standing over a fresh kill, while its mate at one side appears as if about to slink away. The background, by Mr. Corwin, depicts light, open forest rather than deep jungle, and the colors are bright and warm. The specimens were collected by the Simpson-Roosevelts Asiatic Expedition. The group was prepared by Staff Taxidermist C. J. Albrecht.

One of the two additions to the exhibits of African mammals in Carl E. Akeley Memorial Hall (Hall 22) is a group of the rare, forest-dwelling bongo, the most distinctly marked and brightly colored of all antelopes. This attractive group includes five excellent specimens of these magnificent hoofed animals—two males, two females, and a fawn—posed in a bamboo thicket, with a background painted by Staff Artist Corwin. These specimens were collected by the Harold White-John Coats African Expedition of Field Museum in 1930, and the group was prepared by Staff Taxidermist Albrecht.

A group of the odd-shaped aardvarks was also completed and installed in Akeley Hall. These peculiar animals feed wholly upon ants and termites, which are abundant in Africa. Notwithstanding their rather large size and weight, they are adept burrowers and hide in their excavations during the day. Being nocturnal in their habits, they are seldom encountered and, therefore, they are rarely represented in collections. The two specimens in this group were obtained by the Harold White-John Coats Abyssinian Expedition in 1929 and were prepared for exhibition by Mr. Albrecht, who was a member of the expedition. One of the animals is shown partly concealed in a reproduction of its burrow; the other is standing on the ground in front of two termite nests.

The systematic exhibit of North American birds in Hall 21 was brought to practical completion by the addition of four new screens and the rearrangement of several others. The new screens include two of grouse and quail; one of doves, pigeons, and terns; and one of cuckoos, swifts, parrots, and hummingbirds. All the important species of birds known from North America north of Mexico are represented in this exhibit and, although it will be subject to inter-

mittent change, substitution, and improvement in future years, it now stands as a unit with no large gaps to be filled. The number of species and subspecies included is 687, represented by 842 individual specimens, and the work is mainly by Staff Taxidermist Ashley Hine, who has devoted his time almost exclusively to it for more than ten years. The synoptic exhibit of foreign birds on the south side of Hall 21 received an important addition in a case of gallinaceous birds prepared by Assistant Taxidermist John W. Moyer. On one side of the screen are shown selected examples of the pheasant family, and on the other are the grouse, quail, and partridges. Among the pheasants are the peacock, the great argus pheasant, and rare and beautiful species such as the blood pheasant, impeyan, and tragopan, as well as the better-known golden pheasant, ringneck, and others kept in aviaries. Among the grouse are the large capercaillie of Europe, the black cock, and other Old World game birds.

A further interesting addition to the foreign birds was a single specimen of a New Guinean cassowary which was placed in the case of ostriches and their allies. It was prepared from a specimen received in fresh condition from the Lincoln Park Zoo. This made it possible to apply the so-called "celluloid" method to reproduction of the highly colored and much carunculated head and neck so characteristic of this bird. All the naked parts, including the legs and feet, were reproduced by this method and attached to the body, which was mounted in the usual way. The result is exceedingly lifelike and doubtless is the most natural and realistic preparation of a cassowary ever exhibited in a museum. The exhibit was prepared by Staff Taxidermist Leon L. Walters.

Two special exhibitions were presented during the year, both in the west half of Hall 20. The first was an exhibition of 473 photographs illustrating results and methods in modern taxidermy. This was the International Exhibition of Taxidermic Art, sponsored by the technical section of the American Association of Museums. The work illustrated included that of some eighty highly skilled taxidermists from Germany, Spain, Switzerland, and the United States, among them several members of the taxidermy staff of Field Museum. The exhibition was on view from April 1 to 15. Later in the year, an exhibition of paintings and photographs was shown in connection with the annual meeting of the American Ornithologists' Union, which was held in the Museum from October 22 to 25. These included the Museum's original paintings of Abyssinian birds and mammals by the late Louis A. Fuertes, and group

photographs of ornithologists from the collection of the late Ruthven Deane, loaned by the Division of Fine Arts of the Library of Congress.

THE N. W. HARRIS PUBLIC SCHOOL EXTENSION

All of the 375 Chicago public schools which were open during 1934 received the services of the Department of the N. W. Harris Public School Extension. This was an increase of forty-two compared with the number served in 1933, accounted for by the opening of two new buildings and the reopening of forty which had been closed. To each of these schools, whose aggregate attendance is approximately 500,000 pupils, two traveling exhibition cases were delivered on a bi-weekly schedule throughout the school year. The same service was also given to the University High School of the University of Chicago, thirty-six parochial and private schools, nine branches of the Chicago Public Library, seven branches of the Y.M.C.A., five social settlements, and two Boys' Union League Clubs, the exhibits thereby reaching probably an additional quarter of a million persons. Thus the total number of institutions served was 435, and in delivering and collecting the 870 cases loaned to them the two Museum trucks traveled a distance of 10,744 miles.

During the year an unusually large number of letters of appreciation of the Harris Extension's services was received from principals, teachers, and pupils of the schools, and the heads of other institutions to which exhibits were loaned. Several of the letters received indicated that lack of funds prevents large numbers of children from ever making excursions outside the city limits, and that many seldom can even visit the Museum because their parents cannot afford the carfare. Consequently, the Harris traveling exhibits provide the only avenue to nature study available to them. Many other letters stressed the superior value of the visual education provided by these exhibits as compared to mere book studies.

Illustrating the interest aroused by these exhibits are 145 booklets of essays by seventh and eighth grade pupils of the Mozart School. In these compositions, which were forwarded to the Museum, the children reveal in their own words that they have absorbed much knowledge from the Harris Extension cases.

As in previous years, loans of cases were made on requests received from several institutions not on the list for regular service. Six cases of natural history and economic subjects were shown at the Chicago meeting of the Institute for Juvenile Research of the State Department of Public Welfare; four cases of wild flowers and birds



were loaned to the Central Branch of the Y.W.C.A.; three cases of wild flowers were exhibited in the booth of the Illinois Chapter of the Wild Flower Preservation Society at Mandel Brothers' department store; twelve cases were sent to the summer camp of the United Charities of Chicago at Camp Algonquin, Illinois, and twelve cases of insects and birds were on display in the Hall of Science at A Century of Progress exposition.

Each year requests are also received and granted for the loan of cases to museums and other civic organizations for the purpose of illustrating the desirability of establishing similar educational services in other communities. Such loans were made to the Museum of the Cincinnati Society of Natural History, Cincinnati, Ohio; to the Florida State Museum at Gainesville; and to the Museum Section of the Civic Auditorium, Winnipeg, Manitoba.

Thirty new cases were produced during the year, 237 were repaired, and forty-six were completely reinstalled. Many of the reinstallations required the preparation of new specimens, new accessories, and the tinting and installation of backgrounds. This work occupied the major portion of the Department staff's time. Twenty cases which had become unserviceable on account of long usage, fading or deterioration of specimens or materials, or irreparable damage, were permanently withdrawn from circulation. There remained at the end of the year 1,214 exhibits available for use. All cases were inspected, and thoroughly cleaned and polished during the year. New label copy was written for thirty-eight subjects. The work begun in 1932 of replacing all old style black and white labels with the buff type adopted as standard was completed in 1934, the last 114 cases being thus equipped.

The ceilings and side walls of the Acting Curator's office, the two large rooms used for storage of cases, and the shop of the cabinet-maker were washed and, where needed, repainted. The three laboratories and their accessory cabinets and cases were also cleaned, and repainted in lighter colors, thus affording better light for working. The labor in connection with these improvements was performed by workers assigned by the Illinois Emergency Relief Commission.

THE JAMES NELSON AND ANNA LOUISE RAYMOND FOUNDATION FOR PUBLIC SCHOOL AND CHILDREN'S LECTURES

As in past years the James Nelson and Anna Louise Raymond Foundation has provided various series of lectures and entertain-

ments for children both at the Museum and in the schools. Despite the continuance of such a counter attraction as A Century of Progress exposition, a larger number of school groups came for instruction in the exhibition halls than in the preceding year, and the popularity of the extension lectures continued to gain.

ENTERTAINMENTS FOR CHILDREN

Two series of free motion picture entertainments were presented, one in the spring and the other in the autumn. The programs, given on Saturday mornings in the James Simpson Theatre, were as follows:

SPRING COURSE

- March 3—The Alligator Family; Mexico.
 March 10—Beach and Sea Animals; The Making of Maple Sugar; The Triumph of the Century.
 March 17—The Strange Maoris of New Zealand.
 March 24—Who's Who in the Zoo; Little Visitors from Foreign Lands; The Story of Tea.
 March 31—Sloths and Anteaters; Musko and Musme, the Japanese Wrestlers; Quaint Boats on the Inland Sea; Japanese Children.
 April 7—The Settlement of Jamestown.*
 April 14—The Elephant and Its Child; The Romance of Life; Across the Seven Seas; Thrills of Lumbering.
 April 21—The Collision of the Icebergs; Hunting Whales; A Mother Bear Fights for Her Cub.
 April 28—Neighbors of Simba, the Lion; Plants That Trap Visitors; By the Blue Mediterranean.

AUTUMN COURSE

- October 6—Views of Our New Zoo; The Journeys of the Seeds; In the Land of Yaks; Two Cities of Old Cathay.
 October 13—Snake Myths; Columbus Sails West.*
 October 20—In Sunny Guatemala; A Beaver Pet; The Story of Coffee.
 October 27—Feeding Time for the Hippos; Rollin' Down to Rio; Under the Southern Cross; Me and My Dog.
 November 3—By Dog-train and Snowshoes; In Canada's Fiords; The Bella Coola Indians; The Romance of Rubber.
 November 10—From Trails to Rails; The Octopus and Its Cousins; In a Cave-man's Home.
 November 17—Our Animal Neighbors; The Cement Gnomes; Women Workers of Ceylon.
 November 24—An Arctic Visitor; The Story of the Pilgrims.*
 December 1—The Fall Winds Blow; The Woodchuck Sleeps; A Friend to All the World; Winter Fun.

* Gift to the Museum from the late Chauncey Keep.

In addition to the two regular series of entertainments, two special programs were offered in February as follows:

- February 12—Lincoln's Birthday Program: Abe Holds Court; Native State.
 February 22—Washington's Birthday Program: Washington and His Times.

Twenty programs in all were offered to the children of the city and suburbs. The total attendance at these entertainments was 27,653, of which 13,549 came to the spring course, 8,549 to the autumn course, and 5,555 to the special programs.

The following newspapers gave publicity to the programs: *Chicago Daily News*, *Chicago Tribune*, *Chicago Herald and Examiner*, *Chicago Evening American*, and *Chicago Daily Illustrated Times*.

An expression of appreciation for films loaned for the programs is due to the Department of the Interior of the Dominion of Canada, National Museum of Canada, Atlas Educational Films, Dynamic Pictures of New York, Canadian National Railways, Chicago Rapid Transit Company, and the Department of Conservation of Michigan.

MUSEUM STORIES FOR CHILDREN—RAYMOND FOUNDATION

Two series of Museum Stories for Children were written by members of the Raymond Foundation staff. These were published and copies were handed to all in attendance at the entertainments. The material of the stories correlated with certain films shown on the programs or with talks given by staff members who used colored slides to illustrate the topics presented. The list of stories follows:

Series XXII—The Builders of Mexico City; Sugars of Many Kinds; New Zealand and the Maoris; The Story of Tea; The Sloths and Their Cousins; The Powhatan Indians; Tapioca; Some Interesting Beach and Sea Animals; The Giraffe.

Series XXIII—How Seeds Travel; American Snake Myths; The Story of Coffee; The Hippopotamuses; The Bella Coola Indians; Snails of Land and Water; The Pearl of the Orient; The Owls; Skis and Snowshoes.

During the summer, accumulated stories were placed in a holder at the North Door to be taken by visitors. The total distribution of Museum Stories for Children during the year was 42,500 copies.

LECTURE TOURS FOR CHILDREN—RAYMOND FOUNDATION

Classwork in the exhibition halls was extended to the following groups:

	Number of groups	Attendance
Tours for children of Chicago schools		
Chicago public schools	204	7,752
Chicago parochial schools	19	615
Chicago private schools	12	259
Tours for children of suburban schools		
Suburban public schools	121	3,878
Suburban parochial schools	3	113
Suburban private schools	10	167
Tours for special groups from clubs and other organizations		
	35	1,975

In all, 404 groups were given guide-lecture service and the attendance was 14,759.

