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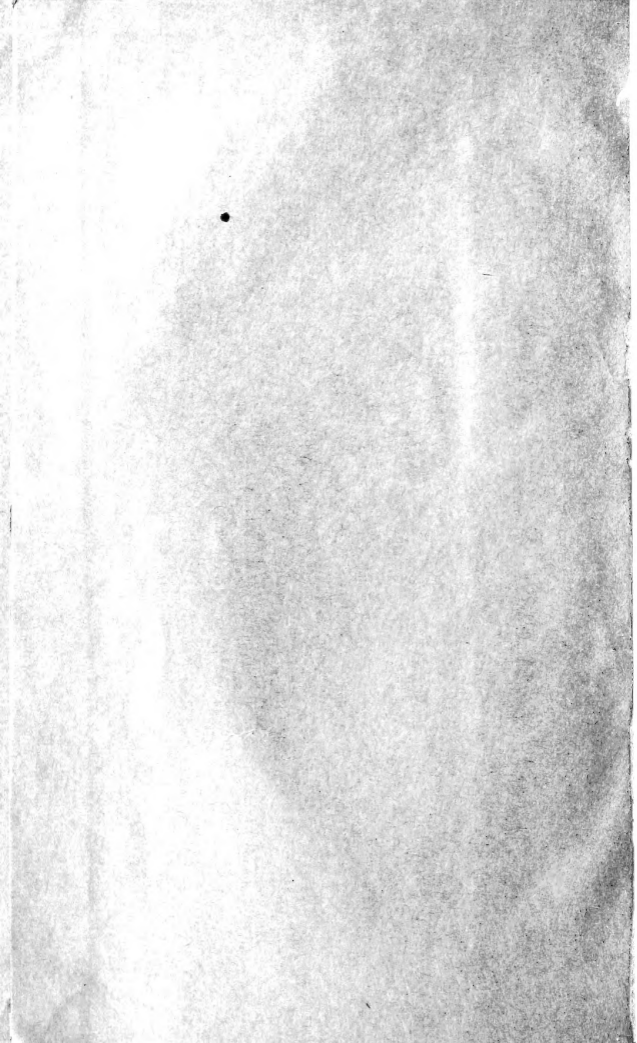
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PUBLICATIONS

OF

FIELD MUSEUM OF NATURAL
HISTORY

REPORT SERIES

VOLUME VII



CHICAGO, U. S. A.

1926-1928



THE LATE DAVID C. DAVIES

Director of the Museum from December 19, 1921 to July 14, 1928, the date of his death

FIELD MUSEUM OF NATURAL HISTORY

FOUNDED BY MARSHALL FIELD, 1893

PUBLICATION 256

REPORT SERIES

VOL. VII, No. 3

ANNUAL REPORT OF THE
DIRECTOR

TO THE
BOARD OF TRUSTEES

FOR THE YEAR 1928



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UNIVERSITY OF ILLINOIS

CHICAGO, U. S. A.

January, 1929

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

Bank contributions made within the taxable year to Field Museum of Natural History from amount not in excess of 10 per cent of the taxpayer's net income are allowable as deductions in computing net income under Article 631 of the Illinois Tax Code relating to the income tax under the Illinois Act of 1939.

Endowments may be made to the Museum with the proviso that an annuity be paid to the patron during his or her lifetime. These annuities are not treated as gifts until after the death of the donor.

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DAVID CHARLES DAVIES

June 27, 1886—July 14, 1928

Elected Director December 29, 1921

During the year under review the Museum sustained a very serious loss through the death of its Director, David Charles Davies, which took place, after an illness of several months, at his residence, on July 14, 1928.

Mr. Davies entered the service of the Museum in 1894 as Auditor. He was successively Recorder, Assistant Secretary and Secretary, succeeding to the Directorship of the Museum in 1921 at the death of Dr. Frederick J. V. Skiff, the Museum's first Director.

Throughout his many years of connection with the Museum, Mr. Davies performed his services with judgment and ability and always sought the Museum's best interests.

Chosen to the position of Director by virtue of his administrative ability and profound knowledge of the needs and aims of the institution, Mr. Davies carried on the Museum's work to new objectives and enlarged its fields of usefulness. He did his full share in helping to build up the Museum to the position it now occupies.

On July 16, 1928, the Board of Trustees adopted the following resolution in tribute to the memory of Mr. Davies:

"The Trustees of Field Museum of Natural History desire to express and record their deep sorrow at the loss which they and the institution have sustained by the death on July 14, 1928, of their fellow Trustee, Secretary of the Board, and Director of the Museum, David Charles Davies.

"Mr. Davies' connection with the Museum dated shortly after its inception and continued to the time of his death, during which period he exerted a beneficent influence on its activities, and devoted himself to its interest with success and fidelity.

"As a member of the Board, his fellow Trustees placed great reliance on Mr. Davies' judgment and knowledge of the needs of the institution and the best methods of promoting its progress.

"Mr. Davies' very able administration of his many and varied duties won the highest respect and esteem of the Board of Trustees.

His unselfish labors on behalf of the Museum will bear fruit for many years to come.

“The Board of Trustees desires to have this expression of their appreciation of Mr. Davies’ work and character spread upon the records of the institution and a duly attested copy thereof sent to the members of his bereaved family.

“STEPHEN C. SIMMS, Acting Secretary

STANLEY FIELD, President”

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ANNUAL REPORT OF THE DIRECTOR

1928

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, 1928.

There is much cause for gratification in the accomplishments of the Museum during the twelve months to be herewith reviewed. For the second time attendance has exceeded one million. The membership of the Museum has shown a healthy growth which indicates increasing appreciation and approval by the public of the institution's activities. Extensive permanent improvements have been made in the Museum building, especially notable among them being the installation of exhibits in six large new exhibition halls on the ground floor, which were opened to the public in June. In extra-mural work the Museum has maintained its proud record of past years, having had thirteen exhibitions in operation in widely scattered parts of the world during 1928. The Museum has been the recipient of many benefactions from its friends. The institution's educational activities for both adults and children have kept pace with the constantly growing demand on the part of the public for such cultural opportunities. Throughout the world attention has been focused through the press on the activities of the Museum, brightening the international prestige which the institution has always enjoyed since its establishment.

The number of visitors to the Museum during 1928 was 1,016,674. When the long and frequent periods of unfavorable and inclement weather conditions which prevailed during 1928 are taken into consideration, together with the fact that in 1927 there was one day (October 5) when a special event in Soldier Field brought 50,000 visitors to the Museum, it will be seen that the 1928 attendance compares favorably with that of the preceding year, 1,043,546. The decrease, 1928/9, is less than 2 per cent, and is more than accounted for by the single exceptional day's attendance in 1927 above mentioned, as there were no events in Soldier Field during 1928 which drew comparable crowds during Museum hours.

Renewed expressions of gratitude and appreciation are due to those who have evidenced their good will toward and interest in

the Museum through contributions in the form of memberships. The Museum now has on its rolls more than 5,000 Members—the exact figures by classifications, and a complete list of the names, are to be found in other sections of this Report.

The increase in the number of such contributors may well be considered as an indication of widening public approval and appreciation of the Museum and its mission. Each person registered on the rolls, through all the membership classes from Benefactors to Annual Members, is entitled to recognition as a public-spirited citizen who by his contribution is supporting a great educational work. Every one of these Members is helping the Museum to maintain and expand its activities in the fields of scientific research and dissemination of knowledge, and without their aid the institution's work would be seriously curtailed. The Museum is happy to acknowledge this support, and it is indeed a great satisfaction to note the continuing growth of the membership lists.

In recognition of the very valuable and eminent service rendered the Museum by Mr. William V. Kelley, the Trustees have elected him as a Benefactor, and they have named Hall 17 (which is to be devoted to Asiatic mammals, some groups of which have already been installed) "William V. Kelley Hall."

During 1928 the Trustees also elected Mrs. Emily Crane Chadbourne and Mrs. William H. Moore as Patrons of the Museum because of their generous help to and interest in the institution.

The following were elected Life Members: Mr. George E. Brannon, Mr. Reuben G. Chandler, Mr. Russell Tyson, Mr. R. Douglas Stuart, Mr. Alfred E. Hamill, Mr. Homer L. Dixon, Mrs. Harold E. Leopold, Mr. Edward J. Ryerson, Mr. Arthur Reynolds, Mrs. Watson F. Blair, Mr. Frank A. Hecht, Jr., Mr. Edward N. Hurley, Mr. John Jay Abbott, Mr. John Griffiths, Mr. Moise Dryfus, and Mr. Robert A. Gardner.

Prominent among the many important activities undertaken during 1928 was the completion and opening to the public of six large new exhibition halls in the Department of Anthropology. These halls were opened in June, and are the first six to be completed of a total of fourteen which are being added to the exhibition space through extensive reconstruction of the Museum's ground floor. This project has been made possible through the generosity of President Stanley Field.

The six new halls opened in 1928 contain new collections illustrating the ethnology of Africa and Madagascar (the latter being

the results of the Captain Marshal Field Anthropological Expedition to Madagascar in 1926-27, and probably the world's finest collection of faunal, and also entomogical and botanical collections representing the ethnology of Polynesia, Melanesia, Malay Peninsula, Malay Archipelago, Philippine Islands, India, Siberia and Korea, and Egyptian ethnology. The anthropological area gained by transferring this large part of the ground floor anthropological exhibition halls amounts to 48,000 square feet. Further details concerning these halls and the collections they contain will be found elsewhere in this Report.

Important changes were made also in Ernest R. Graham Hall of Historical Geology. The fossils in this hall were transferred, and to them were added some of the outstanding specimens obtained by the two Captain Marshal Field Paleontological Expeditions to Argentina and Bolivia the second of which concluded its work in 1927. On the walls of this hall were installed the first ten of the proposed series of twenty-eight large mural paintings representing the prehistoric world and its life, which Mr. Ernest R. Graham is giving the Museum. Work on these paintings was begun in 1925, as recorded in the Annual Report of the Director for that year. In restoring scenes of the prehistoric periods and the life typical of each, the artist, Mr. Charles R. Knight of New York City, has based his conceptions on the facts established through scientific research by paleontologists. The cases and the paintings in Ernest R. Graham Hall are united by an extremely effective new method.

Among other important new exhibits installed during 1928 are the following: a habitat group of the *Ovis poli* or Marco Polo sheep, and the Himalayan or Asiatic ibex, composed of animals obtained by Colonel Theodore Roosevelt and Mr. Earnest Roosevelt while they were leading the Jaeger-Simpson-Roosevelts Asiatic Expedition for Field Museum in 1923-25, a group of five mountain goats, four of the specimens of this rare animal having been secured by the Field Museum Chicago, Emily Vonn Alvensleben Expedition, in 1926-27, and one having been presented by Captain Harold A. White, a specimen of the same, one of the rarest animals in the world, obtained by the Captain Marshal Field African Expedition, 1925, a habitat group of gnarled leopards from Yavalat Hills, Assam, a group of the distinctive antelope, the dik dik, another group representing a species for making of the Malay Peninsula. There were also many other interesting and important additions to the exhibits from Departments of the Museum, details of which appear elsewhere in this Report.

Several innovations which have proved very helpful to visitors were made during 1928. An effective and much needed directory service giving the numbers and locations of halls was inaugurated by placing framed printed placards near the entrances of the Museum, and at the head and foot of each stairway. To further serve the visitors, there were installed at either side of the main entrance other large printed and framed placards giving useful information concerning the Museum. Also, at the entrance to each exhibition hall framed and printed placards were placed, giving the number and designating the contents of the hall. On the walls in prominent places on the ground and first floors attractive frames were installed, which may be quickly and easily opened for the changing of timely announcements. These are used for the display of posters advertising the Museum's lecture courses for adults, the Raymond Fund entertainments for children, the monthly schedules of guide-lecture tours, bulletins calling attention to new exhibits, and other announcements.

The Museum had thirteen expeditions in the field during the year. Several of these did not begin operations until the last quarter, and they are expected to continue their work through all or most of 1929. Following is a brief summary of the year's expeditions:

The William V. Kelley-Roosevelts Expedition to Eastern Asia, to make zoological collections in remote parts of French Indo-China, and to explore certain unknown territory lying northward of Indo-China along the gorges of the Mekong River, set out in two contingents late in the year. Colonel Theodore Roosevelt and Mr. Kermit Roosevelt are the leaders, and Mr. William V. Kelley is sponsor. One contingent led by the Roosevelts themselves, left the United States November 10; the other, led by Mr. Harold J. Coolidge, Jr., of Boston, sailed December 22. After completing their separate objects and covering their separate territory, the two parties will unite in Indo-China for further work together. Among other members of the expedition are Mr. Suydam Cutting of New York; Dr. Josselyn Van Tyne, Assistant Curator of Birds of the Museum of Zoology of the University of Michigan; Dr. Ralph E. Wheeler of Cambridge, Massachusetts; Mr. Russell W. Hendee of Brooklyn, New York, and Mr. Herbert Stevens of London, England.

Mr. Cornelius Crane is sponsor and leader of the Crane Pacific Expedition which will circumnavigate the Pacific Ocean and collect land and marine zoological specimens. The voyage is being made on his yacht, the *Illyria*. Mr. Karl P. Schmidt, Assistant Curator of



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Reptiles, a leader of the mammal section. Among other members of the expedition are Dr. Henry W. Hensley, Curator of the Museum of Zoology of Johns Hopkins University, Dr. W. J. Minn of Harvard Museum of Science, Mr. George H. Brown of Johns Hopkins, Mr. Stephen N. Mitchell of Cornell and Messrs. Walter A. Wood and Frank Wauder of the Museum's Department of Zoology.

The David Whitehead Vertebrate Expedition of Field Museum, Chicago, and led by its leader, David B. Whitehead, New York and Major John C. Gray of Johns Hopkins, left in October to make mammal collections in Virginia. Among other members of the expedition are Mr. J. J. Alcock of the Academy of Nat. Sci., Philadelphia, and Mr. George E. Carter of University, Maryland.

The Hayden-MacMillan Botanical Expedition of Field Museum, which began operations in June 1927, was finished its work and returned home in September, 1928. This expedition was grouped by Mr. Frederick H. Ewens, and was led by Commander Donald H. MacMillan. The expedition was successful in making important collections of microorganisms, botanical, geological and general material, and it obtained much new scientific data on a wide variety of subjects, including the ethnology of the Eskimo and Indians of Labrador and Baffin Land. Among the members of the expedition were Dr. William D. Strong, Assistant Curator of North American Ethnology and Anthropology of the Museum, Mr. Stuart E. Roy, Assistant Curator of Invertebrate Paleontology of the Museum, Mr. Alfred C. Wood, Assistant Curator of Botany of the Museum, Mr. Arthur C. Eastgate of the Museum, Baltimore, and Mr. Charles S. Sewall, Botanist of Worcester, Mass., and Dr. E. E. Laughton of Chicago. Working in conjunction with the Hayden-MacMillan Expedition was the Rogers-Marsden Field Botanical Expedition, which was organized in charge of Assistant Curator Roy, which collected invertebrate fossils.

The Field Museum-Oxford University Joint Expedition to Mississippi completed its sixth season of archaeological excavations on the site of the ancient city of Natchez during 1928 with excellent success. The season was extremely fruitful in the recovery of numerous objects in the lower strata of the great temple mound of ancient Natchez. Large sections of the temple of Hachigahoon, the Earth Goddess of the Natchezans, have been exposed. Material excavated this season is estimated to date back to between 4000 and 3000 B. C. An almost complete but unexcavated platform, and well preserved

remains of a two-wheeled chariot, which are believed to be the oldest relics of their kind ever excavated, are numbered among the most important finds.

Human and animal skeletal material, important for the light they throw upon the life of the ancient city, have also been unearthed. The expedition will continue its operations in 1929. Captain Marshall Field is sponsor of the expedition for Field Museum, and Mr. Herbert Weld is its sponsor for Oxford. Professor Stephen Langdon of Oxford, is director of the expedition; Mr. L. S. Watelin is in charge of excavations; and Mr. Henry Field, Assistant Curator of Physical Anthropology at Field Museum, was one of the principal collectors during the season of 1928.

The Captain Marshall Field Anthropological Expedition to Europe did not return to the United States until 1928, although its work of collecting material bearing upon prehistoric man, for use in a proposed Hall of Prehistoric Man in the Museum, was completed in 1927. Assistant Curator Henry Field was leader. The two Captain Marshall Field North Arabian Desert Expeditions, the first of which ended late in 1927, and the second of which worked in the spring of 1928, were also under the leadership of Assistant Curator Field, and they made an extensive archeological survey of part of the North Arabian or Syrian Desert lying between the Damascus-Maan railroad and Bagdad. The expeditions covered some 6,000 miles, discovered several hundred open-air prehistoric sites, and obtained important specimens and data.

Two Captain Marshall Field Archaeological Expeditions to British Honduras under the leadership of Mr. J. Eric Thompson, Assistant Curator of Central and South American Archaeology at the Museum, conducted operations in 1928. The first, which had begun its work in the latter part of 1927, concluded operations in 1928. The second expedition departed in December to continue the researches into ancient Maya civilization begun by the first expedition, which discovered the sites of three buried cities. In addition to the archaeological work, ethnological studies are to be made, and Maya artifacts are to be collected.

The Museum obtained a collection of woods, including some rare ones, and herbaceous material from Panama, as the result of a joint expedition of Field Museum, Yale University, the New York Botanical Garden and the United Fruit Company. Captain Marshall Field was sponsor for the Museum. Mr. George Proctor Cooper of Los Angeles was the collector.

A joint expedition of Yale University and Field Museum made collections of the fauna of Nicaragua. Mr. E. C. Engleming of Puerto Cabezas was the collector.

A botanical expedition, sponsored by Captain Marshall Field, which has been working for several years in South America is charge of Dr. A. Weberbauer of Lima, Peru, continued operations.

A zoological expedition in South America, Dr. Conrad P. C. Frazarstone of Toronto, also continued operations begun in previous years. Captain Marshall Field is its sponsor.

The Museum was the recipient of many contributions during the year. It is feeling hard to receive the expressions of gratitude to all who have made contributions in money and material.

Acknowledgments of contributions of funds follow somewhat:

Mr. William V. Kelley made a gift of \$100,000 to defray the expenses of the William V. Kelley-Roosevelts Expedition to Eastern Asia for Field Museum.

Captain Marshall Field made his annual contribution of \$500,000 to cover the expenses of various Museum expeditions of 1928.

Mr. Ernest R. Coatsworth gave the sum of \$25,000 which represents the final payment on his contribution of \$125,000 to the Museum.

President Stanley Field made contributions totaling \$89,998.16 during the year. These included \$61,998.76 towards the building deficit fund; \$20,998 to cover the operating deficit of the Museum for the year 1928, and \$7,001 to cover the operating expenses of the Stanley Field Plant Reproduction Laboratories for 1928.

Mrs. Stanley Field made a further contribution of \$20,000, making a total of \$120,000, towards the Sam Carroll Field Fund for the purchase and installation of a pipe organ in the Museum.

Mr. Cornelius Crane is financing the Crane Field Expedition of Field Museum which sailed late in 1928, and will continue operations through most of 1929. In connection with this expedition, he gave the Museum also \$2,000 for the purchase of supplies and equipment.

Mrs. Emily Crane Chubbuck made a contribution of \$10,000 to be known as the Emily Crane Chubbuck Zoological Fund.

Mr. Richard T. Crane, Jr., gave the Museum \$1,000 for the purchase of specimens for the pine collection in Herbert N. Gray Insectary Hall.

Mrs. William H. Morse contributed \$1,000 for the purchase of twelve fine pieces of early Chinese jade.

Mrs. Anna Louise Raymond made a further contribution of \$2,000 for the work of the James Nelson and Anna Louise Raymond Public School and Children's Lecture Division, which was established in 1925 on an endowment of \$500,000 provided by her, and which has been the recipient of other generous contributions she has made.

For the purchase of the Herbert Devine Jade Collection the following contributions were made: from Mr. Martin A. Ryerson, \$1,000; from Miss Kate S. Buckingham, \$1,000; from Mrs. George T. Smith, \$1,000; from Mr. John Jay Abbott, \$100, and from Mr. Charles B. Goodspeed, \$100.

Mr. Henry J. Patten donated \$1,000 to be used in financing archaeological work.

Mr. William J. Chalmers continued his contributions as in past years by giving \$435 for the purchase of specimens of minerals for the William J. Chalmers Crystal Collection.

Mrs. Chauncey B. Borland gave \$150 for the purchase of a petrified turtle with ancient Chinese inscriptions.

The American Friends of China contributed \$475 as their annual gift for the development of the Chinese section of the anthropological collections.

Mr. Henry M. Wolf gave \$250 towards the purchase of a ceremonial Chinese robe from the Herbert J. Devine Collection.

The estate of the late George F. Porter paid the Museum a legacy of \$25,000, and the estate of the late Arthur B. Jones paid a legacy of \$2,000.

The South Park Commissioners turned over to the Museum \$212,637.59 derived from the tax levy authorized for this purpose by the State Legislature.

The great amount of material for the collections of the Museum received as gifts is a cause of satisfaction, because it indicates that the Museum has a large number of friends who take an active interest in its growth and development. Details of the acquisitions of the year are given in the departmental sections of this Report, and in the list of Accessions beginning on page 513. Among noteworthy gifts were two specimens of red deer, given by Lord Astor of London, England, a beautifully cut rose quartz bowl given by Mr. Richard T. Crane, Jr., and a collection of 3,240 specimens of minerals given by Mrs. Charles M. Higginson. The red deer are from Lord Astor's hunting preserves on the island of Jura off the coast of Scotland, and they have been made into an attractive exhibit



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installed in George M. Peabody Hall. The case quartz bowl has been placed on exhibition in Hubert N. Hightestham Hall.

Noteworthy donations and specimens for the various Departments of the Museum were donated, and by the following individuals: Mrs. Chaucery J. Ingraham, Mrs. William H. Moore, Mrs. George T. Smith, Miss Kate Parkington, Mrs. Joseph Smith, Mrs. Edward F. Ayer, Mr. Martin A. Ryerson, Mr. John Jay Abbott, Mr. Charles B. Goodspeed, Mr. Henry M. Wolf, Mr. Milton C. Rowley, Mr. John Boster, Mr. Corwin Cramer, Mr. William J. Johnson, Mr. Richard T. Crane, Jr.

Other noteworthy additions to the collections were acquired through Museum expeditions, purchases, and through exchanges with other institutions. Details of these will be found elsewhere in the Report. Among the most notable of these are a large Maya altar stone bearing a Maya date corresponding to 673 A. D., obtained by the Captain Marshall Field Anthropological Expedition to Central Honduras; a large mammoth specimen, weighing about 1,400 pounds, from Galton, Queensland, Australia, which was purchased by the Museum; an unusually well-preserved skeleton of a prehistoric, susceptible, *Procerosaurus* from Germany, acquired by purchase; the previously mentioned whole and other parts of ancient chariots, believed to be the oldest in the world, excavated from the ruins of Eilat, by the Field Museum-Oxford University Joint Expedition to Mesopotamia; a log of blackwood maple, one of the finest woods in the world, obtained by a joint expedition in Panama of Field Museum, Yale University, the New York Botanical Garden, and the United Fruit Company; and a store of the specimens of prehistoric stone implements and fragments collected in the Gobi Desert in Inner Mongolia by the Central Asiatic Expedition of the American Museum of Natural History, New York, with Field Museum, cooperating, under the leadership of Dr. Hoo Ching-shan, Andrews.

Gratifying results have been attained in all branches of the work in the five Departments of the Museum during 1928. Collections have been enlarged; installations of new exhibits have been continued at a satisfactory rate; many older exhibits have been re-stuffed and improved; research has been conducted into many subjects; a number of publications have been issued setting forth the results of important work by the scientific staff, and much work has been done on other still in course of preparation; cataloguing, inventorying and labeling have been carried on conscientiously; members of the staff have given lectures to the Museum and else-

where, including radio talks; and a great amount of public service has been rendered by the Staff in answering the many inquiries which come in on various subjects within the scope of the Museum.

An important publication issued by the Museum during 1928 is *The Prehistory of Aviation* by Dr. Berthold Laufer, Curator of Anthropology. Because of the prominent place aeronautics hold in public interest at present this publication proved extremely timely.

Important from the scientific standpoint was the discovery, during the year, of a new type of crocodile from New Guinea by Mr. Karl P. Schmidt, Assistant Curator of Reptiles. The species, described in a Museum publication issued recently, was discovered by Mr. Schmidt through work on some crocodile skulls which had been transferred to the Department of Zoology from the Department of Anthropology, which had received them with an ethnological collection.

The discovery also of a new genus of Abyssinian aquatic rodents by Dr. Wilfred H. Osgood, Curator of Zoology, who led the Field Museum—*Chicago Daily News* Abyssinian Expedition, is the subject of another publication issued during the year.

The various Divisions of the Museum—Raymond Division, Public Relations, Library, Printing, Photography, Roentgenology, Illustration and Memberships—as well as the Departments have all made notable progress during 1928. The details of their work appear elsewhere in this Report.

All educational activities of the Museum were continued in 1928, some of them, particularly those dealing with children, on a larger scale than theretofore. Every effort has been made to increase the use of the Museum and establish the most friendly relationships between the institution and the public, both adults and children. The usual spring and autumn courses of free illustrated lectures on science and travel by eminent explorers and scientists, were given in the James Simpson Theatre of the Museum, and the response on the part of the public has been most gratifying. Special series of lectures for Members were also given. All seats in the Theatre were lettered and numbered, and this has simplified the reserving of seats and aids greatly in ushering the holders of them.

As in past years traveling cases containing natural history and economic exhibits were circulated among the schools of Chicago by the N. W. Harris Public School Extension Department of the Museum. The number of cases used and the number of schools and other centers served has continued to increase as in past years.

Throughout the school year lecturers with lantern slides were sent out to the schools by the James Nelson and Anna Louise Raymond Public School and Children's Lecture Division of the Museum. Also under the auspices of this Division the usual spring and autumn series of free morning picture entertainments for children were given in the James Nelson Theatre of the Museum, and in addition special similar programs were arranged for the summer and winter seasons.

The educational work conducted for children by the Museum through the N. W. Harris Public School Extension Department and the James Nelson and Anna Louise Raymond Public School and Children's Lecture Division, was made the subject of a pamphlet, "Field Museum and the Child," published by the institution in 1928. This pamphlet contains a complete outline of this work, and is for distribution to school officials, principals, teachers, and others interested.

Guide-lecture tours of the exhibits were given twice a day, except Saturdays and Sundays, at the Museum, under the plan inaugurated in December, 1927, whereby subjects are changed daily instead of maintaining, as in the past, a set schedule repeated each week. These tours have attracted many visitors, and their success is attested by favorable comment received direct from the public and through the press of Chicago during the year. Guide-lecture service has been furnished also for special groups including adult members of various organizations, and classes of children brought from the schools and elsewhere. Several hundred letters were received from boys and girls, members of the "Four H Clubs" located in widely separated parts of the United States and Canada, expressing their appreciation of their visit to the Museum while attending the International Live Stock Exposition.

The public has been reached further by lectures given over the radio, some by speakers assigned by the Museum, and others by outside radio speakers interested in this institution.

The Library of the Museum performed valuable service to the general public as well as to scientists and students, and because of the important collections of reference works on natural history subjects it contains, it is a large factor in the educational work carried on.

The Museum suffered two serious losses by the deaths during 1928 of Mr. David C. Davies, Director and member of the Board of

Trustees, and Mr. Watson F. Blair, Second Vice-President and member of the Board of Trustees.

An obituary of Mr. Davies appears at the beginning of this Report (page 387).

Mr. Blair died on February 7, 1928. He had been a Trustee of the Museum since 1894. In 1909 he was elected Second Vice-President and held that office until his death. He was also a Patron, a Corporate Member and a Life Member of the Museum. The following tribute was paid to his memory by the Board of Trustees in a resolution adopted on May 21:

"The death of Mr. Watson F. Blair having been announced at the monthly meeting of the Board of Trustees of Field Museum of Natural History, held May 21, 1928, the following resolution was adopted as a testimonial of his unselfish labors in behalf of the institution:

"The Trustees of Field Museum of Natural History have learned with profound regret of the decease of their fellow Trustee, Watson F. Blair, February 7, 1928.

"The closing of the life of Mr. Blair removes from the Board one of its oldest members. He had served as a member of the Board of Trustees and of its Finance Committee since the incorporation of the Museum. In 1907 he accepted the Chairmanship of the Finance Committee and a membership on the Executive Committee, and in 1909 he was elected Second Vice-President of the Corporation. As a member of these Committees, and as an Officer of the Board, he performed his exacting duties with unflinching interest, ability and devotion until the time of his death, although they involved, especially in the earlier years, a considerable sacrifice of his time.

"He was in the fullest accord with the purposes of the Museum, and was always deeply concerned in its progress and welfare.

"The Trustees extend to the members of Mr. Blair's bereaved family their sincere sympathy; and in token thereof have unanimously adopted the foregoing testimonial and ordered it to be spread upon the records of the Board, and a copy of same to be properly attested and presented to the family of the late Watson F. Blair."

On July 16 the Board of Trustees elected the present incumbent, Stephen C. Simms, formerly Curator of the N. W. Harris Public School Extension Department, as Director, and also as a member of the Board of Trustees, to fill the vacancies caused by Mr. Davies' death. The new Director also became a Corporate Member, and was elected Secretary of the Museum, which office had likewise been held by Director Davies.

At the end of 1928, Mr. Harry E. Byram resigned from the Board of Trustees because of his change of residence to New York City. His resignation was accepted with regret.

At the December meeting of the Board of Trustees Mr. Fred W. Sargent and Mr. Samuel Insull, Jr., were nominated to fill the vacancies on the Board caused by the death of Mr. Blair and the resignation of Mr. Byram. Final action on their election was scheduled for the January, 1929, meeting.

Further tribute was paid to the memory of the late Carl E. Akley, to whom the Hall of African Mammals was dedicated as "Carl E. Akley Memorial Hall" in 1927, through publication in 1928 by the Museum of a portion of photographs of the principal examples in Field Museum of Akley's work in both taxidermy and sculpture.

There were few changes in the scientific staff of the Museum during 1928. Dr. Paul C. Standley, for nineteen years Associate Curator of the United States National Museum at Washington, D. C., joined the Staff of Field Museum as Associate Curator of the Herbarium. Dr. Ralph Linton and Dr. William M. McGovern, both of whom had been Assistant Curators in the Department of Anthropology, resigned. The services of Dr. George T. Allen were re-engaged and he continued his work through the year as Assistant Curator of Egyptian Archaeology. Mr. Lowell Williams of the Department of Botany was given the title of Assistant in Wood Technology. The title of Mr. J. E. Thompson, formerly Assistant Curator of Mexican and Maya Archaeology, was changed to Assistant Curator of Central and South American Archaeology.

A number of changes resulted in the personnel of the Lumen Nelson and Anna Louise Raymond Public School and Children's Lecture Division. Mrs. Dorothy R. Coakley resigned as Chief and Mrs. Margaret Fisher Pyatt, her senior assistant, was promoted to fill her position. Mr. Edmund Cooke, guide-lecturer, resigned, and Mr. Cleveland P. Grant, formerly guide-lecturer, was appointed Acting Curator of the N. W. Harris Public School Extension Department. Three guide-lecturers were engaged to fill the vacancies on the staff. In the order of employment they are: Mr. Frank Putney, Miss Jane Work, and Mr. A. L. Hertel. Miss Margaret Cornell continued with the Division, becoming the Senior Assistant Lecturer.

The Museum has been fortunate in having the wholehearted cooperation of the newspapers, and of various organizations in control of advertising media, in its campaign of publicity and advertising.

Generous space has been given the activities of the Museum in the newspapers of Chicago and the press of the country as a whole. The Museum has been advertised in posters displayed by local transportation companies, by space given in theatre and opera programs, and by the distribution of Museum direction folders through railroads, hotels, civic associations, and other organizations. Details of the publicity and advertising are given elsewhere in this Report. Grateful acknowledgement is hereby extended to those in charge of the various enterprises which have thus given generous assistance in promoting public interest in this institution.

A large amount of reconstruction work and improvement in the building was undertaken and completed during 1928. Of first importance was the preparation of the new halls on the ground floor, the opening of which has already been referred to. Involved in this work was the moving of the north wall of Hall J, containing the Egyptian collections, seven feet to the north, and the building of a new type of case 199 feet long on the north and east walls. A similar case thirty feet long was constructed on the west end of the south wall. These cases extend fourteen feet to the ceiling, and the upper parts are offset to form an upper overhanging case immediately above the view glass of the lower section. Illumination is provided within the case but entirely outside the range of vision. Installed in the lower sections are mummies on inclined benches and other ancient Egyptian relics, with fabrics stretched on frames on the back walls and tomb sculptures set flush with those walls. Installed in the upper cases are a seventy-seven foot facsimile of the funerary papyrus of Ani, and, occupying 116 feet, plaster casts of sculptures enameled and glazed with umber to bring out the detail. These cases follow closely in principle, construction and illumination the habitat group cases in the Department of Zoology, but their adaptation to anthropological material and the installation methods employed here are, so far as can be learned, an innovation in museum work.

A case thirty-six feet long for African wood carvings was built on the west wall of Hall D. Tile partitions were built along the south side of Hall J and on the south and east sides of Hall B (one of the new ground floor halls unoccupied as yet). The doors to the north of Hall J leading to the stairways and passenger elevator were removed, and the openings enlarged to the full width of the corridors.

Various partitions were removed and doors and transoms blocked up to make available for exhibition space areas previously used for

storage north and south of Hall K (unoccupied ground floor hall) and also north of the James Simpson Theatre. About three hundred feet of fresh air duct were removed, and the fresh air inlets on the north wall of Hall J were connected to the fan under the north entrance. This reduced the route of travel for fresh air through ducts to Hall J by more than four hundred feet. The removal of this air duct, together with the removal of old steam mains and other abandoned service pipes, made available the aforementioned storage space, some 11,000 square feet, for future ground floor exhibition halls. The removal of the old steam mains from the ceiling also made feasible the construction of the new types of exhibition cases in Hall J and it may be said, in fact, that every exhibition hall on the ground floor has been greatly benefited by the removal of the pipes.

Steam tunnels and trenches were caulked with tarred rope oakum. Ceiling outlets for illumination in Halls D, E, G, H and J were lined up. Those in Hall J were extended down the piers to provide for future individual case lighting. This, and the removal of paper partitions, involved a great amount of plaster cutting and patching.

Halls D, E, F, G, H and J, and the corridors leading to the cafeteria, were painted. New shades were provided for Hall H. Two balcony fronts and three stained glass windows representing eighteenth century Egypt were repaired, fitted with light boxes, and installed on the south wall of Hall J. Nine cases in Hall K were provided with ground glass in their ceilings, and their interiors were painted in preparation for scenic backgrounds for future exhibits of marine mammal groups.

Much miscellaneous improvement and maintenance work was done in various parts of the Museum. Two bronze cases were provided at the south end of Stanley Fleish Hall for the installation of New Guinea leather masks of towering height. Insulating papers were installed in windows of Halls 9, 21 and 22. All window drapes were taken down, cleaned and rebung in certain halls, and the walls where the drapes hung were cleaned. Five cases for habitat groups of Asiatic mammals were built in William V. Kelley Hall (Hall 17) and ten such cases were built in Hall 16, devoted to habitat groups of American mammals. Illuminated case labels were provided for these and other similar cases. Six partition walls were built between Halls 16 and 17. Illuminating boxes and trussings were fitted to cases for the nyala and dik dik groups.

A new system of individual case lighting in Ernest R. Graham Hall, and a system of beam lighting for the new fossil paintings in

that hall, were installed. New silverite glass was installed in the tops of cases.

Because of the inadequacy of space and the unsuitability of the former ground floor location of the X-ray studio, it was installed in more suitable quarters on the third floor. It now occupies a suite of three rooms—operating room insulated with lead sheeting, dark room, and office.

New sun curtains were installed in the photographic operating and printing rooms.

Much interior cleaning and painting was done, particularly in the Herbarium, and in Rooms 7, 40 and 108 on the third floor. Some 870 trays, with racks in steel cabinets, were constructed for bird and mammal storage, and many model cases and much other equipment necessary for the work of the various Departments were made.

On the roof of the building new skylight bars and ribbed wire glass were installed on the main skylight, except for nineteen rows of lights at the southeast corner which were placed in 1927. A large fan was installed at either end of the clerestory under the roof to circulate the air, as an added precaution to prevent condensation on the skylights. The terra cotta cornice and the court windows were tuck pointed. Four men worked full time cutting out loose mortar joints in the marble work and refilling them with cement mortar. All of the exterior window sills of the building received a coat of paint.

Western Union Time Service was installed during the year for the clocks at the north or main entrance, and at the entrance to the James Simpson Theatre. A new canopy was installed at the west door.

Under its agreement with the Shedd Aquarium the Museum began supplying heat to that building in December, when it was found that it would be needed for drying out purposes during construction.

LECTURES AND ENTERTAINMENTS

GENERAL LECTURES.—The Museum's forty-ninth and fiftieth courses of free lectures were given in the James Simpson Theatre on Saturday afternoons during the spring and autumn months. These were illustrated by motion pictures and stereopticon slides. Following are the programs of both courses:



THE LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Foreign and District Lectures

- February 25—"An Excursion to Yagou (Yao)"
Professor Maxime G. Perrot, leader of the Yagou Expedition of the Expedition Institute.
- March 5—"Among Savages in America!"
Mr. Howard H. Craker, New York City.
- March 17—"An Explorer's Life"
Professor John Gairdner, Institute of Archaeology, Liverpool, England.
- March 14—"Managers!"
Dr. Victor Gollancz, formerly Assistant Director of the British Museum, Manager, Field Museum, leader of the "Carnegie-Macmillan Field Expedition to Madagascar."
- March 31—"Savages in America."
Dr. Daniel Melissinos, Department of Public Instruction, Bureau of Commercial Economics, Washington, D. C.
- April 7—"Abyssinia and the Source of the Blue Nile"
Dr. Wilfrid H. Ogilby, Curator of Zoology, Field Museum; leader of the Field Museum-Chicago Daily News Abyssinian Expedition.
- April 14—"Camping Among the Plains and Pueblo Indians."
Dr. G. Clyde Fisher, American Museum of Natural History, New York.
- April 27—"Yucca Yucca and the Wagon of the Cosmos."
Mr. Frank S. Egge, Associate Curator of Paleontology, Field Museum; leader of the Wheeler-Yucca-Methuen Field Expedition, Indian Expedition to Argentina and Brazil.
- April 28—"Camping of Santa America"
Dr. William Macgregor Macgregor, formerly Assistant Curator of Insect American Zoology, Field Museum.

Public and Special Lectures

- October 6—"Across Sumatra from East to West"
Professor Adrian J. Harrison, Columbia University, New York.
- October 11—"Land of the Sunburst"
Mr. Fred Taylor, postmaster, Wood Park, Wisconsin.
- October 20—"On the Road of the World"
Captain John H. Noel, London; official photographer of the 1924 Mount Everest Expedition.
- October 27—"Jungle Gods"
Captain Carl von Hoffman, F. B. G. S., New York.
- November 2—"Excavations at Kish, Mesopotamia"
-Work of Field Museum-trained [?]
Mr. Henry Wood, Assistant Curator of [?]
Field Museum.
- November 20—"Wonders of America and the West"
Mr. George Francis Bennett, M. S., Cleveland Museum of Natural History.

- November 17—"Treasure Hunting in Bolivia."
Lieutenant-Colonel Charles Wellington Furlong, F. R. G. S.,
Boston.
- November 24—"Under the Northern Lights."
Commander Donald B. MacMillan, leader of the Rawson-
MacMillan Subarctic Expedition of Field Museum, 1927-1928.
- December 1—"Civilization of the Mayas—Past and Present."
Mr. J. Eric Thompson, Assistant Curator of Central and South
American Archaeology, Field Museum; leader of the Captain
Marshall Field First Archaeological Expedition to British
Honduras, 1928.
- December 8—"The Turkestan."
Mr. George K. Cherrie, member of the James Simpson-
Roosevelt-Field Museum Expedition to Central Asia, 1925-1926.

The total attendance at these nineteen lectures was 25,065.

In addition to the regular spring and autumn courses, the follow-
ing special lectures were given:

- January 14—"Birds and Animals of Alaska."
Mr. William K. Finley, Director of Wild Life Conservation,
State of Oregon.
- January 15—January 14 lecture repeated.
- January 22—"The Way of the Sperm Whaler."
Dr. Robert Cushman Murphy, American Museum of Natural
History, New York.
- January 28—"Explorations in Plant Life."
Mr. Arthur C. Pillsbury, Berkeley, California.
- January 29—"The Malay Peninsula."
Mr. Carveth Wells, F. R. G. S.
- February 11—"The Wonderland of Big Game."
Major A. Radcliffe Dugmore, F. R. G. S., F. R. P. S., London.
- February 12—February 11 lecture repeated.
- February 26—"By Aeroplane to Pigmy Land."
Professor Matthew W. Stirling, leader of the Stirling New
Guinea Expedition of the Smithsonian Institution.
- October 21—"On the Roof of the World."
Captain John B. Noel, London, official photographer of the
1924 Mount Everest Expedition.
- October 28—"Jungle Gods."
Captain Carl von Hoffman, F. R. G. S., New York.
- November 4—"Excavations at Kish, Mesopotamia."
(Work of Field Museum-Oxford University Joint Expedition,
season of 1927-1928.)
Mr. Henry Field, Assistant Curator of Physical Anthropology,
Field Museum.
- November 18—"Ptolemy's Mountains of the Moon."
Dr. James P. Chapin, American Museum of Natural History,
New York.