On December 4 and 6, the Museum was host to 1,186 boys and girls who were delegates to the Annual Congress of 4-H Clubs of the United States. As for several years past, the boys lunched in the cafeteria, and both groups were given special lectures in the halls devoted to prehistoric plants and animals and the Hall of the Stone Age of the Old World. Many letters of appreciation indicate that the visit to the Museum was considered one of the outstanding features of the congress.

EXTENSION LECTURES—RAYMOND FOUNDATION

Extension lectures were offered to the schools as in previous seasons. The following subjects were presented in classrooms and assemblies to both high and elementary school audiences:

FOR GEOGRAPHY AND HISTORY GROUPS

Glimpses of Eskimo Life; South America; North American Indians; Native Life in the Philippines; The Romans; The Egyptians; Migisi, the Indian Lad.

FOR SCIENCE GROUPS

Field Museum and Its Work; Prehistoric Life; Insects and Reptiles; Coal and Iron; Coffee, Chocolate, and Tea; A Trip to Banana Land; Food Fishes of the World; Birds of the Chicago Region; Animal Life of the Chicago Region; Wild Flowers of the Chicago Region; Trees of the Chicago Region; Animals at Home; Our Outdoor Friends.

The total number of extension lectures given by the staff of the Raymond Foundation was 428, and the total attendance was 162,360.

RADIO BROADCASTING—RAYMOND FOUNDATION

Radio broadcasts were given by the Raymond Foundation staff in connection with the public school radio programs of Station WMAQ. From January to the end of the spring semester talks were given every other week to the upper grades. These talks correlated with the nature study and science course being used in the schools. One talk on the Raymond Foundation was given over WGN.

ACCESSIONS—RAYMOND FOUNDATION

The Raymond Foundation acquired during the year for use in the Theatre and in the extension lectures 404 slides made by the Division of Photography. The Museum artist colored 476 slides for the Foundation.

The Foundation was also the beneficiary of the following acquisitions: 5,000 feet of motion picture film on Guatemala, presented by Mr. Leon Mandel, of Chicago, and 375 feet of film taken at the new Brookfield Zoo and purchased by the Museum.

LECTURE TOURS AND MEETINGS FOR ADULTS—RAYMOND FOUNDATION

The services of guide-lecturers were offered, as in former years, without charge, to clubs, colleges, conventions and other organizations, and to Museum visitors in general. Special tours were offered in July and August for the benefit of those attending A Century of Progress exposition. The printed monthly tour schedules were placed at the main entrance for the use of visitors, and were also distributed through libraries and other civic centers of the city and suburbs. During the year, 153 general tours and 189 tours covering specific topics were offered to the public. The adult groups which took advantage of these lecture tours numbered 323, with a total attendance of 7,545 individuals. Besides the regular public tours, special tours were given to 47 groups from colleges, clubs, and other organizations, and these were attended by 1,262 persons.

The James Simpson Theatre was used for several meetings during the year. In February, 1,050 foreign-born adults attended a program given by the Board of Education; in March, 1,250 members of the Juvenile Council of the Cook County schools held an all-day session; in June, the foreign-born adult commencement of the city schools was held there for 582 graduates; and in October, both the Theatre and the small lecture hall were used for four meetings of the American Ornithologists' Union, attended by 763 persons. Total attendance at all seven meetings was 3,645.

SUMMARY OF ATTENDANCE AT ENTERTAINMENTS, LECTURES,
TOURS, ETC.—RAYMOND FOUNDATION

The total number of groups reached through the activities of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures was 1,222, and the aggregate attendance included in these groups numbered 213,579 individuals.

LECTURES FOR ADULTS

The Museum's sixty-first and sixty-second courses of free lectures for adults 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:

SIXTY-FIRST FREE LECTURE COURSE

March 3—Monarchs of the Air.

Captain C. W. R. Knight, London, England.

March 10—The Passing of the Old West.

Colonel Charles Wellington Furlong, F.R.G.S., Cohasset,
Massachusetts.

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- March 17—Miracles in Nature.
Mr. Arthur C. Pillsbury, Berkeley, California.
- March 24—A Naturalist in the Canadian Rockies.
Mr. Dan McCowan, Banff, Canada.
- March 31—With Byrd to the Bottom of the World.
Dr. Lawrence M. Gould, Carleton College, Northfield, Minnesota.
- April 7—The Wonderland of Mexico.
Major James C. Sawders, Nutley, New Jersey.
- April 14—Massa-Magaga: Head-takers of Formosa.
Captain Carl von Hoffman, New York.
- April 21—The South Sea Islands.
Mr. H. C. Ostrander, Jersey City, New Jersey.
- April 28—Motion Pictures.
Trail of the Swordfish; The Veldt; The Prowlers; Jungle Giants; Krakatoa.

SIXTY-SECOND FREE LECTURE COURSE

- October 6—In the Cellars of the World.
Mr. Russell T. Neville, Kewanee, Illinois.
- October 13—Volcanoes of Hawaii.
Mr. Ray Jerome Baker, Honolulu, Hawaii.
- October 20—New Zealand.
Mr. M. P. Greenwood Adams, Hackensack, New Jersey.
- October 27—The Philippines Today.
Mr. James King Steele, San Francisco, California.
- November 3—The Human Adventure.
Produced by the Oriental Institute of the University of Chicago
with technical assistance of the Erpi Picture Consultants, Inc.
Talking motion picture sketching man's rise from savagery to civilization.
- November 10—Islands of the Pacific.
Mr. H. C. Ostrander, Jersey City, New Jersey.
- November 17—Life on the Ocean Bottom and Wonders of the Plant World.
Mr. Arthur C. Pillsbury, Berkeley, California.
- November 24—The Conquest of Everest.
Air Commodore P. F. M. Fellowes, D.S.O., A.D.C., London,
England.

The total attendance at these seventeen lectures was 23,932; 13,309 for the spring course, and 10,623 for the autumn course.

A special lecture for Members of Field Museum was given on Sunday, November 25. The speaker was Air Commodore P. F. M. Fellowes, D.S.O., A.D.C., of London, and the subject "The Conquest of Everest." The attendance was 394. This brought the total attendance for all adult lectures to 24,326.

SUMMARY OF ATTENDANCE AT LECTURES, ETC.

The total number of groups receiving instruction or other services from the Museum during the year was 1,247, with an aggregate attendance of 241,550 individuals. These figures include the 1,222 groups and 213,579 individuals reached through the activities of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, as well as the 24,326 persons attend-

ing the adult lectures, and the 3,645 persons attending the meetings of outside organizations to which the use of the James Simpson Theatre and the small lecture hall was made available.

LIBRARY

During the year the physical appearance of the Library was much improved by thorough cleaning of the walls, which added much to the attractiveness of the room.

During about seven months of the year several federal Civil Works Service and Illinois Emergency Relief workers were assigned to the Library and with their assistance considerable extra work has been accomplished. The number of such workers varied at different times from one to four, and their total length of service was 650 working hours. The cataloguing of a large accumulation of pamphlets was finished by them, and the pamphlets were thus made available for use in the various Departments. Another project was the cataloguing of material which had been packed for many years and only recently placed on shelves. This work is about half finished.

A much needed inventory of the Department of Geology Library was also made by these relief helpers. Likewise with their aid 2,100 geological pamphlets were placed in covers. These were arranged alphabetically and cards written for them, 1,641 in all.

Approximately 9,800 cards have been thus written by relief workers and added to the various catalogues.

The purchases of books during the year were limited to those most needed for immediate work.

Field Museum Library depends for its growth so largely on its exchanges that this subject is always uppermost in all plans. The number of exchanges, both foreign and domestic, has had some valuable additions during 1934, and these have brought much desired material. Some valuable exchanges have also been made with members of the staff of this institution.

Although many libraries had fewer readers in 1934 than in the previous year, Field Museum Library served approximately the same number.

Friends of the Museum have graciously made gifts of books to the Library, which are much appreciated, not only because of the value of the material but also for the interest in the Library's work indicated by them.

The list of periodicals which, as reported last year, had been so drastically curtailed by the necessity of making economies, was

partly sustained by assistance given by some members of the staff who continued a number of the subscriptions so that there might be no break in the files. Grateful acknowledgment of this cooperation is made herewith.

Assistant Curator Henry Field, on his return from the Field Museum Anthropological Expedition to the Near East, brought an important collection of books received from various institutions, mostly in the Union of Soviet Socialistic Republics.

The American Friends of China, Chicago, again made generous gifts of greatly desired books, selected by the late Dr. Berthold Laufer, Curator of Anthropology, to supplement to best advantage works already on the shelves.

At the death of Dr. Laufer his private library, which he had accumulated and used in connection with his work, became the property of Field Museum as a result of a bequest for which he had arranged some years ago. It will add 5,000 or more titles to the Library. As the Museum already had a carefully selected collection of works on China, and the greater part of Dr. Laufer's books are on this subject, this addition will give the Museum one of the most complete libraries on China in the Middle West. The Chinese section will be segregated so as to be easily accessible for the use of scholars desirous of consulting it. Dr. Laufer's books on other subjects will greatly strengthen other sections of the Library.

Mr. Sadajiro Yamanaka, of New York, enriched the Library by presenting some valuable books on ceramics of China and Japan: *Ko-Sometsukesara Hyakusen* (*Album of Selected Old Chinese Blue and White Porcelain Dishes*); *Ko-Akaesara Hyakusen* (*Album of Selected Old Three-color Porcelain Dishes of China*); *Nippon Koto Mehinshu* (*Album of Selected Old Ceramics of Japan*); *Kutani Nabeshima Kakiyemon Meihinshu* (*Album of Old Ceramics of Kutani, Nabeshima and Kakiyemon*); *Tanamono Shusei* (*Collection of Japanese Wood, Lacquer Tables and Chests*). All of these are illustrated with beautiful plates.

Mr. Fahim Kouchakji, of New York, presented a work in two volumes entitled *Glass; Origin, History, Chronology, Technic, and Classification to the 16th Century*. This is a subject on which it is difficult to find information, and these volumes will be very useful.

A Century of Progress exposition sent to the Library a collection of its most interesting publications.

Mrs. Mae Ellena Bachler, of Chicago, presented a very beautifully prepared book by Manly P. Hall: *Encyclopedic Outline of the Masonic, Hermetic, Qabbalistic and Rosicrucian Symbolic Philosophy*.

The Carnegie Institution of Washington, D.C., has again presented several important volumes of its valuable publications. President Stanley Field has continued presenting week by week the issues of the *Illustrated London News*, and Director Stephen C. Simms has given those of the *Museum News* published by the American Association of Museums. The publishers of the *Scientific American* kindly placed the Museum Library on their free list for the coming year.

Among other gifts that have been of especial value are: *Liberia Rediscovered*, presented by Mr. Harvey S. Firestone, Akron, Ohio; L. Kraglievich's *La Antigüedad Pliocena de las Faunas de Monte Hermoso y Chapaduratal*, presented by the National Museum of Buenos Aires; *Mélanges entomologiques*, volume 5, from M. Henri Gadeau de Kerville, Paris; 14 botanical works from Mr. Hermann Benke, Chicago; *Glossary of Arms and Armor in All Countries and in All Times*, from Mr. George Cameron Stone, Portland, Maine; *Sweet's Architectural Catalogue*, 4 volumes, from the publishers, Sweet's Catalogue Service, New York; and Bureau of American Ethnology *Annual Reports*, 4 volumes, from Misses Edith and Faith Wyatt, Chicago.

Even more than in previous years the Museum Library is indebted to other libraries for loans of books needed in the work of this institution. Among those especially helpful were: The Library of Congress, Washington, D.C.; Library of the American Museum of Natural History, New York; University of Illinois Library, Urbana, Illinois; University of Michigan Library, Ann Arbor, Michigan; Grosvenor Library, Buffalo, New York; the libraries of the Peabody Museum of Archaeology and the Museum of Comparative Zoology at Harvard University, Cambridge, Massachusetts; University of Chicago Library; United States Department of Agriculture Library, Washington, D.C.; and the library of the Arnold Arboretum, Jamaica Plain, Massachusetts. Field Museum has also lent more books to other institutions this year than at any time before.

Binding has necessarily been omitted during the last few years, but the Library was fortunate in having a little of the most needed work done in 1934.

During the year there have been 2,252 books and 3,000 pamphlets added to the Library. The approximately 5,000 books left to the Museum by Dr. Laufer are not included here because the work of

cataloguing them has not yet been completed. There have been written and filed 15,626 catalogue cards, bringing the total number in the files to 438,480. From the John Crerar Library, Chicago, 4,851 cards were received and filed. To the Library's record books, now occupying eighteen volumes, there were added 2,252 entries, making the total number of entries 86,727.

DIVISION OF PRINTING

The work in the Division of Printing for the entire year was, as nearly as possible, evenly divided between Museum publications and exhibition labels. The total number of labels produced for all Departments was 24,282. Miscellaneous work totaled 373,262 impressions.

Seven additions were issued in the regular Museum publication series, of which four were geological, one was anthropological, one zoological, and one the *Annual Report of the Director* for 1933. Of these a total of 10,530 copies was produced. The aggregate number of pages of type composition was 1,002. Seven leaflets were printed, of which three were anthropological (two reprints, and one a revised new edition of the same leaflet), one was botanical, one geological (a reprint), and two were zoological (of which one was a reprint). A botanical guide, *North American Trees*, was also printed. Of these additional books, 16,347 copies were printed. They involved a total of 318 pages of type composition.

Following is a detailed list of these publications:

PUBLICATION SERIES

- 328.—Report Series, Vol. X, No. 1. Annual Report of the Director for the Year 1933. January, 1934. 136 pages, 12 photogravures. Edition 5,474.
- 329.—Anthropological Series, Vol. XXI, No. 2. The Ovimbundu of Angola. By Wilfrid D. Hambly. July 11, 1934. 276 pages, 84 photogravures. Edition 803.
- 330.—Zoological Series, Vol. XIII, Part VII. Catalogue of Birds of the Americas. By Charles E. Hellmayr. November 15, 1934. 532 pages. Edition 770.
- 331.—Geological Series, Vol. VI, No. 5. The Auditory Region of an Upper Pliocene Typotherid. By Bryan Patterson. December 31, 1934. 8 pages, 3 zinc etchings. Edition 819.
- 332.—Geological Series, Vol. VI, No. 6. Upper Premolar-molar Structure in the Notoungulata, with Notes on Taxonomy. By Bryan Patterson. December 31, 1934. 22 pages, 14 zinc etchings. Edition 883.
- 333.—Geological Series, Vol. VI, No. 7. Cranial Characters of Homalodotherium. By Bryan Patterson. December 31, 1934. 6 pages, 1 zinc etching. Edition 884.
- 334.—Geological Series, Vol. VI, No. 8. Trachytherus, a Typotherid from the Deseado Beds of Patagonia. By Bryan Patterson. December 31, 1934. 22 pages, 5 zinc etchings. Edition 897.

LEAFLET SERIES

- Anthropology, No. 30.—The Races of Mankind (second reprint). By Henry Field, with preface by Berthold Laufer, and an introduction by Sir Arthur Keith. 40 pages, 8 photogravures, 1 plan of hall. February, 1934. Edition 500.

- Anthropology, No. 30.—The Races of Mankind (third reprint, *see above*). March, 1934. Edition 629.
- Anthropology, No. 30.—The Races of Mankind (second edition, revised; *see above*). 44 pages. June, 1934. Edition 3,011.
- Botany, No. 17.—Common Weeds. By Paul C. Standley. 32 pages, 27 photogravures. September, 1934. Edition 3,068.
- Geology, No. 11.—Neanderthal (Mousterian) Man (reprint). By Oliver C. Farrington and Henry Field. 16 pages, 8 photogravures, 1 map. December 26, 1934. Edition 2,559.
- Zoology, No. 13.—Sculptures by Herbert Haseltine of Champion Domestic Animals of Great Britain. 6 pages of text, 19 photogravures, with captions opposite. June, 1934. Edition 2,564.
- Zoology, No. 10.—The Truth about Snake Stories (reprint). By Karl P. Schmidt. 20 pages. December 8, 1934. Edition 2,514.

GUIDE SERIES

- Botany Guide. North American Trees. By Samuel J. Record. September 17, 1934. 120 pages, 85 zinc etchings. Edition 1,502.

DIVISIONS OF PHOTOGRAPHY AND ILLUSTRATION

The Division of Photography in 1934 produced negatives, prints, enlargements of photographs, lantern slides, and transparent exhibition labels totaling 23,095 in number. These included 280 photographic prints and 59 stereopticon slides for sales on orders placed by the public. The balance were for various uses in Departments and Divisions of the Museum. Of 20,137 prints made, 12,864 were done by relief workers assigned by the federal Civil Works Service and the Illinois Emergency Relief Commission; the balance were made by the Museum's regular photographers. The Division benefited from the assignment of from one to three relief workers throughout most of the year, whose hours of service totaled nearly 700. In addition to the making of prints, which included many from negatives obtained through the Joint Project of the Rockefeller Foundation and Field Museum for photographing botanical type specimens in European museums, the relief workers made great progress on the huge task of cataloguing the Division's negative collection (now numbering more than 80,000 negatives). In this work the relief assistants wrote and filed about 30,500 index cards.

The total number of photogravure prints produced in the Division of Photogravure was 578,820. These were for the illustration of publications and leaflets, for headings of posters, for covers of various published works, and for picture post cards.

The Museum Illustrator completed 1,238 orders for the Museum's Departments and Divisions. These included 323 pen drawings, 19 wash drawings, the coloring of 461 lantern slides, and other miscellaneous tasks. One relief worker was assigned for a short period to assist the Illustrator in coloring lantern slides and other work.

DIVISION OF PUBLICATIONS

The distribution of publications, as in previous years, was about equally divided between foreign and domestic institutions from which Field Museum in turn receives publications for its Library.

An increase in both foreign and domestic exchanges was made, thirty-five names having been added to the mailing lists. The total number of books sent on exchange was 6,146, of which 4,941 were copies of scientific publications and 1,205 were leaflets. The Museum also sent 3,879 complimentary copies of the *Annual Report of the Director* for the year 1933, and 696 leaflets, to Members of the institution. Sales for the year show totals of 420 publications, 9,166 leaflets, and 7,850 miscellaneous publications and pamphlets—guides, handbooks, and memoirs.

Grateful acknowledgment is tendered the Smithsonian Institution, at Washington, D.C., for its cordial cooperation in distributing Field Museum publications which were sent to the international exchange bureau to be forwarded to foreign destinations.

For future sales and exchanges, 14,301 copies of the various publications and leaflets issued during 1934 were wrapped into 291 packages, labeled, and stored in the stock room.

Published early in the autumn, a season when so many people are especially interested in trees and weeds, the reference book on *North American Trees* and the leaflet on *Common Weeds* have been greatly in demand. Amateur botanists, teachers, students, and others interested in the plants local to the Chicago region, and in trees native to this country, have found these well-illustrated books to be of much use.

Fairly wide distribution also has been given a leaflet issued last June, which describes and illustrates the sculptures by Herbert Haseltine of champion domestic animals of Great Britain, presented to the Museum through the generosity of Mr. Marshall Field.

Interest in the living races of mankind and in prehistoric man continued to manifest itself in the numerous purchases of copies of the *Races of Mankind* and *Prehistoric Man* leaflets. These two books, published in the summer of 1933, when the exhibition halls to which they relate were first opened to the public, have been quite as popular as they were during the year they were issued. More than 3,100 copies were sold in 1934.

Early in the summer the Museum added to the various items on display and sale at its leaflet and post card stands a pocket size

folding type of stereoscope, together with views of habitat groups and other exhibits in Field Museum. The views were arranged in units of five and ten pictures each. This proved a highly successful venture, as many visitors purchased these stereoscopes and the various sets of views as a most desirable souvenir. The views and stereoscopes are a product of the Keystone View Company of Meadville, Pennsylvania.

Numerous sales have been made of several books published outside and handled on consignment at the Museum. They pertain to natural history, are written in popular style, and the authors of some of them are members of the Museum staff.

POST CARDS

Although the number of post cards sold during 1934 was considerably less than in the previous year, because of the decrease in attendance, the total of 107,842 was very gratifying.

Of the sets of cards containing views of the bronzes illustrating the races of mankind, more than 934 (totaling over 27,510 cards) were sold. An endeavor was made to serve persons especially interested in types of certain limited geographic divisions. This was done by offering, in addition to the set of thirty cards of miscellaneous racial types, five other sets covering respectively the racial types of Africa, America, Asia, Europe, and Oceania and Australia.

One new set of cards was added to the series on zoological subjects. New views for the individual post card assortment include forty-seven anthropological subjects, twenty-six zoological, and one general.

DIVISION OF PUBLIC RELATIONS

Through the continued cooperation of the newspapers and various national and international news distributing agencies, Field Museum has been enabled throughout 1934 not only to gain publicity for its current activities but also to use the press as an additional means toward the accomplishment of the institution's primary mission—the popular dissemination of scientific information.

There has been prepared and distributed to newspapers, magazines, news service associations, radio stations, and other publicity media an average of five press releases a week. These, and numerous photographs of Museum subjects, received generous space in all the newspapers of Chicago. Through the channels made available by such organizations as the Associated Press, United Press, International News Service, Universal Service, and Science Service, they appeared also in newspapers in all parts of this country and frequently

in foreign countries as well. In addition, the Museum has received attention through articles and photographs prepared by members of newspaper staffs especially assigned by their editors for this purpose. Likewise, the Museum's cultural and educational values have been the subject of occasional favorable comment in the editorial as well as the news columns.

For the fifth year the bulletin, *Field Museum News*, has been published monthly. As in the past, it has been sent to all Members of the Museum promptly at the beginning of each month. It is circulated also as an exchange to various scientific institutions, and to newspapers and magazines which frequently reprint or quote from it, thus augmenting the Museum's general publicity. Continued efforts have been made to include in each issue articles and pictures which would appeal to the widely varying interests of the bulletin's several thousand readers.

The Museum has been advertised, as in past years, without cost, through media generously placed at its disposal by various organizations, for which appreciation is herewith expressed. The Illinois Central System and the Chicago and North Western Railway again permitted the display at their city and suburban stations of posters in the spring and autumn announcing the Museum's lecture courses. These placards have likewise been posted in department stores, hotels, clubs, libraries, schools, and other establishments having wide public contacts. Many of these organizations, as well as local, interurban, and interstate transportation companies and agencies, further advertised the Museum by distributing folders giving information about the institution.

Various opportunities have arisen whereby the Museum obtained radio publicity. Noteworthy was a series of talks by members of the Museum staff given at the invitation of WGN (the *Chicago Tribune* station), and a special program arranged by WLS (the *Prairie Farmer* station).

Work was performed by the Division of Public Relations in connection with certain published matter of the Museum, such as a new edition of the General Guide to the exhibits, a leaflet on the collection of sculptures by Herbert Haseltine of British champion domestic animals, and various special articles, reports, etc. A large volume of correspondence and other detail was also handled.

Grateful acknowledgment is hereby made to the Consolidated Press Clipping Bureaus of Chicago for their continuance, for the second year, of press clipping service to the Museum without charge.

DIVISION OF MEMBERSHIPS

The decline in the number of persons on the Museum's membership rolls, which had been serious for several years, seemed to be almost completely checked in 1934. It is encouraging to note that the net loss of members for the year was only 57, as compared to losses of 320 in 1933, 819 in 1932, and 702 in 1931.

The Museum is greatly indebted to those Members who have continued to give their loyal support through the difficult years of depression. It is realized that many of those who resigned had no alternative in the face of the distressing economic conditions which have prevailed, and with full appreciation of the assistance they rendered to the institution in the past, the Museum extends to them an invitation to renew their memberships whenever they may find it possible.

The following tabulation shows the number of names on the list in each of the Museum's membership classifications at the end of 1934:

Benefactors	18
Honorary Members	18
Patrons	31
Corresponding Members	7
Contributors	109
Corporate Members	47
Life Members	304
Non-Resident Life Members	8
Associate Members	2,396
Non-Resident Associate Members	4
Sustaining Members	25
Annual Members	1,175
Total Memberships	4,142

The names of all persons listed as Members during 1934 will be found at the end of this book.

CAFETERIA

The total number of persons served with meals or refreshments in the lunch rooms of the Museum in 1934 was 141,207. Of these, 109,257 were served in the main public cafeteria and in the Aztec dining room which is assigned to the officials and staff of the Museum and their guests; and 31,950 in the special children's room. There was a decrease of approximately 69,000 from the total number served in 1933, attributable to the decreased Museum attendance.

In the pages which follow are submitted the Museum's financial statements, lists of accessions, names of Members, *et cetera*.