- November 25—Under the Southern Lights
 Commander Donald L. MacMillan, leader of the Hawaiian Marine Survey—Department of East Museum, 1917-1924
- December 2—Continuation of the Mexican Past and Present
 Mr. J. Lee Thompson, Assistant Curator of Central and South American Anthropology, East Museum, leader of the Captain Matthew Peck East Anthropological Expedition to Central Honduras, 1927
- December 20—The Vikings
 Mr. George K. Thorne, member of the James Simpson, Liverpool East Museum, 1921-1927, George Ave., 1927-1928

The total attendance at these special lectures was 17,399.

A special motion picture program, "Alaskan Adventures," given on December 15, was attended by 480.

CONCERTS—A series of chamber music concerts was given by the Gordon String Quartet in the James Simpson Theatre, on the following Sunday afternoons: February 5 and 12, March 11 and 18, and April 8 and 15.

On Sunday, May 13, Mrs. Elizabeth Sprague Coolidge sponsored a concert given by the Rose String Quartet of Vienna in the James Simpson Theatre. The total attendance at the seven concerts was 4,328.

EDUCATIONAL MEETINGS

The use of the Lecture Hall was extended to eleven educational and civic groups. These conferences were attended by a total of 1,384 persons.

RADIO TALKS

During the year, four radio talks were given by a member of the Raymond Division. Three of these were over WGN, the Chicago Tribune station, and completed the series of ten begun in November, 1927. One on "Ocean Life" was broadcast over WMAQ, the Chicago Daily News station.

LECTURE TOURS FOR ADULTS

As in previous years, the services of Museum guides-lecturers were offered without charge to clubs, organizations and other organizations, and to Museum visitors in general. For the public 114 guided tours and 125 tours covering specific subjects were arranged. Forty monthly schedules were kept at the main door for distribution to visitors. Handouts of copies were sent at the beginning

of each month to libraries, social settlements, retail stores, and other centers of distribution.

There were seventy-five groups from clubs, conventions and colleges, and fifty-two other special parties, totalling 2,362 persons, who received guide-lecture service.

General public groups numbered 399, with 3,846 in attendance.

The total number of adult tours was 526, with an attendance of 6,208.

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

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

Series of entertainments were offered as usual in the spring and autumn, and in addition summer and winter series were added this year. By arrangement with the South Park Commissioners, special children's tours and motion picture programs were conducted during eight weeks of the summer. The groups brought from the various parks and playgrounds of the South Parks system for this course of tours and motion pictures totalled 2,202 children.

In addition to the special summer series arranged under the auspices of the South Park Commissioners, Field Museum carried on during the same season a similar series under the provisions of the Raymond Fund. These programs were given special publicity in the local press, and invitations to send groups were extended to the various clubs maintained for children by Chicago newspapers, including the "Topsy Turvy Times" of the *Daily News*, "Junior Journal" of the *Journal*, "Boys and Girls Post" of the *Evening Post*, and the Sally Joy Brown groups of the *Tribune*. Ten such groups were given guide service, with an attendance of 447, and seven special motion picture programs, attended by 2,150 children, including both the newspaper groups and other children, were presented. The "Chronicles of America" series of motion pictures, a gift to the Museum from Mr. Chauncey Keep, were used for both series of summer programs.

The programs of the entire year were as follows:

SPRING COURSE

February 11—"Abraham Lincoln."

February 18—"George Washington."

- February 29 "Chung"
- March 9 "Long Days"
"Jewels of Venice"
"Bliss on the Sea"
"The Mountain Lion"
"Wander Book No. 1"
- March 16 "Papua"
- March 27 "Smoking Wings"
"Death Vagabond"
"Monkeys"
"High in the Andes"
"Horns and Horns"
- March 28 "Assorted Babies"
"The Fight for Life"
"Niagara the Glorious"
"Where the Moose Hunt Linger"
"Feathered Braves"
- March 31 "Grass"
- April 7 "An African Adventure"
"The Jaguar Hunt"
"Lions"
"The Lyons"
"Wander Book No. 2"
- April 14 "Fragments of a Naturalist Among the Indians."
[Dr. G. Clyde Baker, American Museum of Natural History, New York—restorer.]
- April 21 "China"
"Nature's Cathedral"
- April 28 "Mounts of the South Seas"
- SUMMER PROGRAM
- July 10 "Columbus"
- July 18 "Jamestown"
- July 26 "The Puritans"
"The Pilgrims"
- August 2 "Peter Stuyvesant"
"The Gateway to the West"
- August 9 "Wife and Mountain"
"The Eve of the Revolution"
- August 16 "The Declaration of Independence"
"Vermont"
- August 23 "Grand Home"
"The Pioneer Woman"
- August 30 "Yonah"
"Astruc-Hamilton"
- AUTUMN PROGRAM
- October 6 "The Frenchie"
"The Bay"
"Our Earth"
"Cannons of Greenland"
"Mysteries of Snow"
- October 13 "Beak"
"How Living Things Find a Home"

- "Butterflies and Moths."
 "Jungle Round-up."
 "Children of the Sun."
- October 20—"The Sahara."
 "Ants."
 "Bees and Spiders."
 "The Lion Hunt."
 "Perfume and Nicotine."
- October 27—"Switzerland."
 "Seaside Friends and Their Country Cousins."
 "A Day at the River."
 "Where Snowtime is Joytime."
 "Mountain Climbing in Glacier National Park."
- November 3—"China."
 "Down at Our Pond."
 "In Birdland."
 "Monarchs of the Plains."
 "Our Four-footed Pals."
- November 10—"Argentina."
 "Pirates of the Sea."
 "Pets."
 "The Story of Leather."
- November 17—"Peoples of the Mediterranean."
 "Furry Creatures."
 "Friends to Man."
 "Secrets of the Sea."
 "The Parasol Ant."
- November 24—"From England to South America."
 "Preparing for a Garden."
 "Palace of Honey."
 "Golden Fleeces."
- December 1—"The Rhine Valley."
 "Growing Things."
 "Fruit and Flowers."
 "Bird Sanctuary."
 "Monarch of the Glen."

WINTER PROGRAMS

- January 28—"Secrets of the Flowers."
 (Mr. Arthur C. Pillsbury, Berkeley, California—lecturer.)
- February 22—"George Washington."
- December 15—"Alaskan Adventures."
- December 22—"Bre'r Rabbit and His Pals."
 "The Little Indian Weaver." —
 "The Wee Scotch Piper."
 "The Little Swiss Wood Carver."
 "The Little Dutch Tulip Girl."
- December 29—Entertainment by Chief Little Moose, a Chippewa Indian.

SPECIAL

- November 12—Americanization Program.

Field Museum cooperated further with the South Park Commissioners by loaning certain films for showing in programs held at the various parks and playgrounds of the South Parks system.



HERBARIUM OF THE
UNIVERSITY OF CALIFORNIA, BERKELEY
DEPARTMENT OF BOTANY, UNIVERSITY OF CALIFORNIA, BERKELEY
CALIFORNIA, U.S.A.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Not only have the children's departments of the Chicago newspapers cooperated in bringing the summer programs before the attention of their young readers, but they have also given special publicity to the other series of children's entertainments in the spring and fall, in addition to that obtained in the regular news columns. The *Chicago Evening Post* in its children's department has reprinted some of the "Museum Stories for Children" distributed at the entertainments. The "Topsy Turvy Times" of the *Chicago Daily News* cooperated by linking some of its features with the Museum entertainments under a special arrangement.

On October 26 a meeting of both adults and children under the auspices of the Chicago Board of Education was held in the James Simpson Theatre. This civic assembly was most enthusiastically carried out. Forty local communities were represented, and men from the various organizations interested in the betterment of the city and its coming World's Fair spoke. The program closed with a group of historical puppets, depicting the development of Chicago.

The total number of children's programs was forty-one. If to this number is added the attendance of 1,200 at the meeting in the Theatre on October 26, arranged by the Chicago Board of Education, to which came children from all districts of the city, the total number of children's groups which have been entertained is forty-two, and the total attendance is 48,045.

LECTURE TOURS FOR CHILDREN.—Lecture tours correlating with school programs or organized for a general knowledge of Museum exhibits were given to groups from public, parochial and private schools of Chicago and surrounding suburbs. In all, 411 such groups totalling 17,392 children, received this service.

EXTENSION LECTURES.—Extension lectures were offered to elementary, junior and senior high schools of the Chicago public school system. The total number of schools visited was 114, and the total number of lectures given was 126. This includes the lectures presented in school classrooms and assemblies, and those given to school clubs, at conferences, and at Camp Agassiz. The total attendance was 186,398.

The titles of lectures were as follows:

- Mammals of the Chicago Area.
- Mammals of North America.

"Birds of the Chicago Area."
 "African Animals."
 "Food Fish of the World."
 "Silk and Wool."
 "Flax and Cotton."
 "Coal and Iron."
 "Activities of Field Museum."
 "North American Indians."
 "Glimpses of Chinese Life."
 "What We Owe to South America."
 "Life of the Ancient Egyptians."
 "Life of the Native Philippines."

TOTALS.—If the number of children receiving instruction by means of entertainments, tours and lectures be added to the number of adults receiving similar instruction, the total reached by these Museum educational efforts in 1928 consists of 1,566 groups, numbering 307,161 individuals.

ACCESSIONS.—The Raymond Division acquired during the year, through the Division of Photography, 432 lantern slides for use in its public school extension lectures. Thirteen other slides were obtained by purchase, making the total number added to the collection 445. This brings the total number of lantern slides now available for school lectures to approximately 5,000.

The Chicago Chapter of the Wildflower Preservation Society of America kindly loaned the Museum a number of its lantern slides on wildflowers of the Chicago area, for reproduction, and plans for a lecture on this subject, to be added to the list of school extension lectures, were thus facilitated.

NATURE STUDY COURSE

Preliminary steps were inaugurated during the year for a course in nature study to be given during the spring of 1929.

The course, as planned, will cover the topics most needed by those directing study of nature subjects in camps, school clubs, community organizations, et cetera. These will include studies of the animal, mineral and plant groups of the Chicago area, which will be discussed in the small Lecture Hall and followed by tours of correlated exhibits. The tours will be conducted by the guide-lecturers of the Museum.

Indications are that the course will meet the needs of many organizations, and it is hoped to make it a permanent part of the educational work of the Museum.

PUBLICATIONS

In the regular series of Field Museum Publications eight were issued during the past year, six of which were zoological, one anthropological, and one the Annual Report of the Director. In addition to these, one booklet was added to the general leaflet series, four to the general annual publications, and one portfolio of photogravures was issued. Following is a detailed list of these publications:

- Pub. 248—Zoological Series, Vol. XIV, No. 4. *Investigations on Insects in Panama*. By W. H. Anderson. 1924. February 7, 1925. 72 pages. Edition 1,000.
- Pub. 249—Zoological Series, Vol. XIV, No. 5. *A New Genus from New Guinea*. By Karl P. Schmidt. February 20, 1925. 8 pp., 2 photogravures. Edition 1,000.
- Pub. 249—Report Series, Vol. VII, No. 2. *Annual Report of the Director for the Year 1927*. January, 1928. 287 pp., 21 photogravures. Edition 1,000.
- Pub. 249—Zoological Series, Vol. XIV, Part III. *The Marine Fauna of Panama*. By Seth E. Mook (deceased) and Samuel F. Hildebrand. September 1, 1928. 344 pp., 31 halftones. Edition 1,500.
- Pub. 250—Zoological Series, Vol. XIV, No. 10. *A New Genus of Aquatic Bebelets from Panama*. By Wilton H. Stimpson. November 21, 1928. 9 pp., 1 photogravure. Edition 1,000.
- Pub. 250—Zoological Series, Vol. XIV, No. 10. *Beetles Collected by Salvador for the California Institute of Technology*. By Karl P. Schmidt. November 21, 1928. 12 pp., 1 sine. Edition 1,017.
- Pub. 250—Zoological Series, Vol. XIV, No. 10. *Notes on South American Cicadas*. By Karl P. Schmidt. November 21, 1928. 30 pp., 9 photogravures. Edition 1,010.
- Pub. 251—Anthropological Series, Vol. XVIII, No. 1. *The Prehistory of America*. By Berthold Laufer. December 6, 1928. 96 pp., 12 photogravures, 1 sine. Edition 1,500.

LEAFLETS

- Anthropology, No. 17. *The Versatile in History and Art*. By Berthold Laufer. March, 1928. 48 pp., 9 photogravures, 1 cigarette, 21 text-figures, 1 cover design. Edition 1,500.

MISCELLANEOUS PUBLICATIONS

- Taxidermy and Mounting*. The work of Carl E. Amey at Field Museum of Natural History. A portfolio of 47 photogravures, and text. Edition 1,000.
- Field Museum and the Child*. 24 pp., 5 photogravures, 5 halftones. Edition 1,450.
- Field Museum Stylebook*. An Editorial and Typographical Manual. 18 pages. Edition 200.
- General Guide*. Twelfth Edition. 22 pp., 1 photogravure, 2 sines. Edition 4,825.
- General Guide*. Thirteenth Edition. 28 pp., 1 photogravure, 3 sines. Edition 7,500.

To protect the Museum in the future from unauthorized use of material in some of its more popular leaflets and other publications, such as has occurred several times, it was decided to copyright all leaflets, and certain other publications. Copyrights were obtained during 1928 for "The Giraffe in History and Art," and also for the series of paintings on paleontological subjects presented by Mr. Ernest R. Graham, and photographs of these paintings.

LIBRARY

During the year there were added 2,910 books and pamphlets to the Library. The total number now on the shelves is approximately 95,000.

The Library had the good fortune to obtain several rare items that have been desired for some years. Noteworthy among these are:

- Martius, *Flora Brasiliensis*, fifteen volumes in forty, 1840-1906.
- Karsten, *Florae Columbiana*, 1858-1861.
- Gesner, *Historiae Animalium, Liber iii qui est de auium natura*, 1555.
- Aiton, *Hortus Kewensis*, 1789.
- Flacourt, *Histoire de la Grand Isle Madagascar*, 1661.
- Brasseur de Bourbourg, *Etudes sur le Système Graphique et la Langue des Mayas*, 1869-1870.
- Azara, *Reise nach Sud Amerika*, 1781-1801.
- Rengger, *Reise nach Paraguay*, 1818-1826.
- Rochon, *Voyage to Madagascar and the East Indies*, 1893.
- Levaillant, *Histoire Naturelle des Promerops... Oiseaux de Paradis*, 1807.
- Spix, *Animalia nova sive Species Novae Lacertarum quas in Itinere per Brasiliam Annis MDCCCVII-MDCCCXX*, 1825.
- Daudin, *Traité Élémentaire et Complet d'Ornithologie*, 1800.
- Sodiolo, *Contribuciones al Conocimiento de la Flora Eciatoriana*, 1833, 1895.
- Apparent, *Traité de Géologie*.
- Haug, *Traité de Géologie*.
- Brinton, *The Annals of the Cakchiquels*, 1885.

The generous distribution of the Museum's publications has continued, and the Library has received in exchange valuable material from other museums, research organizations, scientific societies, and individuals, both at home and abroad. Among these were sets of publications from Naturforschende Gesellschaft, Basel, Switzerland; The Mining and Geological Institute of India, Calcutta; the Universidad Nacional de Tucuman, Argentina; Station Océanographique, Salamambo, Tunis, Africa; Departement van Landbouw, Nijverheid en Handel, Dutch Guiana; Dansk Geologisk Forening, Copenhagen, Denmark; Sociedad de Geografia Historia,

Guatemala, Metropolitan Library, Peking, China, Ameghino, Obras Completas y Correspondencia Científica, Buenos Aires; Princeton University, New Jersey.

Through exchanges of duplicate material valuable books were obtained from the following libraries: McGill University Library, Montreal; University of Chicago Library, and Notre Dame Library, Notre Dame, Indiana.

Through the use of the system of inter-library loans it has been possible to borrow books for the use of various members of the Staff from the libraries of Chicago, and also from libraries of other cities books that were not available in any of the Chicago libraries. The Museum Library has in turn extended its usefulness by loaning its books similarly to other institutions.

The files of the Botanical Library were considerably strengthened by the gift of a collection of 666 botanical specimens, presented by Dr. Paul C. Standley of the Department of Botany.

Dr. Donald Dickey, of Pasadena, California, presented a set of his writings on birds and mammals.

During the year the final parts were received of the Oxford English Dictionary, a monumental work, the compiling of which took thirty years. Also, the concluding volume, six, was received of the beautifully illustrated set, George Hamarjargalou Collection, Catalogue of the Chinese, Korean and Persian pottery and porcelain, by Hobson.

There were written and filed in the various catalogues 12,405 cards. From the John Crerar Library were received monthly installments of their author cards, totalling 7,513.

There were prepared, forwarded and returned from the laundry 666 volumes.

EXPEDITIONS AND RESEARCH

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

The Captain Marshall Field First Archaeological Expedition to British Honduras, under the leadership of Assistant Curator J. Eric Thompson, was in the field from January to June. Mr. Thompson arrived at Belize, the capital, on January 9, and after a few days, during which he purchased stores and obtained the necessary concessions for excavations, he left for Champ 6 in the Cayo District, which is a small site dating from the close of the Maya

Old Empire. There excavations were carried on until the middle of March. On the discovery of two new sites a few miles outside of this concession, Mr. Thompson returned to Belize and obtained a concession to excavate them.

One of these cities, to which Mr. Thompson gave the name of Tzimin Cax, is of great archaeological importance, for in it were found burials of the earliest known Maya period (roughly 200 B.C.-A.D. 200). Information on this early culture is very meagre, and material is scarce. As a result of operations at this site three important burials were discovered. Two of these graves yielded pottery of a type hitherto found only in the highlands of Guatemala. It had long been believed that an early culture flourished in this mountain area, but no direct connection with any other culture known had hitherto been found. These burials supply the evidence which had been missing of a stream of highland influence filtering into the Peten regions in early Maya times. Intensive excavation will probably throw more light on this early and little known phase of Maya history.

The second site, Hatzcap Ceel, and a third site, Cahal Pichic, discovered a month afterwards, represent the close of the Old Empire, and date some eight hundred years later. This was a period of transition, of which little is known. These sites of about A.D. 600 yielded a finely carved altar stone and practically all the jade that the expedition found. The altar stone is, so far as known, the only carved Maya monument with a legible date in the United States.

A third phase of culture, rich in pottery and shell work, is also represented at Tzimin Cax. This probably represents a period intermediate between the opening and close of the Old Empire.

Unfortunately, shortage of water forced the cessation of work after six weeks of excavation. The work throughout was hampered by the uncertainty of it. Members of the expedition were compelled to wait for occasional rains to make possible each few days of work. This uncertain condition also affected the labor supply. It was impossible to sign up the laborers, Maya Indians, for a month, because at no period during the six weeks did the water supply appear sufficient for more than a week ahead. These conditions were unusual, the previous winter having been exceptionally dry, causing the shortage.

After dispatching his collections from Belize, Mr. Thompson moved to the north of the colony, and began excavations among

some small ruins at Lomas de, a few miles from Comagal, from which place he visited an interesting site on the Rio Honda, Mexico. As the Museum unfortunately had no permission to excavate on Mexican soil, he was unable to conduct any operations in this territory.

During his archaeological work Mr. Thompson collected ethnological data which will be incorporated in a publication he is preparing on the culture of the Maya Indians of central and southern British Honduras.

Work in the Maya field has been confined so far largely to a search for fresh ruins. The results of such work do not add much to our knowledge. One of the objectives of the Captain Marshall Field Expedition was to seek pottery that would shed light on the interrelationship that undoubtedly existed between different Maya cities. So far the earliest Maya pottery known comes from a city which has been named Holmul, where, a number of years ago, a fine series of pottery vessels showing a high artistic skill was found. Mr. Thompson found several graves containing this early type of pottery.

This discovery enlarges the horizon of early Maya ceramic types, and gives a clearer view of what types were contemporaneous at that early time. As a result of the expedition it will be possible in the future to date many sites by the similarity of their pottery to the new series of early types established. The same applies, although to a less extent, to the middle period. Here the horizon of contemporaneous pottery types has been considerably extended, although the exact place this horizon should occupy in the system of Maya chronology is not so certain. The expedition appears to have established for the first time the rarity of jade in early Maya times and its comparative abundance in later periods. This conclusion applies certainly to this area and probably to the whole Maya zone.

The Second Captain Marshall Field Archaeological Expedition to British Honduras and Guatemala, also led by Mr. Thompson, left Chicago in the middle of December. During the first part of 1929 intensive work will be continued at the three cities discovered by the first expedition. Especial attention will be paid to Tutuix Cax, where it is hoped Maya history will be traced even farther back.

Assistant Curator William Douglas Strong accompanied the Rawson-MacMillan-Suharsola Expedition of 1927-28 as anthropologist.

gist. Starting June 25, 1927, from Wiscasset, Maine, the expedition arrived in Hopedale, Labrador, July 18. Dr. Strong carried on archaeological investigations on near-by islands, finding several burial cairns, skeletons, and typical Eskimo grave gifts. Piloted by an Eskimo, he visited the aberrant stone ruins at Sculpin Island, north of Nain. From the type of construction, evidences of whale-bone roof-beams, lack of fire-pits, and the known fact that typical Eskimo burials were located on near-by hills, the conclusion was reached that the stone walls represented an old Eskimo whaling camp. Later investigation in Frobisher Bay revealed indubitable Eskimo ruins of this type. On July 30, while landing stores at the station site, Anatalak Bay, the first Naskapi Indians were sighted.

A cruise around Frobisher Bay in southeastern Baffin Island occupied the time from August 7 to 28. In the western end of the bay at Bishop's Island and Koojesse Inlet, stone ruins of a type identical with those on Sculpin Island, Labrador, were examined. Eskimo artifacts found in situ clinched their identity. On the Sylvia Grinnell River a base camp of Nugumiut Eskimo, living in primitive style, was encountered. Lack of able interpreters as well as time prevented the securing of collections, but sketches and photographs were made. The men and able-bodied women of this band were in the interior (vicinity of Amadjuak Lake), but their kayaks and umiaks on the Jordan River were seen.

Old stone, sod, and whale-bone iglus were encountered on Brewster Point, but time for digging was lacking. A representative collection of modern Eskimo camp debris (old lamps, harpoon-points, bone work) was secured from a temporarily abandoned camp of the Nugumiut. On Kodlunarn (White Man's) Island the ruins of Sir Martin Frobisher's camp were examined, and some fragmentary objects collected. Following the expedition's return to Labrador, the time between August 29 and September 28 was spent working on the house that was to shelter the party during the winter.

From September 29 to October 15 a trip was made south to Jack Lane's Bay and up Hunt's River in search of a band of Naskapi-Montagnais Indians. Dr. Strong was accompanied by a local boy, who, it turned out, had never been in the region before and did not know the whereabouts of the Indians. In the interior traveling was done by canoe. Storms, swift water, many portages, and an unknown country rendered the trip very difficult. There were no signs of the Indians where they had been reported to be, and though Dr. Strong and his companion pressed farther into the interior, still none were

seen. On returning from this trip Dr. Strong was held up in a snow-storm for several days. The journey against drifts, however, led to an ancient Eskimo country site was discovered at the head of Jack Lane's bay, and a series of six spear shafts, one spear and knife points was obtained.

From October 22 to December 10 ice was forming and being blown out to sea, making all travel impossible. The time therefore was spent on the houses and cutting wood.

On December 11 accompanied by one man and a dog team, Dr. Strong began a foot-hike trip which took him some forty miles northwest of the station. There he found the camp of a band of Barren Ground Indians. Some information, photographs, and worth-while objects were obtained. Low temperatures -30° and high winds made this excursion memorable. It ended when the Indians moved to a site near the station. Owing to the bad condition of the ice, the period from December 14, 1927 to January 11, 1928 was used for study. Lack of an interpreter however, made study, when Indians were near, difficult and limited in scope.

From January 12 to April 6 the best work with the Naskapi Indians was accomplished. During that time Dr. Strong traveled with the Davis Inlet band, for the most part in the interior. Struckbush, an Indian known to the whites as Joe Rich, acted as interpreter. Dr. Strong lived with him and his family, thus learning a great deal about all phases of their life. Crowded in a tiny tent with some ten Indians, eating their food, helping them haul their toboggans, and hunting with them, Dr. Strong obtained a comprehensive idea of native life. They were some two hundred miles from the station and had traveled through a large area heretofore unvisited by white men. Temperatures as low as 40° vernal, occasional periods when the Indians went on prolonged sprees on mukkasen beer, and at times lack of food, were the main hardships.

As the Naskapi depend almost entirely on migratory herds of caribou for food, their life is controlled to a great extent by the habits of these animals. Some fifteen years ago the Davis Inlet people, who originally came from Northwest River, lived on Indian House Lake with the Barren Ground band. It was then not extraordinary to kill a thousand or more caribou by spearing them when the main herd was crossing the lake on its annual autumn migration. Then, for some unknown reason, the deer changed their route, and now only a few comparatively small herds wander through the barren lands in this area.

According to the Indians, this happened because the deer smelled great heaps of bones left uncared for. The caribou, they say, told the caribou god of these bones, and he became very angry. He took all the caribou down into a distant mountain which the Indians call the Caribou House, the legend continues, and since then the Indians have been very hungry. Thus, they explain, they were forced to move to the coast where they could supplement their hunting trips with fishing, trade, and beggary. The Indians now are very careful to practise all the sacred rites pertaining to the caribou, thus hoping to make the caribou god relent. They are especially concerned about preventing the dogs from touching the head, horns, or long bones of the deer. They require that the sacred marrow used at the ceremonial feasts be eaten in the lodge, and the container cleaned at once. This is to prevent possible profanation of the deer by dogs.

The mythology of the Naskapi forms an interesting link between that recorded by Turner in Ungava and that by Speck in southern Labrador. The many references to southern animals, mere names to these people, and the contents of the myths which refer to such things as palisaded villages, suggest a rather recent northerly movement of the people. The fact that Indian place names, especially towards the coast, seem to be comparatively scarce, while they use Eskimoan or white men's names for rivers and lakes, confirms this suggestion.

A mythical people, called the Katcimedgeezue, are greatly feared by the Naskapi. These people are said to come far into the lonely interior in magical tall-bowed canoes and to steal Naskapi children. Their whistling may be heard by the common people, the Naskapi say, but they are invisible except to the Naskapi conjurers who pretend they can see them and drive them away by the aid of their own powerful spirits. This would seem to be the northern version of the tales inspired by the fierce Iroquois, who in early times drove the Naskapi to the north. Dr. Strong reports that the interior of Labrador is so utterly desolate and lonely that it is small wonder that the Indians believe it to be the abode of these and a host of other malevolent spirits.

The Naskapi Indians do not seem to regard certain areas as belonging exclusively to certain bands. Each has a huge region, that of the Barren Ground people including some thirty thousand square miles, totally unoccupied save by about one hundred Indians. Should one band be markedly successful in the hunt, or should

caribou be abundant near them, they are visited by those less fortunate. The bands are loose organizations of kinsfolk, and are constantly shifting population. Marriage is accompanied by no ceremony, but is usually monogamous. It must be between people who are not related in any close degree. An exception to this rule, however, is the tradition marriage of one band of women, traditionally termed cross-cousins. This custom is clearly reflected in their kinship terminology, and has important sociological bearings.

Their implements are simple, and except for modern rifles and axes, are largely made of wood. The Indians, unlike the Eskimo, always cook their food. This dependence on timber is the main factor preventing their moving farther north into the treeless area where the main herds of caribou seem to be present. The art of these people finds its best expression in painting on skins, although some wood and bone carving is done. Strange to say, their art capabilities seem to be very slightly developed. So far as could be estimated by exhaustive investigation, art is almost entirely intended for decoration, not for magical or religious purposes.

When the Indians are caught out in a storm or on treeless barren grounds, a heap of snow is piled up and allowed to freeze for half an hour, it is then hollowed out with a snowshoe, and deeply bedded with spruce boughs if they are available. When all the Indians are inside, the door is sealed shut. Possibly the Indians may have been influenced to build these houses through seeing Eskimo black-built snow-houses, but the construction of the Indian house is entirely different. The type is unique, and it is the first record of a house built entirely of snow among any Indians. The investigator's stay with the Indians was terminated by their return to the coast because of scarcity of caribou in the interior.

In April the expedition moved to Hopeside, where some seventy-five Eskimos were measured, and blood tests were made in cooperation with Dr. E. K. Langford, physician of the expedition.

A trip to Inian was made from April 24 to May 2, during which more than a hundred Eskimos were measured. Full data on hybridization were secured from the Moravian Mission records.

From May 2 to 18 the northern stations at Oqaa and Hahman were visited. All people encountered at these stations were measured. Various runs were investigated as thoroughly as the season permitted. Melting ice made the return journey difficult and somewhat hazardous, especially since the ice on the fresh-water lakes in the Kiglapuk Mountains was breaking up.

The time from May 19 to June 19 was spent at the station, because melting ice prevented travel. Studies and measurements of some twenty-five Indians were made, and some Indian material was collected.

From June 20 to July 4 an excursion was made in a canoe for about fifty miles over the difficult Hunt's River route to investigate a stone age Eskimo ruin reported by the Indians. Many ancient Eskimo stone implements were secured, and the ancient Sharp Hill quarry (head of Jack Lane's Bay) was thoroughly investigated.

During the period from July 5 to 22 stone age Eskimo sites at Windy Tickle and sites of the early Mission period (about 1770) were excavated at Spirit Island and Hopedale.

From July 27 to August 10 archaeological investigations of islands east of Nain were continued, partly by motor-boat and partly by canoe. On these excursions the cooperation and assistance of Messrs. Frank Henderson and Novio Bertrand, two of Commander MacMillan's aids, were of great value. Excavations were made in early Mission period ruins at Natcutuk, Ivalik, and Nukasujtok Islands. About twenty old Eskimo graves and gift cairns were studied, and their contents secured.

The cultural remains encountered during excavations on the northern Labrador coast indicate two main periods of Eskimo occupation of the region between Port Manvers and Hopedale.

The first is a stone age culture, found in small camp sites exposed by wind or water erosion, which are marked by well-chipped chalcedony, quartz, or flint points and blades, ground-stone pot fragments, adze-blades, a gouge, and stone ulus. There is a notable absence of bone or ivory work. Some small fragments of fossilized bone were found at these sites, but no worked bone implements. The majority of these sites are on the coast, but one old site which is identical was found some fifty miles up Hunt's River.

An old native quarry of colorless chalcedony, its lower exposures covered by two feet of moss and soil, was discovered at the head of Jack Lane's Bay. Hammer-stones and characteristic stone implements were found in the bare wind-eroded exposures near-by. This quarry marked the only occurrence of chalcedony known in the region, and the site shows evidence of extensive work. The character of the stone ulus, adze-blades, and of one steatite charm indicates that the makers were Eskimoan. The presence of the gouge and the type of chipped stone points indicate a relationship with the



Illustration of a Tyrannosaurus Rex, showing the head and neck, and the body and tail.

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Chicago, Illinois, U.S.A.

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greatly varying in population and in economic resources. It is assumed that the two main land-use changes during the period are related to the increased and decreased population along with changes in the wealth. There is some disagreement between sources and general reading would seem to need further research concerning what are not yet clear.

The second land-use culture is that of later, and may be detected as one of the Early Mission period. It is characterized by large rectangular plots, and well spaced trees, and is found in some of the former Plover Valley lands. The main use of the land is for agriculture, and the main use of the land is for agriculture. The main use of the land is for agriculture, and the main use of the land is for agriculture. The main use of the land is for agriculture, and the main use of the land is for agriculture. The main use of the land is for agriculture, and the main use of the land is for agriculture.

The third land-use culture is that of the latter part of the period. It is characterized by large rectangular plots, and well spaced trees, and is found in some of the former Plover Valley lands. The main use of the land is for agriculture, and the main use of the land is for agriculture. The main use of the land is for agriculture, and the main use of the land is for agriculture. The main use of the land is for agriculture, and the main use of the land is for agriculture.

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the Royal College of Surgeons, and Professor Elliott Smith of University College, London, in connection with studies of Neanderthal man. Mr. Frederick Blaschke, of Cold Spring on Hudson, New York, sculptor who accompanied the expedition, made a model of the Forbes Quarry Gibraltar skull of a Neanderthal woman, under the supervision of Sir Arthur, with the original skull before him. The Chapelle-aux-Saints cranium was taken as a model for Neanderthal man and a similar work of reproduction accomplished. The sculptor also made a one-fifth scale model of a Neanderthal man, with Sir Arthur and Professor Smith giving many valuable suggestions. Plaster casts of several Neanderthal skeletal remains were purchased to aid the sculptor. Books and other sources of information were placed at his disposal. These models will be of use in carrying out plans for the proposed hall.

The members of the expedition next proceeded to Paris, where they were joined by Abbé Henri Breuil, professor at the Institut de Paléontologie Humaine, who had agreed to act as scientific adviser. Mr. Pierre Gatier of Paris was engaged as artist, and Mr. Henri Barreyre as photographer. Headquarters were established at Les Eyzies in the Dordogne region of southwestern France. Mr. D. Peyrony, Director of the Les Eyzies Museum, kindly granted the expedition permission to collect data and to make photographs, motion pictures and color sketches in and about the famous rock-shelter of Cap Blanc, whence came the skeleton of a Magdalenian young man which the Museum obtained in 1927—the only complete adult paleolithic skeleton in the United States. Samples of the earth covering the rock-shelter were secured, and pieces from the wall were obtained for the use of Field Museum.

Cap Blanc was visited, and Abbé Breuil and Mr. Field spent much time examining collections of prehistoric objects excavated by farmers living near-by. Upon the recommendation of the Abbé, Mr. Field purchased the Castanet collection, which includes a remarkable Aurignacian necklace from La Souquette. This necklace is composed of beads made from mammoth ivory, shells, perforated teeth, and small pebbles, and is approximately 35,000 years old. All noted prehistoric caves in the region were visited to aid in selection of material for future exhibition, and several small collections were purchased. The art staff then proceeded to Mas d'Azil and made photographs, motion pictures, sketches and two models.

At the invitation of Professor Hugo Obermaier of the University of Madrid the expedition visited the renowned cave of Altamira

near Santander in northern Spain. Several small collections were purchased in that neighborhood. Data on the Archaic period were collected. Albin Frey and Mr. Field then visited the cave of Gargas and gathered first-hand information which will be of use in one of the exhibits planned for the proposed fall.

Mr. Field, accompanied by his art staff, next crossed France to Brittany's great alignment of menhirs at Carnac, where lines of single stones stretch for four or five miles. This is believed to have been in prehistoric times a great temple dedicated to the sun. An extensive series of photographs was taken, numerous sketches were made, and other data were collected. Summer data on Swiss lake-dwellings were collected at Lake Neuchâtel, Switzerland.

Valuable assistance was rendered the expedition by Miss Dorothy Garrod, of Oxford University, who discovered a Neanderthal child's skeleton at the palaeolithic cave called Devil's Tower, of the Mesolithic period at Gibraltar, where Assistant Curator Field had made some studies in 1925.

Dr. Henri Martin of Paris, who discovered in 1927 a freeze of animals definitely belonging to the Salubrian period, kindly granted to the expedition the privilege of acquiring the only set of casts made from the first mold. No other set has been permitted to leave France. The animals are life-size, carved in relief, and all females. Included is an interesting scene in which a cow, with lowered head, is chasing a man.

The Field Museum-Oxford University Joint Expedition to Mesopotamia, financed by Captain Marshall Field and Mr. Herbert Weld, completed its sixth season at Kish, working from the beginning of December, 1927 to April 1, 1928. The field director was again Mr. L. C. Watrous. He was assisted by Messrs. Henry Field and Eric Schroeder. The general supervision of the work was, as previously, in the hands of Professor Stephen Langdon of Oxford University.

During the season of 1925-26 trial trenches had been dug into the southern portion of the great temple-complex of Harasghammas, the earth gullies on the western side of the largest apparatus. These trenches entered and pierced the massive wall and platform of the temple-tower, but did not reach any of the lower levels. During the following season, 1926-27, under the direction of Mr. Watrous, it was decided to clear a large rectangular space in the area in which the temples were presumed to be located. During the season under consideration, 1927-28, it was possible to clear the soil to a depth

of five meters over an area of about a hundred square meters. The center of this area revealed a building designated in the records as Monument Z, which contained practically no objects. Although it was located beneath the Arab remains, it was above the culture stratum attributed to the period of Sargon I.

The general plan for this season was to clear a limited area down to water level, and to make an effort to obtain objects of cultural importance belonging to the earliest inhabitants of Kish. It was also imperative to secure skeletal material that would contribute to solving the problem as to the physical characteristics of the early inhabitants of Mesopotamia. The work was carried on with a force of about two hundred workmen and basket-boys. A light railway system consisting of eight small trucks was employed for the removal of the earth of the mounds above the plain level. Below this, basket-boys were used, and a space about ninety meters in length and thirty meters in width was excavated down to a depth of fifty feet below the original surface of the mound. At this point water was reached, and further digging was impossible.

Continuing below the magnificent temple of Nabonidus, erected toward the middle of the sixth century B.C., an almost sterile red stratum which covered the entire area at this particular depth was reached. Just above this red layer was found a female skeleton with a thin gold headband in place around the skull. There were numerous large pots with handles emblematic of the mother-goddess, so characteristic of cemetery "A," excavated by the expedition during its second season. From another grave, presumably that of a princess, were brought to light a beautiful lapis-lazuli and gold necklace, copper hairpins surmounted by figures of cow heads, and a variety of beads, silver earrings, bracelets and other jewelry. In the red stratum, which divides the upper and lower layers, were found two lapis-lazuli cylinder seals with clearly cut inscriptions, which Professor Langdon has been able to date at about 2950 B.C. As the work continued down toward water level, it was obvious that everything to be found below this red stratum was prior to 3000 B.C.

Human skeletons occurred in all the various levels, and Assistant Curator Field spent every day with two Arab workmen, especially trained for this kind of work, in the task of removing the earth from the bones, applying to them a thin coat of wax, and packing them in wooden boxes preparatory for shipment to Chicago. Accurate records were kept of the exact level in which each skeleton was

found, together with the objects discovered with the skeleton. Drawings and sketches of the positions of the objects were also made. Fragments of more than two hundred skeletons were sent to Chicago. The condition of the bones as water level was approached became decidedly worse, and in several cases it was impossible to preserve them.

The general culture encountered in the lower levels differs markedly from that of the layers overlying the red stratum. There was a quantity of pottery, many pieces representing new forms. There was a definite transition to a newer and richer stone culture, and numbers of very fine stone tools found in association with the skeletons, were refound. Only one small fragment of gold wire was found below the red stratum. There was a complete absence of precious stones, although there were numerous beads of new forms, particularly a skirt or girdle of long beads made from the center wheel of a large shell assumed to have been brought from the Persian Gulf. Part of the external wheel of this shell was cut off, and the shell itself was used as a primitive form of lamp. A number of copper objects were unearthed, including a lamp made in the shape of a solid copper frog with eyes of natural limestone, supporting from the center of the back a vertical rod terminating in five petals.

The two most important objects discovered in the lowest levels are remains of two chariots, one with two wheels, another with four. The former was drawn by bulls. There were several human skeletons lying in various positions inside the low-walled enclosure close to the wheels of this chariot. The wood of the wheels was disintegrated, and had become almost as thin as paper. Around the edge of each wheel were copper nails. Some weeks after the discovery of the two-wheeled chariot the four-wheeled one was encountered. The skeletons of four animals that had apparently drawn it were lying on either side of the pole. They had evidently been sacrificed with their master. Between two of the animals was found a shaft terminated by a metal boss and supporting the rings surmounted by a small copper ball, through which passed the reins. This very important discovery throws a new and precise light on the means of transport in use about 3200 B. C. The excavation of the wheels and body of the chariot was a slow and difficult process, occupying nearly three weeks. The wood was in a very fragmentary condition, and it was only by applying sixteen coats of oak varnish over its surface that it could be preserved. The framework of the chariot crumbled the moment that it was exposed to the air, but Mr. Watson

succeeded, by using meticulous care, in determining its dimensions and general technique.

According to his report, the wheels consist of wooden planks kept in place by a rim, and strengthened on both the outside and the inside by wooden cross-pieces measuring two and three-eighths inches in diameter. The rim is covered with copper nails at close intervals. The axles supported a platform which had a copper border at the anterior end, and wooden semicircular sideboards.

Close to the four-wheeled chariot was found a copper saw, probably used for cutting the wood of the wheels. There were also several human skeletons lying in this vicinity, and one complete skeleton in a very good state of preservation was recumbent on the slope some ten feet away from the rear end of the chariot.

At the close of the season the work of cataloguing and packing was completed after the division of the objects with the Irak Museum, represented by Mr. R. S. Cooke, Honorary Director of Antiquities for Irak.

During the season a comprehensive series of photographs was taken at Kish. An interesting motion picture of the work in progress was also made. Mr. Schroeder and Mr. Field also took numerous photographs illustrating the season's activities and the general progress of the excavations.

The most remarkable discovery of the season, according to Professor Langdon, is a new prehistoric culture, not Sumerian, but allied to Sumerian, equally old and entirely distinct. This new culture represents a people characterized physically by a side hair-lock worn over the right ear and falling from the crown of the otherwise completely tonsured head. They produced finely painted pottery both in one color and in yellow, black, and red. The pottery was wheel-made and decorated almost entirely with geometrical designs, although a few naturalistic motives of animals occur, connecting this culture directly with early Elam.

In 1926, Jemdet Nasr, which lies eighteen miles northeast of Kish, yielded many fragments of painted pottery and some complete painted jars and tablets of an archaic type. Mr. Watelin decided to continue excavations there in March, 1928, with a force of two hundred workmen accompanied by Messrs. Field and Schroeder. The workmen, after removing an enormous quantity of earth, found hundreds of fragments of painted pottery and some complete jars, as well as some pictographic tablets in linear script, seals of various



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archaic types, and four fragmentary human skeletons in a poor state of preservation.