STEPHEN C. SIMMS, *Director*

COMPARATIVE ATTENDANCE STATISTICS
AND DOOR RECEIPTS

FOR YEARS 1933 AND 1934

	1934		1933
Total attendance.....	1,991,469		3,269,390
Paid attendance.....	99,553		212,298
Free admissions on pay days:			
Students.....	19,870		21,901
School children.....	54,712		90,151
Teachers.....	1,139		2,295
Members.....	1,208		1,817
Admissions on free days:			
Thursdays (52).....	523,580	(52)	895,487
Saturdays (52).....	603,953	(52)	949,543
Sundays (52).....	687,454	(53)	1,095,898
Highest attendance (Sept. 2).....	55,458	(Aug. 24)	65,966
Lowest attendance (Dec. 21).....	56	(Feb. 7)	22
Highest paid attendance (Sept. 3).....	3,946	(Sept. 4)	6,363
Average daily admissions (365 days).....	5,456	(365 days)	8,957
Average paid admissions (209 days).....	476	(208 days)	1,020
Number of guides sold.....	4,706		8,918
Number of articles checked.....	37,310		64,322
Number of picture post cards sold.....	107,842		164,729
Sales of publications, leaflets, handbooks, portfolios, and photographs.....	\$4,209.48		\$6,306.23

COMPARATIVE FINANCIAL STATEMENTS
FOR YEARS 1933 AND 1934

INCOME	1934	1933
Endowment Funds.....	\$173,059.17	\$183,042.24
Funds held under annuity agree- ments.....	38,349.29	39,134.46
Life Membership Fund.....	13,081.56	13,346.10
Associate Membership Fund... ..	12,669.33	12,753.90
South Park Commission and Chicago Park District.....	101,226.19	125,802.68
Annual and Sustaining Member- ships.....	10,061.00	9,859.00
Admissions.....	24,888.25	53,074.50
Sundry receipts.....	29,439.45	21,171.41
Contributions, general purposes.	28,467.95	15,991.47
Contributions, special purposes (expended <i>per contra</i>).....	43,718.33	145,746.92
Special funds: Part expended this year for purposes cre- ated (included <i>per contra</i>)..	16,041.03	16,396.09
	\$491,002.05	\$636,318.77

EXPENDITURES

Collections.....	\$ 70,220.98	\$175,767.04
Expeditions.....	24,662.30	7,973.96
Furniture, fixtures, etc.....	6,389.04	12,894.68
Pensions, group insurance.....	17,320.90	16,136.76
Departmental expenses.....	31,763.13	38,847.64
General operating expenses.....	280,522.79	295,342.04
Annuities on contingent gifts... ..	36,305.69	37,138.20
Added to principal of annuity endowments.....	2,043.60	1,996.26
Interest on loans.....	4,258.29	6,049.73
Paid on bank loans.....	10,000.00	51,100.00
	\$483,486.72	\$643,246.31
Balance.....	\$ 7,515.33	Deficit \$ 6,927.54
Notes payable January 1.....	\$105,000.00	\$156,100.00
Paid on account.....	10,000.00	51,100.00
Balance payable December 31.....	\$ 95,000.00	\$105,000.00

THE N. W. HARRIS PUBLIC SCHOOL EXTENSION

COMPARATIVE FINANCIAL STATEMENTS FOR YEARS 1933 AND 1934

	1934	1933
Income from Endowment.....	\$19,427.71	\$17,803.58
Operating expenses.....	17,654.81	17,700.60
Balance, December 31.....	\$ 1,772.90	\$ 102.98

LIST OF ACCESSIONS

DEPARTMENT OF ANTHROPOLOGY

AMERICAN FRIENDS OF CHINA, Chicago: 1 brush-holder of the Emperor K'ien-lung, made of Burmese padouk wood with inlaid inscriptions and designs in ivory, jade, and semi-precious stones, dated A.D. 1736—China (gift).

ASHER, DR. HARRY H., Chicago: 3 human lower molar teeth of unusual type—American whites, Chicago, Illinois (gift).

AYER, EDWARD E. and EMMA B., ESTATE OF, Chicago: 18 blankets—southwestern United States and Mexico (gift).

BEBB, WILLIAM, Oakland City, Indiana: about 60 fragments of flint artifacts—Fort Gibson, Oklahoma (gift).

BEDDOES, HUBERT, Chicago: 1 folio album containing 134 large photographs—China, Japan, and Java (gift).

BENNETT, MISS HELEN B., Los Angeles, California: 25 stone artifacts: knives, scrapers, and projectiles—Salt Cliffs, Arkansas (gift).

BIRREN, MRS. JOSEPH, Chicago: 1 stone ax—Illinois; 1 boomerang—Australia; 2 wooden war clubs, 1 conch-shell trumpet—Polynesia; 1 muzzle with bridle—Spain; 1 cotton baldric—India (gift).

BOULTON, MRS. LAURA C., Chicago: 18 musical instruments—west Africa (gift).

CARTER, MRS. DAGNY, Peiping, China: 4 fragments of Chou pottery and 1 crupper damaskeened iron—Sui-yüan, Shensi Province, China (gift).

CROCKER, TEMPLETON, San Francisco, California: 1 carved bowl—Marquesas Islands; 24 mats, baskets, ornaments, fish-hooks, etc.—Puka Puka and Samoa; 810 examples of weapons, clothing, and fishing, household, personal and ceremonial objects—chiefly from southeastern Solomon Islands, Rennell, Bellona, Sikaiana, Swallow group, and Anuda Islands; 9 phonograph records and 325 photographs—Polynesia and Melanesia (gift).

CROSS, MISS GRACE BREWSTER, Chicago: 1 feather headband (lei), 1 shell headband, 1 string of crabs'-eyes or vine beads (*Abrus precatorius*), 2 strings of seed beads—Honolulu, Hawaii (gift).

CUTTING, C. SUYDAM, New York: 1 bag of monkey skin, 1 bag of goral skin—Upper Burma (gift).

DOUGLASS, DR. A. E., and HARRY T. GETTY, Tucson, Arizona: 32 polished cross sections of logs from various dated ruins, charts, photographs, and a boring tool—Arizona and New Mexico (gift).

DUKE, MISS T., Chicago: 1 cactus girdle of fiber, 4 fiber moccasins, 2 stone arrowheads—Rio Grande River bank, 18 miles northeast of Del Rio, Texas (gift).

FELIX, BENJAMIN B., Chicago: 48 Chinese coins and 2 Japanese coins—China and Japan (gift).

FIELD MUSEUM OF NATURAL HISTORY:

Collected by J. Eric Thompson (leader, Carnegie Institution—Field Museum Joint Expedition to British Honduras): 13 pottery whistles, figurines; 69 pottery vessels, disks; 115 lots (about 6,000 pieces) of pottery sherds; 14 stone knives and spear-heads; 38 obsidian and 5 jade objects; 21 shell ornaments and beads; 13 spindle whorls of stone and pottery; 1 pearl; 1 textile; 2 mirrors; 8 miscellaneous objects such as carbon and paint for identification; 14 skeletal pieces. Total, 6,199 pieces—San José, Orange Walk District, British Honduras.

Collected by Field Museum—Oxford University Joint Expedition to Mesopotamia (Marshall Field Fund): 21 cases of Sumerian, Babylonian, and Sasanian objects—Kish, Mesopotamia.

Collected by Paul S. Martin (leader, Field Museum Archaeological Expedition to the Southwest): 38 pieces of pottery, 3,477 potsherds, 8 human skeletons, 5 arrowheads, 10 bone awls, 27 pieces of roof beams (shipped to Gila Pueblo), 33 pieces of animal bones, and 3 pendants—Lowry ruin, Ackmen, Colorado.

Collected by Henry Field (leader, Field Museum Anthropological Expedition to the Near East, 1934): 500 flint implements of paleolithic and neolithic types from North Arabian desert, Kurdistan, and Persia; 10 basalt blocks of Himyaritic inscriptions from Transjordan; 2 fragments of twelfth century Mohammedan vessels from Beled Sinjar, Iraq; approximately 7,000 photographs; 800 hair samples—Near East and Russia.

Collected by Miss Malvina Hoffman (Expedition to Asia): 3 nail protectors of enameled silver—China.

Transferred from Department of Zoology: 1 skeleton of female gibbon—southeast Borneo; 1 skeleton of female chimpanzee—south Cameroon, west Africa.

Purchases: 1 pair of Navaho moccasins—New Mexico; 1 complete skeleton of a Chinese.

GANN, MRS. M. E. L., Lake Forest, Illinois: 2 strings of Russian blue glass trade beads—Alaska (gift).

GILA PUEBLO (museum), Globe, Arizona: 30 specimens of prehistoric painted pottery—Rio Mimbres and other localities of New Mexico (exchange).

ITO, T., Chicago: 3 samples of old fabrics—Japan (exchange); 2 volumes of Chinese wood-engravings illustrating agriculture and sericulture, Japanese edition of 1807—China-Japan (gift).

JOHNSON, MRS. FRANK S., Pasadena, California: 1 Chinese mandarin coat—China (gift).

KEEP, CHAUNCEY, ESTATE OF, Chicago: bronze heads of Toda, Berber, San Ildefonso Pueblo woman; bronze bust of Bontoc Igorot (also plaster casts of same); bronze busts of an Alpine, a Zulu woman, a Turk, a Jicarilla Apache, a Carib, and a Korean; life-size figure of a Navaho (gift).

KOUCHAKJI, FAHIM, New York: 1 glass pitcher with Christian designs, fourth century A.D.—Syria (exchange).

MANDEL, FRED L., JR., and LEON, IN MEMORY OF THEIR MOTHER, MRS. BLANCHE R. MANDEL, Chicago: 14 Lamaist paintings, 18th–19th century (framed)—Tibet and China (gift).

MARTIN, MRS. GEORGE H., Chicago: 2 carved horn spoons—Sitka Indians, Sitka, Alaska (gift).

NATIONAL MUSEUM, Copenhagen, Denmark: 16 pieces of fur garments; 57 wood, 29 bone, 49 stone, and 17 leather objects; 2 glass beads—Greenland (exchange).

NATIONAL MUSEUM OF MEXICO, Mexico City, Mexico: 76 pottery objects—Oaxaca, Jalisco, and Campeche, Mexico (exchange).

RATHBUN, ROWLAND, Chicago: 23 drawings of Sasanian stucco (gift).

REEVES, CAPTAIN DACHE M., Dayton, Ohio: 2 large aerial photographs of Hopewell Mounds, Ohio (gift).

SARGENT, HOMER E., Pasadena, California: 1 blanket—Kabyle, Algeria, northwest Africa (gift).

SETON-KARR, H. W., London, England: 10 paleolithic stone implements—Somaliland, east Africa (gift).

TAYLOR, ZACHARY, Bangkok, Siam: 2 leather shadow-play figures—Bangkok, Siam (gift).

TOLER, G. E., Chicago: 1 stone effigy pipe, 1 pottery vessel—Bluff City, Fulton County, Illinois (gift).

WARREN, ALLYN D., Chicago: 1 large carved figure of Vishnu riding on Garuda—Bali, Dutch East Indies (gift).

WILSON, SAMUEL, Chicago: 1 official document on yellow paper bound in yellow silk—China (gift).

DEPARTMENT OF BOTANY—ACCESSIONS

ALFARO, PROFESSOR ANASTASIO, San José, Costa Rica: 46 specimens of mosses (gift).

ANDREWS, A. H., Estero, Florida: 2 chayote fruits (gift).

ARNOLD ARBORETUM, Jamaica Plain, Massachusetts: 650 specimens of plants (exchange).

ARSÈNE, REV. BROTHER G., Santa Fe, New Mexico: 2,702 specimens of plants—New Mexico (gift).

ATLAS BREWING COMPANY, Chicago: 11 samples of beverages (gift).

BAILEY, DR. L. H., Ithaca, New York: 100 photographs of palms (exchange).

BELLUE, MISS MARGARET K., Sacramento, California: 1 plant specimen (gift).

BENKE, HERMANN C., Chicago: 12 negatives, 6 photographs of Osage orange trees, 88 specimens of Illinois plants (gift).

BUHL, CARL, Chicago: 203 plant specimens (gift).

BURKART, ARTURO, Buenos Aires, Argentina: 93 specimens of plants—Argentina (exchange).

CABRERA, PROFESSOR ANGEL L., La Plata, Argentina: 64 specimens of plants—Argentina (exchange).

CALDERON, DR. SALVADOR, San Salvador, Salvador: 2 plant specimens (gift).

CALIFORNIA ACADEMY OF SCIENCES, San Francisco, California: 372 specimens of plants—western United States (exchange).

CALIFORNIA DEPARTMENT OF AGRICULTURE, Sacramento, California: 1 plant specimen (gift).

CANAL ZONE EXPERIMENT GARDENS, Summit, Canal Zone: 1 plant specimen (gift).

CARDÉNAS, PROFESSOR MARTÍN, Cochabamba, Bolivia: 178 specimens of plants—Bolivia (gift).

CARNEGIE MUSEUM, Pittsburgh, Pennsylvania: 27 specimens of plants—Barro Colorado Island (exchange).

CATHOLIC UNIVERSITY OF AMERICA, Washington, D.C.: 275 plant specimens (exchange).

CLARKSON, MRS. RALPH, Chicago: 3 plant specimens (gift).

CONSERVATOIRE BOTANIQUE, Geneva, Switzerland: 140 specimens of plants (exchange).

CURTIN, MRS. THOMAS E., Santa Fe, New Mexico: 6 plant specimens (gift).

DAHLGREN, DR. B. E., Chicago: 1 specimen of jaboticaba wood—Brazil (gift).

DEPAUW UNIVERSITY, Greencastle, Indiana: 150 specimens of plants—Hawaii (exchange).

DESERT LABORATORY, Tucson, Arizona: 18 plant specimens (gift).

DIRECCION GENERAL DE AGRICULTURA, Guatemala City, Guatemala: 1 plant specimen (gift).

DONALDSON, C. S., Avon Park, Florida: 3 plant specimens (gift).

DOOLITTLE, MRS. HAROLD M., Onekama, Michigan: 1 plant specimen (gift).

DUPONT DE NEMOURS, E. I., AND COMPANY, Wilmington, Delaware: 1 sample of synthetic rubber (gift).

ELIAS, REV. BROTHER, Barranquilla, Colombia: 348 specimens of plants—Colombia (gift).

FIRESTONE TIRE AND RUBBER COMPANY, Akron, Ohio: 1 specimen rubber latex, 1 specimen Jelutong rubber (gift).

FIELD MUSEUM OF NATURAL HISTORY: Collected by Henry Field and Richard Martin (Field Museum Anthropological Expedition to the Near East): 550 samples of seeds, 55 samples of woods, 8,500 plant specimens.

Collected by Karl P. Schmidt (Leon Mandel Guatemala Expedition of Field Museum): 3 specimens of plants—Guatemala.

Rockefeller Foundation Fund for Photographing Type Specimens: 5,750 negatives of type specimens of European herbaria.

Transferred from the Division of Photography: 3,393 photographic prints.

Purchases: 100 plant specimens—Patagonia; 508 plants—Peru; 414 specimens of plants—Brazil; 175 specimens of cryptogams—Germany, Austria, and Switzerland; 478 specimens of plants—Honduras; 1 specimen of kola nuts—west Africa.

FISHER, GEORGE L., Houston, Texas: 136 plant specimens, chiefly from Texas (gift).

FLORES, DR. ROMÁN S., Progreso, Yucatan: 3 photographs, 2 wood specimens, 63 plant specimens (gift).

FOREST RESEARCH INSTITUTE, Dehra Dun, India: 30 wood samples (exchange).

FREYMUTH, MRS. W. C., River Forest, Illinois: 1 plant specimen (gift).

FRITZ, PROFESSOR EMANUEL, Berkeley, California: 1 branch of incense cedar, 1 branch of redwood, 1 branch of western red cedar, 1 branch of Douglas fir, 1 branch of Port Orford cedar, 1 branch of Monterey cypress (gift).

FULLER, DR. GEORGE D., Chicago: 1 specimen of alga—Florida (gift).

GÖTEBORGS BOTANISKA TRÄDGÅRD, Göteborg, Sweden: 455 plant specimens—Europe, Chile, Juan Fernandez (exchange).

GRAHAM, GEORGE, Chicago: 1 sample of maple sugar—Wisconsin (gift).

GRANT, MRS. ADELE L., Los Angeles, California: 77 plant specimens—south Africa (gift).

GRAY HERBARIUM OF HARVARD UNIVERSITY, Cambridge, Massachusetts: 100 photographic prints, 180 specimens of plants (exchange).

HAYNES, MISS CAROLINE C., Highlands, New Jersey: 20 specimens of hepatics—New Mexico (gift).

HERMANN, FREDERICK J., Ann Arbor, Michigan: 115 plant specimens—New Jersey and Pennsylvania (exchange).

HINES, EDWARD, LUMBER COMPANY, Chicago: 1 board of ponderosa pine (gift).

HOCHREUTINER, B. P. G., CONSERVATOIRE ET JARDIN BOTANIKES, Geneva, Switzerland: 2 blueberry cradles (gift).

HOOD, PROFESSOR J. DOUGLAS, Rochester, New York: 2 plant specimens—Canal Zone (gift).

IMPERIAL FORESTRY INSTITUTE, Oxford, England: 71 specimens of plants—tropical Africa (exchange).

JARDIM BOTANICO, Rio de Janeiro, Brazil: 74 specimens of plants—Brazil (exchange).

JARDIN BOTANICO, Madrid, Spain: 270 plant specimens—Peru and Colombia (exchange).

JOHNSON, S. C., AND SON, INC., Racine, Wisconsin: 9 samples of vegetable waxes (gift).

KANSAS AGRICULTURAL COLLEGE, Manhattan, Kansas: 542 specimens of plants—Kansas and Michigan (exchange).

KING, C. J., UNITED STATES FIELD STATION, Sacaton, Arizona: 2 cotton plants (gift).

LABORATORIOS DEL MINISTERIO DE AGRICULTURA, San Salvador, Salvador: 8 plant specimens (gift).

LANKESTER, CYRUS H., Cartago, Costa Rica: 1 photograph (gift).

LAWRANCE, ALEXANDER E., Bogotá, Colombia: 9 plant specimens—Bolivia (gift).

LENARD, I., Chicago: 1 sample of potato whiskey—Poland (gift).

LINGNAN NATURAL HISTORY SURVEY AND MUSEUM, Canton, China: 105 samples of woods—China (exchange).

LIONEL DISTILLED PRODUCTS, INC., Chicago: 12 samples of distilled and fermented beverages (gift).

MCFARLIN, JAMES B., Sebring, Florida: 2 plant specimens (gift).

MARTINEZ, PROFESSOR MAXIMINO, Mexico City, Mexico: 1 plant specimen (gift).

MEXIA, MRS. YNES, San Francisco, California: 34 photographic prints, 332 specimens of plants—Mexico, Brazil and Peru (gift).

MILTON, ROY H., Nashville, Tennessee: 2 samples of tobacco (gift).

MOORE, GEORGE E., Lebanon, Missouri: 1 plant specimen (gift).

MOORE, O. G., Brownsboro, Alabama: 1 sample of chittam wood (gift).

MUELLER, C. H., Cuero, Texas: 5 plant specimens (gift).

MUSEO NACIONAL, San José, Costa Rica: 122 specimens of plants—Costa Rica (gift).

MUSEO NACIONAL DE HISTORIA NATURAL, Buenos Aires, Argentina: 100 specimens of plants—Argentina (exchange).

NATIONAL HERBARIUM OF VICTORIA, South Yarra, Australia: 52 plant specimens—Australia (exchange).

NATURHISTORISKA RIKSMUSEET, Stockholm, Sweden: 361 specimens of mosses from Scandinavia, 370 plant specimens—South America and Europe (exchange).

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NEW YORK BOTANICAL GARDEN, Bronx Park, New York: 652 specimens of plants (exchange).

NEW YORK COFFEE AND SUGAR EXCHANGE, INC., New York: 9 samples of standards for coffee grading (gift).

ORTEGA, JESUS G., Mazatlán, Mexico: 223 specimens of Mexican plants (gift).

PAGE, E. C., Evanston, Illinois: 1 plant specimen (gift).

PARAMOUNT LIQUOR COMPANY, Chicago: 3 specimens of liquors (gift).

PARODI, LORENZO R., Buenos Aires, Argentina: 50 plant specimens—Argentina (exchange).

PHILP, GUY L., COLLEGE OF AGRICULTURE, UNIVERSITY OF CALIFORNIA, Davis, California: 1 specimen jujube (gift).

POMONA COLLEGE, DEPARTMENT OF BOTANY, Claremont, California: 49 specimens of plants, mostly from Lower California (exchange).

POPE, W. T., Honolulu, Hawaii: 1 specimen of stems of awa (gift).

PURPUS, DR. C. A., Zacuapam, Mexico: 160 specimens of Mexican plants (gift).

RICHMOND CEDAR WORKS, RECEIVERS FOR, Norfolk, Virginia: 1 board of southern white cedar (gift).

ROUSSEAU, PROFESSOR JACQUES, Montreal, Canada: 24 specimens of plants—Mexico (gift).

SCHIPP, WILLIAM A., Punta Gorda, British Honduras: 250 specimens of plants—British Honduras (gift).

SHERFF, DR. EARL E., Chicago: 411 specimens of plants—Hawaii (gift).

SMITH, F. W., Guasave, Mexico: 1 packet of seeds (gift).

SPANN, JAMES H., Summerville, South Carolina: tea flowers and fruit (gift).

STANDLEY, MISS MARGARET, Fort Myers, Florida: 1 specimen of fungus (gift).

STANDLEY, PAUL C., Chicago: 11 plant specimens—Indiana (gift).

STANFORD, LELAND, UNIVERSITY, California: 376 plant specimens—western United States and Mexico (exchange).

STATE COLLEGE OF WASHINGTON, Pullman, Washington: 100 plant specimens—northwestern United States (exchange).

STEINHEIMER, D. J., St. Louis, Missouri: 1 sample of elderberry wine (gift).

UNITED STATES NATIONAL MUSEUM, Washington, D.C.: 95 plant specimens (exchange).

UNIVERSITY OF ARKANSAS, DEPARTMENT OF BOTANY, Fayetteville, Arkansas: 177 specimens of plants—Arkansas (exchange).

UNIVERSITY OF CALIFORNIA, DEPARTMENT OF BOTANY, Berkeley, California: 1,353 plant specimens (exchange).

UNIVERSITY OF CALIFORNIA AT LOS ANGELES, Los Angeles, California: 89 specimens of plants—Guatemala (exchange).

UNIVERSITY OF MICHIGAN, DEPARTMENT OF BOTANY, Ann Arbor, Michigan: 8 microscopic slides of wood (gift); 1,385 plant specimens, mostly from Central America (exchange).

UNIVERSITY OF MINNESOTA, DEPARTMENT OF BOTANY, Minneapolis, Minnesota: 111 specimens of plants—Minnesota (exchange).

UNIVERSITY OF MONTANA, DEPARTMENT OF BOTANY, Missoula, Montana: 55 plant specimens—Montana (exchange).

UNIVERSITY OF WISCONSIN, DEPARTMENT OF BOTANY, Madison, Wisconsin: 1 plant specimen (exchange).

UPHOF, PROFESSOR J. C. TH., Winter Park, Florida: 1 plant specimen (gift).

VAN CLEEF BROTHERS, Chicago: 4 samples of rubber and materials used in processing it (gift).

VISKING CORPORATION, Chicago: 1 sample of processed abacá fiber (gift).

VON PLATEN-FOX COMPANY, Iron Mountain, Michigan: 1 board of tamarack (gift).

WHEELER, LOUIS C., La Verne, California: 11 plant specimens (gift).

WILLIAMS, ARTHUR R., Riverside, Illinois: 1 plant specimen (gift).

WILLIAMS, PERCY, Pretoria, South Africa: 5 fruits of *Hyphaena crinita* (gift).

YALE UNIVERSITY, SCHOOL OF FORESTRY, New Haven, Connecticut: 568

specimens of plants (gift); 131 wood samples (exchange).

YULE, ROBERT, Chicago: 1 sample of Chinese rice liquor (gift).

ZETEK, JAMES, Balboa, Panama Canal Zone: 344 specimens of plants—Barro Colorado Island (gift).

DEPARTMENT OF GEOLOGY—ACCESSIONS

ALASKA MUSEUM, Juneau, Alaska: 32 specimens minerals and ores—Alaska (gift).

BARBER, C. M., Hot Springs, Arkansas: 1 vertebra of *Tylosaur*; 4 invertebrate fossils—Arkadelphia, Arkansas (gift).

BARCLAY, GEORGE C., Newport News, Virginia: 6 fossil shells—Yorktown, Virginia (gift).

BAUER, J. A., Hot Springs, Arkansas: 1 group quartz crystals—Hot Springs, Arkansas (gift).

BECKER, A. G. and RAYMOND B., Clermont, Iowa: 81 specimens invertebrate fossils—Florida (gift).

BENSABOTT, R., INC., Chicago: 1 carved figure of quartz after crocidolite—South Africa (gift).