An illustrated report by Professor Langton on last season's work at Kish was published in *Art and Archaeology*, November, 1928.

In June, 1928, Mr. Field returned to Kish with Mr. Showket, assistant in photography, to make a series of anthropometric measurements of the present-day inhabitants of the Kish area. In three weeks, during which the temperature reached a maximum of 121° in the shade, and the minimum was 70°, more than five hundred Arabs were measured. Front and profile photographs were taken of them and a hair sample of practically every one was obtained. This work was done with a view to comparing at some future date the people now living in the Kish area with the ancient Sumerians and Semites, and it is of particular value because no other large anthropometric series from Mesopotamia is available. More than two thousand photographs of physical types were taken.

As a result of the discovery of flint implements of prehistoric types by Messrs. L. H. Dudley Buxton and Henry Field in 1925 between Amman in Transjordan and Bagdad, an appropriation was made for the continuation of this archaeological survey, known as the Captain Marshall Field First (November, 1927) and Second (Aged to June, 1928) Archaeological Expeditions to the North Arabian Desert, led by Assistant Curator Field. A seven passenger touring car was purchased, and a desert driver was leased to the expedition by the Nairn Eastern Company in Damascus for the month of November, 1927. Thanks to the cooperation of the Air Ministry in London and particularly to Group Captain Rees, V.C., himself a keen archaeologist, the first expedition was allowed to accompany an armored car patrol into the desert. Flint implements, undoubtedly chipped by man, were collected from about twenty-five surface sites at various points in the desert. At Ilar Wells implements of Upper Chellean type were obtained from the gravels, an important discovery. The expedition proved the existence of man in a prehistoric phase of culture in the now almost waterless desert of North Arabia between the Hejaz Railway and Bagdad. The old idea that this region formed a geographical barrier to migration is disproved.

Through the kindness of the Air Ministry in London and Air Headquarters in Bagdad, and on invitation of Major A. L. Holt of the Turkish Petroleum Company, the second expedition was allowed to accompany a desert survey party. The expedition personnel

consisted of Messrs. Henry Field, Eric Schroeder, S. Y. Showket, and G. Vania. For part of the way the expedition accompanied an armored car patrol, and was thus able to visit many important sites within an area containing a hostile population. Thousands of flint implements were collected from more than three hundred new sites. A large number of photographs was taken, and all the Roman and Arabic ruins were recorded. One of the most interesting places visited is Qasr Burqa which lies on the eastern border of the great Harrat er-Rajil and was the easternmost outpost of the Roman Empire. The ruins were mapped in detail, and more than two hundred photographs were taken. Detailed information on numerous historical ruins was obtained. Photographs of the Bedouins and their tribal life were made whenever possible.

In addition to the objects collected, and the data gathered bearing upon ruined buildings, information of great value concerning hundreds of miles of desert land was obtained. Notes on the topographical nature of the country traversed, the additional information and corrections which can be placed upon the new maps, and the deduction that this was once a well-watered and fertile area inhabited by man, all resulting from this expedition, add materially to the existing knowledge of the North Arabian Desert.

A preliminary archaeological survey was made in northeastern Irak between Kirkuk and Mosul in an attempt to link the chain of prehistoric surface sites in the desert with northeastern Irak. Caves were reported from near Rowanduz and Akkra, and it seems plausible to suggest that some of the prehistoric peoples passed through these gorges or to the south at Suleimania, where search is now being made for traces of paleolithic man.

Mr. Field returned to Chicago on October 3.

A great amount of research has been accomplished during the year by present and past members of the Staff of the Department of Anthropology. The results of many of these researches have already been received in manuscript, and others have reached an advanced stage so that the preparation of manuscript for publication may be expected in the not distant future.

Professor A. L. Kroeber, Research Associate in American Archaeology, has been engaged for two years in a technical investigation of ancient Peruvian fabrics collected by him during two expeditions to Peru on behalf of the Museum. He is aided in this work by a textile expert, Miss Lila O'Neale, of the University of California. Each fabric is analyzed as to technique, color scheme, pattern,

seams, finishees, and tassels. There are often from three to six techniques employed in one fabric. Some of these appear to be new to science. When the observations have been completed they will be classified according to area and period. It is hoped that in this way not only a better idea of the range and variety of Peruvian textile art will be obtained, but also some ideas of its future development from early to later periods. A feature of the art which is already outstanding is the combination of exceedingly simple apparatus for weaving with extreme refinement of process. Professor Kroeber expects to have a manuscript on Peruvian fabrics ready for publication during 1929.

Professor Roy L. Moxley, the well-known paleopathologist, submitted a portion of his manuscript entitled "Roentgenographic evidences of disease and injury in ancient unopened mummy-packs from Egypt and pre-Columbian Peru, in Field Museum of Natural History." This investigation is based on roentgenographic made of Egyptian and Peruvian mummies in the Division of Roentgenology of the Museum.

Assistant Curator A. B. Lewis completed a study of Melanesian shell money. Melanesia is notable for the great variety of shell money formerly in use in many parts of the region. The Museum is fortunate in having in its collections examples of most of these varieties, many of which are quite rare and undescribed. The study in question gives a general account of the use of shell money throughout Melanesia, the distribution of the different varieties, the methods of manufacture, and a description of all examples in the Museum's collections.

Dr. Ralph Linton, formerly an assistant curator of the Department, and now associate professor of anthropology at the University of Wisconsin, has completed about one-half of the first of a projected series of ethnological studies based on his work as leader of the Captain Marshall Field Expedition to Madagascar. The first study deals with the Tanala, a pagan tribe of Madagascar. The Tanala live in the dense rain forests of the eastern mountain chain of the island, and have been little influenced by European contact. Their arts, industries, social organization, and religion still retain practically their original form, and they offer an unusual opportunity for the study of a primitive culture still in full vigor. Their culture appears to be archaic, retaining many features which had disappeared elsewhere even at the time of the first European contact.

A leaflet dealing with the use of tobacco in Africa has been prepared along lines which coordinate with a series of five leaflets on tobacco published some years ago. A chapter on the introduction of tobacco into Africa has been written by Curator Laufer. Assistant Curator W. D. Hambly deals with African customs relating to tobacco, while the use of tobacco in Madagascar is presented by Dr. Ralph Linton. This subject presents many points of interest which center around the growing and manufacture of tobacco, the making of pipes and snuff boxes, and many quaint customs connected with smoking.

The manuscript of a study of the painted pottery and other objects found at Jemdet Nasr has been received from Mr. Ernest Mackay, and will shortly be published in the Memoir Series of the Museum.

Assistant Curator J. Eric Thompson prepared a manuscript on the ethnology of the present-day Mayas of British Honduras.

The results of the Captain Marshall Field Expedition to Colombia of 1922-23 were submitted for publication by its leader, Dr. Alden Mason, now of the Museum of the University of Pennsylvania.

Dr. William M. McGovern, formerly an assistant curator in the Department, and now of the faculty of Northwestern University, completed a manuscript on the ethnology of the Gran Chaco region.

The Curator, Dr. Berthold Laufer, made a study of the history of the game of polo in Asia for which he has collected an abundance of illustrative and documentary material from Persia, China, and India, and continued his researches into the domestications of animals, three of which are now almost ready—the cock, the cormorant, and the cat. The last-named investigation will definitely settle the problem of the first appearance of domesticated cats in Asia and the varieties of cats produced in the Far East. Corresponding with his "Prehistory of Aviation" and "Prehistory of Television," Dr. Laufer is planning to write five more prehistories—those of telegraphy, electricity, paleontology, meteorology, and the refrigerator.

Professor F. E. Wood, of Chicago, availed himself of the opportunities offered by the Department's study room, and examined all Peruvian skulls in the Museum's collection, measuring 362 of these and making notes on teratological and pathological conditions found.

BOTANY.—The major exploration work of the Department of Botany during the past year was the Captain Marshall Field Expedi-

tion to Panama, conducted by Mr. G. Praxton Cooper, field assistant of Yale University School of Forestry, who has had wide experience in expeditionary work in Central America. For this expedition the Museum obtained the cooperation of the New York Botanical Garden, and of the School of Forestry of Yale University, through the interest of Professor Samuel J. Record, Associate in Wood Technology in Field Museum. The work of the expedition was facilitated by substantial assistance rendered by the United Fruit Company of Boston.

Mr. Cooper worked in Panama from December, 1927, until the first of April, 1928. Most of his time was devoted to exploration in the Province of Bocas del Toro, on the Atlantic coast, where he collected from 292 trees series of specimens illustrating wood and other botanical characteristics. Many of these were previously unknown to students of woods. In April he collected thirty-one wood specimens around Perené, in the Department of San Blas.

The value of the wood samples was greatly increased by the fact that herbarium specimens showing the leaves, and when possible the flowers and fruits, were also collected from most of the trees, thus making possible the accurate identification of the woods.

Around Cartago, Costa Rica, Mr. Cooper obtained sixty-seven different kinds of herbs and shrubs, and in Bocas del Toro 172 of similar plants. The expedition brought back about two thousand herbarium specimens which have been shared with the other interested institutions. The results of this undertaking were most satisfactory, the Museum acquiring a valuable series of woods and a large number of herbarium specimens from a region heretofore almost without representation in its collections.

Several papers have been published by Professor Record and Mr. Cooper detailing the results of the expedition. Among the woods obtained chief interest attaches to a fine slab of the "Carique bloodwood," which has been placed on exhibition in Stanley Field Hall. This tree, previously unknown to science, has proved to be an undescribed one, *Brassia colorata*, a near relative of the famous letterwood of the Guianas. It is one of the rarest woods in the world. The natives regard this lustrous, reddish wood as possessing curative properties, and its possession is restricted to the chief of the tribe. "Carique bloodwood," as it is known to the Indians, is not obtained from living trees, but from old trunks which have lain buried in the forest floor until nothing remains but a core of dense heartwood.

The herbarium specimens have been studied and determined by Associate Curator Paul C. Standley, who has found them to be of exceptional interest. They include representatives of two new genera, about sixty new species of trees, and one family of plants—the Quinaceae—unknown heretofore north of South America, besides several published species of trees which had not been collected before in Central America. No other recent collection of plants from middle America has proved so rich in new or rare species.

* Mr. Llewelyn Williams, Assistant in Wood Technology, proceeded early in the year to Yale University where every facility was afforded by the School of Forestry to select specimens from the duplicate collection of tropical woods in that institution. At the same time he made studies of certain tropical woods, and the results of the investigations were published under the title "Studies of Some Tropical American Woods" in the September issue of "*Tropical Woods*," the publication issued quarterly by the Yale University School of Forestry.

The Department shared in one Museum expedition, the Rawson-MacMillan Subarctic Expedition. Messrs. C. S. Sewall and A. C. Weed assembled 678 specimens of plants, mostly from Labrador. The collection, added to those obtained by the same collectors in previous years, gives the Museum an excellent series from a region imperfectly known botanically.

As an indication of the extensive use which is being made of the Herbarium for research purposes, there may be cited twenty-nine papers published during the year. Some of these were prepared by the Staff of the Department of Botany, some describe the results of Museum expeditions, and others are based, at least in part, upon material in the collections of the Department.

Professor Samuel J. Record, Associate in Wood Technology, published in *Tropical Woods* a paper of twenty-seven pages listing the trees obtained in the region of Bocas del Toro by the Captain Marshall Field Expedition to Panama, 1928, and also a list of the trees collected by the same Expedition near Permé, Panama. The vernacular names are given for most of the trees reported, and the two papers form an important contribution to the knowledge of the forests of Central America.

Associate Curator Paul C. Standley published in *Tropical Woods* five short papers describing new species of Central American trees represented in collections received for determination by Field Museum. He published also in *Science* a brief article descriptive

of Lanocella Experiment Station, Honduras, in the vicinity of which he made a large collection of plants during the winter of 1927-28.

Assistant Curator J. Francis Macbride published in *Tropical Woods* an account of the newly discovered Peruvian monogamy tree. In the same journal Mr. Williams published a detailed account of the woods of seven species of trees from Cuba, Panama, Guatemala, and Venezuela.

Mr. G. Proctor Cooper published in *Tropical Woods* two papers describing the results of the Captain Marshall Field Expedition to Panama. The first, entitled "Some Interesting Trees of Panama," treats of several important timber trees, among them the handsome blackwood caryocarp, a fine slab of which recently was placed on exhibition in Stanley Field Hall. The second paper by Mr. Cooper is a descriptive account of the forests of western Panama.

In *Tropical Woods* for March 1, 1928, under the authorship of Mr. David A. Kuhn, there appeared an important account of "The Permaid Collection of British Guiana Woods," covering forty pages and based upon a collection made for Field Museum in 1923-24 by Mr. A. C. Permaid. There are enumerated sixty-eight species of woods, belonging to sixty genera and thirty-two families.

Mr. H. C. Benke published in *Rhodora* two papers describing asters and other plants, based upon material in the Museum Herbarium. Dr. E. E. Steudl, in continuation of his studies of the genus *Bolusa*, published in the *Botanical Gazette* a paper describing several new species and varieties whose types are in the Herbarium of Field Museum.

Among other writers who have published papers based partly upon Field Museum collections may be mentioned Dr. S. F. Blake, who described ten new species of *Besleria* and *Diplazium* whose types are in the Herbarium; Mrs. F. W. Erlanson, who described a new rose in a paper appearing in *Rhodora*; Mr. Elsworth P. Kimp, who published seven new Peruvian plants collected by the Captain Marshall Field Expedition to Peru; Mr. C. E. Kobushik, whose monographs of Acanthaceae list many Field Museum specimens; Dr. Francis W. Pennell, whose paper upon "Agulinas and Allies in North America" cites numerous Museum specimens, especially from the central states; and Dr. B. L. Robinson, who designated as types of certain new South American species of *Mikania speciosa* in the Herbarium of Field Museum.

The determination of unnamed collections received during the year occupied much of the attention of the Staff of the Herbarium.

The most important collection studied was that made in Panama by Mr. G. Proctor Cooper of Yale, which required several weeks because of the large number of new or rare species which it contains. A paper describing the new species was prepared and is now in process of publication.

During the year many lots of plants were received from correspondents for determination, and these have been named and in most cases added to the Herbarium. A large part of the most valuable and desirable material received during the period under review was acquired in this manner. Material requiring determination was received from many portions of the United States, and from Mexico, British Honduras, Guatemala, Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Ecuador, Peru, British Guiana, and Venezuela. Among these collections there were many interesting and unknown plants of which descriptions have been prepared for publication.

In order to make possible the accurate determination of the Museum's collection of tropical American plants of the family Rubiaceae, a group which yields coffee, quinine, ipecac, and other useful products, there were borrowed from the larger herbaria of the United States, through the courtesy of their curators, several hundred specimens of the family. These are being studied by Associate Curator Paul C. Standley who is preparing an enumeration of the Rubiaceae of Colombia, Ecuador, Peru and Bolivia.

A flora of the Yucatan Peninsula, which it is expected will be ready for publication during the coming year, has been brought nearly to completion by Associate Curator Standley.

Assistant Curator J. Francis Macbride has been able to devote a satisfactory amount of time to study of the collections of the Captain Marshall Field Expeditions to the Peruvian Andes. These collections, supplemented by those of Dr. A. Weberbauer, Mr. Carlos Schunke, and other collectors, are serving as the basis of a comprehensive list of the flora of Peru, now in course of preparation. During the year manuscript has been prepared for several of the larger families.

In the determination of Illinois plants Mr. H. C. Benke, of Chicago, contributed generously of his time, naming specimens sent by correspondents to the Museum for determination, and revising the identifications of specimens already in the Herbarium. Dr. Earl E. Sherff, of Chicago, has continued in the Herbarium his studies of the Compositae, particularly in the genus *Bidens*, and

BLUES-WINGED TEAL.
 This species is one of the most numerous and common of the waterfowl of California. It is found in all parts of the State, and is especially abundant in the Central Valley. It is a migratory species, and is found in large numbers in the Central Valley during the winter months. It is a very hardy and resilient species, and is able to withstand the harshest conditions of the winter. It is a very common species, and is found in all parts of the State. It is a very hardy and resilient species, and is able to withstand the harshest conditions of the winter. It is a very common species, and is found in all parts of the State.

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FIGURE 1. A pair of Blue-winged Teal, Taxidermy, mounted in a wooden frame with glass front. The birds are shown in a naturalistic setting with reeds and grasses. The display is mounted on a wooden frame with a glass front. There are two informational plaques, one above and one below the display.

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has determined critically most Museum material, thus increasing its value.

From the Herbarium there were sent out in 1928, in exchange, 8,975 specimens of plants. This material consisted in large part of duplicates from the U. S. Systematic Botanic Collections, but included also a substantial number of specimens from the United States.

The loans made from the Herbarium during the year amount to 3,622 specimens. Many of these were specimens of difficult groups of tropical American plants sent to institutions for determination for the benefit of the Museum. Among those who have cooperated in the determination of critical material are Mr. Edwin E. Hartman, of Berksville, Pennsylvania, in mosses; Professor Oskar Aron, of the Botanical Museum of Harvard University, in orchids; Dr. E. L. Robinson, of the Gray Herbarium of Harvard University, and Dr. S. F. Blake, of Washington, D. C., in Compositae; Dr. William Yribeuse, of Urbana, Illinois, in Hypericaceae; Dr. William R. Maxon, of the United States National Museum, in ferns; Mr. Ellsworth P. Killip, of the United States National Museum, and Dr. Ivan M. Johnston, of the Gray Herbarium, in various groups of South American plants; Dr. C. L. Shour and Mr. John R. Stevenson, of the United States Department of Agriculture, in fungi; Mrs. Agnes Chase and Dr. A. S. Hitchcock, of the Department of Agriculture, in grasses; Mr. Loren B. Smith, of the Gray Herbarium, in Bromeliaceae; Dr. N. L. Britton, of the New York Botanical Garden, in various groups; and Dr. M. A. Howe, of the same institution, in algae.

Of the more important loans sent out upon request to persons wishing to study the specimens may be mentioned: 1,400 sheets of grasses of the genus *Psychopodium* to Mrs. Agnes Chase, who is preparing a monograph on this group; 100 specimens of *Phlox* to Dr. Edgar V. Wherry, of Washington, D. C.; thirty-seven numbers of *Mimodactylon*, to Dr. H. A. Gleason, of the New York Botanical Garden; 124 specimens of *Labiellaceae*, to the Natural History Museum of Vienna, for study by Mr. F. E. Wimmer; 120 specimens of South American plants to the Botanical Museum of Berlin; and sixty-four specimens of *Agrostoides* to the Missouri Botanical Garden, St. Louis.

It is especially pleasing to note the increasing use that is made each year of the Herbarium. The loans made to outside students prove that the importance of the Museum's collections are being

nized elsewhere, and the same fact is indicated by the large number of correspondents who forward material for determination. Frequent requests are received, also, for the names of local plants brought to the Herbarium by visitors from the Chicago district. By mail there are received numerous requests for information covering many branches of botanical knowledge, requiring the expenditure of much time to furnish the necessary data. The Department of Botany has assisted in the work of other Departments of the Museum by supplying information upon botanical matters.

The Herbarium has enjoyed visits during the past year from a large number of botanists of the United States and foreign countries who came to study the collections or to make the acquaintance of the Herbarium and its Staff.

Dr. J. S. Enander of Lillhardal, Sweden, one of the leading authorities of the world upon the willows, spent two weeks in the Herbarium, studying the *Salix* collections and annotating them. Dr. Enander was commissioned by the Swedish government to make a trip around the world for the purpose of studying willows and obtaining living material of them for introduction into Sweden, where they are used for basket making. With the assistance of the Staff of the Department and friends of the Museum he obtained a collection of cuttings of the willows of the Chicago region for shipment to Sweden. The death of this noted willow specialist, within a few weeks of his visit to the Museum, is noted with regret.

Mr. Charles C. Deam, State Forester of Indiana, Bluffton, Indiana, visited the Herbarium twice in order to obtain data for use in the preparation of an account of the grasses of his state. Dr. Cristobal Hicken, of Buenos Aires, one of the leading botanists of Argentina, visited the Museum in June, to familiarize himself with the Herbarium and the plant geography of the Lake Michigan dunes. Dr. C. R. Ball, of the United States Department of Agriculture, studied the collection of American willows, upon which he is an authority. Professor Edgar Anderson, of the Missouri Botanical Garden, St. Louis, studied the Iris collection, and Mr. R. E. Woodson, of the same institution, studied the American plants of the family Apocynaceae. Mr. H. Teuscher, of the Morton Arboretum, Lisle, Illinois, visited the Herbarium in order to identify specimens of woody plants. Mrs. Eileen W. Erlanson, of the University of Michigan, studied the collections of American roses.

Mr. G. S. Witterick, of the University of Washington, Seattle, was engaged for the greater part of the summer in the study of the species of *Agave*, a group of *Compositae* and he utilized the Museum's extensive collections in this group. The Museum borrowed from other herbaria a large number of specimens for use in the preparation of his monograph.

Among other visitors to the Herbarium were Dr. Wilson Piper, Director of the Lamont Experiment Station of the United Fruit Company at Pico Bonifacio; Professor F. L. Stevens, of the University of Illinois; Mr. G. Proctor Cooper, of Yale School of Forestry; Professor H. E. Stork, of Catholic College, Northfield, Massachusetts; Professor L. A. Kennerly, of Edinboro, Michigan; Mr. E. J. Palmer, of the Arnold Arboretum, Jamaica Plain, Massachusetts; Dr. Ivan M. Johnston, of the Gray Herbarium of Harvard University; Dr. Albert W. Henre, of Leland Stanford University, California; Mr. Willard N. Chase, of Boston University, Philadelphia; Indiana; and Mr. Edwin E. Hartman, of Ellensburg, Pennsylvania. Several students of the University of Chicago also made use of the Herbarium.

(GEOLOGY)—Assistant Curator Stuart R. Roy, after completing his work as a member of the Rawson-MacMillan Subarctic Expedition, went to Newfoundland in charge of a special expedition provided for by the Captain Marshall Field fund. There he continued the work of collecting fossils and other geological specimens which had been begun in the previous year in Labrador and Baffin Land.

The winter months he spent chiefly in preparing, labeling and packing the specimens from Baffin Land and Newfoundland that had been obtained in the year previous. A preliminary study of the Baffin Land fossils indicates that the fauna is of a later period than had previously been supposed. It is expected that the complete study of the material will throw much light on the paleontology and stratigraphy of the Ordovician period in the Arctic.

Since the matrix of many of the specimens was calcareous shale, their preparation required considerable time, but by painstaking care a fine series was made ready for study and exhibition. Collecting was resumed early in the spring and was continued until the middle of August. The area chiefly investigated in Newfoundland was the so-called "eastern region" which included the "Avonlea Peninsula" and that region lying between the eastern boundary of Notre Dame Bay on the northeast coast and the Bay d'Espoir on the south coast. The west coast was also visited.

The locality at Manuels gave the best results, more than four hundred specimens of the fossils of Upper and Middle Cambrian age being obtained there. In all, about two thousand specimens were collected during the season. These belonged to the classes Lamellibranchiata, Annelida, Gastropoda and Trilobita. A large proportion are trilobites of Middle and Upper Cambrian age, and because of their antiquity and rarity they are an important addition to the Cambrian collections of the Museum. Their importance is further increased by the fact that preliminary studies indicate that many new genera and species will be found among them. Remarkably good preservation characterizes most of the fossils. The Cambrian fossils are of unusual interest also because many of them can be closely correlated with those of Massachusetts, New Brunswick, Great Britain, France, Spain, Bohemia and Scandinavia. These correlations indicate definitely that an open marine passage existed between northeastern North America and northwestern Europe during Middle Cambrian time.

A comprehensive collection was made also of the ores and minerals of Newfoundland, twelve different localities being represented in the specimens secured.

At Sydney, Nova Scotia, Mr. Roy rejoined the Rawson-Mac-Millan Expedition on its return trip, and reached the Museum early in September. All the specimens which he obtained are of species new to the Museum collections.

Through the courtesy of Judge George Bedford of Morris, Illinois, an opportunity was afforded to send Mr. J. B. Abbott of the Museum paleontological staff to visit several localities in Kansas, Nebraska, South Dakota and Colorado from which vertebrate fossils had been reported. Judge Bedford not only generously donated the use of his car, but accompanied Mr. Abbott on the trip to these localities. The first point at which collections were made was near Winona, Kansas, where remains of a large Mosasaur had been reported to the Museum by Mr. Mentor Etnyer of the Etnyer Survey. This locality yielded a skull, lower jaws, paddle bones and some other skeletal parts of the large Mosasaur, *Tylosaurus*, all of which were carefully excavated and shipped to the Museum.

A find of the horned dinosaur, *Triceratops*, near Camp Crook, South Dakota, was next investigated, but the specimen proved to be too poorly preserved to warrant removal. The party then proceeded to the well-known locality for fossil mammals at Agate Springs, Nebraska.

Here Mr. James Cook, owner of the property, kindly gave permission to excavate. About thirty cubic yards of sandstone were blasted out and removed in order to reach a fossil-bearing layer. From this, a slab seven feet long, four feet wide and fourteen inches thick was removed intact. This slab contains thickly assemblages of Miocene rhinoceroses and associated animals. It is planned to exhibit this slab as a whole, after carefully exposing the bones to view. Besides this slab, five excellent skulls of the par-borned rhinoceros, *Dicotyles*, were collected at the locality. The party then proceeded to Hoehler Island, Colorado, where another find had been reported by the Etnoy Survey. A few reptilian bones were obtained there. The collection resulting from six weeks spent in the field in these localities is of much value.

Associate Curator Henry W. Nichols made a brief trip to the oil fields at Lawrenceville, Illinois, in order to obtain data, sketches and photographs for use in constructing a model of an oil well for exhibition at the Museum. Through the kindness of Dr. M. M. Leighton, Chief of the Illinois State Geological Survey, Mr. E. R. Fritz of the Survey, who was thoroughly familiar with the field, was detailed to accompany Mr. Nichols and assist him in securing data. A number of the important wells in the district were visited, and about thirty photographs and many sketches showing details of the machinery and other features were made, all of which will be of much assistance in insuring accuracy and instructiveness in the model.

Several series of fossils from those collected by the Captain Matson Field Paleontological Expeditions in South America have been placed in the hands of specialists for study and description. Dr. W. A. Storer of Princeton University has completed the study of a series of marzipan-vertebrates collected by the second expedition, and has submitted the manuscript of this study for publication to the Museum. Dr. W. H. Scott of Princeton University has in preparation an extended description of the extinct mammal *Hemidactylus*, an animal of which a large part of a skeleton was obtained by the second expedition. This study will also be submitted for publication by the Museum. Dr. G. E. Wheland of Yale University has at hand a series of the bones of an Artibeus-like bat, probably of Tertiary age, collected by the first expedition, the study of which is expected to throw much light on the origin of this group. Dr. Wheland spent a week at the Museum during the summer in the study of these bones. The results of his studies it is expected will soon be available for

publication by the Museum. The fossil bird remains collected by the second expedition have been placed in the hands of Dr. A. Wetmore of the United States National Museum for study and description, and a report of his conclusions is expected shortly.

Dr. James H. C. Martens, the geologist of the First Rawson-MacMillan Subarctic Expedition, completed his studies of the series of sands which he collected in the regions visited, and his results are now in course of publication by the Museum.

An illustrated lecture on mining in South America was given during the summer at the Museum by Associate Curator Nichols to members and guests of the local section of the American Institute of Mining Engineers. Associate Curator Elmer S. Riggs gave a lecture, during the Museum's spring course, on the fossils of the Valley of Tarija, Bolivia.

The Curator and members of the Staff devoted a not inconsiderable amount of time to answering inquiries received by letter and in visits. Information was furnished in this way to 350 correspondents and sixty visitors. These requests were largely for identification of minerals and fossils, but more general information also was often sought.

ZOOLOGY.—The zoological work of the Rawson-MacMillan Subarctic Expedition of Field Museum was largely devoted to fishes and to efforts to obtain exhibition material of the larger mammals, such as seals and polar bears. The expedition reached Nain, Labrador, late in July, 1927, and after a period of unloading, sailed on August 9 for a three weeks' stay in Baffin Land, where a circuit of Frobisher Bay was made. Opportunities for zoological collecting were very limited, and only a few specimens could be collected at this time. After returning to the station, near Nain, all hands were required for the work of building winter quarters. Freezing weather then set in.

Fishing through the ice was begun in January and carried on until about June 1, whenever weather permitted. Nets were set in the bay early in June and tended regularly during that and the following month. Dredging with a small dredge was done in July and August with very satisfactory results.

Meanwhile, hunting and trapping for birds and mammals were carried on, and much time was devoted to hunting seals, a number of which were secured. Polar bears were not found in the vicinity of the station, and members of the expedition were not able to secure

specimens directly, but all specimens were obtained by means of which specimens suitable for use in the preparation of a habitat group were acquired. The collection of animal mammals, although not large, includes very desirable material. The same is true of the birds. Animal life on land was exceedingly scarce and difficult to obtain, having been subjected to one of those periodic depletions so well known in northern latitudes.

The result of the fish collecting was much more satisfactory. All the more numerous fishes were obtained in suitable quantity, and most of the rarer ones. The number of fish specimens is 1,100. Full notes on the habits, distribution and peculiarities of the fishes were taken, and excellent color sketches were made from the fresh material. A general collection of marine invertebrates, numbering 2,400 specimens, was preserved, together with a small number of insects.

Zoological hunting in India was continued by Colonel J. C. Fauchald, from whom eighteen specimens of large mammals were received. These include selected examples of sambar deer, wild deer, Indian antelope and south bear, fulfilling nearly his former promise to be installed in William V. Fisher Hall, devoted to Asiatic mammals. In addition to group material, Colonel Fauchald obtained several desirable specimens for the systematic exhibits, among them being examples of the Indian barking deer or muntjac, and the four-horned antelope.

Three large and important new zoological expeditions were organized during the year, all starting within a period of a few weeks in October and November.

The William V. Fisher-Roosevelt Expedition to Eastern Asia of Field Museum, which has been in preparation for some months, left the United States in two divisions, the first sailing from New York November 20, and the second from Vancouver B. C., December 22. The expedition is the result of continued interest in Field Museum and its Asiatic expedition on the part of the brothers, Colonel Theodore Roosevelt and Leonard Roosevelt. It is planned on a similar scale to that of the previous James Simpson-Roosevelt Asiatic Expedition, and will undertake explorations which, to a certain extent, will supplement and enlarge those of that expedition.

The expedition is sponsored and financed through the generous contribution of Mr. William V. Fisher of Chicago, president of the Middle Westing Press and Manufacturing Company. Mr. Fisher, previously identified with Field Museum as a Patron, has been

added to the list of Benefactors. The first division of this expedition is being led by the Roosevelt brothers personally. Accompanying them are Mr. Suydam Cutting of New York, who will act as photographer, and Mr. Herbert Stevens of London, England, zoological collector. These four men expect to work northward near the Tibetan border in the provinces of Yunnan and Szechuan in south-western China. This is an exceptionally rugged, mountainous country in which travel is likely to be slow and laborious. Thence, turning southward along the gorges of the Mekong River, the party will descend into northern French Indo-China where it will meet the second division. This second division has the following personnel: Mr. Harold J. Coolidge, Jr., of Pride's Crossing, Massachusetts, mammalogist and division leader; Dr. Josselyn Van Tyne, of Ann Arbor, Michigan, ornithologist; Mr. Russell W. Hendee, of Brooklyn, New York, mammalogist and artist; and Dr. Ralph E. Wheeler, of Cambridge, Massachusetts, physician and naturalist. This division will work intensively for some months, mainly in the northern and western parts of the province of Tonkin in northern French Indo-China. Much of this region is wholly unknown zoologically, and it is proposed to make a thorough study of its whole vertebrate fauna.

The two divisions of the party, after meeting in central French Indo-China, will proceed as a body to the province of Cambodia for a collection of large mammals to complete the needs for habitat groups in William V. Kelley Hall. The expedition will remain in the field during the greater part of 1929. It enjoys the cooperation of the Paris Museum of Natural History and the British, French, Chinese and Siamese governments.

The second important zoological expedition which set out in 1928 is the Crane Pacific Expedition of Field Museum, sponsored and accompanied by Mr. Cornelius Crane, who is a son of Mr. Richard T. Crane, Jr., a Trustee and Honorary Member of Field Museum. The expedition is traveling on Mr. Crane's brigantine auxiliary yacht, the *Illyria*, recently built and especially fitted with laboratory, refrigeration, diving gear, and other equipment for zoological collecting. The party is as follows: Assistant Curator Karl P. Schmidt, of Field Museum, herpetologist and scientific leader; Dr. A. W. Herre, of Stanford University, ichthyologist; Dr. W. L. Moss, of Harvard University, physician and immunologist; Mr. Walter A. Weber, of Field Museum, artist and ornithologist; Mr. Frank C. Wonder, of Field Museum, taxidermist. Three friends of



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Mr. Crane has accompanied the expedition and will have charge of photography and will act as assistant to the scientific staff. They are Mr. Sidney Shufflett of London, Mr. Murray Pughman of London, and Mr. Charles E. Peck of Mexico, D. C.

The expedition passed from Sonora to Sinaloa by a short strip at Bermejo, Hual, and Pinaros, *et passim*, to Tula. The route is to cover most of the drainage of the Tula and the Tula Valley, the principal points being Guasmas, Maryanna, Tula, El Salinas, San Sebastian, San Joaquin, Maricopa, Tula, Bermejo, Kuroshi, Llaneros, San Juan, Siqui, *et passim*, Tula, *et passim*. The trip will average about one year and subsequent to winter in number of outings will be made. Events recorded up to the year were to the effect that a brief strip of only a few days in Hual had been very successful resulting in the preservation of over 400 specimens.

The third new zoological expedition is the Harold White-John Coats Atkinson Expedition of Field Museum which left New York in October. This is financed jointly by Captains Harold A. White of New York City and Major John Coats of Arizona, Scotland, both of whom accompany the expedition. A third principal member is Mr. C. J. Albert of Field Museum's staff taxidermists. Mr. George E. Carey, Jr., of Hillmore, Ill. is a member of the party. In addition, there are several professional photographers from England and Germany who will make a special photographic record of the expedition's operations.

The object of the expedition is the general zoological exploration of northwestern Sonora in the district of Maja and near Lake Huah and Stefano, a region which was not reached by the former Field Museum-Chicago-Italy-New-Africanian Expedition. A special objective will be material for a large hybrid group of the reticulated giraffe, which has its center of abundance in this region, and which is the finest and handsomest of the giraffes. The route of the expedition, therefore, will be southwestward from Agua Ahua to Maja and thence to Lake Stefano and around the north end of Lake Huah. In this vicinity, the party will divide, Mr. Albert taking one section with accumulated collections to pullhead in Koma and returning via Tula, while Captain White and Major Coats strike southwestward through the possession of Kaha, possibly returning via the Silver River and the White Lake.

King Tula, Makoman, is whom Field Museum is already indebted for many fowls in possession with its previous Africanian

ian expedition, has again been most courteous in according privileges and facilities for travel. This is deeply appreciated.

The Department of Zoology had the following publications in press at the close of the year, as the result of research conducted by members of the Staff:

Zoological Series, Catalogue of the Birds of the Americas, Part VI, by C. E. Hellmayr.

A Contribution to the Ornithology of Northeastern Brazil, by C. E. Hellmayr. Leaflet Series No. 10. The Truth About Snake Stories, by Karl P. Schmidt. Leaflet Series No. 11. Frogs and Toads of the Chicago Area, by Karl P. Schmidt.

The Department acknowledges very substantial assistance from Volunteer Assistant Charles Westcott, who has been in full time attendance, and has catalogued 3,676 birds, read and corrected proofs of several lengthy manuscripts, and otherwise aided in carrying on the routine of the Department.

Following the general growth in recent years, the Staff has met with a great increase in miscellaneous routine which has made great inroads upon the time of every member. The demands from the public for information or assistance by letter, by telephone, and in person are vastly greater than formerly. Increased activities in exhibition work, in the conduct of expeditions, and in relations with other Departments of the Museum and with visitors from other museums both American and foreign, all combine to keep the Staff fully occupied.

The following list indicates the various expeditions in the field during 1928:

LOCALITY	COLLECTORS	MATERIAL
KISH, MESOPOTAMIA (Sixth season)	Stephen Langdon L. C. Watelin Henry Field T. K. Penniman René Watelin	Archaeological collections
BRITISH HONDURAS (Two expeditions)	J. Eric Thompson	Archaeological collections
NORTH ARABIAN DESERT	Henry Field Eric Schroeder	Archaeological collections
PERU	A. Weberbauer	Botanical collections
PANAMA	G Proctor Cooper	Botanical collections
NICARAGUA	F. C. Englesing	Botanical collections
NEWFOUNDLAND	Sharat K. Roy	Paleontological collections
ABYSSINIA	Captain Harold A. White Major John Coats C. J. Albrecht George E. Carey, Jr.	Zoological collections

INDIA	James F. Lamberton	Zoological specimens
LARBAK and BATTIN LAND	Donald D. MacMillan Alfred C. Wood Arthur G. Hunnert Shant K. Bho William Thomas Strong Charles S. Newell E. K. Langford, M. D.	Anthropological, botanical, zoological and zoological specimens
SOUTHEASTERN ASIA (Two continents)	Colonel Theodore Roosevelt and Ernest Roosevelt Harold G. Knibbe, Jr. Saylham Cutting Herbert Stevens Jenselyn Van Tyne Ralph E. Wenzler Russell W. Henne	Zoological collections
PACIFIC ISLANDS AND EAST INDIES . . .	Cornelius Crane Karl P. Schmidt W. L. Moss, M. D. Albert W. Henne Charles H. Peck Sidney N. Shurtleff Murray Fairbank Walter A. Weber Frank C. Wonder	Zoological specimens

Leader of expedition named first in each case.

*Leader, second contingent.

ACCESSIONS

ANTHROPOLOGY.—Accessions received and registered during the year by the Department of Anthropology amount to fifty-one. Of these twenty-nine are by gift, eight as the result of expeditions, eight by exchange, and six by purchase. These accessions are from numerous parts of the world and aggregate a total of about 30,021 objects. The principal accessions of the year are herewith briefly reviewed.

The collection secured by Assistant Curator Strong as anthropologist of the Rawson-MacMillan Suluwesi Expedition of 1927-28 consists of some 280 objects from Esimo archaeological sites, thirty-five present-day Esimo carvings and implements, five hundred ethnological objects from the Niasipi Indians, and some thirty-five ancient Esimo skeletons or parts thereof.

The archaeological material embraced in the next two periods relatively far apart in the history of the Labrador Eskimo. First, there are a large number of very ancient stone implements including both the chipped and polished stone techniques. Some specifically chipped harpoon-points of translucent staurolite and several

ground-stone ulus, or women's knife-blades, are the most interesting. The second period is that of the earliest Christian missions on the coast (about the year 1770). Bone and ivory harpoon-points, well carved soapstone dishes and lamps, caribou antler implements, and abundant beads or carved ornaments are particularly well represented. In addition there are a number of iron tools and hunting implements of an early type.

A small collection of artifacts from the modern Eskimo serves to bring this representation of ancient Eskimo life up to the present time. The skeletal material from ancient graves will be of great value in determining the physical characteristics of the older people on the coast, and when compared with the large series of modern Eskimo measurements secured by the expedition, will show the modifications that have taken place due to hybridization and changed conditions of life.

The collection from the Naskapi Indians illustrates nearly all phases of the life of these interesting and primitive American hunters. Their clothing is well represented, including their finely painted coats and leggings. Naskapi beadwork, which was obtained in considerable quantities, is remarkable both for its beauty and for the unique character of the designs, which seem to be rather different from the general type of northeastern Indian art. Wooden bows and crossbows, arrows of various types, stabbing spears for killing caribou in the water, and fishing implements, all serve to demonstrate the manner in which the Indians secure a living in their barren environment. The crossbows are of especial interest as not being truly native, but as having been copied from European examples in colonial times.

Skin-dressing tools, native types of knives, well-made snowshoes, toboggans, games of various sorts, and a large number of drawings made by the Naskapi themselves complete the collection. These sketches will be of great interest to the student of Indian art, depicting as they do the life of the people as they themselves see and portray it. On the whole this collection, in conjunction with a similar collection purchased from Dr. Frank G. Speck of Philadelphia, who secured it from the Montagnais of southern Labrador, will give the Museum a very representative exhibit of this culture area.

A small collection of articles of clothing, household utensils, and snowshoes from the Penobscot Indians, Maine, who are closely related to the Naskapi, was purchased also from Dr. Speck, who

obtained it as the result of an ethnological investigation of the tribe.

A beaded basket strip, a pair of beaded moccasins, and a pipe-bag beaded with quince fringes from the Sioux Indians of Dakota, were obtained through purchase.

The collections obtained by the Captain Marshall Field First Archaeological Expedition to British Honduras, under the leadership of Assistant Curator Thompson, are more comprehensive than any ever made in that country in one season. They consist of about 130 objects, chiefly of pottery, stone, jade, wood, obsidian, and shell. Larger jade objects were found in native caches buried in the tops of temples, and were probably placed there as votive offerings on the completion of the pyramids. One of the finest pieces of its kind is a small jade mask showing a Maya head in profile probably worn as a breast-ornament. Examples were obtained of ear-plugs which the Mayas wore in the sides of their ears. These were made of jade for the wealthy and of pottery for the poor. Bone ornaments and leather pendants were inserted in the holes in the center of the ear-plugs.

The area explored by the expedition proved to be rich in objects of shell. Weapons were very rare. Obsidian, which was imported from farther south, also was rare. Coral traded from the coast was found in one of the native caches, and was undoubtedly much prized by the Mayas. The pottery obtained by the expedition is of great value in making possible establishment of a sequence of periods in the development of Maya civilization.

Of a Maya altar stone found at Hatzup, Cox, a portion unfortunately is missing, but the half of it now in the Museum shows a very well carved captive, probably the victim to be sacrificed on the dedication of the monument. The Mayas had a custom of erecting a monument to mark the passage of every five or ten years. The altar in question was erected to commemorate the close of five years from the opening of the tenth cycle. A series of excellently carved glyphs in a very good state of preservation give the calendar round date 13 Ahau 13 Uo. The position that this occupies in the long count is 10.0.0.0. There follows a day 7 Ahau which presumably represents the previous K'atun ending, and highly important cycle-ending date 10.0.0.0. 7 Ahau 18 Zip. This date may correspond to February 18, A. D. 862.

The style of the glyphs appears to require an earlier date, for they are excellently carved, but possibly at this provincial center

art continued to flourish at its highest level long after signs of decadence were making their appearance in other cities. There are now known to have been a series of cities with dated monuments running along the north and south line, which now forms the frontier between British Honduras and Guatemala. In the north are situated Cax Unic and Benque Viejo, in the center Hatzcap Ceel, and in the south Pusilha, where a series of stelae were discovered during 1927 by a Field Museum expedition.

Through the generosity of Mrs. Chauncey B. Borland of Chicago the Museum obtained one of the most remarkable objects received this year—a fossil turtle of the Miocene period found in Shen-si Province, China. The carapace of the turtle is covered with six delicately traced inscriptions revealing the earliest stage of Chinese script which is identical with that found on the famous oracle bones of Ho-nan. The tortoise, in the estimation of the ancient Chinese, was a divine animal endowed with supernatural qualities and the gift of predicting the future. At a very remote period the shell of the tortoise was one of the chief elements in the art of divination. The shell was scorched over a fire, and the cracks thus arising yielded a picture foreshadowing future events. The oldest forms and examples of Chinese writing are preserved on tortoise-shell fragments containing questions addressed to soothsayers and the answers given. An examination made of the fossil turtle by Assistant Curator Karl P. Schmidt, of the Department of Zoology, showed that it represents an unknown species of the genus *Testudo*. Thus it has a bearing on three sciences—paleontology, zoology, and archaeology.

Important additions were made during the year to the Museum's collection of ancient Chinese jades. Mrs. William H. Moore of New York (formerly of Chicago) contributed twelve choice archaic pieces of the Chou and Han periods: an outstanding mace of dark gray jade clouded with brown and russet spots and decorated with the seven stars of the dipper; a ceremonial axe-head of yellow jade engraved alike on both sides with delicate tracings of animals and geometric designs; another axe-head of light gray and green translucent jade, of very early date; a unique disk of green and brown jade decorated on both sides with different designs derived from the ornamentation of archaic bronzes; two green jade dragons, one from the late Wu Ta-ch'eng's renowned collection; a semicircular double dragon; a gray jade carving of a tiger; three jade carvings of fishes of naturalistic style, and a very rare spike of brown and yellow jade in the form of a pyramid.

Nine remarkable pieces of jade are part of another gift received during the year. They include a magnificent plaque exhibiting a dragon-face vigorously carved in high relief on unusually large gray disk decorated with interlaced bands and spiral designs, three *kuai pi* (combination of nose with hair) used in the worship of ancestors, and stars of the Han, Tang and Sung periods, respectively; a plaque fashioned into the figure of a bird of the Chou period; a decorated sweet-hill of the Han period; a flask with incense of the Sung period, interesting as the forerunner in type of the later snuff-bottles; and a pair of exquisite white jade bracelets of the Tang dynasty. In addition to the jade collection this gift includes a sun-rod and an imperial ceremonial silk robe, made for the temple of Li Tzu in Peking as the presentation of an emperor's last gift for clothing the statue of this god at the conclusion of his festival. This collection of jade and other objects was acquired through joint subscriptions from the American Friends of China, Mrs. George T. Smith, Miss Kate S. Buckingham, and Messrs. Martin A. Ryerson, John Jay Abbott, Charles E. Goodspeed, Henry M. Wolf and Martin C. Schwab, all of Chicago.

Dr. Allison W. Small of Chicago presented a blue-wood statuette of the Chinese god of longevity, decorated with enamel and "longevity" characters inscribed in silver wire.

Two Korean jars of celadon pottery of the thirteenth century were presented by Mrs. Douglas Smith of Hubbard Woods, Illinois, who likewise gave a Japanese vase glazed in two colors made by Nippon. Three interesting Japanese bronze vases are a gift of Mr. Maurice F. Sullivan of Chicago. Two colored woodcut statuettes of great quality, representing Buddhist monks and provided with a date that corresponds to A. D. 1755, were given by Mr. Corwith Cramer of Lake Forest, Illinois. Dr. I. W. Drummond of New York presented an album, bound in leather, containing twenty-four photographs of Japanese sword-guards and sword-monuments in his private collection.

Fabric articles of clothing, a mat, bracelets, a robe, and a betelnut holder from various tribes of the Philippines were contributed by Mr. Frank W. Selberg of Washington, D. C. An interesting collection of costumes and utensils from the great tribes of the island of Formosa was acquired by purchase.

A very fine old piece of decorated Hawaiian tapa formerly the property of a chief was bought. The Walter Field Company, Chicago,

presented a piece of tapa from Samoa, decorated with geometric designs in the center and a vine painted on the border. An extraordinary drum from the Marquesas Islands was secured through an exchange with the American Museum of Natural History, New York. The drum is carved out of a tree trunk, and is more than seven feet high. Such drums were kept in temples and beaten to summon the tribesmen to a religious gathering at which the principal ceremony frequently was the offering of human sacrifices to the gods. The drummer had to stand on a stone platform about four feet high to reach the drum-head, which is made from the tightly stretched skin of a giant ray. The skin was beaten with the drummer's knuckles. These drums are scarce now; it is believed that not more than four are in existence.

A group of twenty-one valuable objects, chiefly from Polynesia, was received as an exchange with the Department of Ceramics and Ethnography of the British Museum, London. The collection includes some very rare articles made by the ancient Maori of New Zealand; a finely carved model of an old type canoe; a wooden box, decorated with beautiful carved designs, for preserving feathers; a kilt, and three cloaks of so-called New Zealand flax; two old wooden clubs from Fiji; a paddle club from the Marquesas; a spear-shaped club from the Hervey Islands; samples of tapa from Hawaii and Fotuna, and eight stone celts from Ashanti, West Africa.

The Museum's ethnological collections from Australia have been augmented by a welcome gift from Mrs. J. F. Connelly of Perth, West Australia, comprising four emu-feather plumes used by the aborigines for personal ornament; two bone pins worn through the septum of the nose; two bone implements for making fine serrations round the edges of stone spear-heads, and a pointing bone. The last-named is exceptionally interesting because of its use in magical ceremonies. The medicine-man, or any other person wishing to injure an enemy, repairs to the bush, taking with him this long slender bone. The instrument is held in the direction of the enemy's camp, while a curse is uttered.

A pair of so-called *kurdaitcha* shoes, purchased from Mrs. Connelly, consists of bundles of emu feathers bound with human hair. Yet, in spite of their harmless appearance, they were in time past part of the medicine-man's equipment when tracking a foe. The shoes are the same shape at each end, a fact which may render the medicine-man safe from detection. There would be difficulty in determining direction from such tracks, and the spoor could not



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be said to dilute our judgement. While awaiting these leather suits, the Hungarian mountaineers were instructed to "keep warm and dry."

A great amount of winter clothing was bought, but will be received in full as the result of the Hungarian Government's donation of the East German clothing industry. The Hungarian mountaineers were also provided with a large selection of winter clothing, including a large selection of heavy winter boots, heavy winter jackets, and heavy winter hats. The winter clothing was provided to the mountaineers by the Hungarian Government. The winter clothing was provided to the mountaineers by the Hungarian Government. The winter clothing was provided to the mountaineers by the Hungarian Government.

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Mrs. Elizabeth G. ...
 Address: ...

From the expedition to western Europe, ...
 brought back ...
 and other objects excavated ...
 Among the most important objects ...
 including ...

shells, and small pebbles. This was excavated in the cave of La Souquette near Les Eyzies in the Dordogne region of France.

The entire range of the paleolithic periods is very well represented by the collection of flint implements resulting from this expedition, which include a series of fine "laurel-leaf" (Solutrian) blades. Wherever possible, a complete collection of flint and bone implements and casts of animal remains found in one limited locality were purchased, so as to render the collections of greater scientific value and interest. The majority of the rarest prehistoric objects of France are in the Musée National at St. Germain-en-Laye near Paris; casts of most of these were purchased. Further, casts of all the remains of paleolithic man found throughout the world were obtained through Damon and Company in London and Dr. F. Krantz of Bonn, Germany. A set of casts of a frieze of animals found at Le Roc in the Charente by Dr. Henri Martin of Paris was also acquired.

Exchanges made during the year with the Logan Museum, Beloit, Wisconsin, and Mr. Harry G. Beasley of London, England, have resulted in the acquisition of two small but valuable collections from Africa.

The ethnological objects received from the Logan Museum were collected by Professor George L. Collie and his staff in southern Algeria and the Hoggar Mountains, a somewhat inaccessible region in the northern Sahara. This collection of sixty-eight objects relates to the culture of the Tuaregs, a tribe engaged chiefly in breeding camels and carrying on the caravan trade of the Sahara. In this collection the most valuable object is a large shield of oryx hide, ornamented with ancient and intricate designs. Several locks of brass and wood are of a pattern traceable to ancient Egypt. Baskets of the coiled type, richly ornamented leather goods, and a pottery drum are welcome acquisitions. A small group of personal ornaments includes a stone armlet of ancient pattern, valuable alike for its antiquity and excellent workmanship.

From the collections of Mr. Beasley, Field Museum acquired a set of 122 small brass weights from Ashanti on the west coast of Africa. These were used in time past for weighing gold dust in the presence of the king. They are cast by the lost-wax process, and their forms are interesting in relation to the plant and animal life of the country. Other objects of interest in this collection are a well-carved wooden mask from the Yoruba and a peculiar human fetish figure from Gaboon near the mouth of the Congo. From the

same locality are derived three ornamental ivory combs and a tobacco-pipe of excellent style.

Dr. James Walker of Chicago presented three articles of clothing worn by men of distinction among the Bakongo people of West Africa. The two caps are contemporaneous with very fine linen, and to have been prepared from European patterns. The shoulder cape is skillfully woven from fine fibers of raffia-palm leaf. Mr. Arthur Flute of Chicago presented a pair of Zulu bracelets which are a good example of the plating of fine silver and copper wire made by that tribe.

An exchange with the Rhodesian Museum, Bulawayo, Africa, resulted in the acquisition of three rings and one small stone implement of the early prehistoric period from Rhodesia. This is an interesting group representing the Central and Africanian zones of South Africa.

An exchange with the South African Museum of Cape Town yielded a collection of archaeological material which rounds out the Museum's South African prehistoric collections. These specimens, suggestive of the Solutrean period of Europe and the Caucasus of North Africa as well as an enormous ring or pebble, the second largest on record from South Africa, are worthy of special mention. A number of ethnological objects from various tribes such as the Bushmen and Kaffirs are included in this collection. They are all good, are old, and are suitable for exhibition. Many of them represent types no longer obtainable in their country of origin.

By purchase from Dr. Neville Jones, Bulawayo, Rhodesia, who is the foremost living authority on the stone age of South Africa, there was obtained a collection comprising more than a hundred objects illustrating all the important types of stone implements found in South Africa, properly identified as to localities and culture. It is the most complete collection of the sort that has been brought to the United States, and forms an important addition to the Museum's collections.

By exchange with the Rhodesian Museum there was secured a small but valuable collection of European ethnological and archaeological material. Many of these objects are of types no longer obtainable. In view of the fact that the Museum has previously had no European material, this is a welcome addition.

With funds of the Charles Marshall Fund Expedition to Malawi, part of some ethnological, ethnological material was acquired, mainly

from the Barotse tribe. It includes baskets, wood-carvings, weapons, pottery, musical instruments, and a good series of fur cloaks made from the skins of various animals, previously lacking in the Museum. Five of these robes have been placed on exhibition. Seven Zulu tobacco-pipes of types not previously in the Museum were given by Dr. Ralph Linton.

In addition to the material accessioned last year, about 1,500 objects from the Bara, Tanala, Betsileo, and Imerina tribes of Madagascar were received this year from the Captain Marshall Field Expedition to Madagascar in charge of Dr. Linton. Especially noteworthy are fine wood carvings and brass castings from the Bara and an unusually complete Tanala collection illustrating practically all known types of artifacts produced by this tribe. Three large iron lamps, one of these the property of the last Betsileo king; a ceremonial axe, emblem of royalty among the Betsileo; two royal robes of silk heavily beaded, the only ones which have ever left the island; about fifty other robes of wild silk and cotton, and four magnificent carved panels are the outstanding features of the Betsileo collection. The Imerina material consists of a number of fine blankets of domestic silk and a huge blanket of wild silk woven by an Imerina princess to be used as her shroud, one of the best examples of Imerina weaving extant. Most of this Imerina material has been placed on exhibition.

BOTANY.—The number of specimens received by the Department of Botany in 1928 was 21,864, an increase of 6,946 over the specimens reported for 1927. The number of accessions was 241. Of the specimens mentioned, 1,930 were additions to the economic collections, consisting in large part of wood samples. The remainder, amounting to 19,934 specimens, were herbarium specimens.

Of the herbarium specimens, 2,900 were presented by friends of the Museum; 11,155 were received in exchange from various institutions and individuals; 3,900 were purchased, and nearly 2,000 were acquired as the result of Museum expeditions.

Professor Samuel J. Record, Research Associate in Wood Technology for the Museum, and professor at the Yale School of Forestry, has continued to contribute herbarium material of tropical American timber trees, and during 1928 forwarded 371 specimens, chiefly from Central America. Particularly worthy of mention among these was a collection made on the east coast of Nicaragua by Mr. F. C. Englesing, of the Bragmans Bluff Lumber Company, which has

proved of special interest because it contained numerous woody plants unknown to science. Mr. Jennings's specimens were made in a part of Tehuacan in which he was working and been there before Professor Davis's collection of several collections from various localities within the same area, some of which he brought to the United States. The material, like the earlier ones, was made in the month of vegetation in that country. In every hemisphere included in that time of the undistributed plants.

The Museum's Illinois Herbarium was increased by several notable additions. Mr. H. C. Deane of Chicago, after a season of diligent botanical in the state presented 41 specimens which will help to fill the gaps in that collection, and he gave a number of specimens regarding the distribution of the tree members of the Illinois flora. Mr. Robert Highway of Chicago, Illinois, presented 100 specimens from Railroad County, Illinois, among which are represented many of the less common members of the state flora. Study of his collection revealed a new Illinois *Salix* (*Salix* *laevis*) and a new form of the common yellow pond lily (*Najas* *laevis*).

Mr. A. B. Tobolsky of the Illinois Natural History Survey, Illinois, presented 100 specimens, mostly of woody plants. From Dr. Martin Anderson of South Bend, Indiana, there were received 200 specimens collected in Illinois and Michigan, and from Mrs. M. H. Janke of Illinois, Illinois, three plants gathered at Havana, Illinois.

Miss Mary Brewer of Crown Point, Indiana, presented specimens of several rare plants of the Duane region of Lake and Porter Counties, Indiana, among them a rare variety of aster and a new form of the red cedar (*Juniperus virginiana*). As a gift from Dr. C. E. Hellmuth of the Department of Zoology, two specimens of rare orchids were received. Miss Nellie V. Harper of Oak Park, Illinois, contributed material of several unusual plants of the Chicago region, among them yellow-fruited forms of the black hawberry and white-flowered yellow hawberry from the same.

The Museum was fortunate in receiving in gift a large number of plants from Mexico, and Central and South America, the regions from which such study material is most desired. Most of these collections were sent for the purpose of obtaining determinations of the plants. From Dr. J. A. Purpus of Veracruz, Mexico, there were received seventy-two plants from the State of Veracruz, Mexico, and from Dr. Blas F. Eche of Ixcel, Durango, Mexico, fifty-two specimens from the State of Durango, a part of Mexico

which is almost unknown botanically. Mr. Charles F. Henderson of Berkeley, California, presented an interesting series of fifty-seven plants, mostly from Mexico. These were collected as the host-plants of insects under study by the donor, and include several rare members of the pigweed family.

As a contribution to the little-known flora of British Honduras it was particularly gratifying to receive from Dr. J. S. Karling of Honey Camp, Orange Walk, British Honduras, seventy-six specimens collected in the northern part of the colony. Mr. C. R. Lundell, of the Institute for Plant Research in Tropical America, Washington, D. C., forwarded 144 specimens from the same country, among them numerous latex-yielding plants. Dr. Salvador Calderón, of the Laboratories of the Department of Agriculture of Salvador, presented 110 specimens of Salvadorean plants, several of which were additions to the flora of that republic as published a few years ago by Dr. Calderón and Associate Curator Standley.

Professor L. A. Kenoyer of Kalamazoo, Michigan, sent to the Museum thirty-five specimens and photographs of plants of Barro Colorado Island, Canal Zone, for use in the preparation of a second list of the plants of this island by Professor Kenoyer and Associate Curator Standley, which is being published by Field Museum. Eight specimens of rare plants were received from Mr. James Zetek of Ancon, Canal Zone. The Department of Agriculture of Guatemala presented twenty-eight specimens of plants from the high mountains of that country. Mr. C. H. Lankester sent from Costa Rica eleven specimens of mosses, which have been determined through the courtesy of Mr. Edwin B. Bartram of Bushkill, Pennsylvania.

From Peru were received collections which will be useful for the flora of that country now being written by Assistant Curator J. Francis Macbride. Professor Fortunato L. Herrera, of Cuzco, Peru, well-known student of the Peruvian flora, presented 126 specimens from the wet tropical mountains, for use in the preparation of this work, and Mr. Oscar Haught of Negritos, Peru, gave forty-four interesting plants from the arid region of that locality. Both of these collections are particularly welcome because they come from localities not represented otherwise in the Museum's Peruvian herbarium.

Dr. Earl E. Sherff, of Chicago, as in previous years, has donated to the Herbarium valuable material, and in the past year contributed eighty-five sheets, mostly species of *Bidens*, a group of Com-

portion of which he is preparing a monographic account. Professor A. O. Garrett of Salt Lake City, 1926, presented a desirable series of 151 specimens illustrating the flora of Utah. From the recently established Witte Memorial Museum, of San Antonio, Texas, through the courtesy of Mrs. Ellen Schulz Quillin, a comprehensive collection of 465 Texas plants, including material of two new species, was received.

Three specimens of *Asplenium* representing previous species in this difficult genus, were received as a gift from Dr. T. E. Hall of Washington, D. C., the leading American authority upon the genus, and twelve specimens of Ohio plants were presented by the Cleveland Museum of Natural History, through the courtesy of Mr. George F. Simmons. From the veteran collector of the southern flora, Professor Albert Reel, of Fort Worth, Texas, some were received (mostly four Texas plants).

In December Mrs. Florence Patterson of Columbia, Missouri, arranged for the deposit in the Department of Botany of First Museum of the National Government of the late Harry N. Patterson. The generous gift will supplement admirably the Patterson Herbarium which was acquired by the Museum some time ago. Mr. Patterson had a wide acquaintance among American botanists, and the correspondence and other papers available contain a large amount of pastoral material. This collection is now at Carthage College, Carthage, Missouri, where, in compliance with the donor's wishes, it may be retained two years for study purposes.

Several large lots of plants were received in exchange during 1928. The most important accession of the year consisted of 8,807 specimens, many of them mounted, transmitted by the National Herbarium of the United States National Museum, through the courtesy of Dr. William R. Maxon. The material comprises chiefly of tropical American plants, and added to the Herbarium a large number of species which were not represented before. The largest item in this accession consisted of 4,128 plants from Herbarium, which constitute a practically complete set of the interesting bundle in that country in the winter of 1921-22 to Associate Curator Stanley. The Herbarium collection is now being mounted in First Museum, and will serve as the base of a flora of the Lacanja Valley, publication of which may be expected in the near future. The series appears to be that of new plants, and already twenty-five new species of *Piper* and *Psychotria* have been indicated by it by Dr. William Trelease of Urbana, Illinois.

From the Royal Botanic Gardens, Kew, England, there was received in exchange an exceptionally valuable set of Colombian plants—647 specimens—collected many years ago by F. C. Lehmann. This collection, along with other recent ones, has added to the Herbarium many South American species not represented previously.

The California Academy of Sciences, through Miss Alice Eastwood, forwarded as an exchange a desirable lot of 415 specimens, mostly from Lower California. The Gray Herbarium, of Harvard University, through Dr. B. L. Robinson, Director, with customary generosity, transmitted 659 plants, nearly all from Europe. Brother Marie-Victorin, of Montreal, in continuation of former sendings, forwarded eighty-six specimens collected by himself in the still little-known districts of eastern Canada.

From the Universitetets Botaniske Museum of Copenhagen, through Dr. Carl Christensen, there was received a particularly valuable series of 276 specimens, consisting of plants collected in Venezuela by Eggers and Warming, and of the classic collections obtained nearly one hundred years ago in Mexico and Central America by Liebmann and Oersted, among them a quantity of invaluable type material. From the Hungarian National Museum were received in exchange one hundred specimens, beautifully prepared and informatively labeled, of the exsiccatae issued by that institution to illustrate the flora of Hungary. The Botanic Station of Brignoles, France, sent ten specimens and packets of seeds. The latter have been transmitted by Field Museum to the Morton Arboretum, Lisle, Illinois, for propagation.

The Museum has been able to secure by purchase several important and extremely useful plant collections from tropical America, and these, together with others obtained by gift and exchange, have made a very large contribution to the representation of tropical American flora in the Herbarium.

Among the more important purchases were 298 plants collected in Argentina by Mr. S. Venturi, of Tucuman, Argentina, among which are many species new to the Herbarium. One of the most successful collectors of South America, Dr. Otto Buchtien, of La Paz, Bolivia, collected 300 specimens in Bolivia which have added appreciably to the Museum's extensive representation of the Bolivian flora. Another Bolivian collection purchased consisted of 300 plants collected in the Province of Santa Cruz by Mr. Jose Steinbach of Buenavista, Bolivia. Coming from a province previously unexplored,



Portulaca oleraceae
L.
Common Purslane
Portulacaceae
Cultivated in the South Sea Islands
Common in the South Sea Islands
Cultivated in the South Sea Islands

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this collection is proving to be containing a number of undescribed plants, as well as in species not reported elsewhere from Bolivia.

A useful collection, likewise, during the year consists of 145 plants collected by Dr. Constantino Meffert at Antioquia in Uruguay, a country almost without representation in North American herbaria. Through the courtesy of Dr. H. A. Gleason of the New York Botanical Garden, there were obtained approximately 100 plants collected in British Guiana by Mr. J. S. Burley from Georgetown, British Guiana, in continuation of a large series previously from the same collector in former years. From Mr. W. E. Woodson of Port of Spain, there were received 45 plants from the island of Trinidad and Tobago.

Of outstanding value among the acquisitions was a collection of 500 specimens of Mexican plants received from Mrs. Yusef Meira of San Francisco. These were obtained in the Sierra Madre in the states of Jalisco and Nayarit, mostly in localities not visited by any earlier collector. The collection was named chiefly by Associate Curator Standley, and was found to contain numerous new species as well as material of many plants which are extremely rare in herbaria.

There were purchased 333 plants collected in Haiti by Mr. Walter J. Pyerhus of Seattle, Washington. Very few plants from this portion of the island of Hispaniola have found their way into American herbaria, and the collection helps to fill certain omissions of the Herbarium's rich series of the West Indian flora acquired in large part by the field work of the late Dr. C. F. Millspaugh.

The United States section of the Herbarium was improved by the addition of 363 plants gathered in Texas by Professor Albert Ruth, of Fort Worth, Texas, by 200 selected specimens of Oregon plants purchased from Mr. J. W. Thompson, of Seattle, Washington, and by 100 California specimens obtained from Mr. A. A. Heller, of Chico, California. From Mr. Ficus Ives, of Washington, D. C., were received 336 plants collected in the course of his work in Yosemite Park, British Columbia.

From Professor Carl Epling, of Los Angeles, there were purchased one hundred photographs of type specimens existing in European herbaria. Photographs like these are of the greatest value for study purposes, since usually they are much less satisfactory as the specimens themselves for comparison in the determination of certain material.

Mr. G. Proctor Cooper, of the Captain Marshall Field Expedition to Panama, 1928, collected about 1,100 specimens of Panama plants, which are described more fully in preceding pages. Besides the set of these plants deposited in the Museum Herbarium there remains a quantity of duplicates for distribution to other institutions.

During the past year Mr. C. S. Sewall and Assistant Curator A. C. Weed, of the Rawson-MacMillan Subarctic Expedition of Field Museum, obtained 678 specimens of plants, mostly from Labrador. This collection, supplemented by an equally large number obtained in 1926 and 1927, gives to the Herbarium a substantial representation from this region.

It is gratifying to note the interest evinced by the lumber and wood-working industries, as well as by various individuals and other institutions, in the wood collections of the Museum, as evidenced by the substantial donations of valuable specimens during the year.

The Yale University School of Forestry donated a collection consisting of 1,600 authentically identified hand-specimens of tropical woods which augments the reference collection considerably. The Museum reciprocated by sending exchange shipments for study and other purposes.

The Government Forest Service of Burma, India, forwarded a shipment composed of 178 identified wood samples of that country.

The Jacob Bayer Lumber Company of New York City donated a board of black cherry.

Samples of the well-known koa wood, in addition to the wooden parts of a ukelele and a finished instrument, were presented by the Hawaiian Mahogany Company of Hawaii.

Twenty-nine boards and planks of important commercial woods from various tropical countries were presented by the C. H. Pearson and Son Hardwood Company, New York City, to be placed on exhibition.

A collection composed of 260 hand-specimens of tropical woods was secured from the Panama region by Mr. G. Proctor Cooper, who undertook the exploration of certain districts of that area in cooperation with the Museum. In addition, a log of the rare and highly-colored "bloodwood cacique" was obtained for exhibition purposes.

A board of Honduras rosewood was received from J. C. Deagan, Incorporated, Chicago, manufacturers of chimes and xylophones.

The United Fruit Company of Boston donated a board of similar wood.

A pod of Peruvian *linguistea*, collected by Mr. George Innes, president of the Agave Malingani and Timber Company of Boston, and forwarded by the Yale School of Forestry, figured in the Museum with the first authentic specimens of the true *linguistea* of the upper Amazon region.

Mr. W. E. Hirst of Highland Park, Illinois, an Associate Member of the Museum, again demonstrated his interest in the study of woods by augmenting the reference collection with several samples of foreign woods.

Through Professor Record a very interesting exhibit of the wood and latex of the remarkable Guatemala cow-tree, was received. This particular tree, *Coussia guatemalensis* Standley, is limited in its distribution to the Puerto Barrios district of Guatemala. On making incisions in the bark a creamy white sap, resembling milk in appearance, exudes, and when allowed to dry it becomes sticky. The natives, who are familiar with this latex, use it occasionally like cream in coffee, or combine it with sugar to make a sweetmeat.

Cones of white pine were presented by the Botany Department of Yale University and Mr. Huron H. Smith of the Milwaukee Public Museum.

The bark of a leguminous tree, *Cassia atropurpurea*, extensively used for medicinal purposes in South America, was presented by Mr. G. A. Farwell of Park, Davis and Company, Detroit.

A pine-bark beetle of *lyctus-vivax* from Panama was received from Mr. Thomas G. Sutherland, Chicago.

The Aschens Company, of Pineland, North Carolina, donated wood specimens of Turkey cedar and Florida pine.

Through the courtesy of Mr. D. Bassett, the Lumber Securities Company, of Chicago, contributed several hard specimens of woods from Chile and Brazil.

Specimens of Osage orange wood were secured for the Museum by Messrs. M. E. Clines and V. F. Deane of Chicago, and presented by them.

One of the most interesting wood specimens added to the collection during the year was the so-called pine cone, donated by Professor Samuel J. Record. The cone was cut out of a log secured after repeated attempts by Mr. Rufus Wood of New York City.

The tree producing this beautiful pinkish wood is *Rhamnus Zeyheri* Sond., of the Buckthorn family (Rhamnaceae), and grows in scrub forests or hot thorn-veld valleys in Zululand and neighboring regions. Ordinarily, it does not exceed twenty feet in height, and has a slender trunk that rarely attains one foot in diameter. The Kaffir name for the wood is "umini," while the Zulus refer to it as "umgoloti."

Because of its scarcity and color, the wood has been highly prized by the Zulus, and under the old tribal custom, still prevailing in the interior districts, the trees were not allowed to be cut. As a symbol of regal authority only the head of the royal house was entitled to carry a stick of "umgoloti," and infringement of this peculiar privilege was punishable by death. History recites that the Zulu king, Dingaan, who was vanquished by the Boers, invariably carried a spear of pink ivory. After his defeat he was put to death with this weapon, at his own request, by his henchmen.

Through the courtesy of Mr. O. F. Phillips of the Bureau of Agricultural Economics, United States Department of Agriculture, a tray of standard barley grains for the United States was supplied for the grain exhibit in Hall 25. The tray includes four samples of two-rowed barley—Hannah, Haunchen, Swanhalz and Chevalier; and eleven samples of six-rowed barley—Manchuria, Oderbrucker, Tennessee winter, Horsford and Gataui which are eastern grown, and Coast, Utah winter, Mariout, Trebi, Nepal and Black hull-less, all of which are grown in the west. It also contains a display of the defects of barley which are of importance as grading factors, such as damaged grains, heat-damaged grains, skinned grains, smut, soil, brome grass, other foreign material and dockage.

Some additions were made to the exhibits of edible oils, edible nuts and dried fruits in Hall 25 by purchase in the local market of fresh specimens of melon seed, a source of edible oil in some parts of the world, and of pistachio and cashew nuts and of litchi fruits.

Tubers of the elephant ear were presented by Vaughan's Seed Store of Chicago for use in the exhibit of starchy tubers and starches, and some of the starchy tubers commonly grown in the West Indies, such as yams, tannias and eddois, were supplied by Acting Curator B. E. Dahlgren.

The New York Cocoa Exchange donated samples of the following eight varieties of cacao beans, including the most important commercial beans: Accra from British West Africa; Sanchez from

the Dominican Republic, Grenada from British West Indies; Surinam from Dutch Guiana, and varieties from Panama, Venezuela, Trinidad, and India, Brazil.

Twenty-nine selected specimens of tea were presented by the Museum by the Chungking firm of Yuen-Huachuan Whistery, Tsingtau. These samples illustrate the ethnical teas of commerce, namely, Japanese, Chinese and Siamese. The Japan teas are represented by three, various and common grades of baked-fired leaves, three, medium and common grades of fermented leaves and the by-products of tea preparation, *ku*, *cha*, *chaga* and *chong-ku*. Firmin's Oolong tea leaf is represented by three grades, as well as by a sample of *chong*, *medium* and *common* fermented oolong tea. Of the green teas of China there are the popular *iron-needle*, *iron-gunpowder*, *imperial* and *orange*, each of which is represented by three grades. The *pu-eh* or fermented tea, namely, the *pu-eh* of Canton, India and Java as well as of China, are represented by the following grades listed in descending order: *flavour orange*, *peach*, *orange peach*, *peach*, *peach swimming*, *brown orange peach* and *broken peach*.

Among other economic plant material recently obtained are some newly listed products derived from such various fibers used in paper, clothing and rope manufacture. These were received as gifts from the manufacturers of such products. Crane and Company of Hallowell, Massachusetts, presented five specimens of paper material: *fine*, *rag*, *raw linen fiber* for paper manufacture, *half-stock* not yet put into the *beater*, and an *unfinished* and *finished* sheet of *hull-tote* paper. From S. D. Warren and Company of Hallowell, Massachusetts, there were received eight specimens illustrating the manufacture of spruce paper, the vehicle of our daily news print. The series consists of spruce chips for paper making, *unbleached sulphite pulp*, *bleached soda pulp*, *stock* ready for the paper machine, *resin size*, *china clay* and *cassia*.

The American Writing Paper Company of Hallowell, Massachusetts, presented material for an exhibit of various fiber paper. This arrangement, composed of eight specimens, included the following: a *box of new rags*, a *box of old rags*, a *jar of new rag ballstock*, a *jar of beater stock*, a *jar of machine stock*, *white engender* and *white glazed envelope bond paper* and *seven photographs* illustrating the various processes in the manufacture of paper. The Hollingsworth and Vose Company of Hallowell sent twelve specimens of rope and jute, together with paper in various stages of preparation made

from them, as follows: rope as received at the paper mill, rope cut and dusted, rope cooked, rope half-stock unbleached, rope half-stock bleached, jute bagging as received at the paper mill, jute cut and dusted, jute cooked, jute half-stock bleached, cables insulated with rope paper, insulating paper used for winding on wire, and samples of rag and jute papers.

At times the Department of Botany is asked to analyze samples of paper textiles. This has been done during the past year for the Department of Anthropology and the Division of Printing of the Museum. It is of great value on such occasions to have for comparison not only authentic fiber specimens and paper made from various kinds of authentic materials, but also slides and photo-micrographs of the various fibers of commerce. Nine photo-micrographs were received through the courtesy of the United States Bureau of Standards of Washington as follows: wood fiber of Douglas spruce (*Pseudotsuga taxifolia*), linen fiber (*Linum usitatissimum*), cotton fiber (*Gossypium* sp.), jute fiber (*Corchorus capsularis*), hemp fiber (*Cannabis sativa*), sweet gum fiber (*Liquidambar styraciflua*), paper mulberry fiber (*Broussonetia papyrifera*), aspen wood fiber (*Populus tremuloides*), and rice straw fiber (*Oryza sativa*). Thirty microscope slides of commercial fibers, mounted by Mr. Edwin Sutermeister of Westbrook, Maine, were acquired by purchase, namely: pineapple (*Ananas sativa*), oat straw (*Avena sativa*), bamboo stalks (*Bambusa arundinacea*), pita (*Agave* sp.), ramie (*Boehmeria nivea*), New Zealand flax (*Phormium tenax*), bowstring hemp (*Sansevieria guineensis*), hemp grown in Russia (*Cannabis sativa*), hemp grown in the United States (*Cannabis sativa*), corn stalk complete (*Zea Mays*), sugar cane bagasse (*Saccharum officinarum*), linen (*Linum usitatissimum*), raffia (*Raphia ruffa*), two slides of silver leaf poplar (*Populus alba*), sisal (*Agave sisalana*), jute (*Corchorus capsularis*), manila hemp (*Musa textilis*), paper mulberry (*Broussonetia papyrifera*), esparto grass (*Stipa tenacissima*), rice straw (*Oryza sativa*), cotton fiber mercerized without tension (*Gossypium* sp.), cotton fiber (*Gossypium* sp.), banana fiber from stalk (*Musa sapientum*), aspen wood fiber (*Populus tremuloides*), red oak wood fiber (*Quercus*, sp.), basswood fiber (*Tilia americana*), Douglas spruce wood fiber (*Pseudotsuga taxifolia*), and lodgepole pinewood fiber (*Pinus Murrayana*).

Dr. Salvador Calderón of San Salvador sent to the Museum a sample of the fiber of the palma de sombrero (*Inodes* sp.) of his

native country. Mr. G. Procter Cooper of Yale University donated a bag made of the fiber of *pata floja* *Apass* sp.

During the period under review a number of additional corn products were received as gifts from the Commercial Solvents Corporation of Terre Haute, Indiana. These consisted of the following specimens of substances obtained from corn kernels: corn germ meal, corn leaf, very fine wood shavings, grass, common butch grasses, debited grasses, butch, white to white, common grasses. All of these will be included in the collection existing, where they will serve to show the many uses to which the grain and surplus and waste products may be put.

Specimens of fruit of screw-pine (*Fraxinus* sp.) and seeds of the Virgin butch (*Musa* sp.) were secured by Mr. G. Procter Cooper during his explorations in Panama and forwarded to the Museum. Two lots of specimens of *Callitriche rigida* from Labrador were obtained by the Rawson MacMillan Expedition and are being studied by Dr. M. A. Howe of the New York Botanical Garden.

The Department of Botany obtained during the year a number of excellent photographs for use in illustrating exhibits in the hall, for lantern slides and for publications. Some of these have been secured by purchase, many others as gifts.

Through the courtesy of Mr. Charles Atwood, its vice-president, the firm of Lewis-Harrisons-Whitney, Incorporated, Chicago, presented the Museum with fifty-three photographs illustrating the cultivation, harvesting and preparation of tea for export in the different countries of the world. Mr. Allen Plummer of Chicago supplied various photographs pertaining to coffee production in Brazil. Mr. William Street, of the United States Department of Agriculture, donated a photograph of a field of potatoes in blossom.

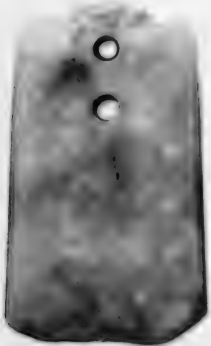
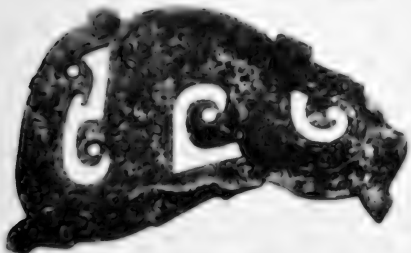
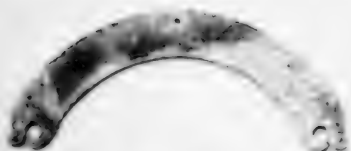
Some interesting small boxes made from the rind of the hesperid orange, were presented to the Museum by Professor Gaetano Platania of the University of Catania, Italy.

GRASSES.—The Department of Grasses received during the year specimens from seventy-five different individuals and institutions. Of these, sixty were by gift, five by exchange, six by purchase and four from Museum expeditions. The total number of specimens thus received and catalogued was 4,315. Of these the largest number were included in the gift received from Mrs. Charles M. Higginson. This remarkably comprehensive collection, gathered by the donor's

late husband, numbers 3,240 specimens, representing more than four hundred mineral species and varieties, or most of the important species in the entire range of minerals. Mr. Higginson's interest in minerals was aroused in early life through his studies under the elder Agassiz, and collecting was continued by him and Mrs. Higginson during the remainder of his life. Having been gathered during a long period, the collection contains many specimens from localities now exhausted. Minerals from these older localities were sometimes given names differing from those now in use, and the specimens from these localities now serve as paratypes of these varieties. All the specimens, when received, were carefully labeled as to species and localities. While many of the specimens are not of large size, there are plenty suitable to make a good display for exhibition. Suites of especial importance are those of tourmalines from Pierrepont, New York, pyroxenes from St. Lawrence County, New York; the series of micas and hydromicas, beryls and many other silicates from New England localities now exhausted, and specimens of gold from twenty localities, chiefly in California.

Mr. William J. Chalmers generously continued his interest in the collection of crystallized minerals, and presented to it forty-three choice specimens. These included excellent specimens of South African diopside and cerussite, rare crystals of pyrrhotite and realgar from Roumania, and many specimens from European localities which had been held in early collections and had just become available. Mr. Chalmers also contributed a brilliant specimen of precious opal to the gem collection, and an interesting series of photographs, made many years ago, illustrating mining and other activities in Japan.

Mr. Richard T. Crane, Jr., made some notable contributions to the gem collections in Harlow N. Higinbotham Hall. Foremost among these is a carving of rose quartz in the form of a large bowl, eighteen inches in diameter and six inches in height, wrought from a single piece of the mineral of gem quality. The walls of the bowl are cut to such thinness (less than one-half of an inch) that they display to a marked degree the rare tints and opalescence of the mineral. Three emeralds, having a total weight of twenty-six carats, cut from gems obtained at Bom Jesus dos Meiras, Bahia, Brazil, were also included in Mr. Crane's contribution. These give an excellent representation of the cut emeralds of this locality, from which four large crystals had been collected by the Curator in 1923. A dish of vesuvianite of the variety known as California jade, carved by an



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American lapidist, an unusual specimen of agate, and a polished slab of green aventurine from India, are other additions contributed by Mr. Crane.

Mr. John Burtel, leader of the American West-Mountain Arctic Expedition, presented two subject tusks and a lower jaw of the Siberian mammoth which he procured during this expedition. The tusks are remarkable for their large size and curvature of form, one especially having a beaklike, polished surface and cuspidate tip. This tusk, which has a length of ten feet, is also remarkable for showing a double curve, an unusual feature in such tusks, and for the ebony color of the tip, which contrasts with the yellowish hue of the remainder.

A skin of a fossil mastodon found at Harwood, Illinois, and presented by Mrs. Stanley Ford, is of interest as demonstrating the existence of this animal in the southern United States at an earlier time.

The Illinois State Museum contributed, through the courtesy of Dr. A. R. Crook, Chief, a three-pound specimen bordered with crust, of the only meteorite ever known to have fallen in the state of Illinois. This specimen was part of the forty-six pound individual which fell at Tilden, Randolph County, Illinois, July 13, 1927. The specimen shows most of the important features of the meteorite, and is of sufficient size to permit enough for laboratory work and analysis to be removed without any material loss. The same museum presented also a cast of the forty-six pound individual which adds to the completeness of the representation of this fall.

Dr. Ralph Foster, of Madison, Wisconsin, presented a rather colored but little or water soluble mass of gypsum weighing nine cents, and a set of white from a mixture of cast and crushed barite weight. These provide some very representative specimens of these gems that had previously been in the Museum collection.

A slab of polished idocrase given by Mrs. Theodore Thomas of Cambridge, Massachusetts, was a pleasant addition to the gem collection, the coloring of the stone being unusually brilliant.