BRIGHAM, EDWARD M., Battle Creek, Michigan: 1 agate geode—Datil Mountains, Mexico (gift); 40 specimens volcanic material—Hawaii (exchange).

BROCK, C. S., Houston, Texas: 1 specimen smaragdite with corundum—North Carolina; 1 specimen wood opal—Texas (exchange).

BUKER, L. W., Provo, South Dakota: 1 specimen fossil wood; 5 specimens invertebrate fossils—South Dakota (gift).

CALVERT, EARL L., San Gabriel, California: 1 polished half of blue agate—Mohave Desert (exchange).

CARNEY, THOMAS A., Portland, Oregon: 4 specimens wood opal—north of Roosevelt, Washington (gift).

CHALMERS, WILLIAM J., Chicago: 15 specimens placer gold—California and Nevada (gift).

CLARK, WAYNE, Salt Lake City, Utah: 4 specimens concentric bleaching in

shale—Bad Lands of southern Utah (gift).

CLOYD, C. C., New Richmond, Wisconsin: 1 specimen *calymene niagarensis*—Chicago (gift).

CROSS, MISS GRACE BREWSTER, Chicago: 1 specimen sulphur; 1 specimen Pele's hair—Kilauea, Hawaii (gift).

DASTON, JOSEPH, Chicago: 1 tooth of *Merychippus*—Mexico (gift).

DURAND, ARTHUR FRANKLIN, Chicago: 2 specimens hollow hematite concretions—Saugatuck, Michigan (gift).

EL DORADO GOLD MINES, LTD., Northwest Territories, Canada: 3 specimens radium and silver ore—Great Bear Lake, Canada (gift).

FENTON, CARROLL LANE, West Liberty, Iowa: 12 specimens invertebrate fossils, 27 geological specimens—Glacier National Park and Waterton National Park (gift).

FIELD MUSEUM OF NATURAL HISTORY:

Collected by Rudyerd Boulton (Straus West African Expedition): 5 specimens lava—Mount Cameroon, Africa.

Collected by Oliver C. Farrington (Second Marshall Field Brazilian Expedition): 1 specimen gold nugget, 1 specimen placer gravel with nugget—Bahia, Brazil.

Collected by Henry Field: 5 specimens limestone—Gibraltar.

Collected by Henry Field (Anthropological Expedition to the Near East, 1934): 1 specimen tin khawa—Amarah, Arabia.

Collected by Henry W. Nichols: 2 specimens quartzite—Ontario; 1 specimen free gold in quartz—Nova Scotia.

Collected by Phil C. Orr: 21 specimens cave products, 3 specimens rocks,

20 specimens invertebrate fossils, 18 specimens geodes—Glasgow Junction, Kentucky.

Collected by Elmer S. Riggs: 2 specimens vertebrate fossils—Bad Lands, South Dakota; 1 specimen shell marl—Aurora, Illinois.

Collected by Sharat K. Roy: 66 specimens invertebrate fossils, 17 specimens fossil plants—Nebraska and Pennsylvania.

Collected by Karl P. Schmidt (Cornelius Crane Pacific Expedition of 1929): 1 specimen hematite—near Suva, Fiji Islands; (Leon Mandel Guatemala Expedition): 2 specimens lava; 2 specimens pumice—Guatemala.

Purchase: 6 specimens trilobites—Wichita, Kansas.

FIELD, HENRY, Chicago: 19 specimens minerals, 6 specimens rocks, 60 specimens invertebrate fossils; vertebra, jaws and teeth of *Ichthyosaurus*—England and Germany (gift).

GARDNER, WILLIAM, Chicago: 27 specimens minerals, 45 specimens invertebrate fossils and fossil plants—various localities (gift).

GUNNELL, E. MITCHELL, Galesburg, Illinois: 3 specimens minerals—various localities (gift); 1 specimen meteorite, 21 specimens minerals—various localities (exchange).

HOCKENBARY, ELMER, Interior, South Dakota: 3 specimens fossil molar teeth—Bad Lands, South Dakota (gift).

HUBER, HERMAN J., North Washington, Iowa: 1 limonite concretion, 1 sand-polished and etched agate—North Washington, Iowa (gift).

JOHNS-MANVILLE COMPANY, Chicago: 1 specimen asbestos board (gift).

JOHNSON, F. L., Frankfort, Indiana: 1 specimen rock weathering—Clinton County, Indiana (gift).

JONES, MRS. T. R., JR., Mena, Arkansas: 2 specimens dendrite on novaculite—Mena, Arkansas (gift).

KOPEC, EMIL, Ashland, Nebraska: 15 photographs (exchange).

KYANCUTTA MUSEUM, Kyancutta, South Australia: 5 specimens meteorites—Australia and Africa (exchange).

LANGHE, W. A., Taylor, Texas: 1 specimen tripoli—Taylor, Texas (gift).

LEE, MISS VIRGINIA, Ableman, Wisconsin: 225 specimens fulgurite—Ableman, Wisconsin (gift).

LURAY CAVERNS CORPORATION, Luray, Virginia: 2 stalactites, 3 stalagmite deposits, 6 colored transparencies—Luray Cavern, Virginia (gift).

MARKHAM, FLOYD, Chicago: 12 specimens invertebrate fossils—Blue Island, Illinois (gift).

MARKHAM, FLOYD, Chicago; J. MANN, Oak Lawn, Illinois; J. LEE, Oak Lawn, Illinois; and SHARAT K. ROY, Chicago: 7 specimens invertebrate fossils—Blue Island, Illinois (gift).

MANLEY, JOHN A., New Brunswick, New Jersey: 2 limonite geodes—Middlesex County, New Jersey (gift).

MANN, J., Oak Lawn, Illinois: 2 specimens invertebrate fossils—Blue Island, Illinois (gift).

MARRIOTT, CHARLES, Sault Ste Marie, Michigan: 48 claystones—Sault Ste Marie, Michigan (gift).

MCINTOSH, FRANKLIN G., Beverly Hills, California: 8 specimens minerals—California (gift); 1 specimen mineral—California (exchange).

MIKIMOTO, KOKICHI, Tokyo, Japan: collection of culture pearls—Japan (gift).

MISSOURI COMMISSION TO A CENTURY OF PROGRESS, Jefferson City, Missouri: 9 specimens minerals—Washington County, Missouri (gift).

MITCHELL, PAUL H., Marietta, Illinois: 1 specimen stigmara—Marietta, Illinois (gift).

MUNROE, CONRAD, Chicago: 1 specimen mineral—unknown locality (gift).

NININGER, PROFESSOR H. H., Denver, Colorado: 1 slice of Sandia Mountains meteorite—New Mexico; 6 specimens meteorites—various localities (exchange).

OLBERG, PETER, Chicago: 1 specimen sequoia—Spitzbergen (gift).

POUGH, FRED, St. Louis, Missouri: 6 specimens minerals—various localities (exchange).

PRICE-GREEN, C., Montreal, Canada: 12 specimens gold ore, 1 specimen gold in quartz—Porcupine, Ontario, Canada (gift).

PRUITT, S. W., Niles, Michigan: 1 specimen tin ore—North Carolina; 2 lots minerals—Georgia (gift).

REZABEK, STANLEY, Chicago: 1 specimen diamond—South Africa (gift).

ROBBINS, GEORGE W., Valdez, Alaska: 1 mammoth tooth, 1 section of mammoth tusk—Fairbanks District, Alaska (gift).

ROBERTS, EDWIN A., Riverside, California: 2 specimens minerals—California (gift); 4 specimens minerals—California (exchange).

RODGERS, DR. E. A., Sainte Genevieve, Missouri: 1 specimen *Orthoceras*—Sainte Genevieve, Missouri (gift).

ROYAL ONTARIO MUSEUM OF PALEONTOLOGY, Toronto, Canada: 1 skull without jaws of *Anchiceratops ornatus*, 1 skull and jaws of *Edmontosaurus regalis*—Alberta, Canada (exchange).

SHAEFFER, WALTER L., Chicago: 1 specimen pumice—California (gift).

SHEAD, J. O., Norman, Oklahoma: 9 specimens barite roses—Norman, Oklahoma (gift).

SLOANE, ROBERT, and A. R. RENNER, Klamath Falls, Oregon: 1 specimen wood opal—Quartz Mountain, Oregon (gift).

STANDARD OIL COMPANY OF INDIANA, Chicago: 42 specimens petroleum prod-

ucts—Whiting, Indiana; 44 wax flow-ers, 36 dozen wax paper dishes, 6 dozen sheets paraffin paper (gift).

STANDARD OIL COMPANY OF NEW JERSEY, New York: 14 specimens vertebrate fossils—Argentina (gift).

SYLVANUS, EDWARD C., Chicago: 1 polished slab of Mexican onyx—Viroqua, Wisconsin (gift).

UNITED STATES POTASH COMPANY, New York: 5 specimens minerals, 1 specimen malpais lava—New Mexico (gift).

VON DRASEK, FRANK, Cicero, Illinois: 33 specimens minerals—Arkansas (gift).

WEIL, JACK, Chicago: 16 specimens minerals—Colorado (gift).

WHARTON, J. R., Roseburg, Oregon: 1 polished specimen of lignite in shale—Roseburg, Oregon (gift).

WHEELER, SEYMOUR, for his father, the late CHARLES P. WHEELER, Chicago: 37 specimens lead and zinc ore—Em-breeville, Tennessee (gift).

WITER, ROBERT V., Bayers, Nebraska: 10 specimens minerals—Morrill County, Nebraska (gift).

WRIGHT, RANDALL, Chicago: 1 specimen orthoclase—San Diego, California (gift).

WRIGHT-HARGREAVES MINES, LTD., Ontario, Canada: 1 specimen gold ore—Kirkland Lake, Ontario (gift).

DEPARTMENT OF ZOOLOGY—ACCESSIONS

ACOSTA Y LARA, EDUARDO F., Montevideo, Uruguay: 3 bat skins and 4 skulls—Uruguay (gift).

ALDRICH, JACK, Oak Park, Illinois: 1 pickerel head—Lake Delavan, Wisconsin (gift).

ANDREWS, E. WYLLYS, IV, Chicago: 1 vampire bat, 1 frog, 1 lizard, 4 turtles, 30 snakes, 2 lots snake eggs and embryos, 15 insects and allies—Yucatan (gift).

BEBB, HERBERT, Chicago: 7 beetles—Chicago (exchange).

BIRKS, THOMAS K., Chicago: 1 tiger salamander—Okee, Wisconsin (gift).

BLACKBURN, MISS E. R., Merida, Yucatan: 5 lizards, 16 snakes—Merida, Yucatan (exchange).

BOWER, H. M., Evanston, Illinois: 2 butterflies, 2 moths—Utah and Wisconsin (gift).

BRISTOL, MAURICE L., Elgin, Illinois: 3 cicadas—Elgin, Illinois (gift).

BROWN, E. J., Oranjested, Aruba: 122 insects—Ecuador (gift).

BRUNDAGE, EDWARD, Washington, Connecticut: 1 coral king snake, 24 insects and allies—various localities (gift).

BUCK, FRANK, A Century of Progress exposition: 1 East Indian monitor, 2 iguanas, 1 king cobra (gift).

CARIBBEAN BIOLOGICAL LABORATORIES, Biloxi, Mississippi: 9 mammal skins and 8 skulls—Biloxi, Mississippi; 5 tree-frogs—Australia; 1 lizard—South Africa (gift).

CARNEGIE MUSEUM, Pittsburgh, Pennsylvania: 104 frogs and toads, 62 lizards, 35 snakes—Africa (exchange).

CASCARD, BEN, Chicago: 9 beetles—San Jacinto Mountains, California (gift).

CHALMERS, WILLIAM J., Chicago: 2 photographs of sable antelope and wildebeest, 1 map and guide to Kruger National Park (gift).

CHARLESTON MUSEUM, Charleston, South Carolina: 14 eastern chain pickerel—Berkeley County, South Carolina (gift).

CHICAGO ZOOLOGICAL SOCIETY, Brookfield, Illinois: 1 spiny anteater, 3 kangaroos—Australia and New Guinea; 1 brocket deer—Guatemala; 2 chimpanzees—Africa; 1 cormorant, 2 albatrosses—Galapagos Islands; 2 bower birds, 1 Asiatic starling; 2 snakes, 4 lizards—Australia; 3 snakes, 11 lizards—various localities (gift).

COLE, L. C., Chicago: 2 lizards—Navajo County, Arizona (gift).