Dr. Oliver C. Farrington of Chicago, presented 111 specimens of minerals and eight specimens of bones from various localities, and five geological photographs. The minerals included diamonds in the matrix, diamond-bearing gneiss with pyrite rough, and a small red stone, some very unusual phosphates and other rare minerals, and a number of specimens of beryl and topaz. The collection had previously been loaned to the Museum but has now been lent out as a gift.

Eleven specimens of potash salts from Texas and New Mexico, which were presented by the United States Geological Survey through Director George O. Smith, are of importance as indicating possible resources of potash of unusual value in the United States.

A number of valuable specimens of minerals and fossils were received by exchange. From the Eastern Washington Public Museum at Spokane, Washington, through Mr. C. O. Fernquist of that museum, there were received, by exchange, twenty-five specimens of the interesting hyalite, opal, sphaerosiderite, *et cetera*, that are obtained from cavities in the volcanic rocks about Spokane, and are peculiar to that region. The fossils comprise chiefly well-preserved leaves and other plant remains of the Miocene age, which also occur in the Spokane region. Both the fossils and the minerals when received, had all been carefully identified, prepared and labeled.

From Professor H. H. Nininger there was received, by exchange, a full-sized section, weighing seventy grams, of the Ballinger, Texas, iron meteorite, and a full-sized section, weighing 886 grams, of the Mount Tabby, Duchesne County, Utah, iron meteorite. The latter is remarkable for the unusual beauty of its etching figures and for its content of nodules of an anomalous iron sulphide.

Exchange with the Paterson Museum of Paterson, New Jersey, through Mr. James F. Morton, Curator of that museum, added to the collection in Field Museum fourteen specimens of the minerals which occur in the trap rocks about Paterson. Several of these specimens are of large size and showy aspect.

A fairly complete skeleton of *Oreodon* from Nebraska, and a good skull and jaws of *Poebrotherium* from Wyoming, were obtained by exchange with the University of Chicago. They give the Museum a more complete representation of these fossil mammals than had been possessed before.

An important addition by purchase was an exceedingly well-prepared slab from the fossil beds at Holzmaden, Württemberg, showing a complete skeleton of the crocodile-like animal, *Steneosaurus*. This slab is two by eight feet in size, and shows practically all parts of the skeleton, preserved in a natural manner. The animal was a crocodile-like reptile characterized by a long, slender head with numerous teeth, and having numerous, bony, deeply pitted plates covering part of the body.

Two iron meteorites were added to the meteorite collection by purchase. The largest of these came from Gladstone, Queensland,

Australia. This is a small, cylindrical, weighing 1.400 grams; it is two feet wide, and has one foot from bottom ends, and four inches in height. The specimen is remarkable not only for its large size, but because of its external features, contrasting as it does, features of an unusual composition. The other ammonite purchased is a fine fossil near Houston, Arizona. This individual is a well-preserved form, weighing 100 lbs. So far as known, this is the only individual of the form.

Section 5. Ammonite fossils from the Colorado Desert, 1891. This is the smallest number in series, 1891. The series had half of the total amount of fossils will contain ammonites, which is unusual. The fossils are very large, and are very abundant. They have been purchased from the Colorado Desert, Colorado, and are probably from the same locality. The specimens are mostly in the form of shells, and are mostly in the form of shells, and are mostly in the form of shells. The specimens are mostly in the form of shells, and are mostly in the form of shells. The specimens are mostly in the form of shells, and are mostly in the form of shells.

Gifts of specimens amount 270 specimens of fossil shells from Argentina presented to Mr. William D. Hoar, the British Museum. An important study has been made in the form of an album containing material from Dr. H. F. Thompson of Chicago. There is a small amount in the fact that it is a collection of fossil shells, and is mostly in the form of shells. The fossils are mostly in the form of shells, and are mostly in the form of shells. The fossils are mostly in the form of shells, and are mostly in the form of shells.

Among other things, the most important is a series of *Platystrophia* fossils, and a few other specimens received from Mr. A. W. Harker of Punta Arenas, Patagonia. The other fossils from South America, and a collection, also received by exchange from the United States National Museum. These are a variety of *Platystrophia* fossils from Argentina, and a *Platystrophia* fossil from Chile.

The donations of fossils presented to the department have various sources. Especially noteworthy was a collection of fossil shells and an animal from California presented by the California Institute of Technology through Mr. Harold E. Deary. Other gifts of fossils and shells were received from California, and from Central M. L. University of New York, New York, and

Oklahoma frogs from Miss E. R. Force, of Tulsa, Oklahoma; seventeen German reptiles from Mr. C. F. Gronemann, of Elgin, Illinois, and 176 specimens from Wisconsin collected and presented by Mr. F. J. W. Schmidt, of Stanley, Wisconsin.

No extensive gifts of fishes were received, but two especially fine specimens of North American species were presented. These were a large lake trout from Mr. E. C. Vacin of Chicago, and a specimen of the inconnu, *Stenodus mackenzii*, from the Booth Fisheries Company of Chicago.

The number of insects accessioned was 2,853 of which 2,173 were presented by Associate Curator W. J. Gerhard, being specimens collected over a number of years during vacation periods in Illinois and Indiana. Certain large and desirable insects to the number of fifty-four were received as a gift from Señor E. Jacy Monteiro, Rio de Janeiro, Brazil. Local insects donated include ninety-eight specimens from Mr. Bryan Patterson, Chicago, and fifty-two from Mr. A. B. Wolcott of Downer's Grove, Illinois.

The most extensive zoological accessions of the year were those received from the Rawson-MacMillan Subarctic Expedition of Field Museum, which added 4,433 specimens to the collections. Of these, 2,711 are insects and other invertebrates, while 1,500 are fishes with which are important and valuable colored sketches made from fresh or living material. Mammals to the number of 118 were obtained, and eighty-eight birds and eggs, collections in these groups being relatively small, owing to very unfavorable conditions.

DEPARTMENTAL CATALOGUING, INVENTORYING AND LABELING

ANTHROPOLOGY.—The number of accessions in the Department of Anthropology during the year was fifty-one of which thirty-two have been entered. Eight accessions from previous years were also entered.

The work of cataloguing has been continued as usual during the current year, the number of catalogue cards prepared totaling 5,825. The total number of catalogue cards entered from the opening of the first volume is 181,159.

The 5,825 cards written during 1928 for accessions received during the year or in previous years are distributed geographically as follows: North American archaeology and ethnology, 93; Mexican, Central and South American archaeology and ethnology, 641;

archaeology and ethnology of China, Japan and Korea, 235; ethnology of Philippines, 11; Polynesian ethnology, 53; Melanesian ethnology, 1; Australian ethnology, 11; African ethnology, 416; Madagascar ethnology, 3,773; Egyptian archaeology, 693; ethnology of Turkey, 8. Of these cards 5,173 have been entered on the inventory books which now number forty-nine volumes. Also seventy-seven cards prepared for accessions received previous to 1928 were entered, making a total of 5,842 cards entered.

A total of 8,046 labels for use in exhibition cases were prepared and placed during the year. These labels are distributed as follows: archaeology of Egypt, 570; ethnology of Africa, 1,714; ethnology of Madagascar, 2,178; ethnology of Malaysia, 3,026; archaeology of Mexico and Mayas, 77; ethnology of South America, 160; ethnology of the Naskapi, 165; archaeology of China and Tibet, 148; ethnology of Melanesia, 8.

To the Department's albums 1,657 photographs were added.

BOTANY—During the year entries made in the catalogue of the Herbarium amounted to 9,628, bringing the total mounted sheets to 580,357.

Labels were written for about 13,000 specimens of Honduras plants, for several thousand current accessions, and for duplicates now ready for distribution.

All the wood samples in the reference collection, numbering close to 7,000 specimens, are now labeled and arranged in a systematic order, as outlined in last year's Report. This enables any particular specimen to be located with ease.

For the classified index of the specimens in the economic collections several thousand new cards were written and filed. A large part of the material in the economic reference and storage collections, hitherto identified only by numbers referring to accession catalogue entries, has been supplied with specimen labels and has been card indexed during the year. This work was started years ago and has been carried on almost continuously since February, 1925, by Assistant Curator James B. McNair and Mr. Llewelyn Williams, Assistant in Wood Technology. This organization of the economic collections is now practically completed, and the result is an orderly arrangement of the storage material, with a finding index to material which cannot be filed in the Herbarium.

Descriptive labels were written for all new installations in the exhibition halls. Diagrams showing structural composition, and

maps showing distribution were prepared for various economic exhibits.

The filing, as a card index, of the labels in the exhibition halls has been continued.

Several thousand index cards to agricultural literature have been received from the Institut Colonial de Marseille. These have been classified and filed.

GEOLOGY.—The total number of specimens catalogued during the year was 4,575, making a total of 184,472 now recorded. Of the additions, the largest number were from the mineral collection presented by Mrs. Charles M. Higginson, which amounted to 3,240 specimens. Other additions of some magnitude were 384 specimens of fossil vertebrates and invertebrates from the collections of the Captain Marshall Field Paleontological Expeditions to South America; 241 specimens of Illinois fossil plants, invertebrates *et cetera*, presented by Mr. Bryan Patterson; 215 specimens of crystallized minerals and photographs presented by Mr. W. J. Chalmers; 118 specimens and photographs presented by Dr. O. C. Farrington, and 72 specimens of minerals and fossils received by exchange from the Eastern Washington Public Museum.

Some special exhibits and series were provided with labels of the latest type during the year. These included the exhibit of Baffin Land and Newfoundland fossils and minerals in Stanley Field Hall, and in Ernest R. Graham Hall seven of the Knight murals; a case of mounted tablets of invertebrate fossils, and a case each of fossil sponges, Jurassic invertebrates, Jurassic ammonites, fossil crinoids and models of dinosaurs, Miocene horses and rhinoceroses, and Minooka (Illinois) Mastodons. Typewritten labels have been provided in Graham Hall for a case each of South American fossils, Mongolian fossils and fossil fishes. In Hall 36 the case of pigments has been supplied with typewritten descriptive labels.

Copy for a total of 3,979 labels was sent to the printer during the year; 704 printed labels were received. Typewritten labels for exhibited series made during the year numbered 379. Typewritten labels of the style used in the study collections were also made for all the specimens of the Charles M. Higginson mineral collection.

For Ernest R. Graham Hall, copy was prepared which indicates the place on the geological scale of the specimens contained in each case. These labels include lists of the characteristic fossils of the

geological subdivisions represented, and the families to which the specimens belong. Common names of the forms represented are used as far as possible.

Mounting of photographic prints in the Department's albums kept pace with their receipt during the year, and a total of 760 prints was thus added. Typewritten labels were provided for all of these. Of the prints, 312 represent subjects for geological post-cards which had been selected during the year.

Exhibits.—Regular entries in the zoological catalogues were made for 6,077 specimens. These were distributed as follows: mammals, 1,840; birds, 4,036; reptiles, 198; skeletons, 14; insects, 9.

Specimens of mammals were numbered as catalogued, and Museum labels were written and attached to 591 skins and 300 skulls. The skulls of 2,462 mammals were numbered. Special labels have been provided for the stuffed skins of large mammals, and the writing of these labels has begun. A card index has been prepared for these large skins which, with a few other entries, adds 340 cards to the general index of the mammal collection. A considerable number of guide labels has been placed on the drawers of the new storage cases for mammals and birds.

Owing to the absence of Assistant Curator Alfred C. Weed in the field, no cataloguing was done in the Division of Fishes. The cataloguing in the Division of Reptiles is nearly abreast of the accession, so no especial effort was made there and only 198 entries appear.

Exhibition labels were prepared and installed as follows: mammals, 96; birds, 92; reptiles, 49; fishes, 62. Copy for exhibition labels, including 681 for birds and 418 for insects, was prepared.

In the Department's photographic albums, 1,208 prints were mounted during the year.

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

	Number of new entries	Total entries to June 30, 1928	Entries during 1928	Total of cards within
Department of Anthropology	49	181,169	5,682	186,851
Department of Botany	63	282,137	10,019	292,156
Department of Geology	26	184,497	4,375	188,872
Department of Zoology	44	146,595	6,077	152,672
Litrary	16	178,777	2,758	181,535

INSTALLATIONS AND REARRANGEMENTS

ANTHROPOLOGY.—The most notable event of the year was the opening to the public on June 1 of six new exhibition halls located

on the ground floor. In accordance with this plan all efforts during the first part of the year were bent toward completing this task with the best possible results.

A total of sixty-five exhibition cases, including three life-size groups, were installed during the year, located as follows:

Egypt (Hall J).....	6
Africa (Hall D).....	2
Madagascar (Hall E).....	25
Polynesia (Hall F).....	1
Malaysia (Hall G).....	2
Stanley Field Hall.....	7
Mexico (Hall 8).....	11
South America (Hall 9).....	8
Tibet (Hall 32).....	2
China (Hall 24).....	1
Total.....	65

Hall J, devoted to the archaeology of Egypt, has been completely reorganized. Previously Egyptian mummies had been exhibited individually in nineteen special cases which varied considerably in size and hardly permitted a detailed study. These old cases have been discarded, and the mummies and coffins have been aligned in a consecutive chronological order in two built-in cases extending 119 feet along the north wall of the hall. Walking along this case from west to east, the visitor is able to study human mummification and burial in Egypt through a period of 2,500 years, as the coffins on exhibition range in date from the tenth dynasty at about 2300 B.C. to the Roman period of A.D. 200. Encased top-lights make for an even diffusion of light, and variety of exhibits is insured partially by the use of slanting bases, and partially by placing mummy covers with carved portraits erect. Coptic fabrics from graves of early post-Christian centuries hang on the wall as a background, and painted linen shrouds from mummies occupy the end walls. A facsimile of the funerary papyrus of Ani is shown in the upper compartment of this case. A built-in case along the east wall of the hall, sixty-three feet in length, contains tomb-sculptures and frescoes in chronological arrangement, running north to south from the third to the nineteenth dynasty (thirtieth to thirteenth century B.C.). The compartment above this case contains plaster casts of important tomb and temple sculptures, the originals of which are still in place in Egypt.

A reproduction of the famous Rosetta stone is shown in an illuminated wall-case. Six X-ray pictures, made in the Museum's



MOOSE IN MOUNTAIN REGION, COLORADO, U.S.A. (1911). PHOTOGRAPH BY
ALBERT R. WOODRUFF, U.S. GEOLOGICAL SURVEY.
U.S. GEOLOGICAL SURVEY, WASHINGTON, D.C.

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Division of Roentgenology, of mammals in the collection, actual size, are exhibited. A built-in case, thirty feet long, on the southwest of the hall is used for a display of six complete Coptic garments in the lower compartment, and parts of garments, tapestries, and embroideries in the upper one. The statuette of Senmut, the famed architect and statesman of the eighteenth dynasty, has been placed in the center of the built-in case opposite. On a section of the southeast wall two carved wooden balcony fronts from Cairo are well shown by recessed electric lighting.

The reinstallation of the Egyptian specimens will be continued during 1929.

In the latter part of 1927 there had been prepared thirty-five cases for installation in the then proposed African Hall, which at that time was not ready to receive them. In the period from January to June of this year the exhibits in these cases were completely labeled, and 110 photographs and water-colors were added. Two cases were installed in addition to the thirty-five noted in the last Annual Report. The more important of these is a built-in case on the west wall of the hall, about forty-eight feet long and fifteen feet high. This case contains well selected examples of the woodworker's craft from Cameroon, West Africa, such as door-posts and window-frames used in the houses of chiefs, large wooden effigies of human form, stools (chairs), shaped in the form of human figures, and a hooded bed intricately carved. A remarkable head ornament of wood from the Bamenda people, thought to be unique so far as the Cameroon region is concerned, is included in this exhibit. The other case installed during the year shows five excellent examples of masks of the Zulus of South Africa, made from the skins of the lion and rock rabbit.

The arrangement of the thirty-seven African exhibition cases in Hall D is carried out on an ethno-geographical basis. The area which is best represented is that of Cameroon, and exhibits from this region shown on the north side of the hall cover almost one-half of the entire collection. In the center of the hall are three life-size figures of Cameroon natives. A map at the entrance to the hall shows what portions of Africa are represented in the exhibits. There are small collections from the Congo Negroes, the Zulus of South Africa, and the Masai of Eastern Africa. The culture of the Senegals is illustrated in four cases, and that of the Hausas in two cases displaying fine beaded hangings as well as wood and ivory carvings. The exhibits in the hall include also representations of

West African life in Cameroon, and material from Togoland, the French Sudan, Angola, the Congo, and other parts of Africa.

During the year the collections obtained by the Captain Marshall Field Expedition to Madagascar of 1926-27 were installed in twenty-five cases in the eastern half of Hall E. The native cultures fall into three groups, and this arrangement has been followed in the installation of the hall. Material from the Plateau tribes is shown on the south side of the hall. These tribes—Imerina, Betsileo, Sihanaka, and Tanala—resemble the Malays in physical type and to a lesser degree, in culture. Their arts and industries are well developed. The collections include a great variety of textiles woven from silk of the domesticated silkworm, wild silk, cotton, hemp, raffia, bast and banana fiber. Except in the Imerina tribe, the designs are simple stripes, but show a fine sense for color. Fine mats from the Sihanaka tribe, steatite lamps of the Imerina, ornamental iron lamps of the Betsileo tribe, pottery, and a series of wood carvings are also shown. Attention should be drawn to the oil and water-color paintings made by native artists after European models. The Plateau tribes had no pictorial art of any sort prior to their contact with Europeans.

Material from the tribes of the southeast coast of Madagascar is displayed on the north side of the hall. The tribes of that region are more negroid than the Plateau people. They are, for the most part, ignorant of both weaving and pottery. They dress in flexible mats, and a series of these mat costumes, showing the various types, occupies one case. A single tribe, the Betsimisaraka, weave raffia cloths, examples of which are displayed.

The culture of the tribes of the west coast and south of the island is shown in five cases in the northeast corner of the hall. These people are negroid in type and are moderately advanced in all the arts, but their work exhibits strong African affinities. They have also been considerably influenced by Arabs, and certain Sakalava groups are Mohammedans.

The tribes of the south—Antandroy, Mahafaly and Bara—are represented by small general collections illustrating their arts and industries. Their wood carvings and weapons merit special mention.

The Sakalava of the west coast are more fully represented, the exhibits including implements, weapons, jewelry, matting, baskets, and textiles. A fine collection of gold and silver jewelry shown in one case is believed to be the best in existence. The figured raffia cloths displayed in another case are the only ones of their sort in any

Hall H, containing a total of thirty-five cases representing the ethnology of the Philippines, was thoroughly rearranged. The groups are now assembled along the south side, and other exhibits occupy the north side of the hall.

Two special cases with framework of bronze were constructed in the south corners of Stanley Field Hall. Each of them contains two large ceremonial feather masks from Hansa Bay, northern New Guinea. Two of the masks are nineteen and two are fourteen feet in height. They are placed on life-size casts of figures, modeled in the Department. The masks were formerly shown without these casts in Joseph N. Field Hall.

Exhibits in a case in Stanley Field Hall, which previously contained selected material from Madagascar, were changed twice during the year. The first exhibit consisted of three bamboo screens or blinds secured by Curator Laufer on the Captain Marshall Field Expedition to China in 1923. These blinds were made exclusively for the doors of the palaces of the Manchu emperors in the eighteenth century, are exceedingly rare, and are unique in their technique. They are composed of thin bamboo rods, chiefly of the spotted bamboo, carefully matched as to color, and tied together. Pictures are formed by strips of silk of various colors skillfully wrapped around each single rod, and are identical on both sides.

This exhibit was changed in October to make room for a display of some choice Chinese fabrics, also obtained by Dr. Laufer on the Captain Marshall Field Expedition to China in 1923. A set of three is shown—a table-hanging and two chair-covers which were used in the palaces of the Manchu emperors for the decoration of tables and chairs on ceremonial occasions, especially on New Year's day. They are a marvelous combination of tapestry weave in exquisite colors with gold brocade. These tapestries were manufactured for the imperial court in the K'ang-hi period (1662-1722). An elegantly decorated roll of purple satin brocade, nearly fourteen feet long, wrought in gold threads, likewise made for the palace in Peking, is shown. A green cut velvet panel of the K'ien-lung period (1736-95), and one in red velvet containing figures of the god of longevity and the Eight Immortals are in the same case.

In December the Eskimo collection presented by Mr. John Borden, and temporarily shown in Stanley Field Hall, was replaced with a representative series of selected objects secured by Assistant Curator William D. Strong from the Naskapi Indians of north-eastern Labrador during the operations of the Rawson-MacMillan

Subarctic Expedition. The exhibit includes unique painted clothing, beadwork of various sorts, and housework and hunting implements of the Naskapi. A series of photographs and original Indian drawings made in their winter hunting camps serve to depict the actual life of the people at the present time.

In another case in Stanley Field Hall is arranged a temporary exhibit of selected material brought back by Assistant Curator J. Eric Thompson from the Captain Marshall Field Archaeological Expedition to British Honduras. The exhibits include the sculptured altar stone referred to on pages 416 and 449, several fine jade objects, pottery of three periods, a necklace of animal skulls, and pieces of obsidian and coral. The earliest pottery in the collection consists of four-legged bowls, the feet of which are frequently molded in the shape of a woman's breasts. Two crematory urns shown in the case were found in a well constructed vaulted chamber in the center of a mound, and contained a small heap of human ashes. Other pottery vessels exhibited are decorated with two heads in high relief, one above the other, and are believed to have been used in religious ceremonies to burn copal which served the Mayan as incense.

Among a selection of Chinese pottery and porcelain of the Sung period (A. D. 960-1279), secured by Dr. Laufer, on the Captain Marshall Field Expedition to China in 1924, and now installed in Stanley Field Hall, is a tall funeral urn of celadon which was placed in a grave and held food for the deceased person. The bell-shaped cover is surmounted by the figure of a hawk with outspread wings. On the long cylindrical neck are represented in high relief the sun symbolized by the three-toothed raven, and the moon symbolized by the hare pounding drugs in a mortar. Unicorn, phoenix, dragon, and tortoise combined with snake are emblematic of the four quarters, and twelve officials arranged in a circle are intended to preside over the twelve animals that form a cycle of twelve years. An interesting feature of this vessel is that gradually, in the course of hundreds of years, masses of loam, a very fine and friable earth, have penetrated through the cracks of the glaze and spread beneath it, forming large yellow and brown patches.

One of the finest examples of celadon in this case is a small dish completely glazed on both sides. A set of sweetmeat dishes of the same glaze, in the shape of chrysanthemum petals, and a palette in which are inserted three tea dishes separated by leaf stalks, are also shown. In their efforts to produce glazes of beautiful colors

the Chinese potters took their models from nature. In white and greenish glazes they strove to emulate the colors of jade, as testified by the seal on a bluish gray porcelain bowl, which reads "resembling jade." A tea-pot, a tea-cup, and a bowl of Temmoku ware, decorated with a dark brown glaze interspersed with irregular yellow speckles in imitation of tortoise-shell, are other features of the exhibit. Included also are many exquisite and rare Temmoku bowls, white and light green bowls of Ting-yao and Yin-ts'ing types, hard and soft Chün-yao, and two unusual pillows of Ts'e-chou porcelain.

In A.D. 1108 the town Kü-lu in the southern part of Chi-li Province was submerged by a flood. Excavations made in recent years on the site of this town have brought to light quantities of pottery and furniture. One of these jars, shown in this same case (there are many others in the Museum's collections), has an over-glaze decoration in brown of floral designs arranged in medallions, and is provided with an inscription which yields the date A.D. 1107. The interesting point is that this vessel was made one year prior to the destruction of the town by the flood, and that it is one of the few dated pieces of Sung ceramics.

Eleven reinstalled cases representing the archaeology and ethnology of Mexico and Central America were placed in Hall 8. A remarkable collection of serapes from northern Mexico, previously presented by Messrs. Martin A. Ryerson and Homer E. Sargent, was reinstalled in a very effective manner. Other cases comprise Mexican pottery of the Aztec period; painted and incised pottery as well as large stone sculptures from the Valley of Mexico; the culture of the Toltecs and Tlaxcaltecs distinguished by fine necklaces, clay figurines, and masks of obsidian and onyx; and the archaeology of Mexico in the states of Guerrero and Oaxaca, as well as the archaeology of Panama.

One case of material never shown before, comprising gold and copper ornaments, necklaces, and ceremonial stone implements obtained by Dr. J. Alden Mason on the Captain Marshall Field Expedition to Colombia of 1922-23, has been added to Hall 9, which is devoted to the archaeology and ethnology of South America. Seven reinstalled cases in this hall contain the following: clothing and hunting implements of the tribes of the Orinoco Basin in Venezuela and Colombia; objects representing the domestic, religious, and ceremonial life of the tribes of the Northwest Amazon Basin; clothing and weapons of eastern or Amazonian Peru; dress

and personal ornaments of the tribes of the Great Plains and baskets of the Anasazi, basket of linen.

Two cases of Tibetan jewelry and jade manufactures were rearranged and placed in Hall 32. Material illustrating linen in China was rearranged in a six-foot case. The gown of a Manchu woman in one of the Blackstone Chinese Collection cases (Hall 24) is now more efficiently shown by the addition of a facial veils which permits completion of the figure with the picturesque head dress adorned with five gilt silver ornaments and silk flowers worn by the Manchu women of Peking. Five fly-whisks of white horsehair and two of our-fiber have been added to one case, and three large writing-brushes to another case. A case containing Chinese metal mirrors, installed last year, was placed at the south end of the hall. A pair, of leather slippers decorated with floral designs in colored beads on red velvet from Annam, presented by Miss Caroline Wicker, Chicago, has been added to a display of Chinese headwork in Hall 32. In a case containing models of pagodas the black background has been changed to a screen of light color.

A total of ninety-seven cases were completely rebuilt during the year. All cases in the halls on the ground floor were carefully gone over before the opening of these halls, and the exhibits rearranged or put in order.

In the carpentry section of the Department twenty-four new screens for exhibition cases were constructed, five old screens were rebuilt, and 469 small individual shelves were made. In addition, 1,785 blocks for labels and 164 pieces of beaverboard for covering the bottoms of cases were cut, and twenty-five wooden bases were made.

Twenty-two picture frames were made for Chinese and Tibetan paintings, and forty-seven of these were framed under glass. A total of 341 photographs, maps, and large descriptive labels were framed for use in exhibition cases. Six large wall maps were hung in the halls on the ground floor.

Eighteen large paper-maché manikins were made for the display of costumes.

Material in thirty exhibition cases was rearranged during the year. Rearrangement of material was made in all storage rooms, and their condition improved. Material stored in the paint room was treated as usual, and is in excellent condition.

Identification numbers marked on Museum objects during the year totaled 11,621.

The work of arranging ancient Egyptian and Coptic textiles and mounting them on linen for better preservation has been continued throughout the year. Five large portfolios of beaverboard were made for the safekeeping of the mounted fabrics.

In the modeling section of the Department, four life-size casts for the New Guinea dance-masks were completed. Head and hands were modeled and cast for the figure of a Manchu woman from Peking. A life-size figure of a Semang pygmy making fire was completed. The life-size figure of a Dyak head-hunter has been modeled in clay to be cast in the near future. Several miniature figures were modeled for the Menangkabau village group. Maya casts in Hall 8 were repaired and retouched. Forty Egyptian and Mesopotamian bronzes were treated by means of the electrochemical process.

In the repair section of the Department six hundred objects were treated, repaired or restored as follows: 113 pieces of Mexican, Maya, Peruvian and Colombian pottery, stone work, and gold; one wooden Japanese statuette; twenty-six Chinese paintings, pottery pieces, silver and stone objects; twenty-seven Tibetan paintings and painted wooden panels; one wooden cup from Formosa; sixteen musical instruments from Java, and one from Hawaii; four strings of Melanesian shell-money; 171 fabrics, sixty-five alabasters, ten pottery jars, five mummies, and three frescoes from Egypt; eleven pieces of pottery from Kish; fifty-one stone implements and one necklace of the French paleolithicon; eighty-five objects from Madagascar, and twenty African wood carvings. The incised lines in the cast of the Rosetta stone from Egypt were whitened to render the inscription clearer and more legible.

The books of the Department Library were vacuum cleaned and rearranged.

BOTANY—So much time was spent during the year in preparation for an ecological group of alpine vegetation, and on restoration of fossil plants for the Carboniferous Forest group, the latter of which is to be a feature of the rearranged Ernest R. Graham Hall in the Department of Geology, that the output of the Stanley Field Plant Reproduction Laboratories for the Hall of Plant Life was greatly reduced.

The most notable addition to the exhibits in the Hall of Plant Life was the reproduction of a cassava plant completed early in the year from material secured by the Marshall Field Brazilian Expedi-



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Gen. of Hill. The material that was included with the other material in the group *Sambucus* at the time of the original description of the plant is now deposited in the Herbarium of the University of California, Berkeley, California, under the name *Sambucus* sp. (det. Hill).

The Herbarium of the University of California at Berkeley is a growing agent of the *Sambucus* sp. (det. Hill) in the following year by a reproduction of a specimen preserved by the Stanley Field Plant Reproduction Lab. As a result, it is estimated that the quantity of *Sambucus* sp. (det. Hill) in the Herbarium is now about 100 specimens. The material was collected by the Stanley Field Plant Reproduction Lab. The material has been collected during the last few years of the Captain Stanley Field Plant Reproduction Lab. The material preserved specimens, as well as all of the material and photographs made in the field, the Stanley Field Plant Reproduction Lab. rendered in glass and celluloid by Mr. Emil Selig, preparator of the Stanley Field Plant Reproduction Laboratories of the Museum.

The material which was collected by the Stanley Field Plant Reproduction Lab. in the Hall of Plant Life, a factory branch in fruiting condition was collected near Chicago and reproduced as an illustration of the general characters of its groups. It has been installed, together with a section of the material and photographs which represent it in form of a plant specimen in the Hall.

A branch of Central American material, the so-called *Hemiphantha malagasy*, which with its large foliage differs so greatly in appearance from the small-leaved West Indian or Cuban material, was obtained from the Government Experiment Station at Port of Spain, Trinidad. The branch has been reproduced in the Stanley Field Laboratories in the Museum to be used as a display of various species of material being prepared for temporary exhibition in the Stanley Field Hall, and for subsequent permanent installation in the Hall of Foreign Woods.

Some alpine plants, distinct from a part of an ecological group, were collected on the Snowy Range, near Larimer, Wyoming, in 1907. The material is now deposited in the Herbarium of the University of California, Berkeley, California, under the name *Sambucus* sp. (det. Hill). The material is now deposited in the Herbarium of the University of California, Berkeley, California, under the name *Sambucus* sp. (det. Hill). The material is now deposited in the Herbarium of the University of California, Berkeley, California, under the name *Sambucus* sp. (det. Hill).

they were collected. They include the Rocky Mountain aster (*Erigeron uniflorus*), which resembles strongly the common English daisy, the yellow avens (*Geum turbinatum*) with buttercup-like flowers and rosettes of much divided leaves, the yellow alpine ragwort (*Senecio Fremontii*), a sedge (*Carex* sp.), and the bistort (*Polygonum bistortoides*), a characteristic alpine plant of the dock family.

Among exhibits under way for the Hall of Plant Life may be mentioned a flowering and fruiting plant of the so-called Panama hat palm which, in spite of its name and its palm-like leaves, is not a palm, although it belongs to an allied family.

The reorganization of the storage collections of economic material, and the new record system which has finally been carried to completion during the year, has made it possible to locate and add some desirable material to the existing installations. The case of true peppers, for which the Stanley Field Plant Reproduction Laboratories furnished the model of the pepper vine as related in last year's Report, has thus been completed as far as the Museum's material permits.

New labels have been placed in Hall 29 as well as in the palm collection and among the food products in Hall 25.

An attractive case containing panels of rare and fancy woods from remote parts of the world was placed on exhibition in Stanley Field Hall. The exhibit, which proved of considerable interest to both the public and lumbermen, comprises woods which, due to their valuable qualities such as density, color and figure, are now gaining favor with the American wood-working industries and are being used extensively for various purposes. For example, there is padouk, one of the woods represented in the case, which possesses a brilliant red color and is used mainly for the manufacture of furniture. Another is the well-known commercial wood, lignum-vitae, which is renowned for its great strength and density. These properties, combined with its self-lubricating properties, make it especially adapted for bearings under water. It is used for making bushing-blocks for lining the stern tubes of propeller shafts of steamships. Another kind shown is Honduras rosewood, which is used for making the bars of percussion instruments, xylophones and marimbas, for which purpose it is particularly fitted because of its density and resonance.

The project of reinstalling the wood exhibits in the Hall of North American Woods has been started with the rearrangement of the case allocated to the pignut hickory. The substitution of a

buff-colored label for the black type used heretofore and the inclusion of a reproduction of a branch in place of a photograph of one make the exhibit more attractive.

Under the supervision of Assistant Curator James H. McLean much work was done in installation and rearrangement of the economic botanical material.

In Hall 26 exhibits of seeds of the bean family, coffee, cocoa, nut, egg, coffee, tea, barley, and edible nuts were installed. In these exhibits the conventional botanical show case was abandoned in the arrangement of each group. The cases for the studies constituting the study exhibits, who first consisted of the 18 cases were arranged in their customary order. The specimens of each exhibit have been placed in a separate bottle or jar, and the exhibits have been made as follows: The coffee is not compelled to give a great effect of abundance by presenting material.

The exhibit in coffee seeds is the first large collection of coffee specimens, which have been selected from 127 samples of coffee seeds in the Museum collection. They include typical representatives of some of the new coffee beans, from various kinds of regions from Peru and Europe. European coffee, this year so extensively used for food in Europe and Latin America, native beans and seeds, from Java, and twenty-seven kinds of other beans, mostly from Mexico and South America, which they furnish one of the food staples.

Seventeen foreign coffee vegetables are being given particular attention, together with samples of their water contents. Among them are represented the rice of sufficient interest, including some, and Indian butter tree.

All the many commercial varieties of coffee grown in Brazil countries there had been placed on exhibition. Among them were eight coffee substituted and substituted, selected from 14 coffee samples and 20 coffee substituted in the Museum collection. There is shown the coffee bean as it appears when picked from the tree and as it is changed by the processes of roasting to the greenish of its preparation for market. In the process of roasting the bean is first roasted, next the paper, parchment, hull and shell, the inner or "silverskin" hull. The coffee particles selected from each coffee substituted region of Australia, Peru, United States, India, Liberia, West Indies, South Africa, Java, and Java.

and Mexico. The adulterants include as diverse articles as peas, chicory, malted barley, wheat, dried prunes, soy beans, dandelion root, and rice.

From 316 specimens of tea available in the Museum's collections thirty-three have been chosen for exhibition. They include representatives of the various grades of tea from Japan, Formosa, China, South Carolina, Ceylon, Jamaica, India and Java. There are shown also brick tea from China and "soluble tea" from Ceylon. The tea exhibit is illustrated by eight photographs showing methods of cultivation and preparation for market in Ceylon, India, and China.

A collection of forty-four of the chief edible nuts of the world has been placed on exhibition. Of these twenty-four are from the eastern and twenty from the western hemisphere. Among the former are displayed coconuts, French chestnuts, almonds, pistachio nuts, longan nuts, litchis, Indian almonds, and English, Chinese, and Japanese walnuts. The American nuts illustrated include pinyon nuts, black and California walnuts, hickory nuts, pecans, chestnuts, acorns, peanuts, cashew nuts, and Brazil nuts.

Through the courtesy of Mr. O. F. Phillips of the Bureau of Agricultural Economics, United States Department of Agriculture, Field Museum has added a tray of barley standards to its exhibit of types illustrating common varieties of grains and grading factors of the official grain standards of the United States.

In 1928 label copy was written for all new exhibits, 244 labels being required for their explanation.

During the year twenty-five large photographs, representing various economic botanical subjects, have been installed in Hall 25. The enlargements were furnished by the Museum's Division of Photography, and the original prints or negatives were obtained from various sources. These illustrations portray phases of the industries connected with coffee, tea, spices, root crops, sugar, and fruit marketing.

It is a great satisfaction to observe the rapid increase in size and scientific value of the Herbarium. It is composed of more than 580,000 sheets, besides a large reserve of probably 100,000 unmounted specimens, mostly from the Old World, which are awaiting incorporation.

The plant mounter prepared for insertion in the Herbarium, by gluing and strapping, 12,330 specimens, a substantial increase over the number mounted in 1927. He also attended to the fumiga-

tion of all material received, and prepared, by grouping, the greater part of the Steudl Herbarium, presented to the Museum a year ago.

The Custodian of the Herbarium, who was on leave of absence during part of the year, catalogued a large number of sheets and distributed them into the permanent collections, this distribution entailing the writing of many new labels, and rearrangement in certain groups.

Work of the curatorial staff consisted primarily in making the current material received available for study by distribution of the sheets, as soon as mounted, into their proper places, and by naming new specimens and correcting wrongly named sheets already in the Herbarium cases. Because of the expeditious methods adopted for mounting and handling the specimens, it is now practicable to file them permanently in the Herbarium the same day they are received. With such prompt distribution, all specimens are quickly and readily accessible for the use of members of the Staff or of outsiders who visit the Herbarium for study purposes. Due to this ready availability of its specimens the Herbarium compares favorably in efficiency with any other large herbarium in the United States.

More than 10,000 mounted sheets, mostly from Central and South America, were added to the Herbarium during the year, thus increasing greatly its permanent value. In the course of the distribution of these plants through the Herbarium hundreds of sheets were determined, and the names of other specimens were corrected. Several large collections which had awaited naming for many years were determined, at least in part, and placed in the Herbarium where they will be useful for study purposes. In its representation of the floras of the West Indies, Mexico, and Central and South America the Herbarium compares favorably with the other large herbaria in the United States, and for certain areas, such as Yucatan and Peru, the Museum's collections are unequalled elsewhere.

GENERAL.—A large part of the time of the Staff of the Department during the year, has been devoted to new installations and reinstallation of cases. The latter work has been required by the change of color of backgrounds, which has necessitated the removal of all the specimens in each case and their replacement after the change of backgrounds was completed. During this reinstallation opportunity has been taken to add to or rearrange the contents of the cases, wherever the interest and value of the contents could be thus improved. Thorough cleaning of glass and refitting of the

sashes and other wood of the cases has been carried out in connection with this work. In Ernest R. Graham Hall and in Hall 36, nearly all the cases, and in Hall 34 and Clarence Buckingham Hall, a large number, were reinstalled in this manner during the year.

In Stanley Field Hall one case was installed; in Harlow N. Higinbotham Hall, one; in Systematic Minerals (Hall 34), fourteen cases; in Clarence Buckingham Hall, four; in *Petroleums, Clays et cetera* (Hall 36), thirty-six, and in Ernest R. Graham Hall, forty-three, making a total of ninety-nine cases.

In Stanley Field Hall an exhibit of some of the fossils, ores and other geological specimens collected by Assistant Curator Roy in Baffin Land and Newfoundland while with the Rawson-MacMillan Subarctic Expedition of 1927-28 was installed in a single case. From Baffin Land are shown in this case, thirty-nine specimens of fossils of Ordovician age and seven specimens of igneous rocks; from Newfoundland, thirty-six specimens, mostly trilobites, of fossils of Cambrian age, and twenty-five specimens of ores and minerals. Several colored photographs of scenes in Baffin Land and outline maps showing routes followed are included in this exhibit.

The exhibit of ores and minerals of South America collected by Associate Curator Nichols as a member of the Captain Marshall Field Expedition of 1926, which had been previously exhibited in Stanley Field Hall, was removed and distributed among the systematic mineral and ore series in Frederick J. V. Skiff Hall and Hall 34.

In Harlow N. Higinbotham Hall the beautiful rose quartz bowl contributed by Mr. R. T. Crane, Jr., was installed in the case of quartzes, and the cut emeralds, agate and vesuvianite which he presented were installed in their respective groups. Specimens presented by other donors during the year were also added to the exhibits in this hall. In order to give a more orderly arrangement, the exhibit of miscellaneous gems in the hall was exchanged in position with part of the exhibit illustrating folk-lore of gems. Thorough cleaning of the cases was carried out in connection with these changes.

In Hall 34 the work of changing backgrounds and reinstallation begun last year was continued and the work completed during the year for fourteen cases. These included two cases of the Chalmers crystal collection and twelve cases of large mineral specimens. The improvement in the attractiveness and visibility of the exhibits, as well as in the general appearance of the hall, brought about by

these changes is marked, and has been favorably commented on by many persons. In connection with this rearrangement a number of new specimens have been added to the exhibits. These include one-half of a case of mineral specimens from Mr. W. J. Johnson and a number of specimens from the mineral collection presented by Mrs. Charles M. Higginson.

In Clarence Doolittle Hall the new remaining cases of ornithologic birds have been fitted with the new specimens and exhibited. A much needed improvement has been provided by the installation of electric light in the case of some specimens of birds from Utah. This lighting of the interior of the case, and the display of the transparency of the feathers, obtained through it, gives a very pleasing effect.

In Hall No. 1, devoted to petroleums, many a rearranging program was made in the way of changing backgrounds and reinstallation. Forty-one cases were emptied and their backgrounds refitted. Of these cases, thirty-four have been reinstalled. This work has required a double hauling of the entire contents of paraffins, clays, tarses, soils, filler & earths and gravities, and much of the coal and petroleum collections. While in many cases the installation is the same as before, changes have been made where it may seemed desirable. For example, the collection relating to the use of nard has been enlarged and changed to one illustrating the use of all forms of oil. The case showing economic uses of sulfur and magnesium has been transferred to the corridor adjoining President J. V. Skill Hall, and that containing the model of a peat bog and some other exhibits has also been moved to the corridor.

Owing to pressure of other work in President J. V. Skill Hall no changes of backgrounds have yet been undertaken. Some additions have been made to the exhibits in this hall, notably that of the series of peatish soils of Texas contributed by the United States Geological Survey. Other specimens of a more character have been made here.

In Ernest R. Graham Hall the work of changing backgrounds and making reinstallation, as well as that of installing artificial lighting for the hall and its cases to replace natural light, has carried on in the first five months of the year. As in the other halls, the work of reinstallation consisted the removal of every specimen, the fitting of glass backs, readjustment of brackets and shelves and repainting of the whole interior of cases, as well as of bases and supports of specimens. Except for some cases of insects

brate fossils, this work was completed. The hall was reopened to the public early in June. In order to give space at the ends of the hall for certain large groups now under construction, and to introduce some new exhibits, some changes in the arrangement of cases and bases were made. The Yorkville and South American Mastodon mounts, the cast of the *Megatherium* and the model of the Moa, all of which had occupied the north end of the hall, were moved to new positions near the center, space being obtained here partly by removal of the cast of *Colossochelys*. The exhibit illustrating methods of fossilization was withdrawn from the case which it had occupied, and an exhibit comparing ancient and modern plants and animals was installed in its stead. Some new specimens were introduced into this exhibit, part of them having been kindly presented by the General Biological Supply House of Chicago. A case containing ammonites was vacated, and three cases changed in position in order to bring corresponding exhibits into juxtaposition and make room for the exhibition of the great slab of the crocodile-like reptile, *Steneosaurus*, acquired during the year. Several specimens obtained by the Captain Marshall Field Paleontological Expeditions to South America in 1922-26 were added to the exhibits in the cases devoted to this area. These included skeletal parts of the Pleistocene horse-like animal, *Hippideum*, and of the short-faced bear, *Arctodus*. An egg of the giant extinct bird *Aepyornis* from Madagascar was transferred from the Department of Zoology and placed in the case of specimens of extinct birds.

The Rancho la Brea fossils, which had previously occupied two cases, were condensed to one case, and in the case thus emptied there was installed a collection of fossil rhinoceros, tapir, tiger-cat and other remains collected in Mongolia by the Third Asiatic Expedition of the American Museum of Natural History, Field Museum cooperating. Some tusks and other remains of the Mammoth and a drawing of a restoration of the Mammoth by Mr. C. A. Corwin completed the installation of this case. In another case containing other specimens of the Mammoth and Mastodon, the superb Mammoth tusks presented by Mr. John Borden were installed.

Of the first ten mural paintings of the series being presented by Mr. Ernest R. Graham, representing typical scenes in different geological periods, prepared for the hall by Mr. Charles R. Knight, seven have been placed in final position on the walls of the hall. The subjects of these paintings are: The Chicago Coral Reef,



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Horned and Fleecing Lemmings, The Arctian Lemming, *Lepus arcticus*, Egg Laying Lemmings, The Mice of New England, Great Kangaroo and Dipodomys, and The Muskrat. The three others were placed in temporary positions on the wall at the south end of the hall. The subjects of them are: A Flying Squirrel, The Significance of Life, and A Sea Shell of the Pleistocene Period. Two of these paintings are 24 1/2 feet in width, the horizontal ones 11 1/2 feet.

In order to light the hall, the cases, and the paintings entirely by artificial light, there were added seven light projections provided an extensive series of the east wall and also a set of the horizontal south ends of the hall. These light projections are fixed attached to the ceiling and are arranged in a series of beams, and the rays from them are directed by inclined reflecting boards the walls of the hall. The lights are arranged in such a way that some rays are incident across a total of 140 light projections to illuminate the side walls and paintings. At the ends of the hall lights are similarly placed parallel to the gallery, concern 270 being provided at each end of the hall. For lighting the upper cases, 140 pairs in number, four lights are placed on the floor of each upper case case with their rays directed through the glass top of the case downward and brought by reflection. Thus the top surfaces are well illuminated. These lights are connected by remarkable circuits. For lighting the cases with sloping tops, the general illumination of the hall is dependent upon:

The framing of partitions at the north end of the hall for cases to be used for exhibiting the insect groups was better constructed by Mr. Frederick Blaschke of New York, is nearly completed and the installation of at least one of these groups is looked for early in 1929. The details of the first group to be installed, that of Neanderthal Man, are now being completed, but specimens from shelters actually occupied by these men, which were collected by Mr. Blaschke at Las Vegas, France, have been received.

Great progress was made during the year in the construction of the Californian Forest group, which, through the generosity of President Stanley Field, is being carried out in the Stanley Field Plant Reproduction Laboratory to the Department of Botany. Almost all the large trunks of *Quercus*, *Liquidambar*, *Lepidodermis* and the smaller ones of their associates, which are to form the principal mass of the vegetation in the reconstruction of an ancient oak forest, have been secured and cut. The characteristic external surface of the trunks has been secured, wherever possible, as in the

case of *Lepidodendron* and the smaller *Sigillaria* stems, by applying to the molded trunks a specially prepared cortex produced in a mold which in each case is a perfect replica of corresponding fossils in the Museum's collections, or in the case of *Lepidophloios*, of a specimen kindly loaned for the purpose by the United States National Museum.

The large quantity of foliage required for the *Calamite* reconstructions has been produced also by mechanical means, and altogether the work on the material for this exhibit is so far advanced that as soon as the case for the group is built, the parts already completed may begin to be assembled, and will give a fair idea of the eventual appearance of the group. This exhibit is to be installed at the south end of Ernest R. Graham Hall.

In the paleontological laboratory a considerable amount of repairing and remounting of vertebrate fossils incident to the re-installations in Ernest R. Graham Hall was carried on, and the work of preparing, for exhibition and study, the vertebrate fossils collected by the Captain Marshall Field Paleontological Expeditions to South America, was continued. Repairs to specimens included those of broken parts of the skeleton of the extinct bird *Dinornis* and of the ribs and sacrum of the mounted skeleton of the large dinosaur, *Apatosaurus*.

Specimens newly mounted or remounted include a skull and two limbs and feet of the extinct short-legged aquatic rhinoceros, *Teleoceras*; of both fore and hind limbs of the North American camel-like animals, *Oxydactylus* and *Stenomylus*; a skull of the large, pig-like *Elotherium*; a skull of the South American hoofed mammal *Astrapotherium*; a skull of the marine reptile *Platecarpus*, and a pair of lower jaws of the *Mastodon*.

Specimens cleaned of matrix and prepared for exhibition or study included a part of the skeleton of the large, extinct South American ground sloth, *Scelidotherium*; several jaws of *Hippideum*; a jaw of *Arctotherium*; a skull of *Nesodon*; additional parts of the skeleton of the little known tapir-like *Homalodontotherium*; bones of a small South American dinosaur; skulls of a new type of a large South American marsupial carnivore, and a skull four feet in length of the great ground sloth, *Megatherium*.

A mold and two casts of the Gladstone meteorite acquired during the year were made in this laboratory by Preparator J. B. Abbott for purposes of record and distribution to other institutions.

The chemical laboratory has been in almost constant use throughout the year. For about three months its facilities were largely employed in the preparation of parts of the foliage used in the construction of the Forest of the Carboniferous Period. For this work it was found necessary to provide a forced draft for the wood. This was accomplished by installing a blower propelled by an electric motor and connected by a flue with the stack. A rotating cap was also provided for the stack in place of the fixed cover previously used.

Many chemical analyses and investigations were carried on in the laboratory by Associate Curator Nichols, the most important being a complete quantitative analysis of the Tilden, Illinois, stone meteorite. Other investigations and analyses were: investigation as to the durability of a number of papers under consideration for use in Museum publications; investigation as to the suitability of a paper desired for special use on a Museum expedition, investigation of a pigment for use on the backgrounds of Museum groups; investigation of the nature of a plastic used in taxidermy resulting in discovery of the possibility of its preparation at a much lower cost than that at which it had hitherto been obtained; investigation of the causes of sediments in the solutions used in the Divisions of Roentgenology and Photogravure; investigation of a solution used for the preservation of ancient Egyptian textiles; investigation of the nature of the crystals occurring on an Inca skull; analysis of the filling of an Inca tooth; investigation of the nature of a pottery bowl, and analysis of the copper used in an aboriginal hoe.

In addition, the restoration of book bindings by the Fine electrolytic method has been carried on in the laboratory almost continuously throughout the year under the supervision of Associate Curator Nichols. A large number of these bindings were restored and a modified form of the process was devised and used for the removal of a malignant fungus that had formed on several Egyptian bronzes. While several years must elapse before it can be determined whether this process will prevent the return of the fungus, no indications of its return have thus far been noted. A special chemical treatment was likewise devised for the treatment of this fungus with results which have also thus far been favorable.

To the mechanical laboratory equipment consisting of a lathe, circular and small saws, and a planer, with two electric motors for operating them, was added during the year, and the work in the laboratory was thereby greatly facilitated. The preparation of

the linings and battens and the refitting of shelves for sixty-four upright cases was carried on here by Preparator Valerie Legault, who also installed the linings and shelves in the cases. The frameworks for three large tree trunks, eighteen feet in height, for the Carboniferous Forest group were also constructed here by Preparator Legault and several bases for mounts in Ernest R. Graham Hall were made by him.

Under the supervision of Associate Curator Nichols, a model of an oil well for exhibition in connection with the exhibit of petroleum in Hall 36 was brought nearly to completion in this laboratory. The model is six feet high, three and one-half feet long and eight and one-half inches deep. It is intended to reproduce essentially the features of a small area in the Lawrenceville, Illinois, oil district. The scale of the model is five feet to the inch. As this scale does not, however, give opportunity to show the true depth at which the oil occurs, a gap is left in the model between the surface features and that part of the model showing the oil-bearing strata.

The surface features show a derrick, pumps, engine, equipment for drilling and various accessories employed both to drill a well and to raise the oil to the surface. The strata passed through to reach the oil are shown in their relative positions, and the relative situations of the oil, gas and salt water in the oil-bearing strata are also shown. The dissimilarities of the strata are brought out by differences in color and texture in the materials used in constructing the model, and they correspond to those which actually occur in the formations passed through in the Lawrenceville district.

ZOOLOGY.—Progress in the preparation and installation of habitat groups of large mammals was unusual, probably exceeding that of any previous year. Four groups of large size were finished and are now on exhibition, as well as one group of small antelopes. Also four cases of large mammals were added to the classified exhibits in George M. Pullman Hall.

Of outstanding interest was the initiation of installations of Asiatic mammals in William V. Kelley Hall. Case construction for one-fourth of this hall was completed, and two important groups were put in place. These were the groups of Marco Polo's sheep and the Asiatic ibex, both prepared from specimens obtained by Colonel Theodore Roosevelt and Kermit Roosevelt on the James Simpson-Roosevelts Asiatic Expedition of Field Museum.

The group of *Marmota flaviventris* consists of five animals, three males and two females, shown crossing a rocky ravine at the base of snow-capped cliffs in the Pacific range of Tetonian as an illustration of about 10,000 feet. The scene effect gives a beautiful picture carrying an impressive demonstration of the bleak, forbidding nature of the habitat of these graceful animals.

The group of Asiatic ibex portrays a scene in the Thien Shan Mountains of north central Asia. It is the same group, the positions represented are those of great wild goats, the rugged, snow-capped slopes, broken ridges and mountain tops, their low, horizontal, close-fitted layers with nearly perpendicular sides. The center figure of the group is a magnificent, tall, swelling, long, tapering horns of record size in ground about 40 to 50 inches of Mr. James Henshaw. Its horns rank among the great swelling trophies of the world. A slightly smaller ram is shown feeding in a protective position above the central figure, and at the sides are a young ram and old ewe with small ones.

Both of these groups are very successful, and reflect great credit upon Taxidermist Julius Franke, who painted the animals, and Staff Artist Charles A. Gowan, who painted the backgrounds.

Two mammal groups, prepared chiefly from specimens obtained by the Field Museum Chinese-Tibetan Expedition, were completed during the year. One is a herd group of the handsome mountain sheep and the other a mixed group of the distinctive antelope known as ibex skins. Both are the work of Taxidermist Louis E. Fry, and both have been installed in Case E. Akeley Mammal Hall.

The group of mountain goats consists of five animals, a fine large bull in prime condition, presented by Captain Harold A. White, a smaller bull, two females, and a half grown young animal. These are represented as lightly shaggy while standing close together on a high open mountain slope. Like other Asiatic groups in the Akeley Hall, this one is prepared without painted backgrounds, being seen on three sides. An improved method of lighting had been applied to it with a very effective result.

The group of ibex skins, although small in size, had proved to be very attractive. A pair of adult animals, among large horned ibex, are shown with a fine, long-horned young one standing in foreground and other smaller young animals characteristic of most wild parts of eastern Asia.

¹. In the hall of American mammal habitat groups, a group of glacier bears was installed in the last remaining space in the eastern half of the hall, thus bringing to completion its first major unit which now includes twelve large groups of high quality. The glacier bear group has for a setting the picturesque glacier-bound mountains of the Alaskan coast. An old female bear is shown with her three cubs, the mother lying down by an alder bush with her eyes watchfully devoted to the youngsters, one of which is curled up beside her, while the others are playfully perched on nearby rocks. The group was prepared by Taxidermist C. J. Albrecht.

In George M. Pullman Hall several important additions and improvements were made to the classified exhibit of hoofed mammals. A case of American mountain sheep shows the Canada sheep or Rocky Mountain bighorn, the Lower California sheep, the Stone's sheep of northern British Columbia, and the Alaskan sheep or Dall's sheep. These are variously posed on a single base of artificial rock-work.

Another new case in George M. Pullman Hall is devoted to two fine specimens of the European red deer, presented to Field Museum by Lord Astor of England. A full grown stag with fully developed antlers is here posed on a natural base, with a young male of the abnormal type known in Scotland as a "cromie." Tufts of Scotch heather are seen at their feet, and the whole effect is very pleasing. The specimens were mounted by Taxidermist Leon L. Pray.

Further new features in the systematic exhibit of mammals are single specimens of the rare and peculiar giraffe-like mammal known as the okapi, and a large bull mountain nyala, each of which occupies an entire case. The okapi was secured by Mr. Edmund Heller on the Captain Marshall Field Central African Expedition, and has been carefully prepared by Taxidermist C. J. Albrecht.

Reinstallation of five screens of mammals was carried out in Hall 15, and all old style cases were eliminated from this hall.

In Hall 21 a case of American ducks was installed with sixty-nine specimens belonging to forty species, representing a practically complete collection of this group of birds. A pair of the extinct Labrador ducks is shown, the male being in replica, because the actual specimen possessed by the Museum is too valuable to risk remounting. Six specimens were added to the case of diving birds and gulls.

Two cases of fishes were placed in Hall 18 to occupy the remaining space in the east half of this hall. The species shown are representa-

live food and game fishes of the Gulf of Mexico. One case is devoted to rays and skates secured from the Marine Biological Laboratory of Woods Hole, Massachusetts, and the other to bony-tongued fishes, including three important game fishes of Florida waters, the barracuda, the King mackerel and the snook, prepared from specimens presented by Mr. A. F. Millet of Chicago.

The new cases of fishes were installed experimentally on screens of pale green color with labels tinted to match. The effect was satisfactory that reinstallation of another case in the same manner was carried out, and a beginning made for the use of this color for screens throughout the fish exhibits.

The exhibits of reptiles and amphibians, for which new material has been accumulating, were greatly improved by the installation of two new cases of the A-type in Hall 18. One of these contains fourteen specimens representing nine specimens of tropical toads, nine specimens of six species of salamanders, and a *Bombina orientalis*. The species shown are mainly North American and, with few exceptions, the preparation is by the process of reproduction in calcium acetate, the so-called "amblyop" process developed by Taxidermist Leon L. Walters. The second case contains twenty-four specimens of twenty-one species of snakes, most of them North American species among which are several varieties of rattlesnakes and other poisonous snakes.

The selection and preparation of insects for exhibition was advanced to a point where material for two cases is ready for installation, awaiting only the printing of labels. One of these provides for an improved and enlarged series of scorpions, centipedes and spiders, and the other for 336 species and varieties of North American butterflies.

The entomological exhibit of mounted skeletons was transferred in toto from Hall 17 to Hall 19, providing space for construction necessary in the development of Hall 17 for habitat groups of American mammals. Corals and other marine invertebrates were temporarily placed on the south side of Hall 17. Construction of built-in cases for the habitat groups of American mammals was begun and carried to an advanced stage in the west half of Hall 16. During construction work in Hall 16, several groups of American mammals were transferred to temporary positions in the south half of Carl E. Adler Memorial Hall. In this hall important changes in lighting method were undertaken by which the cases are individually illuminated by lights concealed in the tops of the cases. At the close of the year work was in progress to continue these changes throughout the hall.

The paintings of Abyssinian birds and mammals by the late L. A. Fuertes were transferred from Stanley Field Hall to Hall 21, and a part of them removed to smaller cases. Duplicate or outworn material, numbering 501 mounted birds and sixty-one mounted mammals, was disposed of.

Five more large groups of mammals were in various stages of preparation at the close of the year. These are the Indian rhinoceros, Alaskan brown bear, polar bear, South American swamp deer, and African cony or dassie. A case of waders and shore birds for the systematic exhibit of American birds was nearing completion.

Progress was made in storing, preparing, and caring for the unusual amount of material recently received in raw condition from expeditions. The entire collection of large mammal skins was overhauled and rearranged, and superfluous specimens were eliminated. The skin dresser was occupied with much fresh material, and in addition 131 skins were dressed by outside agencies. Skulls of mammals to the number of 1,375 were cleaned under contract, and 987 by the Museum osteologist, making a total of 2,362 cleaned.

Rearrangement of the reference collections of mammals and birds was carried out so far as available cases and drawers would permit. Six of the new metal cases are now in full use in the Division of Mammals and eight in the Division of Birds. During recent years, incoming material has been given temporary storage in scattered places wherever space could be found. This condition is now partially relieved and, at least in certain groups, all material of one kind may be found together. The trays in the new cases have been supplied with metal label holders in which labels have been placed showing the contents of each tray and thus greatly facilitating the consultation of the specimens.

THE N. W. HARRIS PUBLIC SCHOOL EXTENSION

Sixteen years ago, in 1912, through the generosity of Mr. N. W. Harris, the Museum added this Department. Its function is to extend the work of the Museum into the schools of Chicago by delivering to them portable cases containing natural history and economic exhibits.

Since that time 1,070 cases have been prepared. Fifty of these were completed in 1928.

During these sixteen years there has been a revolutionary advance in methods of preparing and modes of exhibiting natural history



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material. This Department has kept pace with that advance in all its phases. The cases prepared in recent years have carefully fitted backgrounds and foregrounds, providing a complete natural setting for the specimens displayed. Like the larger stationary cases in the Museum, they represent an almost perfect likeness of the subject as it appears in nature. Although the preparation of such cases is much more intricate, and makes greater demands on the time of the preparators, the production in numbers of new cases has been maintained.

The cases are prepared with every regard for their greatest possible durability. Considering the very frequent transportation, with inevitable changes of temperature and humidity, which they undergo, and the almost constant handling by children in the schools, the breakage has been very small. In 1928 repairs were made to 329 cases, and every case was given a thorough inspection and cleaning.

The regular service of two cases to each school, changed every two weeks, has been maintained for 402 institutions. Of this number 282 are schools—371 of them public, five private, five Roman Catholic, and one Lutheran. The other institutions are eight Y. M. C. A.'s., five branch libraries, three community centers, one boy's club, one hospital, one orphanage, and one boy's detention home. For the summer vacation period forty-three cases were loaned for display at Navy Pier, twelve to the Junior Department of the Art Institute, and twelve to Camp Algonquin, a camp for Chicago children of needy families. Cases were shipped out of town to institutions as follows: two to the Nashville Museum of Art, two to the Children's Museum at St. Louis, Missouri; two to the Boy's Museum at St. Louis, Missouri; four to the Chicago Public Library and Science Museum for display in South Bend, and ten, by the request of the Director of the Illinois Department of Conservation, to the Illinois State Fair at Springfield. Six cases were loaned for the Great Chicago Exhibition of the Chicago Jay, Society of the Illinois Regulated Trout. A few cases were used to make a Field Museum collection of the same material. Live Study Expeditions at the University of Chicago, the efficiency resulting thousands of miles away (p. 107).

LETTER FROM CHICAGO

During the past year the art committee held meetings in Field Museum to discuss the art exhibits of Chicago the greatest collectively ever produced, held in the facilities of the art museum, and in the perfect judgment of the general public.

such study. The value of this type of research has been recognized by other schools of art, and the plan followed in the work has been adopted by other museums and kindred institutions.

Several hundred students, both from beginners' and advanced classes in the Art Institute, participate in these studies. The Art Institute provides the instructors, and Field Museum makes available its study collections, as well as the publicly exhibited material, for sketching and research. Much meritorious pictorial and design work has been produced by the students in these classes.

DIVISION OF PUBLIC RELATIONS

The attention of the public has been drawn to Field Museum's activities, through publicity in the daily press of Chicago, and the press of the entire United States, to a greater extent during 1928 than in any previous year. Also, the more important news concerning the Museum has been given world-wide circulation by international news agencies.

In addition to newspaper publicity, the Museum has received attention in important periodicals of various kinds; it has benefited from advertising, given as in past years without charge, through the generosity of those in control of various advertising media; and it has received further publicity through radio broadcasting and in motion picture newsreels. The Museum's own direct advertising efforts, through distribution of direction folders and other literature designed to attract more visitors from among both local residents and strangers in the city, have been continued as in past years.

NEWSPAPER PUBLICITY.—The Division of Public Relations released a total of 349 news stories during 1928, or an average of more than six each week. Copies of these stories were furnished to the seven major daily newspapers of Chicago; to some sixty community and neighborhood papers published in the city; to more than fifty of Chicago's foreign language newspapers; to some fifty suburban newspapers covering all the principal suburbs, cities and towns within a fifty-mile radius of Chicago; and to all the principal national and international news agencies.

Many of these stories were accompanied by photographs, prints from 261 negatives having been released by the Museum, copies of each of these being sent to a list of twenty-one newspapers and news photograph agencies, through which hundreds of additional copies were distributed to newspapers all over the country. The

photographs have been especially well received by newspapers publishing rotogravure sections.

Inasmuch as the interest of editors necessarily reflects the interest of the public, it is especially gratifying to record the fact that during the year the Museum has received numerous requests from important newspapers and news feature writers asking that their names be added to the publicity mailing list.

The news stories ranged from items of fifty words or so up to full column articles, the majority coming from about one-half to two-thirds of a column. Every story released was printed in several Chicago newspapers and more or all; and the majority of them received extensive space in papers throughout the country. In many cases newspaper staff writers have expanded these releases into full page feature articles. Many Museum activities reported in the press have drawn editorial comment both in Chicago papers and the papers of many other cities.

Especially notable publicity was that given the Museum by the *Chicago Sunday Tribune* on the color page of its rotogravure section. On March 11 the entire front color page was devoted to reproducing three of the striking habitat groups in the exhibits of the Department of Zoology. This was followed by a series of color pictures of material in N. W. Harris Pabst Station, Extonville, Mass., published on several Sundays during the spring. On the Sunday before Thanksgiving a full page was devoted to a reproduction in colors of the Museum's habitat group of wild turkeys. The Museum hereby extends to the publishers of the *Tribune*, to Mr. John Aleski, Sunday editor, and to Mr. Godfrey Lundberg, color photographer, its thanks for their kind interest which resulted in giving the Museum this extremely valuable space and effective publicity.

Likewise grateful recognition is herewith given to the other departments of the *Chicago Tribune*, also to the *Chicago Daily News*, *Chicago Daily Journal*, *Chicago Evening Post*, *Chicago Herald and Examiner*, *Chicago Evening American*, *Chicago Journal of Commerce*, and to the national and international news agencies, such as the Associated Press, United Press, International News Service, Universal Service, and Inpage Service, for their generous cooperation which has contributed so greatly to the success of the Museum's publicity efforts.

Special publicity was obtained through cooperative arrangements between the Museum and officials of the International Live Stock Exposition.

Indicating the extent of the newspaper publicity received, the records show that an average of nearly 1,600 clippings of articles mentioning the Museum are being received each month. As no complete coverage of even the English language newspapers is available, and certain groups such as foreign language papers are not covered at all by the clipping services, this number represents only a part of the space given the Museum. The highest monthly receipt of clippings was in September, with 2,822. The total number of clippings for the year was 19,105.

PUBLICITY IN PERIODICALS.—Many special articles on the Museum and its activities, some prepared at the Museum on the request of editors, and others written by outside writers, usually illustrated with photographs furnished by the Museum, have appeared in general and popular magazines, trade journals, scientific publications, and other periodicals. Among the more important publications in which this material has appeared are *Scientific American*, *Chicago Commerce*, *Popular Mechanics*, *Science*, *Popular Science*, *Americana Annual*, *International Year Book*, *Art and Archaeology*, *Science News Letter*, *Museums Journal* (London), and *American Year Book*.

ADVERTISING.—As in past years, the Museum has been fortunate in having a wide variety of advertising media generously placed at its disposal without charge.

Particularly notable was the action of the *Chicago Evening American*, which, in October, had prepared and gave space to a full page advertisement about the Museum, and then at its own expense bought full pages in other Chicago newspapers for republication of this advertisement. Carrying the heading, "Field Museum—where stay-at-home Chicago sees the world," this advertisement attracted a great deal of attention and stirred much public interest. Grateful acknowledgement is hereby made to the *Evening American* and its publisher, Mr. Herman Black.

The Chicago Rapid Transit Company, and associated inter-urban lines, distributed 50,000 Field Museum descriptive folders, and again kindly displayed in Elevated Lines stations a series of colored posters of Museum exhibits. The Chicago, North Shore and Milwaukee Railroad again allotted space throughout the year to Museum exhibits and lectures in its "This Week's Events" posters displayed at all stations between Chicago and Milwaukee.

The Chicago Surface Lines continued its generosity of previous years by printing at its own expense, and displaying in the street cars, interest overhead posters advertising the Museum. The Illinois Central Railroad and the Chicago and North Western Railway displayed at their city and suburban stations placards announcing Field Museum lecture courses. These posters were likewise displayed in Marshall Field and Company's retail store, and in libraries, schools and other institutions.

From a half page to a page of interesting space was given the Museum in practically all Chicago theatre programs. This is a courtesy which has now continued for several years, and is extended by the Clyde W. Rice Advertising Museum, publishers of *The Playgoer*. The Chicago Cook Opera Company gave prominent space to the Museum in its programs.

The Museum was widely advertised in connection with excursions to Chicago conducted by various railroads, notably the Chicago and North Western Railway. Approximately 100,000 Field Museum descriptive folders were distributed by the Museum and cooperating agencies, including local transportation companies, practically every railroad and lake steamship line entering the city, and all principal hotels, clubs, travel bureaus and department stores. Supplies of these folders were furnished each month also to the officers and delegates of the many conventions held in the city.

Through the cooperation of the University of Chicago and Northwestern University, Museum literature was distributed to thousands of students. The house organs for customers and employees published by the Stevens Hotel, Museum Field Post Company, People's Gas Light and Coke Company, Commonwealth Edison Company, Montgomery Ward and Company, Illinois Bell Telephone Company, Chicago Motor Coach Company, and many other firms, and the advertising folders of many railroads and steamship lines, and hotels helped to advertise the Museum.

RADIO—Radio broadcasting by local stations contributed much to the publicity received by Field Museum during 1928. Among stations which cooperated were those of the Chicago Daily News, Chicago Tribune, Evening American, Evening Post, *Journal World and Examiner*, and the Chicago Federation of Labor. Radio talks on behalf of the Museum were broadcast live by lecturers of the Outing and Recreation Bureau, which is maintained by a group of local and suburban transportation companies and other public utilities.

NEWSREELS.—Motion pictures also brought Field Museum activities before the public. These included newsreels taken by International Newsreel, Kinograms, *Chicago Daily News*, Pathé and special films taken by the Chicago, South Shore and South Bend Railroad.

PAMPHLETS.—Special publicity was given the work done among school children by the Museum in a pamphlet prepared by the Division of Public Relations entitled "Field Museum and the Child," in which the activities of the N. W. Harris Public School Extension Department and the James Nelson and Anna Louise Raymond Public School and Children's Lecture Division are outlined. This pamphlet was widely distributed among school officials, principals, teachers, Members of the Museum, and other persons likely to be interested in this subject.

The Field Museum folder, "One of the World's Treasure Houses," was revised up to date and a new edition published, and a large amount of general editorial work was done by the Division of Public Relations.

DIVISION OF PRINTING

During 1928 the output of the Division of Printing has again greatly exceeded that of previous years. This is especially true of exhibition labels, for which a special need arose in order that certain halls on the ground floor with anthropological exhibits could be opened to the public.

No noteworthy change or increase in the equipment was made during the year, but in order that the composition on publications could be advanced in a satisfactory manner, a monotype operator for a night shift was added to the staff on July 1. As a result of this addition excellent progress was made during the past six months on the composition work for regular publications, guides, leaflets, childrens' stories, and other jobs requiring an unusual amount of typesetting.

The following publications were printed and bound during the period under review:

	Number of copies
Publication 246—Contents and Index to Volume XIV.....	1,000
Publication 247—A New Crocodile from New Guinea.....	1,021
Publication 248—Annual Report of the Director for 1927.....	3,800
Publication 249—The Marine Fishes of Panama.....	1,530
Publication 250—A New Genus of Aquatic Rodents.....	1,017
Publication 251—Reptiles Collected in Salvador.....	1,017
Publication 252—Notes on South American Caimans.....	1,010
Publication 253—The Prehistory of Aviation.....	1,523

Anthropology (under No. 17) The completed boxes and 83	1,511
Field Museum and the Office	1,000
General Goods (Twenty-fifth Edition)	4,500
General Goods (Thirtieth Edition)	1,000
Field Museum from Box	1,000
Inventory Printed for Frank Brown (original 10 copies)	100,000
Inventory Printed for Department of Public Relations (5 copies)	75,000
Publishing Plant Costs	100,000
Labeled Plant Costs	100,000
Textile and Supplies (Army Edition)	1,000
Platons of Fine Card Albums	1,000
Large First Class Albums	1,000
Miniature Sets of Boxes and Labels at Printing	1,000
First class—new view of Building	1,000
First class—our view of Building	1,000
Total number of copies	751,011

The number of labels and other impressions was as follows:

	Labels	Other Impressions
Anthropology	8,500	1,000
Botany	400	100,000
Geology	1,000	1,000
Zoology	1,000	1,000
Harris Extension	1,000	1,000
General	1,000	40,000
Raymond Division	1,000	100,000
The Geographic Society	1,000	1,000
Totals	27,900	204,000

DIVISIONS OF PHOTOGRAPHY, ROENTGENOLOGY AND ILLUSTRATION

PHOTOGRAPHY.—The total number of masters, slides, negatives and prints made by the Division of Photography during the year amounted to 23,892. The following tabulation is a summary of the work performed:

	Number of masters made	Number of negatives made	Number of prints made	Number of transparencies made	Number of exposures developed by hand	Number of exposures
Anthropology	100	1,000	1,000	100	100	100
Botany	10	100	100	10	10	10
Geology	100	1,000	1,000	100	100	100
Zoology	10	100	100	10	10	10
Harris Extension	10	100	100	10	10	10
Raymond Division	100	1,000	1,000	100	100	100
Photography	100	1,000	1,000	100	100	100
Publicity	100	1,000	1,000	100	100	100
General	100	1,000	1,000	100	100	100
Gift	100	1,000	1,000	100	100	100
Base	100	1,000	1,000	100	100	100
Totals	1,540	4,400	4,400	500	500	500

ROENTGENOLOGY.—Considerable publicity was given to the X-ray work of the Museum in 1928. As a result, international attention has been attracted to the findings made by the Division of Roentgenology.

Much careful experimentation has been devoted toward perfecting a technique that will adapt itself to the penetration of the unusual substances that have been submitted to the X-ray laboratory for study. In mummy packages, for instance, to obtain a shadow of the skeletal structure of the body, the bandages and wrappings, and often even the coffin must be penetrated also. The anthropological specimens that have been X-rayed are all mummies contained in their original wrappings, and development of these films brought many surprises.

In the mummy of a child, for instance, it was found that the arms had been removed and the legs broken, presumably to make the body fit a coffin too small for it. From all outward appearances this package seemed to contain the entire body of the child. The original wrappings have never been disturbed, and this mutilated condition was not even suspected until the X-ray film was made.

X-ray examination of another mummy, that of an adult Egyptian disclosed the fact that the arms and torso were missing. The head was suspended to the pelvic region by a board, and the cavity normally occupied by the missing parts was filled with some radiolucent material that casts almost no shadow on the X-ray film.

Pathological conditions, identical with present-day ills such as arthritis, genu valgum, scoliosis, *et cetera*, are clearly defined on some of the films. These findings have been corroborated by Dr. Cora A. Matthews of the Cook County Hospital.

Life-size prints of the above described X-ray films have been placed on exhibition in Hall J. These prints are in close proximity to the original mummies so that interesting comparisons can be made.

PHOTOGRAVURE.—Following is a list of the photogravure illustrations and postal cards completed during the year 1928:

	Number of prints
Publication illustrations.....	133,500
Leaflet illustrations.....	70,000
Design Series illustrations.....	63,000
Guide covers.....	20,000
African Hall Guide illustrations.....	52,500
Posters.....	1,900
Postal cards in series.....	195,000
Postal cards (general).....	96,000
Special (membership headings).....	1,375
Total.....	633,275



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ARTIST: The following is a record of the work accomplished during the year by this Division:

Pen and wash drawings made	120
Water color paintings	2
Etchings	1
Engraved plates	1
Engraving retouched	75
Vegetable printing and lettered	7
Map drawings	1
Map outlines and [redacted]	1
Wood engraving	1
Steel cut engraved	1
Labels for book publication lettered	10
Book engraving covered	1
Engraving by Charles H. Knight retouched	1
Engraving by [redacted] altered	14
cut back	1
Engraving done	1
Reproduction of Thomas Thomas' wood and printing	1

DIVISION OF MEMBERSHIPS

Increased interest in Field Museum and its activities is evidenced by the growing number of public-spirited citizens who have become Members.

Following is a classified list of the same, signifying a number each of which 1928 were added, totaling 266 new for 1928. The total of the Members will be found elsewhere in this report.

Residing	12
Foreign Members	18
Life	10
Foreign Members	45
Life Members	24
Nonresident Life Members	5
Associate Members	1,150
Nonresident Associate Members	1
Residing Members	594
Foreign Members	2,025

Life Members

CATERINA

During the year 86,126 Museum visitors were furnished refreshments in the cafeteria located on the ground floor, an increase of 1,966 over the number served in 1927. The cafeteria is not operated by the Museum, but is under the management of a contractor.

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

STANLEY C. SHAW, Director

ATTENDANCE STATISTICS AND DOOR RECEIPTS

FROM JANUARY 1, 1928 TO DECEMBER 31, 1928

Total attendance		1,023,627
Paid attendance	137,607	
Free admissions on pay days:		
Students	11,031	
School children	50,525	
Teachers	2,677	
Members	1,295	
Admissions on free days:		
Thursdays (52)	126,579	
Saturdays (52)	238,561	
Sundays (53)	455,352	
—————		
Highest attendance on any day (August 19, 1928)	20,894	
Lowest attendance on any day (December 21, 1928)	146	
Highest paid attendance (September 3, 1928)	9,000	
Average daily admissions (366 days)	2,796	
Average paid admissions (209 days)	658	
Number of guides sold	8,282	
Number of articles checked	19,428	
Number of picture postal cards sold	132,877	
Sales of publications, leaflets, handbooks and photographs ..	\$4,087.42	

GENERAL FUND

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS

AT DECEMBER 31, 1928

Balance, December 31, 1927 \$ 65,284.88

Receipts

Income—Endowment, General, Miscellaneous and Trust Receipts	\$ 264,394.46	
South Park Commissioners	217,637.59	
Sundry receipts	20,565.70	
Memberships	62,800.00	
Contributions	475,645.98	
Securities sold and matured	697,270.70	
Bank loans	50,000.00	1,774,309.43
		\$ 3,383,599.43

Disbursements

Operating expenses	\$ 969,489.28	
Expeditions	61,267.71	
Expenses purchased	22,400.00	
Furniture and fixtures	28,500.00	
Securities purchased	80,400.00	
Amounts on contingent gifts	28,600.00	
Additions to building and equipment	44,700.00	
Bank loans repaid	54,500.00	
	\$ 1,788,456.99	
Transferred to sinking Fund	10,000.00	1,778,456.99
Balance, December 31, 1928		\$ 41,709.84

THE N. W. HARRIS PUBLIC SCHOOL EXTENSION

STATEMENT OF INCOME AND EXPENSES FOR THE YEAR 1928

Interest and dividends on investments	\$	20,345.98
Operating expenses		20,809.76
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Excess of expenses over income	\$	463.78

STANLEY FIELD PLANT REPRODUCTION FUND

STATEMENT OF INCOME AND EXPENSES FOR THE YEAR 1928

Balance, December 31, 1927	\$	186.14
Contributions by Stanley Field during 1928		17,322.00
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Operating expenses—1928	\$	17,508.14
		16,857.66
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Balance, December 31, 1928	\$	650.48

ACCESSIONS

DEPARTMENT OF ANTHROPOLOGY

- AMERICAN FRIENDS OF CHINA**
MISS K. S. BUCKINGHAM
MARTIN A. BYERSON
CHARLES E. GOODFIELD
JOHN JAY ABBOTT, Chicago
Herbert J. Ives, inventor
- 3 ancient jade objects, 1 shell
cutting, 1 Han decorated disk,
3 decorated awl, 1 archaic
figure, 1 sword, 1 glass
bottle with cover—China gift.
- AMERICAN MUSEUM OF NATU-
RAL HISTORY**, New York City
- 1 wooden temple-drum, Marquesas
Islands, Polynesia exchange.
- ANDREWS, HELEN PUTNAM**,
Ithaca, New York
- 1 div. Kalakute, New Guinea
gift.
- AYER, MRS. EDWARD E.** Chicago-
Edward E. Ayer, collector
- 1 red marble bust of Artemis in
Troyan-human archaic style—
Italy gift.
- BEASLEY, MARY G.** Chesham, Kent,
England
- 22 ethnological objects: 22 gold
weights Ashanti, 1 wooden boat,
Yucatan, 1 wooden bowl, Java, 1
shell, 1 very tall bamboo pipe, Fung,
Congo, 1 bone harpoon, California,
1 ivory horn, East and West
Mekong, West and Southwest Africa, and
Santa Cruz, Melanesia ex-
change.
- BOLLAND, MRS. CHAUNCEY E.**,
Chicago
- 1 fossil turtle of the Miocene period,
covered with carbon, found in
excavation—Stratford, Connecticut
—China gift.
- BRITISH MUSEUM**, London, Eng-
land
- 27 ethnological objects: six combs,
two ivory model, carved wood
and feather-stem, paddles, Japan
and stone casts, New Zealand,
Marquesas Islands, Harvey Is-
lands, Fiji, Hawaii, Torres
Australis exchange.
- BUTAWA'S MUSEUM**, Butawa,
South Africa
- 10 large stone implements of paleo-
stone type, some six pieces—
Butawa, South Africa ex-
change.
- CARMONA, MRS. ANNE MRS.**
MRS. WAEL, Chicago
- 1 ethnological objects—six pig-
skins, 1 embroideredshaw, 1
silk wrapper, 1 pair of wooden
shoes, 1 ivory comb, 1 embroidered
silk towel, 1 comb, 1 comb and
African, Turkey gift.
- CHALMERS, WILLIAM J.** Chicago
- 2 pictures, 1 water-draw and 2
lacquer-pipe, Japan, and 1 water-
pipe, 1 iron pipe, Japan and China
gift.
- THE AGO CHAPTER OF AMERI-
CAN LEGION—CAPTAIN J. H.**
RUSSELL, Chicago
- 1 ground stone hammer, Mount
Park Forest Preserve, Mount
Carmel, Illinois gift.
- CLARE, MRS. HENRIET** New-
market, Palestine
- About 200 pictures, shell imple-
ments, Palestine gift.
- CONNELLY, J. F.** Perth, West
Australia
- 20 ethnological objects: 4 emu
feather-plumes, 2 bone paddles,
1 bone picture, 2 bone imple-
ments—Aboriginal, East Murrumbidgee
River, North and East
Kathlamet and Northwest, West
Australia gift.
- CRAMER, CORWITH**, Lake Forest,
Illinois
- 1 carved wooden statues of
Trompsburg, Alaska, dated A.D.
1780—Japan gift.
- DRUMMOND, DR. J. W.**, New York
City
- 1 album bound in leather of 24
mounted photographs of Japa-
nese ethnologists and shell
specimens in Kinkyo collection—
Japan gift.

FERGUSON, FRED D., Manito, Illinois.

12 archaeological objects: 10 decorated pottery sherds, 1 clay tobacco-pipe, 1 lot of detached bones—Mound seven miles from Manito, Illinois (gift).

FIELD, HENRY, Chicago.

7 archaeological objects: 5 tubular beads, 1 cylinder seal, and 1 animal carving—Jemdet Nasr, Mesopotamia (gift).

FIELD (WALTER) COMPANY, Chicago.

1 piece of decorated tapa—Samoa (gift).

FIELD MUSEUM OF NATURAL HISTORY.

Collected by Ralph Linton, leader of Captain Marshall Field Expedition to Madagascar:

1,527 objects: wood carvings, brass castings, iron lamps, costumes, blankets—Bara, Tanala, Betsileo, and Imerina tribes, Madagascar.

130 objects of basketry, wood carvings, fur cloaks, weapons, beadwork—mostly Basuto, South Rhodesia, South Africa.

Collected by Dr. Neville Jones, Captain Marshall Field Expedition to Madagascar:

About 100 paleolithic type specimens—South Africa.

Collected by E. S. Riggs, Captain Marshall Field Paleontological Expedition to Argentina and Bolivia, 1926-27:

2 prehistoric potsherds—Tarija, East Bolivia, South America.