CONOVER, BOARDMAN, Chicago: 1 mounted passenger pigeon—Ontario, Canada; 8 game birds—various localities; 3 bird skins—Belgian Congo (exchange); 1 green-winged teal—Illinois (gift).

CRAMER, MISS BERTHA, Highland Park, Illinois: 1 bat skeleton, 2 rail skeletons—Highland Park, Illinois (gift).

CRANDALL, ROBERT H., Phoenix, Arizona: 4 beetles—Phoenix, Arizona (gift).

CUTLER, BOB, Kenilworth, Illinois: 1 green snake—Glencoe, Illinois (gift).

DAVIS, D. DWIGHT, Naperville, Illinois: 4 snakes—DuPage County, Illinois (gift).

DICKEY, DONALD R., COLLECTION, Pasadena, California: 4 bird skins—various localities (gift).

DIXON, MRS. HOMER, Chicago: 1 mounted rabbit (gift).

DYBAS, HENRY, Chicago: 38 insects—Illinois and Indiana (gift).

DYBAS, HENRY, and FLOYD WRIERCINSKI, Chicago: 1 massasauga—Beverly Shores, Indiana (gift).

FELIPPONE, DR. FLORENTINO, Montevideo, Uruguay: 5 bats—Uruguay (gift).

FENNEMA, MRS. MARIE, Chicago: 1 brown bat—Chicago (gift).

FIELD, MARSHALL, New York: 19 sculptured figures of British champion domestic animals (gift).

FIELD MUSEUM OF NATURAL HISTORY:

Collected by Rudyerd and Laura Boulton and Frank C. Wonder (Straus West African Expedition): 350 mammal skins, 502 skulls, 84 mammals in alcohol, 36 skeletons; 714 bird skins, 143 skeletons, 56 birds in alcohol, 14 birds' eggs, 4 boxes group accessories; 245 toads and frogs, 16 chameleons, 220 lizards, 37 snakes, 9 turtles, 6 crocodiles; 323 fishes—west Africa.

Collected by Henry Field and Richard A. Martin (Anthropological Expedition to the Near East, 1934): 127 mammals in alcohol, 7 mammal skins with 2 skeletons, 8 camel skulls, 23 bird skins, 1 set birds' eggs, 78 frogs and toads, 6 salamanders, 330 lizards, 133 snakes, 12 turtles, 20 fishes—southwestern Asia.

Collected by Albert J. Franzen: 2 immature mink—Cook County, Illinois.

Collected by Colin C. Sanborn: 4 toads, 2 frogs, 2 beetles—Lake County, Illinois.

Collected by Karl P. Schmidt, Frank J. W. Schmidt, Emmet R. Blake, Daniel Clark (Leon Mandel Guatemala Expedition): 380 mammal skins, 389 skulls, 111 mammals in alcohol, 23 skeletons; 875 bird skins, 1 skeleton, 30 boxes of nests; 341 frogs and toads, 662 salamanders, 603 lizards, 222 snakes, 17 turtles, 2 crocodiles; 130 fishes; 1,629 insects and lower invertebrates—Guatemala.

Purchases: 2 clawed frogs—Africa; 12 lizards—Balearic Islands; 1 clouded leopard skin—China; 2 pheasants—Illinois; 3 snow-leopard skins—India; 6 hummingbirds—Mexico; 2 sage grouse—Wyoming.

FORBIS, HOMER, Albany, Missouri: 4 sand wasps—Albany, Missouri (gift).

FRANZEN, ALBERT J., Chicago: 1 herring gull skeleton, 1 tern skeleton, 1 turtle, 21 insects, 3 parasitic worms—Illinois (gift).

FRAZIER, C. A., Stuart, Florida: 1 diamond-back rattlesnake—Stuart, Florida (gift).

FRIESSER, JULIUS, Chicago: 1 wasp—Chicago (gift).

GENERAL BIOLOGICAL SUPPLY HOUSE, Chicago: 1 clouded leopard skull—India (exchange); 3 snakes, 5 lizards—California; 4 frogs, 2 salamanders, 5 snakes—various localities; 1 lungfish—Africa (gift).

GERHARD, WILLIAM J., Chicago: 45 insects—Illinois and Indiana (gift).

GREGG, CLIFFORD C., Park Ridge, Illinois: 5 flies—Chicago (gift).

GREGORY, STEPHEN S., Winnetka, Illinois: 1 hawk skeleton—Winnetka, Illinois (gift).

HAMLETT, DR. G. W., Boston, Massachusetts: 23 bats—Brazil (gift).

HASKIN, J. R., Babson Park, Florida: 9 moths—Auburndale, Florida (gift).

HICKIN, N. E., Birmingham, England: 56 butterflies and moths—England (gift).

HINE, ASHLEY, Chicago: 6 mounted young ruffed grouse, 9 grouse skins—various localities (exchange).

HOLLEY, FRANCIS E., Lombard, Illinois: 32 insects—United States and Panama (gift).

HUBBELL, DR. THEODORE H., Gainesville, Florida: 6 camel crickets—Michigan and Ohio (gift).

JOB, DR. W., Popayan, Colombia: 42 insects—Colombia (gift).

KANE, MISS RUTH W., Chicago: 1 grosbeak skeleton—Chicago (gift).

KREER, J. G., Chicago: 7 beetles—Pine Bluff, Arkansas (gift).

LAYBOURNE, MISS PHYLLIS, Homewood, Illinois: 1 red-backed salamander—Shadeland, Indiana (gift).

LETL, FRANK H., Hazel Crest, Illinois: 1 opossum skeleton—Hazel Crest, Illinois (gift).

LILJEBLAD, EMIL, Chicago: 1 stag beetle—Java (gift).

LINCOLN PARK COMMISSIONERS, Chicago: 1 young orang utan, 1 griffon vulture, 1 plantain-eater (gift).

LIU, DR. C. C., Soochow, China: 34 frogs and toads, 6 lizards—China (gift).

LOWRIE, DONALD C., Chicago: 3 snakes, 1 lizard—Greenbriar, Tennessee (gift).

MCLAREN, JAMES, Highland Park, Illinois: 1 red bat—Highland Park, Illinois (gift).

MILLER, FRANK, Delavan, Wisconsin: 1 green snake—Delavan, Wisconsin (gift).

MUSEUM OF COMPARATIVE ZOOLOGY, Cambridge, Massachusetts: 6 bat skins with skulls—Africa and Brazil (exchange).

NECKER, WALTER L., Chicago: 1 pilot blacksnake—Turkey Run, Indiana (gift).

NEITZEL, WILLIAM, Chicago: 3 Fowler's toads—Stevensville, Michigan (gift).

OPPENHEIMER, HARRY D., Chicago: 1 mounted bat—Trinidad; 1 fish skeleton (gift).

PARK, DR. ORLANDO, Evanston, Illinois: 5 beetles—Urbana, Illinois (gift).

PEARSALL, GORDON S., Batavia, Illinois: 1 lesser yellowlegs, 5 snakes, 3 mole crickets—Willow Springs, Illinois (gift).

PEARSON, DR. J. F. W., Coral Gables, Florida: 13 frogs and toads—Coral Gables, Florida (gift).

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PERKINS, R. MARLIN, St. Louis, Missouri: 7 snakes—Brazil and Guatemala (gift).

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PHILBY, H. ST. J., Mecca, Arabia: 1,043 insects and allies—Hejaz, Arabia (gift).

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PIRIE, JOHN T., Lake Forest, Illinois: 1 albino crow—Lake Forest, Illinois (gift).

PIRNIE, M. D., Battle Creek, Michigan: 1 American merganser, 2 American goldeneyes (gift).

PLATH, KARL, Chicago: 1 tanager—South America; 2 bird skeletons (gift).

PRAY, LEON L., Homewood, Illinois: 1 mole—Harvey, Illinois (gift).

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SANBORN, COLIN C., Highland Park, Illinois: 1 white-footed mouse, 1 bug—Highland Park, Illinois; 1 painted turtle—Lake County, Illinois (gift).

SANFORD, DR. L. C., New Haven, Connecticut: 1 Mexican bear skin (gift).

SCHMIDT, F. J. W., Madison, Wisconsin: 1 painted turtle—Ashland County, Wisconsin (gift).

SHEDD, JOHN G., AQUARIUM, Chicago: 86 fishes—various localities (gift).

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 Halperin, Aaron
 Hamill, Charles H.
 Hamill, Mrs. Ernest A.
 Hamill, Robert W.
 Hamilton, Thomas B.
 Hamlin, Paul D.
 Hammerschmidt, Mrs. George F.
 Hammitt, Miss Frances M.
 Hammond, Thomas S.
 Hand, George W.
 Hanley, Henry L.
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 Hansen, Jacob W.
 Harder, John H.
 Hardie, George F.
 Hardin, John H.
 Harding, Charles F., Jr.
 Harding, George F.
 Harding, John Cowden
 Harding, Richard T.
 Hardinge, Franklin
 Harker, H. L.
 Harms, John V. D.
 Harper, Alfred C.
 Harris, Mrs. Abraham
 Harris, David J.
 Harris, Gordon L.
 Harris, Hayden B.
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 Hart, William M.
 Hartmann, A. O.
 Hartshorn, Kenneth L.
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 Harwood, Thomas W.
 Haskell, Mrs. George E.
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 Havens, Samuel M.
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 Hayes, Harold C.
 Hayes, Miss Mary E.
 Haynie, Miss Rachel W.
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 Hazlett, Dr. William H.
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 Hedberg, Henry E.
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 Heinzelman, Karl
 Heinzen, Mrs. Carl
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 Heller, John A.
 Heller, Mrs. Walter E.
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 Hellyer, Walter
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 Hemple, Miss Anne C.
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 Henkel, Frederick W.
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 Herrick, Miss Louise
 Herrick, Walter D.
 Herron, James C.
 Herron, Mrs. Ollie L.
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 Herwig, William D., Jr.
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 Heun, Arthur
 Heverly, Earl L.
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 Higgins, John W.
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 Hillebrecht, Herbert E.
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 Hinkle, Ross O.
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 Hoffmann, Edward
 Hempstead
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 Holmes, Mrs. Maud G.
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 Hoover, H. Earl
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 Horton, Horace B.
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 Howell, William
 Howse, Richard

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 Huff, Thomas D.
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 Huston, Ward T.
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- Ickes, Raymond
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 Jones, Melvin
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 Judah, Noble Brandon
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 Loeb, Jacob M.
 Loeb, Leo A.
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 Loewenstein, Sidney
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 Long, William E.
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 Lucey, Patrick J.
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 Lufkin, Wallace W.
 Luria, Herbert A.
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 Lustgarten, Samuel
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 Lydon, Mrs. William A.
 Lyford, Harry B.
 Lynch, William Joseph
 Lyon, Charles H.
 Lyon, Frank R.
 Lyon, Mrs. Thomas R.
- Maass, J. Edward
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 MacDonald, E. K.
 MacDougal, Mrs. T. W.
 Mackey, Frank J.
 Mackinson, Dr. John C.
 MacLeish, Mrs. Andrew
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 Magan, Miss Jane A.
 Magill, Henry P.
 Magill, Robert M.
 Magnus, Albert, Jr.
 Magnus, August C.