Collected by J. Eric Thompson, leader of Captain Marshall Field First Archaeological Expedition to British Honduras:

About 130 archaeological objects of pottery, stone, jade, and shell—Maya, British Honduras, and Honduras.

Collected by W. D. Strong, anthropologist of Rawson-MacMillan Subarctic Expedition of Field Museum, 1927-28:

About 849 archaeological and ethnological objects: stone, bone, and household implements, soapstone

and ivory carvings, clothing, weapons, and ceremonial material; 34 skeletal remains—Eskimo and Naskapi, Labrador and Baffin Land.

Collected by Henry Field, leader of Captain Marshall Field First and Second Archaeological Expeditions to the North Arabian Desert:

About 15,021 objects of prehistoric flint implements and flakes, stones bearing tribal marks, and one inscribed door-lintel—North Arabia.

Collected by Henry Field, leader of Captain Marshall Field Archaeological Expedition to Western Europe:

About 10,100 objects of prehistoric flint and bone implements, casts from French National Collection, and casts of prehistoric human remains—France, Germany, and England.

Purchases:

3 objects of beadwork: 1 beaded blanket stripe, 1 pair of beaded moccasins, and 1 pipe-bag beaded with quilled fringe—Plains Indians, Dakota, from Mrs. Laura F. Stewart, collector.

1 copper hoe of native "Indian" copper—Arizona, from P. S. Bentz.

17 ethnological objects: articles of clothing, household utensils, and snowshoes—Penobscot Indians, Maine, from Dr. Frank G. Speck, collector.

1 pair of emu feather slippers—aborigines, West Australia, from J. F. Connelly, collector.

30 ethnological objects: clothing, knife, Jew's harp, tobacco-pipes, drinking-cup, and spoon—Taiyal, Paiwan, Bunun, Ami, and Tsou tribes, Formosa, from Gordon T. Bowles, collector.

1 old piece of decorated tapa—Hawaii, from Mrs. Emily Wallace.

FIELD MUSEUM-OXFORD UNIVERSITY JOINT EXPEDITION (CAPTAIN MARSHALL FIELD FUND).

About 24 fragmentary skulls and about 1,500 archaeological ob-

516 FIELD MUSEUM OF NATURAL HISTORY—REPORTS, VOL. VII

- ALEXANDER, MRS. H. H., Avalon, California.
1 herbarium specimen (gift).
- ARCHERS COMPANY, Pinehurst, North Carolina.
3 wood specimens and 1 herbarium specimen of *Taxus* and *Torreya* (exchange).
- ATWOOD, CHARLES E., Chicago.
29 samples of tea (gift).
- BALL, DR. C. R., Washington, D. C.
12 herbarium specimens of willows from Minnesota and North Dakota (gift).
- BARREL, GEORGE, Boston.
1 fruiting specimen of Peruvian mahogany (gift).
- BASNETT, DOUGLAS, Chicago.
14 hand specimens of woods from Brazil and Chile (gift).
- BAYER, JACOB, LUMBER COMPANY, New York City.
A black cherry board (gift).
- BELIZE ESTATE AND PRODUCE COMPANY, Belize, British Honduras.
A mahogany board (gift).
- BENKE, H. C., Chicago.
521 herbarium specimens, chiefly from Illinois (gift).
- BLETSCH, W. E., Highland Park, Illinois.
18 hand samples of tropical woods (gift).
- BOMBAY NATURAL HISTORY SOCIETY, Bombay, India.
6 samples of vegetable oils (gift).
- BREMER, MISS MARY, Crown Point, Indiana.
9 herbarium specimens from Indiana (gift).
- BRIGNOLES BOTANIC STATION, Brignoles, France.
19 herbarium specimens and packets of seeds (gift).
- BRITISH FOREST SERVICE, Belize, British Honduras.
1 specimen of the inflorescence of a palm (gift).
- BUREAU OF STANDARDS, Washington, D. C.
9 photo-micrographs of fiber (gift).
- CALDERON, DR. SALVADOR, Direccion General de Agricultura, San Salvador, Salvador.
106 herbarium specimens from Salvador (gift).
- CALIFORNIA ACADEMY OF SCIENCES, San Francisco.
415 herbarium specimens, chiefly from Lower California (exchange).
- CLEVELAND MUSEUM OF NATURAL HISTORY, Cleveland, Ohio.
18 herbarium specimens from Ohio (gift).
- CLYNES, M. R. and N. E. BECKER, Chicago.
1 wood specimen of Osage orange (gift).
- COLTON, MRS. THERON, Chicago.
1 herbarium specimen from Illinois (gift).
- COMMERCIAL SOLVENTS CORPORATION, Terre Haute, Indiana.
10 samples of corn products (gift).
- CONSERVATOR OF FORESTS, Rangoon, Burma.
176 wood specimens (gift).
- CRANE AND COMPANY, Dalton, Massachusetts.
5 specimens of material employed in paper manufacture (gift).
- DAHLGREN, DR. B. E., Chicago.
A branch of Honduras mahogany and a collection of aroid and other tubers from Trinidad (gift).
- DAHLGREN, MRS. B. E., Chicago.
1 herbarium specimen from California (gift).
- DEAGAN, J. C., INC., Chicago.
A board of Honduras rosewood (gift).
- DIRECCION GENERAL DE AGRICULTURA, Guatemala City, Guatemala.
28 herbarium specimens from Guatemala (gift).



Wild Horses of the
Sierra Nevada
California

THE LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

- FARWELL, OLIVER A.**, Detroit
1 specimen of bark of *Cassia* (gift).
- JOURNAL DE PHARMACIE**, M. L. Fournelle, Massachusetts
1 herbarium specimen (gift).
- FIELD MUSEUM OF NATURAL HISTORY**
Collected by G. Proctor Cooper
of Captain Marshall Field Expedition to Panama, 1845.
1,000 herbarium specimens, 10 wood specimens.
Collected by C. S. Seward and A. West (Kaweah-Maui) near Hawaiian Expedition of Field Museum.
678 herbarium specimens.
Transferred from the Department of Geology.
1 sample of gum resin, South Pacific.
Division of Photography.
10 photographs of tree specimens of *Agave*.
Purchases:
1,847 herbarium specimens, 100 photographs of tree specimens of plants, 4 photographs of vegetation of Portuguese islands, 1 economic specimen.
- GARRETT, PROFESSOR A. C.**, Salt Lake City, Utah.
151 herbarium specimens from Utah (gift).
- GRAY HERBARIUM OF HARVARD UNIVERSITY**, Cambridge, Massachusetts.
658 herbarium specimens, mostly from Europe; 1 photograph (exchange).
- HAUGHT, OSCAR**, Negrete, Peru.
44 herbarium specimens from Peru (gift).
- HAWAIIAN MAHIOUANA**, King KANI, 1770, Honolulu, Hawaii.
Samples of tea-wood and a finished article (gift).
- HAYNIE, MISS NELLIE**, Oak Park, Illinois.
2 herbarium specimens from Illinois and Indiana (gift).
- HELLMAYR, DR. C. F.**, Chicago.
2 herbarium specimens (11 seeds) (gift).
- HENDERSON, CHARLES F.**, Berkeley, California.
1 herbarium specimen (leaf) from Mexico (gift).
- HERBERTA, PROFESSOR FORTUNATO L.**, Casco, Peru.
129 herbarium specimens from Peru (gift).
- HOLLINGSWORTH AND VORSE COMPANY**, East Weymouth, Massachusetts.
12 samples of rope and rope-products (gift).
- HUNGARIAN NATIONAL MUSEUM**, M. Botanica, Budapest, Hungary.
100 herbarium specimens, 100 plant parts (exchange).
- JACOBS, MRS. M. R.**, Riverside, Illinois.
3 herbarium specimens from Illinois (gift).
- KARLING, DR. J. S.**, Honey Camp, Orange Walk, British Honduras.
56 herbarium specimens from British Honduras (gift).
- KENOYER, PROFESSOR I. A.**, Nalamatto, Malabar.
26 herbarium specimens and photographs from the Canal Zone.
- LANEJSTER, C. H.**, Cartago, Costa Rica.
11 specimens of mosses from Costa Rica (gift).
- LOUISIANA STATE UNIVERSITY**, Baton Rouge, Louisiana.
2 herbarium specimens of grasses (gift).
- LUNDHILL, C. L.**, Honey Camp, Orange Walk, British Honduras.
50 herbarium specimens from British Honduras (gift).
- MAHE-VICTORIN, FRED**, Montreal, Quebec, Canada.
80 herbarium specimens from Canada (exchange).

- MARTINEZ, PROFESSOR MAXIMINO, Mexico City, Mexico.
1 herbarium specimen from Mexico (gift).
- NEW YORK BOTANICAL GARDEN, New York City.
6 herbarium specimens (exchange).
- NEW YORK COCOA EXCHANGE, New York City.
8 samples of cacao (gift).
- PEARSON, G. H., AND SON HARDWOOD COMPANY, INC., New York City.
29 wood specimens (gift).
- PHILLIPS, O. F., Chairman, Board of Review, Chicago.
A tray of barley standards (gift).
- PLATANIA, PROFESSOR GAETANO, Catania, Italy.
3 citrus boxes (gift).
- PURPUS, DR. C. A., Zacuapam, Mexico.
72 herbarium specimens from Mexico (gift).
- REKO, DR. BLAS P., Indé, Durango, Mexico.
42 herbarium specimens from Mexico (gift).
- RIDGWAY, ROBERT, Olney, Illinois.
332 herbarium specimens from Illinois (gift).
- ROYAL BOTANIC GARDENS, Kew, England.
647 herbarium specimens from Colombia (exchange).
- RUTH, PROFESSOR ALBERT, Fort Worth, Texas.
34 herbarium specimens from Texas (gift).
- ST. JOHN, DR. HAROLD, Pullman, Washington.
1 herbarium specimen (gift).
- SHERFF, DR. EARL E., Chicago.
85 herbarium specimens (gift).
- SMITH, HURON H., Milwaukee, Wisconsin.
1 herbarium specimen (gift).
- STEVENSON, NEIL S., Belize, British Honduras.
8 specimens of palms from British Honduras (gift).
- STORK, PROFESSOR H. E., Northfield, Minnesota.
1 herbarium specimen from Costa Rica (gift).
- SUTHERLAND, THOMAS G., Chicago.
A police baton made from lignum vitae (gift).
- TEHON, L. R., Urbana, Illinois.
103 herbarium specimens from Illinois (gift).
- UNITED STATES DEPARTMENT OF AGRICULTURE, Bureau of Plant Industry, Washington, D. C.
9 herbarium specimens (exchange).
- UNITED STATES NATIONAL MUSEUM, Washington, D. C.
8,805 herbarium specimens (exchange).
- UNIVERSITETETS BOTANISKE MUSEUM, Copenhagen, Denmark.
276 herbarium specimens from tropical America (exchange).
- WARREN, S. D., COMPANY, Boston.
8 specimens of material used in paper making (gift).
- WIELAND, PROFESSOR G. R., New Haven, Connecticut.
1 ground section of *Cycadeoides* (gift).
- WITTE MEMORIAL MUSEUM, San Antonio, Texas.
465 herbarium specimens from Texas (gift).
- YALE SCHOOL OF FORESTRY, THROUGH PROFESSOR SAMUEL J. RECORD, New Haven, Connecticut.
371 herbarium specimens from tropical America (gift); a log of cacique bloodwood (gift); 1,501 wood specimens (exchange); a bag made of pita floja, latex of the Guatemala cow tree, seeds of *Astrocaryum*, wood specimen of pink ivory (gift).

YALE UNIVERSITY, DEPARTMENT OF MINERALOGY, New Haven, Connecticut.
2 cones of white pine (gift).

ZEEB, JAMES, Anson, Canal Zone.
1 botanical specimens from the Canal Zone (gift).

DEPARTMENT OF GEOLOGY

ACKERMAN, CHARLES N., Chicago.
7 specimens of peat—Antioch, Illinois (gift).
1 specimen vegetation—Antioch, Illinois (gift).
1 specimen oak, changed to lignite—Antioch, Illinois (gift).
11 photographs of peat bog—Antioch, Illinois (gift).

AMERICAN MUSEUM OF NATURAL HISTORY, New York City.
2 enlarged photographs of *Urosaurus* vegetation (gift).

AMES, GEORGE F., Eaton, Indiana.
1 specimen *Mastotia* fossil (gift).

BORDEN, JOHN, Chicago.
2 Mammoth tusks—Illinois (gift).
1 set of lower jaws of Mammoth—Illinois (gift).

BLOWS, E. A., El Paso, Texas.
3 specimens *Pentameris*, southern Illinois (gift).

BUFFINGTON, CHARLES A., Ellettsville, Indiana.
3 specimens matrix—Chicago (gift).

CHALMERS, WILLIAM J., Chicago.
40 specimens crystallized minerals—various localities (gift).
1 specimen (presumably) opal—Australia (gift).
11 photographs of stones in Japan (gift).

COLE, MRS. A. H., Muscle Shoals, Tennessee.
1 specimen fossil fish—Fossil, Wyoming (gift).

CRANE, R. V. II., Chicago.
2 cut emeralds—Brazil (gift).
1 new locality fossil—Idar, Germany (gift).
1 specimen opals—Brazil (gift).

1 specimen green aventurine—India (gift).
1 slab, calcite or calciferous shale—California (gift).

DAVIS, G. C., Peotone, Illinois.
1 fossil trinitite—Hankook, Illinois (gift).

DOYLE, JOHN, Jefferson County, Illinois.
1 specimen fossil (undetermined) Illinois (gift).

DUMMOND, DR. I. W., New York City.
1 specimen (presumably) pyrite—Illinois (gift).

EASTERN WASHINGTON PUBLIC MUSEUM, Spokane, Washington.
25 specimens minerals—various localities (exchange).
40 specimens fossils—various localities (exchange).

FARRINGTON, OLIVER, Chicago.
40 specimens minerals—various localities (gift).
10 specimens diamonds and iron-stone-bearing gravel—Brazil (gift).
2 specimens opals—various localities (gift).
5 geological photographs (gift).

FELIPPOINI, DR. FLORENTINE, Uruguay.
1 specimen, ferrous of *Megasthion*—Uruguay (exchange).

FIELD MUSEUM OF NATURAL HISTORY.
Collected by G. C. Searles.
1 specimen opals—Alto, Uruguay (gift).
Collected by the Third Annual Expedition of American Museum of Natural History and Field Museum of Natural History.

- 45 specimens of fragments of shells of eggs of Protoceratops and Struthiolithus—Mongolia.
- Collected by Captain Marshall Field Paleontological Expedition to Alberta, Canada, 1922:
- 1 trunk of fossil tree — Alberta, Canada.
- Collected by Captain Marshall Field Paleontological Expedition to Argentina and Bolivia, 1922-24:
- 48 specimens fossil invertebrates—Patagonia Beds, Argentina.
- Collected by Captain Marshall Field Second Paleontological Expedition to Argentina and Bolivia, 1926-1927:
- 144 specimens fossil vertebrates and invertebrates — Tarija, Bolivia and Province of Buenos Aires, Argentina.
- 171 specimens fossil vertebrates—Catamarca, Argentina.
- 21 specimens fossil Devonian invertebrates—Austral fauna of Bolivia.
- Collected by H. W. Nichols:
- 2 specimens soils—Antioch, Illinois.
- Purchases:
- 1 iron meteorite—Gladstone, Australia.
- 1 iron meteorite—Houck, Arizona.
- Section of iron meteorite—Duchesne County, Utah.
- Skeleton of Teleosaur in matrix—Holzmaden, Württemberg, Germany.
- 1 specimen modern crinoid—Sagami Bay, Japan.
- 2 specimens fossil echinoids—Pontotoc, Mississippi.
- FIELD, MRS. STANLEY, Chicago.
- 1 specimen claw of fossil sloth—Sarasota, Florida (gift).
- GENERAL BIOLOGICAL SUPPLY HOUSE, Chicago.
- 9 specimens modern plants and animals—various localities (gift).
- GLENDINNING, R. J., Salt Lake City, Utah.
- 1 specimen gilsonite—Utah (gift).
- GOLDBLATT, EDWARD, Chicago.
- 1 specimen fossil fish—Fossil, Wyoming (gift).
- GRONEMANN, C. F., Elgin, Illinois.
- 1 specimen peat from sphagnum—Gilbert's, Illinois (gift).
- HALVORSEN, E. E., Templeton, California.
- 2 specimens fossil pelecypods—California (gift).
- 3 specimens fossil oysters—California (gift).
- 1 specimen petrified wood—California (gift).
- HARRISON, C. M., Amory, Mississippi.
- 16 specimens bentonite and associated rock—Amory, Mississippi (gift).
- HESTER, J. P., Flagstaff, Arizona.
- 1 specimen fossil amphibian footprints—Cameron, Arizona (gift).
- 15 photographs (gift).
- HIGGINSON, MRS. CHARLES M., Kenilworth, Illinois.
- 3,240 specimens minerals—various localities (gift).
- HOLDERNESS, WILLIAM T., Chicago.
- 1 specimen marcasite concretion—southern Illinois (gift).
- ILLINOIS STATE MUSEUM, Springfield, Illinois.
- Portion with crust of the 46-pound individual of the Tilden meteorite, and a cast of the entire individual—Tilden, Illinois (gift).
- KINSER, B. M., Port Stanton, Canada.
- 21 specimens Ordovician fossils—Port Stanton, Canada (gift).
- LANG, JOHN, Jacksonville, Texas.
- 1 limonite concretion—Jacksonville, Texas (gift).
- LAW, D. H., Dixon, Illinois.
- 1 specimen of root of fossil tree—Elsie, Kentucky (gift).
- LAYBOURNE, E. G., Chicago.
- 3 specimens fossil gastropods—Colorado (gift).
- 1 specimen fossil pelecypod—Colorado (gift).

- MILBY MISS** Wisconsin Illinois
 1 specimen fossil fragments in
 quartz—Wisconsin Illinois gift.
- MINTON RALPH** Manual, Wash-
 ington
 1 out white—Malagaesat gift.
 1 out white—Washington gift.
- MORDECAI MISS** Isle of Wight
 England
 10 specimens malachite concretions
 —Isle of Wight, England gift.
- MURHAN DAVID** Dismal Swamp,
 Scotland
 2 specimens great Dismal Swamp,
 Scotland gift.
- MURPHY J. M.** Blue Mountain,
 Arkansas
 1 sand-faceted yellow—Logan
 County, Arkansas gift.
- MURPHY GEORGE S.** Wattle, Cal-
 ifornia
 4 specimens garnet—Wattle, Cal-
 ifornia gift.
- MURPHY WILLIAM** Chicago
 1 specimen ammonite—southern
 Kansas gift.
- MURPHY WARREN** St. Paul, Minne-
 sota
 1 specimen fossil bones teeth of
 Elephant—Hawthorn, Iowa gift.
- MURPHY G. B.** Plumtree, North
 Carolina
 1 specimen ammonite—North
 Carolina gift.
- MURPHY H. H.** McHenry, Kan-
 sas
 Section of long meteorite—Halligan,
 Texas exchange.
 Full size, etched slab of the Irwinite
 meteorite—Mount Tabor, Utah
 exchange.
- MURPHY DR. A. A.** Negriton, Talara,
 Peru
 1 specimen fossil teeth—Maguire,
 Peru gift.
- MURPHY RALPH W.** Belgrade, Gallatin
 County, Montana
 5 specimens fossil trilobites—Bel-
 grade, Gallatin County, Montana
 gift.
- MURPHY MUSEUM** Paterson,
 New Jersey
 4 specimens ammonite—Paterson
 New Jersey exchange.
- MURPHY W. S.** Chicago
 1 specimen fossil fragment—Main
 Street, Illinois gift.
 1 specimen fragment—Main Street,
 Illinois gift.
 1 Malagaesat specimen—Main
 Street, Illinois gift.
 1 Malagaesat specimen—Main
 Street, Illinois gift.
 1 specimen fossil fragment—Main
 Street, Illinois gift.
 1 Malagaesat specimen—Main
 Street, Illinois gift.
- MURPHY THOMAS** Chicago
 1 specimen fossil fragment—Main
 Street, Illinois gift.
- MURPHY WILLIAM B.** Chicago
 1 specimen mineral—Utah gift.
 1 specimen ammonite—Hot Springs,
 Arkansas gift.
 1 specimen out specimen—Hot
 Springs, Arkansas gift.
- MURPHY H. W.** Chicago
 1 specimen fossil ammonite—County
 Antone, Iowa gift.
- MURPHY J. N. EVERETT**, West
 Lafayette, Indiana
 4 specimens ammonite pyram-
 ical gift.
- MURPHY E. A.** Chicago
 8 specimens ammonite fossils—
 Cook County, Illinois gift.
 1 specimen ammonite—Cook County,
 Illinois gift.
- MURPHY J. B.** Bell Lodge, Montana
 6 specimens ammonite fossils—
 Bell Lodge, Montana
 1 specimen ammonite—Bell Lodge,
 Montana
- MURPHY G. S.** Tannock, Ontario,
 Canada
 1 specimen ammonite—Tannock,
 Bell Lodge, Canada gift.

SEKERA, JOHN, Chicago.

- 1 specimen chalcedony — South Dakota (gift).

SHANAHAN, W. F., Chicago.

- 1 specimen cup coral—Decatur, Illinois (gift).

SIEGFRIEDT, DR. T. C. F., Red Lodge, Montana.

- 2 specimens zonolite — Montana (gift).

SOMOGYI, JULIUS, Chicago.

- 1 specimen *Lepidodendron*—(gift).

SOSNOVEC, V., St. Louis, Missouri.

- 8 specimens minerals—St. Louis, Missouri (gift).

- 7 specimens concretions—St. Louis, Missouri (gift).

STATE GEOLOGICAL SURVEY, Urbana, Illinois.

- 3 specimens oil sands—Lawrenceville, Illinois (gift).

THOMAS, MRS. THEODORE, Cambridge, Massachusetts.

- 1 specimen polished labradorite—Labrador (gift).

TRUESDELL, DR. G. W., Taylor Falls, Minnesota.

- 1 specimen conglomerate containing *Lingula*—Taylor Falls, Minnesota (gift).

UNITED STATES GEOLOGICAL SURVEY, Washington, D. C.

- 11 specimens potash salts—Texas and New Mexico (gift).

UNIVERSITY OF CHICAGO, Chicago.

- Skull and jaws of *Poebrotherium wilsoni*—Wyoming (exchange).

- Skeleton of *Oreodon culbertsoni*—Nebraska (exchange).

VAUGHAN, DR. R. V., Avalon, California.

- 1 specimen calcareous tufa—Catalina Island, California (gift).

VEDDER, MRS. W. J., Chicago.

- 1 specimen fossil ammonite—New Mexico (gift).

WEIS, MISS LILLIAN MARY, Chicago.

- 1 specimen sphalerite and calcite—Cumberland, England (gift).

- 1 specimen silver and copper—Lake Superior (gift).

WIEDENIG, JOSEPH A., Chicago.

- 1 specimen covellite—Upper Two Medicines, Montana (gift).

- 1 specimen concretion—Upper Two Medicines, Montana (gift).

WOOLLEY, S. W., Osborne, Kansas.

- 3 specimens invertebrate fossils—Osborne, Kansas (gift).

DEPARTMENT OF ZOOLOGY

ANDERSON, A. N. P., Los Angeles, California.

- 1 rattlesnake skin—Brownsville, Texas (gift).

APPLEBAUM, A. A., Chicago.

- 1 tarantula—Honduras(?) (gift).

BACKES, PETER, Wheaton, Illinois.

- 1 barn owl—(gift).

BERTONI, A. W., Asuncion, Paraguay.

- 1 flycatcher—Puerto Bertoni, Paraguay (gift).

BORDEN, JOHN, Chicago.

- 4 walrus tusks—Alaska (gift).

- 2 ribbon seal skins, 1 skull—King Island, Alaska (gift).

BOOTH FISHERIES COMPANY, Chicago.

- 1 inconnu—Alaska (gift).

BRODKORB, PIERCE, Evanston, Illinois.

- 132 birdskins—various foreign localities (exchange).

BUTTLES, MRS. B. E., Chicago.

- 1 albino bluejay—Chicago (gift).

CARLSON, MRS. MARIA L., Mount Greenwood, Illinois.

- 1 short-eared owl—Mount Greenwood, Illinois(?) (gift).

CAUBLE, F. B., Greenfield, Indiana.

- 1 turtle, 1 moth caterpillar—Orange County, Indiana (gift).

CHICAGO ACADEMY OF
 85 Illinois St., Chicago
 7 birds—Alaska exchange

COLTON, R. H., Ashland, Ohio.
 1 fly—Ashland, Ohio (gift)

CONOVER, H. H., Chicago.
 1 wood duck—Swan Lake, Illinois (gift).
 4 birdskins—Italy, South Dakota, Massachusetts (gift).

COX, JAMES, Chicago.
 1 beetle—Chicago (gift).

CRIMMINS, COLONEL M. L., Fort Sam Houston, Texas.
 1 snake—Fort Sam Houston, Texas (gift).
 1 millipede—Fort Bliss, Texas (gift).

CRISY, MRS. D., Downer's Grove, Illinois.
 1 robin's nest—Downer's Grove, Illinois (gift).

CURFEY, DONALD R., Pasadena, California.
 58 birds, 4 snakes, 31 batwings (gift).

ENGWALL, JOHN T., Chicago.
 1 beetle—Chicago (gift).

FARRO, JOHN, Chicago.
 1 silver-haired bat—Chicago (gift).

FIELD MUSEUM OF NATURAL HISTORY

Collected by Ali Hana (Field Museum—Sungu Dulu Nuru Abyssinian Expedition)

29 mammal skins—Somaland.

Collected by Colonel J. C. Fauntleroy (Captain Marshall Field Expedition to British India)

12 mammal skins, 14 skulls—India.
 1 mamma. skin, 4 snake skulls—India.

Collected by Henry Ford (Captain Marshall Field Syrian Desert Expedition)

7 snakes, 3 birds, 16 insects—Trans-Jordan and Iraq.

Collected by A. Franzen (W. W. Harris Field Natural Expedition)
 2 red squirrel skulls, 1 marten—Chicago.

Collected by W. J. Gestard
 10 snakes—Bosnia, Pennsylvania

Collected by Dr. A. L. Kroeber (Captain Marshall Field Field Zoological Expedition to Peru)

1 mammal skull—Cajete Valley, Peru.

Collected by A. H. Lewis (Department of Anthropology)
 1 crossbill skull—British New Guinea

Collected by Juan Francisco (Captain Marshall Field Brazilian Expedition)
 1 Malabar scree wren—Ilheus, Bahia, Brazil.

Collected by J. J. Lusk (New South Wales)
 1 song sparrow—Dorchester, Illinois

Collected by F. W. Lusk (W. A. Weber and Frank Wender New South Wales)
 12 mammals—Tasman Bay, Illinois

Collected by E. P. Silliman (Captain Marshall Field Brazilian Expedition)
 21 insects—Brazil

Collected by E. B. Slaughter (John Gooden Field Museum Alaska Arctic Expedition)
 1 wren's skull—near Wrangell, Alaska

Collected by J. E. Thompson (Captain Marshall Field Field Archaeological Expedition to British Somaliland)

4 vulture skulls—Beira, British Somaliland

Collected by W. S. Weiser (New South Wales)
 8 mammals—Mt. Morgan and Warrumbungle

Collected by A. S. Wood and A. G. Burnett (Newest Mammal Somaliland Expedition)

104 mammal skins and skulls, 18 birds, 10 bird eggs, 1 snake, 1 frog, 1 large fly, 10 insects, 1 owl, 1 snake, and 1 high-water insect—Brazil, Bahia, Land, Ladras, and Serra Santa.

- Purchases:**
 3 ducks—Wainwright, Alaska.
 1 bird—British Guiana.
 1 snake—Gainesville, Florida.
 18 lizards, 2 snakes—Haiti and Santo Domingo.
 1 mammal skin and skeleton—Madagascar.
 1 mounted raccoon—Michigan.
 96 birds—South America.
 5 snakes, 2 lizards—various localities.
 2 birds—Oregon.
- FIELD, STANLEY, Chicago.**
 1 bronze group, "At Bay," by Carl E. Akeley (gift).
- FORCE, MISS EDITH R., Tulsa, Oklahoma.**
 9 frogs—Tulsa County, Oklahoma (gift).
- FRANZEN, ALBERT, Chicago.**
 1 lot salamander eggs—Manitowish, Wisconsin (gift).
 1 eel pout—Chicago (gift).
- FRIESSER, JULIUS, Chicago.**
 1 moth—Chicago (gift).
- GENERAL BIOLOGICAL SUPPLY HOUSE, Chicago.**
 1 hermit crab—Key West, Florida (exchange).
 1 salamander—Imboden, Arkansas (gift).
 1 snake—Florida (gift).
- GERHARD, W. J., Chicago.**
 2,128 insects—northern Indiana and northern Illinois (gift).
- GILLETTE, WILLIAM J., San Diego, California.**
 1 bird—San Diego, California (gift).
- GRANT, C. P., Chicago.**
 10 bird lice—Chicago (gift).
- GRONEMANN, CARL F., Elgin, Illinois.**
 9 salamanders, 5 lizards, 4 snakes—Hanover, Germany (gift).
- GUERET, E. N., Chicago.**
 3 flies—Chicago (gift).
- HACKNEY, G. W, Gwelo, Rhodesia.**
 10 mammal skulls and horns—Rhodesia (gift).
- HAGER, MISS RUTH, West Palm Beach, Florida.**
 1 lizard—Palm Beach, Florida (gift).
- HARLAN, MAYNARD, London Mills, Illinois.**
 1 woodchuck skull—London Mills, Illinois (gift).
- HARRIS, H. M., Ames, Iowa.**
 9 bugs — various localities (exchange).
- HELLMAYR, DR. AND MRS. C. E., Chicago.**
 9 beetles, 19 butterflies, 7 moths—Alberta, Canada (gift).
- HINE, ASHLEY, Chicago.**
 1 hawk owl—Edmonton, Alberta (gift).
- ILLINOIS DEPARTMENT OF CONSERVATION, Chicago.**
 1 least weasel—Waukegan, Illinois (gift).
- KLAUBER, L. M., San Diego, California.**
 4 snakes—San Diego County, California (gift).
- KREBS, C. L., Chicago.**
 1 spider—Central America (gift).
- LASCH, EMIL, McHenry, Illinois.**
 1 double-crested cormorant, 6 pheasant eggs—McHenry, Illinois (gift).
- LAYBOURNE, E. G., Chicago.**
 1 prairie mole—Thayer, Indiana (gift).
- LETL, FRANK, Chicago.**
 2 mammals—Homewood, Illinois (gift).
 1 butterfly—Chicago (gift).
 2 fishes—Alto Pass, Illinois (gift).
- LILJEBLAD, E., Chicago.**
 1 moth—Chicago (gift).
- LYON, DR. M. W., South Bend, Indiana.**
 1 coyote—North Liberty, Indiana (gift).



Two women in traditional Balinese attire, standing side-by-side. The woman on the left is wearing a dark, patterned sari with a wide, ornate border and a large, decorative headdress. The woman on the right is wearing a light-colored, patterned sari with a dark, diamond-shaped grid pattern and a smaller, simpler headdress.

THE LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

- 2 mammal skins: 1 from 1 year, Indiana gift.
- MULLINE, A. H., Chicago
2 mounted willow ptarmigan, Fla. State Acad. gift.
- MUNTELELLI, E. J. J., San Antonio, Texas
24 insects: Brazil gift.
- MURPHY, THOMAS, Portland, Oregon
1 bird cage, mounted *Geothlypis trichas* gift.
- NATIONAL SCIENCE MUSEUM, Basel, Switzerland
4 mammals: 3 from 11 months of season various countries in exchange.
- OLSON, AXEL A., Virginia, Iowa
2 snakes—Department Plains Zoo gift.
- PAFFENBARGER, DEAN, Chicago
64 insects—1 from County Illinois gift.
24 insects—County County, Illinois gift.
- PURDY, M. W., Chicago
1 bat—Chicago gift.
- RANDALL, MISS LAURA A., Geneva, Illinois
1 skinned Murray—Geneva, Illinois gift.
- RAPP, JOHN, San Mateo, Illinois
2 bats: San Mateo, Illinois gift.
- RITTER, DR. JOHN, Chicago
1 rat skeleton gift.
- ROBINSON, H. P., Mendon, Massachusetts
6 notes—Hudson Island, Maine gift.
- SCHMIDT, F. J. W., Stacey, Wisconsin
2 mammals: 10 skeletons, 14 eggs, 1 bat, 10 snakes, 11 turtles—Clark County, Wisconsin gift.
- STIMCKEN, J. H., Wax, Texas
2 snakes—McLennan County, Texas gift.
- SWARTZ, MISS E. FAULNE
1 snake gift.
- THOMAS, CLIFFORD, London, England
2 rodents—San Diego, Argentina gift.
27 mammals—Comodoro, Argentina gift.
- THOMPSON, DR. F. F., Chicago
1 African elephant skull—Africa gift.
- THOMPSON, GEORGE C., Chicago
2 turtles—Grand Island, Indiana gift.
- UNITED STATES NATIONAL MUSEUM, Washington, D. C.
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- VAIN, E. F., Chicago
1 lake trout—Luttre Vermont Lake, Canada gift.
- WALLER, DR. JAMES W., Chicago
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- WALTERS, L. L., Chicago
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2 cyprinids—Indiana gift.
- WEBER, MISS CAROLYN H., Chicago
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- WELLS, W. A., Chicago
1 female's skin—Chicago gift.
1 rat—Chicago gift.
- WELLS, D. B., Indiana, Geneva, Illinois
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- WONDER, FRANK, Chicago
1 turtle—Hayton Island, Florida gift.
- WRIGHT, THURSTON, Chicago
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- WYATT, ALEX K., Chicago
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15 insects—Hessville, Indiana gift.
- YERGEN, C. M., New York, Illinois
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Purchase:

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Made by Commander Donald B. MacMillan:

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ELSBERG, H. A., New York City.

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139 negatives of natives, landscapes, etc., taken in Northern Arabia.

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FIELD MUSEUM OF NATURAL HISTORY.

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Made by Julius Friesser: 46 negatives of animals.

Made by William D. Strong: 642 negatives of natives, general views, etc.

Purchases:

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FRIEDENWALD, DR. HERBERT, Washington, D. C.

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Rhodesia Museum, Bulawayo.
Rhodesia Scientific Society, Bulawayo.

Royal Society of South Africa, Cape Town.

Société de Géographie d'Alger, Algiers.

Société d'Histoire Naturelle de l'Afrique du Nord, Algiers.

Société des Sciences Naturelles du Maroc, Rabat.

South African Association for the Advancement of Sciences, Cape Town

South African Department of Agriculture, Pretoria.

South African Museum, Cape Town.
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Instituto Geográfico Argentino,
Buenos Aires
Ministerio de Agricultura, Buenos
Aires
Sociedad Argentina de Ciencias Nat-
urales Buenos Aires
Sociedad Ornitológica del Plata,
Buenos Aires
Universidad Nacional de Tucumán,
Tucumán

AUSTRALIA:

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Bureau Gardens and Government
Gardens, Sydney
Commonwealth of Australia, Mel-
bourne
Department of Agriculture, Adelaide
Department of Agriculture, Queens-
land
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tralia, Brisbane
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bane
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sels
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Nomenclature Phytolithologique
Phytolithologique, Verviers, pro-
cessed
Société Belge de Géologie, Brussels
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Société de Botanique, Brussels
Société Ornithologique de la Bel-
gique, Brussels
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Campinas
Instituto de Botânica, São Paulo
Instituto Oswaldo Cruz, Rio de
Janeiro
Ministerio de Agricultura, Rio de
Janeiro
Museo Nacional, Rio de Janeiro
Secretaria de Agricultura, Comissão
e Grupo Florestal, São Paulo
Serviço Geológico e Mineralógico,
Rio de Janeiro

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Board of Agriculture, Georgetown
Forestry Department, Georgetown
Royal Agricultural and Commercial
Society, Georgetown

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Department of Agriculture, Victoria,
British Columbia
Department of Marine, Ottawa,
Ontario
Department of Mines, Toronto,
Ontario
Department of the Interior, Geologi-
cal Survey, Ottawa, Ontario
Entomological Society of Ontario,
Toronto, Ontario
Horticultural Association, Toronto, On-
tario

- McGill University, Montreal, Quebec.
 Nova Scotian Institute of Natural Sciences, New Brunswick, Nova Scotia.
 Provincial Museum, Toronto, Ontario.
 Provincial Museum, Victoria, British Columbia.
 Queen's University, Kingston, Ontario.
 Royal Canadian Institute, Toronto, Ontario.
 Royal Society of Canada, Ottawa, Ontario.
 Université de Montreal, Montreal, Quebec.
 University of Toronto, Toronto, Ontario.
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 Metropolitan Library, Peking.
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 Science Society of China, Nanking.
 University of Nanking, Nanking.
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 Suomen Museo, Helsingfors.
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 Muséum National d'Histoire Naturelle, Paris.
 Nature, Paris.
 Société Botanique de France, Paris.
 Société Dauphinoise d'Ethnologie et d'Anthropologie, Grenoble.
 Société d'Ethnographie, Paris.
 Société d'Etudes des Sciences Naturelles, Reims.
 Société d'Etudes Scientifiques, Angers.
 Société d'Histoire Naturelle, Toulouse.
 Société de Géographie, Paris.
 Société des Américanistes, Paris.
 Société des Sciences, Nancy.
 Société des Sciences Naturelles, Ardennes.
 Société des Sciences Naturelles de Saône-et-Loire, Chalon-sur-Saône.
 Société Linnéenne, Bordeaux.
 Société Nationale d'Acclimatation de France, Paris.
 Société d'Agriculture, Sciences et Arts, Angers.
 Société Nationale d'Horticulture de France, Paris.
 Société Scientifique du Bourbonnais et du Centre de France, Moulins.
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 Akademie der Wissenschaften, Heidelberg.
 Bayerische Akademie der Wissenschaften, Munich.
 Bayerische Botanische Gesellschaft, Munich.

Hayesische Staatliche Mineralogisch-
Botanischer Garten und Botanisches
Museum, Berlin.

Botanischer Verein der Provinz
Brandenburg, Berlin.

Deutsche Dendrologische Gesell-
schaft, Bonn-Poppelsdorf.

Deutsche Entomologische Gesell-
schaft, Berlin.

Deutsche Gesellschaft für Anthro-
pologie, Ethnologie und Urge-
schichte, Berlin.

Deutsche Morgenländische Gesell-
schaft, Leipzig.

Deutscher Seefischerei-Verein, Ber-
lin.

Deutsches Herpetologisches Institut,
Berlin.

Frankfurter Gesellschaft für An-
thropologie, Ethnologie und Ur-
geschichte, Frankfurt on the
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Friedrich-Wilhelms-Universität, Ber-
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Georg-August-Universität, Götting-
en.

Gesellschaft für Erdkunde, Berlin.

Gesellschaft für Erdkunde, Leipzig.
Hamburgische Universität, Ham-
burg.

Mineralogisch-Geologisches Mu-
seum, Jena.

Museum für Tierkunde und Völker-
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Museum für Vögelkunde, Berlin.

Museum für Völkerkunde, Hamburg.
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burg.

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tingen.

Naturforschende Gesellschaft, Wür-
zburg.

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Schlesien, Breslau und West-
falen, Bonn.

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men.

Naturwissenschaftlicher Verein, Tra-
nsilva.

Naturwissenschaftlicher Verein für
Schwaben und Neuburg, Augsburg.

Ornithologische Gesellschaft in Bay-
ern, München.

Reichsanstalt für Ferner- und
Hauptwasser-Forschung, Leipzig.

Sächsische Akademie der Wissen-
schaft, Leipzig.

Preussische Gesellschaft für Vater-
landische Kunde, Berlin.

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Gesellschaft, Frankfurt on the
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Preussische Botanischer Verein,
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kunde, Württemberg.

Verein für Volkskunde, Berlin.

Zoologisches Museum, Berlin.

GREAT BRITAIN

Agricultural Experiment Station,
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Anthropology Museum, Oxford.

Archeological Institute, London.

Biographical Natural History and
Ethnographic Society, Edinburgh.

Brighton and Hove Natural History
and Philosophical Society, Bright-
on.

Bristol Museum, Bristol.

British Library of Historical Science,
London.

British Museum, London.

British Museum, Natural History,
London.

Cambridge Philosophical Society,
Cambridge.

Cambridge University, Cambridge.

Geography Society, London, Town
Hall, Dartmouth.

Department of Scientific and In-
dustrial Research, London.

Imperial Marine Laboratory, Green-
wich.

Physica Royal Observatory,
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Geological Society, Edinburgh.

Geological Society, Liverpool.

Geological Society of England and
Wales, London.

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Imperial College, London.

Imperial College, London.

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Liverpool Free Public Museum,
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Political Science, London.

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Manchester Museum, Manchester.

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National Indian Association, London.

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Natural History Society of Glasgow,
Glasgow.

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(gift).

Royal Anthropological Institute of
Great Britain and Ireland, Lon-
don.

Royal Asiatic Society of Great Bri-
tain and Ireland, London.

Royal Botanic Gardens, Edinburgh.

Royal Botanic Gardens, Kew.

Royal Colonial Institute, London.

Royal Cornwall Polytechnic Society,
Falmouth.

Royal Geographical Society, Lon-
don.

Royal Horticultural Society, Lon-
don.

Royal Society, London.

Royal Society of Arts, London.

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burgh.

School of Oriental Studies, London.

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Natural History Society, London.

Speleological Society, Bristol.

Tring Zoological Museum, Tring.

Victoria and Albert Museum, Lon-
don.

Wellcome Research Laboratories,
London.

Zoological Society, London.

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lat, Budapest.

Musée National Hongrois, Budapest.