- Maher, Mrs. D. W.
 Main, Walter D.
 Malone, William H.
 Manaster, Harry
 Mandel, Mrs. Aaron W.
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 Mandel, Mrs. Emanuel
 Mandel, Miss Florence
 Mandel, Mrs. Robert
 Mandl, Sidney
 Manegold, Mrs. Frank W.
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 Manierre, Louis
 Manley, John A.
 Mann, Albert C.
 Mann, John P.
 Manson, David
 Mansure, Edmund L.
 Marcus, Maurice S.
 Marhoefer, Edward H.
 Mark, Mrs. Cyrus
 Marks, Arnold K.
 Marquis, A. N.
 Marsh, A. Fletcher
 Marsh, Mrs. John P.
 Marsh, Mrs. Marshall S.
 Martin, Mrs. Franklin H.
 Martin, Samuel H.
 Martin, W. B.
 Martin, Wells
 Marx, Frederick Z.
 Marzluff, Frank W.
 Marzola, Leo A.
 Mason, Willard J.
 Masee, B. A.
 Massena, Roy
 Massey, Peter J.
 Masterson, Peter
 Mathesius, Mrs. Walther
 Matson, J. Edward
 Matter, Mrs. John
 Matthiessen, Frank
 Matz, Mrs. Rudolph
 Matz, Miss Ruth H.
 Maurer, Dr. Siegfried
 Maxwell, Lloyd R.
 Mayer, Isaac H.
 Mayer, Oscar F.
 Mayer, Theodore S.
 McAuley, John E.
 McBirney, Mrs. Hugh J.
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 McCarthy, Edmond J.
 McCarthy, Joseph W.
 McClellan, Dr. John H.
 McCluer, William
 Bittinger
 McClun, John M.
 McCord, Downer
 McCormack, Professor
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 McCormick, Mrs.
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 McCormick, Mrs.
 Chauncey
 McCormick, Fowler
 McCormick, Howard H.
 McCormick, Leander J.
 McCormick, Robert
 H., Jr.
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 McDougall, Mrs.
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 McErlean, Charles V.
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 McGraw, Max
 McGurn, Mathew S.
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 McIntosh, Arthur T.
 McIntosh, Mrs. Walter G.
 McKay, James M.
 McKeever, Buell
 McKinney, Mrs. Hayes
 McLaury, Mrs. C. W.
 McLaury, Walker G.
 McLennan, Mrs. John A.
 McMenemy, L. T.
 McMillan, John
 McMillan, W. B.
 McMillan, William M.
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 McNulty, Joseph D.
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 Melchione, Joseph
 Melendy, Dr. R. A.
 Melnick, Leopold B.
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 Merrill, James S.
 Merrill, William W.
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 Metz, Dr. A. R.
 Metzler, Mrs. Albert J.
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 Meyer, Abraham W.
 Meyer, Albert
 Meyer, Charles Z.
 Meyer, Oscar
 Meyer, Sam R.
 Meyer, William
 Meyercord, George R.
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 Milhening, Joseph
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 Miller, Hyman
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 Miller, Mrs. Phillip
 Miller, R. T.
 Miller, Walter E.
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 Miller, William E.
 Miller, William S.
 Mills, Allen G.
 Mills, Fred L.
 Mills, John, Sr.
 Mills, Mrs. William S.
 Miner, Dr. Carl S.
 Miner, H. J.
 Minotto, Mrs. James
 Minturn, Benjamin E.
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 Mitchell, George F.
 Mitchell, John J.
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 Mitchell, Oliver
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 Mohr, William J.
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 Monheimer, Henry I.
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 Moore, Philip Wyatt
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 Moran, Brian T.
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 More, Roland R.
 Morey, Charles W.
 Morf, F. William
 Morgan, Alden K.
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 Morris, Edward H.
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 Morrison, James W.

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 Mowry, Louis C.
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 Mueller, J. Herbert
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 Murphy, Robert E.
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- Naber, Henry G.
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 Nichols, S. F.
 Nicholson, Thomas G.
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 Olson, Gustaf
 Omo, Don L.
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 Pearson, George Albert, Jr.
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 Peet, Fred N.
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 Petersen, Jurgen
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 Davies, William B.
 Davis, Alexander M.
 Davis, Mrs. Charles P.
 Davis, Charles S.
 Davis, Mrs. F. Ben
 Davis, Paul H.
 Davis, Ralph W.
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 Deane, Henry Townner
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 Decker, Hiram E.
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 Degener, August W.
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 Deininger, Mrs. D. M.
 DeLamarter, Mrs. Eric
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 Deneen, Robert J.
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 Porter
 Denison, John W.
 Dennis, Willard P.
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 Deree, William S.
 Derham, John A.
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- Dulsky, Louis
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 Exo, Arnold H.
- Fabrice, Edward H.
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 William J.
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- Fisher, Mrs. W. A.
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 Fowler, Harold A.
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 Klein, Dr. David
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 Leigh, Maurice
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 Logan, Frank G.
 Loring, Edward D.
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 Luther, Miss Edith
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 Henry J.
 Macfarland, Lanning
 Macfarlane, Wilbert E.
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 Malkov, David S.
- Mandelbaum, Mrs.
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 Mansfield, Alfred W.
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 Martin, Mellen C.
 Martin, Ralph H.
 Massmann, Frederick H.
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 Mathews, Mrs. Shailer
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 Mayer, Edwin W. C.
 Mayer, Herman J., Jr.
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 Elizabeth D.
 McCoy, Charles S.
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 McCulloch, Frank H.
 McDonald, Lewis
 McDougall, Mrs.
 Edward G.
 McFadden, Everett R.
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 McGuinn, Edward B.
 McGuire, Simms D.
 McHenry, Roland
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 McKay, Charles R.
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 McKibbin, Mrs. George B.
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 Donald D.
 McKinstry, W. B.
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 McNamara, Robert C.
 McNamee, Peter F.
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 Mears, Grant S.
 Mechem, J. C.
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 Moore, Nathan G.
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 Mowry, Robert D.
 Mueller, Dr. E. W.
 Mueller, Miss Hedwig H.
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 Murfey, E. T. R.
 Murphy, Henry C.
 Murphy, J. P.
 Myrland, A. L.
- Nance, Willis D.
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 Nau, Otto F.
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 Nicholson, W. S.
 Nickelson, S. T.
 Nickerson, J. F.

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- Palmer, Robert F.
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 Rayner, Lawrence
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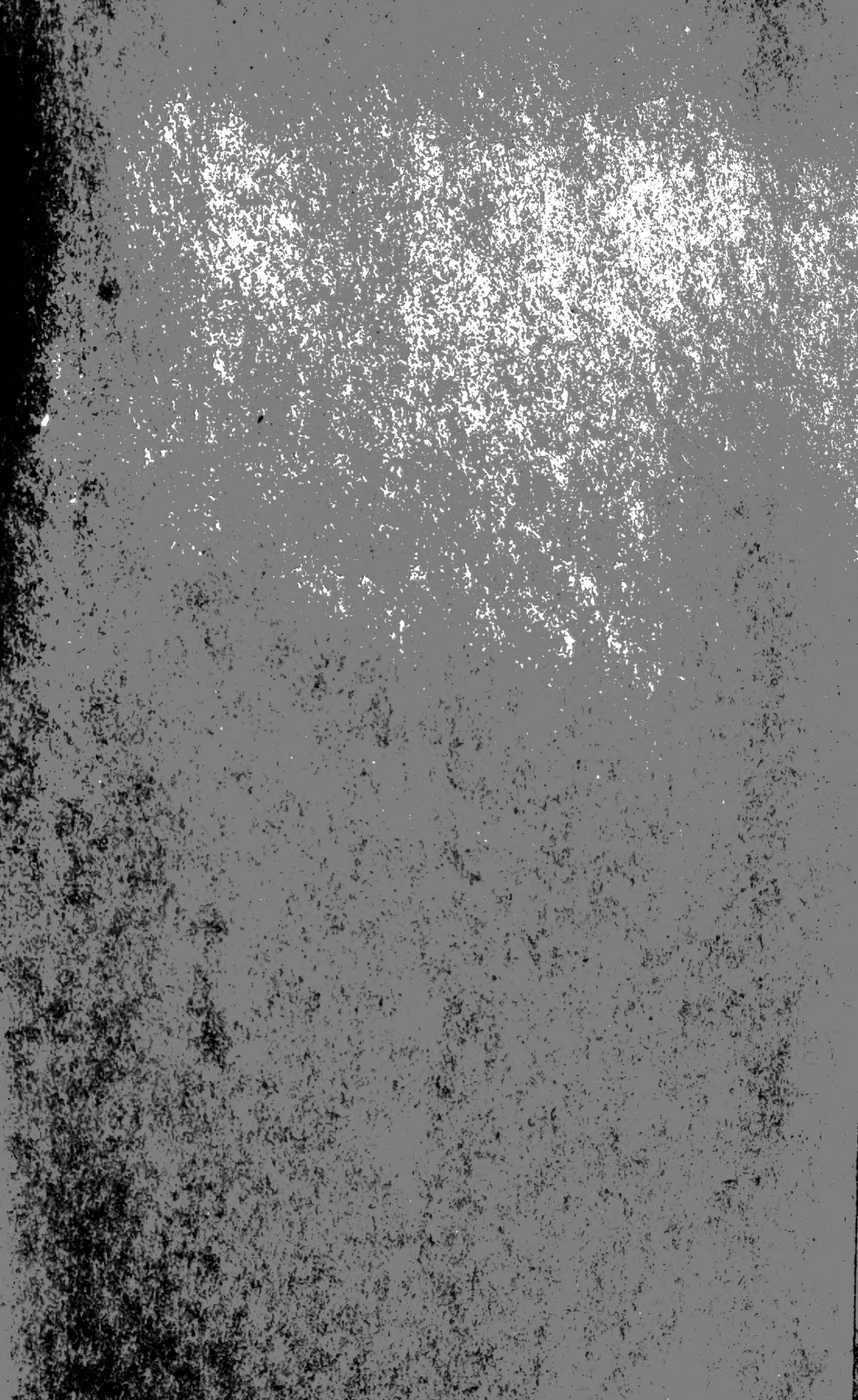
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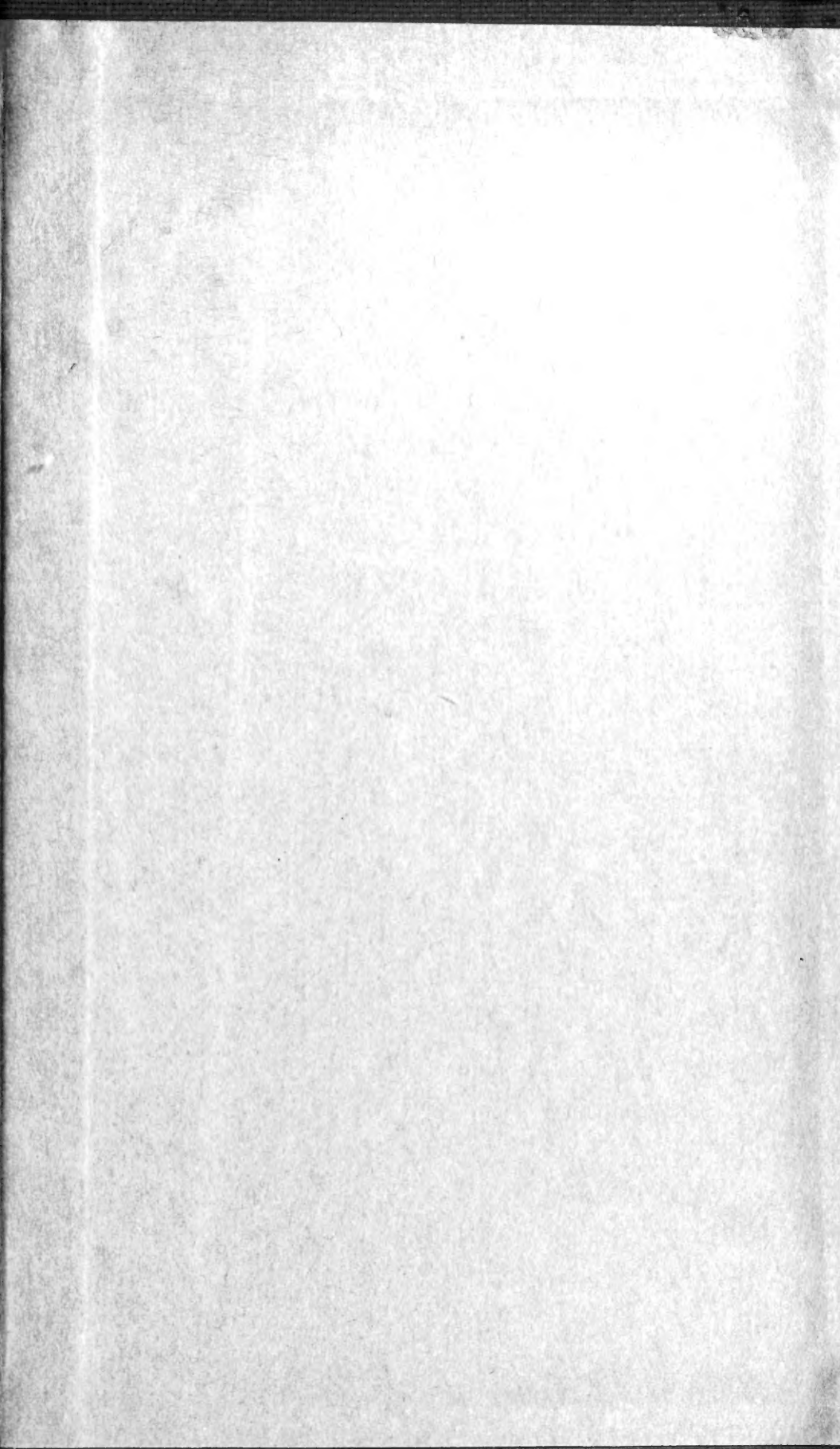
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