Royal Hungary School of Engineer-
ing, Mines and Forests, Budapest.

INDIA :

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Archaeological Department, Hyder-
abad.

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Archaeological Survey, Burma, Ran-
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Archaeological Survey, Calcutta.

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Asiatic Society of Bengal, Calcutta.

Bihar and Orissa Research Society,
Patna.

Botanical Survey, Calcutta.

Department of Agriculture, Bombay.

Department of Agriculture, Madras.

Department of Agriculture, Poona.

Department of Agriculture, Pusa.

Geological Survey, Calcutta.

Government Cinchona Plantations,
Calcutta.

Government of India, Calcutta.

Government Museum, Madras.

Hyderabad Archaeological Society,
Hyderabad.

Indian Museum, Calcutta.

Journal of Indian Botany, Calcutta.

Mining and Geological Institute of
India, Calcutta.

Royal Botanic Garden, Calcutta.

University of Calcutta, Calcutta.

Zoological Survey of India, Calcutta.

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University of Dublin, Dublin.

ITALY:

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Musei Zoologia e Anatomia Compa-
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R. Accademia delle Scienze, Turin.

R. Accademia Nazionale dei Lincei,
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Società dei Naturalisti, Naples.

Società di Scienze Naturali ed
Economiche, Florence.

Società Geologica Italiana, Rome.

Società Italiana de Scienze Naturali,
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Società Reale dei Napoli, Naples.

Società Toscana di Scienze Naturali,
Pisa.

Ufficio Geologico d'Italia, Rome.

JAPAN:

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Department of Agriculture of For-
mosa, Formosa.

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Government Zoological Institute, Tokyo
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MEXICO:

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 Musée d'Anthropologie, Leningrad.
 Musée Géologique de Minéralogie
 Pierre le Grand, Leningrad.
 Poltava's State Museum of the
 Name of Korolenko, Poltava.
 Russian Zoological Journal, Moscow.
 Société des Amis des Sciences
 Naturelles, d'Anthropologie et
 d'Ethnographie, Moscow.
 Société Ouralienne d'Amis des Sciences
 Naturelles, Ekaterinberg.

SPAIN:

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 Etnologia i Prehistoria, Barcelona.
 Institució Catalana d'Historia Natu-
 ral, Barcelona.
 Junta para Amplicación de Estudios
 e Investigaciones Científicas, Ma-
 drid.
 Musei de Ciencias Naturales, Ma-
 drid.
 Sociedad Espanola de Antropologia,
 Etnografía y Prehistoria, Madrid.
 Sociedad Espanola de Historia Natu-
 ral, Madrid.

SWEDEN:

Göteborgs Botanika Tradgrad
 Göteborg.
 Geologiska Institute, Stockholm.
 K. Biblioteket, Stockholm.
 K. Svenska Vetenskapsakademien,
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 K. Vetenskaps-och Vitterhets-Sam-
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 Lunds Universitet, Lund.
 Riksmuseets Etnografiska Avedel-
 ning, Stockholm.

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 Conservatoire et Jardin Botaniques,
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 Musée d'Histoire, Lausanne.
 Naturforschende Gesellschaft, Basel.
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 rich.
 Naturhistorisches Museum, Basel.
 Schweizerische Entomologische Ge-
 sellschaft, Bern.
 Société Botanique, Geneva.
 Société de Physique et d'Histoire
 Naturelle, Geneva.
 Société Helvétique des Sciences
 Naturelles, Bern.
 Société Neuchateloise de Géographie,
 Neuchatel.
 Société Suisse d'Anthropologie et
 d'Ethnologie, Bern.
 Société Zoologique, Geneva.

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 video.

VENEZUELA:

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WEST INDIES:

Academia Nacional de la Artes y
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 Biblioteca Nacional, Havana.
 Department of Agriculture, Bridge-
 town.
 Department of Agriculture, Kings-
 ton.
 Insular Experiment Station, Rio
 Piedras.
 Trinidad and Tobago Department
 of Agriculture, Port of Spain.
 Universidad de Habana, Havana.

Adam, Tassilo, Vienna (gift).
 Beaux, Oscar de, Geneva.
 Castellanos, Alfredo, Buenos Aires
 (gift).
 Collinge, Walter E., York, England.
 Devincenzi, Garibaldi, J., Montevideo.
 Dieseldorff, E. P., Charlottenburg (gift).
 Dunod, Henri, Paris.
 Faura y Sans, M., Barcelona (gift).
 Ferguson, John C., Peking (gift).
 Frankfort, H., London (gift).
 Friedländer und Sohn, Berlin (gift).
 Gleerup, O. W. K., Lund.
 Hartert, Ernst, Berlin.
 Herter, Guillermo, Montevideo (gift).
 Hornell, James, London (gift).
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 Mertens, Robert, Frankfort on the
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 Maller, Lorenz, Munich.
 Mulleried, Federico K. G., Mexico City
 (gift).
 Pittier, Henri, Caracas, Venezuela.
 Platania, Gaetano, Catania, Sicily.
 Prout, A. E., London (gift).
 Rivet, P. Paris.
 Roth, Walter E., Christiansborg, Africa.
 Schinz, Hans, Zurich.
 Schlaginhaufen, Otto, Zurich.
 Sergi, Guiseppa, Rome.
 Spencer, L. J., London.
 Stensio, Erik A., Stockholm.
 Thomson, J. Arthur, Aberdeen, Scot-
 land (gift).
 Tsuboi, R., Osaka (gift).
 Tsuda, Nositake, Tokyo (gift).
 Walsh, George B., Scarborough, Eng-
 land.



Moloch submissus (Cope) (Plate I)
Drawing by the artist
from the original specimen
in the collection of the
British Museum

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Berkeley

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San Francisco

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Los Angeles Museum, Los Angeles
National History Museum, San Diego
Marine Institution of Biological Research, La Jolla

Southern California Academy of
Science, Los Angeles

Southwest Museum, Los Angeles
Stanford University

State Mining Bureau, Sacramento
University of California, Berkeley
University of Southern California,
Los Angeles

COLORADO

Agricultural Experiment Station
Fort Collins

Bureau of Mines, Denver

Colorado College, Colorado Springs
Colorado Museum of Natural History,
Denver

State Agricultural College, Fort
Collins

State Historical and Natural History
Society, Denver

CONNECTICUT

Agricultural Experiment Station,
New Haven

Connecticut Academy of Arts and
Sciences, New Haven

Hartford Public Library, Hartford
Cottons Botanical Laboratory, New
Haven

State Geological and Natural History
Survey, Hartford

Yale University, New Haven

DELAWARE

Agricultural Experiment Station,
Wilmington

FLORIDA

Geological Survey, Tallahassee
University of Florida, Gainesville

GEORGIA

Agricultural Experiment Station,
Tifton

Robert Taylor Army Museum,
Milledgeville

School of Entomology of Agricultural
College of Georgia, Athens

Georgia Ornithological Society,
Athens

Georgia Historical Society, States
Rights

Georgia State History Society,
Athens

Georgia State University,
Athens

Government College, Thomasville

IDAHO

University of Idaho, Moscow
University of Idaho, Moscow

ILLINOIS

Agricultural Experiment Station,
Urbana

Art Institute of Chicago, Chicago
Bureau of Education, Chicago
Chicago Academy of Science, Chicago

Chicago Public Library, Chicago
Division of National History Survey,
Chicago

Forestry Service, Urbana
Geological Society, Chicago

Hullwood Herbarium, Chicago 40th
Inland Forest, Chicago 40th

Irish, Western League of America,
Chicago 40th

John Crerar Library, Chicago
Marine Aquarium, Lake
Michigan, Chicago

Newberry Library, Chicago
Northwestern University, Evanston

Open Court Publishing Company,
Chicago

State Academy of Science, Springfield

State Board of Agriculture, Springfield

State Geographical Survey, Springfield
State Historical Society, Springfield

State Museum of Natural History,
Springfield

University of Chicago, Chicago
University of Illinois, Urbana

INDIANA

Agricultural Experiment Station,
Indianapolis

Indiana University, Bloomington.
John Herron Art Institute, Indianapolis.
Purdue University, Lafayette.
University of Notre Dame, Notre Dame.

IOWA:

Agricultural Experiment Station, Ames.
Historical, Memorial and Art Department, Des Moines.
Iowa Geological Survey, Des Moines.
Iowa Journal of Science, Iowa City.
Iowa Horticultural Society, Des Moines.
Iowa State College of Agriculture, Ames.
University of Iowa, Iowa City.

KANSAS:

State Board of Agriculture, Topeka.
State Geological Survey, Lawrence.
State Historical Society, Topeka.
University of Kansas, Lawrence.

KENTUCKY:

Academy of Science, Lexington.
Agricultural Experiment Station, Louisville.
Kentucky Geological Survey, Frankfort.

LOUISIANA:

Department of Conservation, Baton Rouge.
State Museum, Baton Rouge.

MAINE:

Bowdoin College, Brunswick.

MARYLAND:

Academy of Science, Baltimore.
Agricultural Experiment Station, College Park.
Enoch Pratt Free Library, Baltimore.
Johns Hopkins University, Baltimore.

MASSACHUSETTS:

Agricultural Experiment Station, Amherst.
American Academy of Arts and Sciences, Boston.
American Antiquarian Society, Worcester.
Boston Public Library, Boston.
Clark University, Worcester.
Essex Institute, Salem.
Harvard College, Museum of Comparative Zoology, Cambridge.

Harvard University, Arnold Arboretum, Jamaica Plain.
Harvard University, Gray Herbarium, Cambridge.
Horticultural Society, Boston.
Museum of Fine Arts, Boston.
New Bedford Free Library, New Bedford.
Peabody Institute, Salem.
Peabody Museum, Cambridge.
Salem Public Library, Salem.
Springfield City Library Association, Springfield.
Williams College, Williamstown.

MICHIGAN:

Agricultural Experiment Station, Agricultural College.
Department of Conservation, Geological Survey Division, Lansing.
Detroit Institute of Art, Detroit.
Grand Rapids Public Library, Grand Rapids.
Michigan Academy of Sciences, Ann Arbor.
Michigan College of Mines, Houghton.
Michigan State Library, Lansing.
State Board of Agriculture, Lansing.
State Board of Library Commissions, Lansing.
Edward K. Warren Foundation, Three Oaks.
University of Michigan, Ann Arbor.

MINNESOTA:

Agricultural Experiment Station, University Farm.
Minneapolis Institute of Arts, Minneapolis.
Minnesota Geological Survey, Minneapolis.
Minnesota Historical Society, St. Paul.
University of Minnesota, St. Paul.

MISSISSIPPI:

Agricultural Experiment Station, Agricultural College.
Mississippi Plant Board, Agricultural College.

MISSOURI:

Agricultural Experiment Station, Columbia.
Bureau of Geology and Mines, Rolla.
City Art Museum, St. Louis.
Missouri Botanic Garden, St. Louis.
Missouri Historical Society, Columbia.

Missouri State Library and Print Department, Columbia.
 St. Louis Public Library, St. Louis.
 University of Missouri, Division of Mines, Rolla.
 Washington University, St. Louis.

NEBRASKA

Geological Survey, Lincoln.
 State University, Lincoln.

NEW JERSEY

Agricultural Experiment Station, Trenton.
 Newark Museum Association, Newark.
 Princeton University, Princeton.

NEW MEXICO

Agricultural Experiment Station, Santa Fe.
 Historical Society, Santa Fe.
 New Mexico Museum, Santa Fe.

NEW YORK

Agricultural Experiment Station, Geneva.
 American Academy in Rome, New York City.
 American Museum of Natural History, New York City.
 American Public Chamber of Commerce, New York City.
 Burrell Company Agricultural Department, New York City (gift).
 Bingham Geobotany Collection, New York City (gift).
 Brooklyn Botanic Garden, Brooklyn.
 Brooklyn Institute of Arts and Sciences, Brooklyn.
 Buffalo Society of Natural Sciences, Buffalo.
 Columbia University, New York City.
 Cornell University, Ithaca.
 Garden Club of America, New York City.
 Italy American Society, New York City.
 Japan Society, New York City.
 Metropolitan Museum of Art, New York City.
 Museum of the American Indian, New York City.
 New York Academy of Sciences, New York City.
 New York Botanical Garden, New York City.
 New York Historical Society, New York City.

New York Zoological Society, New York City.
 New York Public Library, New York City.
 New York State Library, Albany.
 Plains Ethnologists, New York City (gift).
 Royal Ontario, New York City.
 Rockefeller Foundation, New York City.
 State College of Forestry, Syracuse.
 State Museum, Albany.
 State Inland Fisheries of Arts and Sciences, State Inland, New York City.
 State Publishing Company, New York City.
 Syracuse University, Syracuse.
 The American Entomological Society, New York City (gift).
 United Fruit Company, New York City (gift).
 University of the State of New York, Albany.
 Van der Smissen, Poughkeepsie.
 Zoological Society, New York City.

NORTH CAROLINA

Duke University, Durham.
 Geological and Economic Survey, Raleigh.
 Fernald Mineral Scientific Society, Chapel Hill.

NORTH DAKOTA

State Historical Society, Bismarck.
 University of North Dakota, University.

OHIO

Agricultural Experiment Station, Wooster.
 Cincinnati Museum Association, Cincinnati.
 Cleveland Museum of Art, Cleveland.
 Cleveland Museum of Natural History, Cleveland.
 Cleveland Public Library, Cleveland.
 Cornell University, Geneva.
 Geological Survey, Columbus.
 Oberlin College, Oberlin.
 Ohio Academy of Science, Columbus.
 Ohio Anthropological and Historical Society, Columbus.
 State University, Columbus.
 University of Cincinnati, Cincinnati.
 Wilson Publishing Co., Warren.

OKLAHOMA:

- Oklahoma Academy of Science, Norman.
- Oklahoma Geological Survey, Norman.
- University of Oklahoma, Norman.

OREGON:

- Agricultural Experiment Station, University of Oregon, Eugene.

PENNSYLVANIA:

- Academy of Natural Sciences, Philadelphia.
- Agricultural Experiment Station, Harrisburg.
- American Philosophical Society, Philadelphia.
- Antivenin Institute of America, Philadelphia.
- Bureau of Topographical and Geological Survey, Harrisburg.
- Carnegie Institute, Pittsburgh.
- Carnegie Library, Pittsburgh.
- Carnegie Museum, Pittsburgh.
- Department of Agriculture, Harrisburg.
- Department of Forests and Waters, Harrisburg.
- Engineers' Society of Western Pennsylvania, Pittsburgh.
- Franklin Institute, Philadelphia.
- Lehigh University, Bethlehem.
- Pennsylvania Museum and School of Industrial Art, Philadelphia.
- Philadelphia College of Pharmacy, Philadelphia.
- Philadelphia Commercial Museum, Philadelphia.
- Reading Public Museum and Art Gallery, Reading.
- Sullivant Moss Society, Pittsburgh.
- University of Pennsylvania, Philadelphia.
- University of Pennsylvania, Museum, Philadelphia.
- Wagner Free Institute of Science, Philadelphia.
- Wistar Institute of Anatomy and Biology, Philadelphia.

PHILIPPINE ISLANDS:

- Bureau of Education, Manila.
- Bureau of Science, Manila.
- Department of Agriculture and Natural Resources, Manila.
- Department of Interior, Manila.

SOUTH DAKOTA:

- State School of Mines, Rapid City.

TENNESSEE:

- Agricultural Experiment Station, Nashville.

TEXAS:

- Agricultural Experiment Station, College Station.
- Baylor University, Waco.
- Scientific Society, San Antonio.
- University of Texas, Austin.

UTAH:

- Agricultural Experiment Station, Logan.
- University of Utah, Salt Lake City.

VERMONT:

- Agricultural Experiment Station, Burlington.

VIRGINIA

- Geological Survey, Charlottesville.
- State Library, Richmond.
- University of Virginia, Charlottesville.

WASHINGTON:

- Agricultural Experiment Station, Seattle.
- Department of Conservation and Development, Division of Geology, Olympia.
- Mountaineer Club, Seattle.
- Pacific Northwest Bird and Mammal Society, Seattle.
- Puget Sound Biological Station, Seattle.
- Washington University, Seattle.
- Washington University, Historical Society, Seattle.

WASHINGTON, D. C.

- American Association for the Advancement of Science.
- American Association of Museums.
- American Mining Congress.
- Archaeological Institute of America.
- Carnegie Endowment for International Peace (gift).
- Carnegie Institution of Washington (gift).
- Library of Congress.
- National Academy of Science.
- National Parks Bulletin.
- National Research Council.
- Pan American Union.
- Science Service.
- Smithsonian Institution.
- Tropical Plant Research Foundation.
- United States Government.
- United States National Museum.

WEST VIRGINIA

Academy of Science, Morgantown
 Geological Survey, Morgantown
 State Department of Agriculture,
 Charleston
 West Virginia University, Morgantown

WISCONSIN

Agricultural Experiment Station,
 Madison
 Beloit College, Beloit
 Furon Museum of Milwaukee
 State Horticultural Society, Madison
 University of Wisconsin, Madison
 Wisconsin Academy of Arts, Letters,
 and Science, Madison

Anderson, Robert van Vleet, Merced
 Park, California.

Arthur, J. J., Lafayette, Indiana.

Baker, Frank C., Concord, Illinois.

Bangs, Octavius, Cambridge, Massachusetts.

Barnes, H. Magnus, Leavenworth, Kansas.

Blake, S. J., Washington, D. C.

Brown, Rudolph, New York City, gift.

Brown, Arthur, Indianapolis, Indiana.

Chapman, T. D. A., Boulder, Colorado.

Cook, Harold J., Agate, South Dakota, gift.

Crozier, L. C., Chicago, gift.

Dancy, Donald R., Pasadena, California.

Everitt, Simon W., Chicago, gift.

Fabrick, C. H., Hamilton, New York, gift.

Farrow, Oliver A., Detroit, gift.

Ford, Henry, Chicago, gift.

Ford, Stanley, Chicago, gift.

Greene, Frank C., Manhattan, Kansas.

Graham, W. J., Chicago, gift.

Gaudin, J. L., Pasadena, California, gift.

Hobbs, William H., Ann Arbor, Michigan.

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Holmes, W. J., Pittsburgh.

Holmes, Van C., Ann Arbor, Michigan.

Howell, Frank W., Philadelphia, Pennsylvania.

Howell, J. S. M., and Merrill, George, gift.

Howell, George H., Berkeley, California, gift.

Howell, George, New York City.

Howell, George, Chicago, gift.

Howell, A. W., Chicago, gift.

Howell, George T., Ann Arbor, Michigan, gift.

Howell, M. W., Leavenworth, Kansas.

Howell, George T., New York City.

Howell, William H., Chicago, gift.

Howell, George T., Berkeley, California, gift.

Howell, H. A. F., Jr., Washington.

Howell, George T., Cambridge, Massachusetts.

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ARTICLES OF INCORPORATION

STATE OF ILLINOIS

DEPARTMENT OF STATE

WILLIAM H. HINRICHSEN, *Secretary of State*

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETING:

Whereas, a Certificate duly signed and acknowledged having been filed in the office of the Secretary of State, on the 16th day of September, A. D. 1893, for the organization of the COLUMBIAN MUSEUM OF CHICAGO, under and in accordance with the provisions of "An Act Concerning Corporations," approved April 18, 1872, and in force July 1, 1872, and all acts amendatory thereof, a copy of which certificate is hereto attached.

Now, therefore, I, William H. Hinrichsen, Secretary of State of the State of Illinois, by virtue of the powers and duties vested in me by law, do hereby certify that the said COLUMBIAN MUSEUM OF CHICAGO is a legally organized Corporation under the laws of this State.

In Testimony Whereof, I hereto set my hand and cause to be affixed the Great Seal of State. Done at the City of Springfield, this 16th day of September, in the year of our Lord one thousand eight hundred and ninety-three, and of the Independence of the United States the one hundred and eighteenth.

W. H. HINRICHSEN,
Secretary of State.

[SEAL]

TO HON. WILLIAM H. HINRICHSEN,

SECRETARY OF STATE:

SIR:

We, the undersigned citizens of the United States, propose to form a corporation under an act of the General Assembly of the State of Illinois, entitled "An Act Concerning Corporations," approved April 18, 1872, and all acts amendatory thereof; and that for the purposes of such organization we hereby state as follows, to-wit:

1. The name of such corporation is the "COLUMBIAN MUSEUM OF CHICAGO."

2. The object for which it is formed is for the accumulation and dissemination of knowledge, and the preservation and exhibition of objects illustrating Art, Archæology, Science and History.

3. The management of the aforesaid museum shall be vested in a Board of FIFTEEN (15) TRUSTEES, five of whom are to be elected every year.

4. The following named persons are hereby selected as the Trustees for the first year of its corporate existence:

Edward E. Ayer, Charles B. Farwell, George E. Adams, George R. Davis, Charles L. Hutchinson, Daniel H. Burnham, John A. Roche, M. C. Bullock, Emil G. Hirsch, James W. Ellsworth, Allison V. Armour, O. F. Aldis, Edwin Walker, John C. Black and Frank W. Gunsaulus.

5. The location of the Museum is in the City of Chicago, County of Cook, and State of Illinois.

(Signed)

George E. Adams, C. B. Farwell, Sidney C. Eastman, F. W. Putnam, Robert McCurdy, Andrew Peterson, L. J. Gage, Charles L. Hutchinson, Ebenezer

Birmingham Andrew Mitchell, Secretary of the Board, M. L. Lewis, Treasurer of
 Kentucky George Thompson, James B. Lewis, William B. Henson, Eugene H.
 Head, F. G. Keith, J. Irving Thomas, John F. Smith, Henry Wade Rogers,
 Thomas D. Ryan, L. J. Lamb, A. J. Warner, A. A. Springer, A. J. Mallory,
 James W. Smith, Geo. F. Smith, John B. Ward, John P. Cunningham, John A.
 Hunter, E. B. Murray, James F. Stone, Frederick W. Ford, James H. Lee,
 Joseph Stanton, Edward H. Brown, John McQuinn, R. A. Walker, G. C.
 Chatfield Taylor, A. Crawford, Wm. Lee Smith, F. H. Ferguson, John T.
 Black, J. J. Mitchell, J. P. Leavitt, George W. Lewis, Thomas A. Fisher,
 Robert W. Patterson, Jr., M. C. Murray, Lewis Wayne, George M. Newman,
 William E. Curtis, James W. Ferguson, William F. Shaw, Wm. T. Hager,
 Martin A. Hyatt, Huntington W. Jackson, N. B. Jones, Nathan Williams,
 Melville E. Stone, Royal L. Lewis, Edmund W. Shackleton, Frank V. Arnold.

STATE OF ILLINOIS |
 COOK COUNTY | 20

I, G. H. MITCHELL, a Notary Public, and for said county, do hereby
 certify that the foregoing petitioners personally appeared before me and
 acknowledged severally that they signed the foregoing petition as their free and
 voluntary act for the uses and purposes therein set forth.

Given under my hand and notarial seal this 14th day of September, 1928.

G. H. MITCHELL.

[SEAL]

NOTARY PUBLIC, COOK COUNTY, ILL.

CHANGE OF NAME.

Pursuant to a resolution passed at a meeting of the corporate members held
 the 10th day of June, 1924, the name of the COLUMBIAN MUSEUM was
 changed to FIELD COLUMBIAN MUSEUM. A certificate to this effect was
 filed June 26, 1924, in the office of the Secretary of State for Illinois.

CHANGE OF NAME.

Pursuant to a resolution passed at a meeting of the corporate members held
 the 8th day of November, 1925, the name of the FIELD COLUMBIAN
 MUSEUM was changed to FIELD MUSEUM OF NATURAL HISTORY.
 A certificate to this effect was filed November 12, 1925, in the office of the
 Secretary of State for Illinois.

CHANGE IN ARTICLE 3.

Pursuant to a resolution at a meeting of the corporate members held the
 10th day of May, 1926, the management of FIELD MUSEUM OF NATURAL
 HISTORY shall be vested in a Board of TWENTYFOUR (24) MEMBERS, who
 shall be elected in such manner and for such time and term of office as may
 be provided for by the By-Laws. A certificate to this effect was filed May 17,
 1926, in the office of the Secretary of State for Illinois.

AMENDED BY-LAWS

JANUARY 1929

ARTICLE I

MEMBERS

SECTION 1. Members shall be of eleven classes, Corporate Members, Honorary Members, Patrons, Benefactors, Fellows, Life Members, Non-Resident Life Members, Associate Members, Non-Resident Associate Life Members, Sustaining Members, and Annual Members.

SECTION 2. The Corporate Members shall consist of the persons named in the articles of incorporation, and of such other persons as shall be chosen from time to time by the Board of Trustees at any of its meetings, upon the recommendation of the Executive Committee; provided, that such person named in the articles of incorporation shall, within ninety days from the adoption of these By-Laws, and persons hereafter chosen as Corporate Members shall, within ninety days of their election, pay into the treasury the sum of twenty dollars (\$20.00) or more. Corporate Members becoming Life Members, Patrons or Honorary Members shall be exempt from dues. Annual meetings of said Corporate Members shall be held at the same place and on the same day that the annual meeting of the Board of Trustees is held.

SECTION 3. Honorary Members shall be chosen by the Board from among persons who have rendered eminent service to science, and only upon unanimous nomination of the Executive Committee. They shall be exempt from all dues.

SECTION 4. Patrons shall be chosen by the Board upon recommendation of the Executive Committee from among persons who have rendered eminent service to the Museum. They shall be exempt from all dues, and, by virtue of their election as Patrons, shall also be Corporate Members.

SECTION 5. Any person contributing or devising the sum of One Hundred Thousand Dollars (\$100,000.00) in cash, or securities, or property to the funds of the Museum, may be elected a Benefactor of the Museum.

SECTION 6. Any person contributing the sum of Five Thousand Dollars (\$5,000.00) in cash or securities to the funds of the Museum, may be elected a Fellow of the Museum, who after being so elected shall have the right in perpetuity to appoint the successor in said Fellowship.

SECTION 7. Any person paying into the treasury the sum of Five Hundred Dollars (\$500.00), at any one time, shall, upon the unanimous vote of the Board, become a Life Member. Life Members shall be exempt from all dues, and shall enjoy all the privileges and courtesies of the Museum that are accorded to members of the Board of Trustees. Any person residing fifty miles or more from the city of Chicago, paying into the treasury the sum of One Hundred Dollars (\$100.00) at any one time, shall, upon the unanimous vote of the Board, become a Non-Resident Life Member. Non-Resident Life Members shall be exempt from all dues, and shall enjoy all the privileges and courtesies of the Museum that are accorded to members of the Board of Trustees.

SECTION 8. Any person paying into the treasury of the Museum the sum of one hundred dollars (\$100.00), at any one time, shall upon the unanimous vote of the Board, become an Associate Member. Associate Members shall be entitled to: tickets admitting member and members of family, including non-resident home guests; all publications of the Museum, if so desired; reserved seats for all lectures and entertainments under the auspices of the Museum, provided reservation is requested in advance; and admission of holder of membership and accompanying party to all special exhibits and Museum functions day or evening. Any person residing fifty miles or more from the city of Chicago, paying into the treasury the sum of Fifty Dollars (\$50.00) at any one time, shall, upon the unanimous vote of the Board, become a Non-Resident Associate Life

Member. Non-Resident Associates and Members shall be exempt from all dues, and shall enjoy all the privileges and immunities of the Museum that are accorded to Associate Members.

SECTION 9. Sustaining Members in payment of such portions as are specified from time to time by the Board of Trustees at any of its meetings, and who shall pay an annual fee of twenty-five dollars (\$25.00), payable within thirty days after notice of receipt and which terms shall apply to following Annual Date. The Sustaining Membership confers the same exclusive privileges for the member and family to the Museum as are had by the Annual Board and also other Museum privileges of participation in the organization's work. When a Sustaining Member has paid the annual fee of \$25.00 for six years, such member shall be entitled to become an Associate Member.

SECTION 10. Annual Members shall consist of such persons as are specified from time to time by the Board of Trustees at any of its meetings, and who shall pay an annual fee of ten dollars (\$10.00), payable within thirty days after each resulting annual date. An Annual Membership shall confer the members to a card of admission for the member and family having all hours when the Museum is open to the public, and free admission for the member and family to all Museum lectures or entertainments. This membership will also confer the holder to the courtesies of the membership privileges of every Museum of note in the United States and Canada as long as the existing system of cooperative interchange of membership tickets shall be maintained, including tickets for any lectures given under the auspices of any of the Museums during a visit to the cities in which the cooperative museums are located.

SECTION 11. All membership fees, excepting Sustaining and Annual, shall hereafter be applied to a permanent Membership Endowment Fund, the interest only of which shall be applied for the use of the Museum as the Board of Trustees may order.

ARTICLE II

BOARD OF TRUSTEES

SECTION 1. The Board of Trustees shall consist of twenty-one members. The respective members of the Board shall hold office and those who shall hereafter be elected shall hold office during life. Vacancies occurring in the Board shall be filled at a regular meeting of the Board upon the nomination of the Executive Committee made at a preceding regular meeting of the Board, by a majority vote of the members of the Board present.

SECTION 2. Regular meetings of the Board shall be held on the third Monday of each month. Special meetings may be called at any time by the President, and shall be called by the Secretary upon the written request of seven Trustees. Five Trustees shall constitute a quorum, except for the election of officers or the adoption of the Annual Budget, when seven Trustees shall be required, but meetings may be adjourned by any less number from day to day, or to a day fixed, previous to the next regular meeting.

SECTION 3. Reasonable written notice designating the time and place of holding meetings shall be given by the Secretary.

ARTICLE III

EMERGENCY TRUSTEES

SECTION 1. As a part of regular and/or emergency arrangements for the Institution, those Trustees who by reason of inability or absence or change of residence, or for other cause, or from ill-adaptedness to serve, happen in such capacity shall resign their office during the year, may be elected, by a majority of those present at any regular meeting of the Board, as Emergency Trustees for the year. Emergency Trustees shall hold office at all meetings of the Board of Trustees, a quorum required as aforesaid, and will be authorized to be present at all such meetings and participate in the transactions thereof, but an Emergency Trustee shall not have voting or vote.

ARTICLE IV

OFFICERS

SECTION 1. The officers shall be a President, a First Vice-President, a Second Vice-President, a Third Vice-President, a Secretary, an Assistant Secretary and a Treasurer. They shall be chosen by ballot by the Board of Trustees, a majority of those present and voting being necessary to elect. The President, the First Vice-President, the Second Vice-President, and the Third Vice-President shall be chosen from among the members of the Board of Trustees. The meeting for the election of officers shall be held on the third Monday of January of each year, and shall be called the Annual Meeting.

SECTION 2. The officers shall hold office for one year, or until their successors are elected and qualified, but any officer may be removed at any regular meeting of the Board of Trustees by a vote of two-thirds of all the members of the Board. Vacancies in any office may be filled by the Board at any meeting.

SECTION 3. The officers shall perform such duties as ordinarily appertain to their respective offices, and such as shall be prescribed by the By-Laws, or designated from time to time by the Board of Trustees.

ARTICLE V

THE TREASURER

SECTION 1. The Treasurer shall be custodian of the funds of the Corporation except as hereinafter provided. He shall make disbursements only upon warrants drawn by the Director and countersigned by the President. In the absence or inability of the Director, warrants may be signed by the Chairman of the Finance Committee, and in the absence or inability of the President, may be countersigned by one of the Vice-Presidents, or any member of the Finance Committee.

SECTION 2. The securities and muniments of title belonging to the corporation shall be placed in the custody of some Trust Company of Chicago to be designated by the Board of Trustees, which Trust Company shall collect the income and principal of said securities as the same become due, and pay same to the Treasurer, except as hereinafter provided. Said Trust Company shall allow access to and deliver any or all securities or muniments of title to the joint order of the following officers, namely The President or one of the Vice-Presidents, jointly with the Chairman, or one of the Vice-Chairmen, of the Finance Committee of the Museum.

SECTION 3. The Treasurer shall give bond in such amount, and with such sureties as shall be approved by the Board of Trustees.

SECTION 4. The Harris Trust & Savings Bank of Chicago shall be Custodian of "The N. W. Harris Public School Extension of Field Museum" fund. The bank shall make disbursements only upon warrants drawn by the Director and countersigned by the President. In the absence or inability of the Director, warrants may be signed by the Chairman of the Finance Committee, and in the absence or inability of the President, may be countersigned by one of the Vice-Presidents, or any member of the Finance Committee.

ARTICLE VI

THE DIRECTOR

SECTION 1. The Board of Trustees shall elect a Director of the Museum, who shall remain in office until his successor shall be elected. He shall have immediate charge and supervision of the Museum, and shall control the operations of the Institution, subject to the authority of the Board of Trustees and its Committees. The Director shall be the official medium of communication between the Board, or its Committees, and the scientific staff and maintenance force.

SECTION 2. There shall be four scientific Departments of the Museum—Anthropology, Botany, Geology and Zoology; each under the charge of a

Curator, subject to the authority of the Trustees. The Curators shall be appointed by the Board upon the recommendation of the Director, and shall serve during the pleasure of the Board. The permanent staff officers in the scientific departments shall be appointed and removed by the Trustees upon the recommendation of the Curators of the respective departments. The Director shall have authority to employ and dismiss all other employees of the Museum.

SECTION 3. The Director shall make reports to the Board at each regular meeting, respecting the operations of the Museum for the previous month. At the Annual Meeting, the Director shall make an Annual Report, reviewing the work for the previous year, which Annual Report shall be prepared in pamphlet form for the information of the Trustees and Members and for free distribution in such number as the Board may direct.

ARTICLE VII

ACCOUNTS

SECTION 1. The Board shall appoint an Auditor, who shall act as Auditor during the pleasure of the Board. He shall keep proper books of account, setting forth the financial condition and transactions of the Corporation, and of the Museum, and report thereon at each regular meeting, and at such other times as may be required by the Board. He shall certify to the correctness of all bills rendered for the expenditure of the money of the Corporation.

ARTICLE VIII

COMMITTEES

SECTION 1. There shall be five committees as follows: Finance, Building, Auditing, Pension and Executive.

SECTION 2. The Finance Committee shall consist of five members, the Auditing and Pension Committees shall each consist of three members, and the Building Committee shall consist of five members. All members of these four committees shall be elected by ballot by the Board at the Annual Meeting, and shall hold office for one year, and until their successors are elected and qualified. In electing the members of these committees the Board shall designate the Chairman and Vice-Chairman by the order in which the members are named in the respective Committee; the first member named shall be Chairman, the second named the Vice-Chairman, and the third named, Second Vice-Chairman, succession to the Chairmanship being in this order in the event of the absence or disability of the Chairman.

SECTION 3. The Executive Committee shall consist of the President of the Board, the Chairman of the Finance Committee, the Chairman of the Building Committee, the Chairman of the Auditing Committee, the Chairman of the Pension Committee, and three other members of the Board to be elected by ballot at the Annual Meeting.

SECTION 4. Four members shall constitute a quorum of the Executive Committee, and in all standing committees two members shall constitute a quorum. In the event that, owing to the absence or disability of members, a quorum of the regular elected members cannot be present at any meeting of any committee, then the Chairman thereof, or his successor, as herein provided, may summon any members of the Board of Trustees to act in place of the absentees.

SECTION 5. The Finance Committee shall have supervision of investing the endowment and other permanent funds of the Corporation, and the care of such real estate as may become its property. It shall have authority to invest, sell, and receive funds, subject to the approval of the Board.

SECTION 6. The Building Committee shall have supervision of the construction, reconstruction, and extension of any and all buildings used for Museum purposes.

SECTION 7. The Executive Committee shall be called together from time to time as the Chairman may consider necessary, or as he may be requested

to do by three members of the Committee, to act upon such matters affecting the administration of the Museum as cannot await consideration at the Regular Monthly Meetings of the Board of Trustees. It shall, before the beginning of each fiscal year, prepare and submit to the Board an itemized Budget, setting forth the probable receipts from all sources for the ensuing year, and make recommendations as to the expenditures which should be made for routine maintenance and fixed charges. Upon the adoption of the Budget by the Board, the expenditures as stated are authorized.

SECTION 8. The Auditing Committee shall have supervision over all accounting and bookkeeping, and full control of the financial records. It shall cause the same, once each year, or oftener, to be examined by an expert individual or firm, and shall transmit the report of such expert individual or firm to the Board at the next ensuing regular meeting after such examination shall have taken place.

SECTION 9. The Pension Committee shall determine by such means and processes as shall be established by the Board of Trustees to whom and in what amount the Pension Fund shall be distributed. These determinations or findings shall be subject to the approval of the Board of Trustees.

SECTION 10. The Chairman of each Committee shall report the acts and proceedings thereof at the next ensuing regular meeting of the Board.

SECTION 11. The President shall be ex-officio a member of all Committees and Chairman of the Executive Committee. Vacancies occurring in any Committee may be filled by ballot at any regular meeting of the Board.

ARTICLE IX

NOMINATING COMMITTEE

SECTION 1. At the November meeting of the Board each year, a Nominating Committee of three shall be chosen by lot. Said Committee shall make nominations for membership of the Finance Committee, the Building Committee, the Auditing Committee, and the Pension Committee, and for three members of the Executive Committee, from among the Trustees, to be submitted at the ensuing December meeting and voted upon at the following Annual Meeting in January.

ARTICLE X

SECTION 1. Whenever the word "Museum" is employed in the By-Laws of the Corporation, it shall be taken to mean the building in which the Museum as an Institution is located and operated, the material exhibited, the material in study collections, or in storage, furniture, fixtures, cases, tools, records, books, and all appurtenances of the Institution and the workings, researches, installations, expenditures, field work, laboratories, library, publications, lecture courses, and all scientific and maintenance activities.

SECTION 2. These By-Laws may be amended at any regular meeting of the Board of Trustees by a two-thirds vote of all the members present, provided the amendment shall have been proposed at a preceding regular meeting.

FOUNDER

*MARSHALL, FIELD

BENEFACTORS

THOSE WHO HAVE CONTRIBUTED 1,000.00 OR MORE TO THE MUSEUM

- | | |
|--------------------------|---------------------------|
| •AYER, EDWARD E. | •HARRIS, NORMAN W. |
| BUCKINGHAM, MISS KATE S. | •HINDENBERG, HANSON N. |
| •FIELD, JOSEPH N. | KEENE, WILLIAM T. |
| FIELD, CAPTAIN MARSHALL | •FULLMAN, GEORGE M. |
| FIELD, STANLEY | RA SWING, MISS ANNA LEONE |
| GRAHAM, FREDERICK B. | •HAYMOND, JAMES NELSON |
| HARRIS, ALBERT W. | SIMPSON, JAMES |
| *UNKNOWN | •STURGES, MRS. MARY D. |

HONORARY MEMBERS

THOSE WHO HAVE RENDERED EMINENT SERVICE TO SCIENCE

- | | |
|------------------------------|--------------------------------|
| AYER, MRS. EDWARD E. | KEEF, CHAUNCEY |
| BREASTED, PROFESSOR JAMES H. | LUDWIG, H. H. H. GUSTAF ADOLF, |
| CHAMBERS, WILLIAM J. | — CLERICAL PRINCE OF SWEDEN |
| CRANE, CHARLES H. | McCORMICK, STANLEY |
| CRANE, RICHARD T., JR. | HINDENBERG, JUDITH |
| FIELD, CAPTAIN MARSHALL | HINDENBERG, MRS. ANNETTA N. |
| FIELD, STANLEY | STURGES, MARTIN A. |
| GRAHAM, FREDERICK B. | SARGENT, HOWARD E. |
| HARRIS, ALBERT W. | SIMPSON, JAMES |
| | SPRAGUE, ALBERT A. |

UNKNOWN, ONE

BLACKSTONE, MRS. T. D.

PATRONS

THOSE WHO HAVE RENDERED EMINENT SERVICE TO THE MUSEUM

- | | |
|------------------------------|----------------------------|
| ARMOUR, ALLISON V. | KNIGHT, CHARLES H. |
| BORLAND, MRS. JOHN JAY | KUNE, GEORGE F. |
| CHADBOURNE, MRS. EMILY GRANT | LANGDON, PROFESSOR STEPHEN |
| CHEERIE, GEORGE K. | MARSHAM, CHARLES H. |
| COLEMAN, ALFRED M. | MOORE, MISS WILLIAM H. |
| CONNOR, BOARDMAN | FRYER, JOHN BERTON |
| CUMMINGS, MRS. ROBERT F. | FREED, EDWARD |
| CUTTING, C. SYDNEY | HANSON, FREDERICK H. |
| DAY, JUD GANNETT | HINDENBERG, ELMER |
| ELLSWORTH, JOHNSON S. | HINDENBERG, THURGOOD |
| KELLEY, WILLIAM V. | SARGENT, HOWARD E. |
| KENNEDY, VERNON SWAN | SMITH, MISS GEORGE T. |
| | STRAVE, CLAY W. |
| | WELCH, EDWARD J. |

UNKNOWN, ONE

FISLER, EDWARD B.

CORPORATE MEMBERS

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BORDEN, JOHN	KNIGHT, CHARLES R.
BORLAND, MRS. JOHN JAY	KUNZ, GEORGE F.
BYRAM, HARRY E.	LANGDON, PROFESSOR STEPHEN
CHADBOURNE, MRS. EMILY CRANE	MCCORMICK, CYRUS H.
CHALMERS, W. J.	MARKHAM, CHARLES H.
CHATFIELD-TAYLOR, H. C.	MITCHELL, WILLIAM H.
CERRIE, GEORGE K.	MOORE, MRS. WILLIAM H.
COLLINS, ALFRED M.	PAYNE, JOHN BARTON
CONOVER, BOARDMAN	PROBST, EDWARD
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FIELD, CAPTAIN MARSHALL	SMITH, MRS. GEORGE T.
FIELD, STANLEY	SMITH, SOLOMON A.
GRAHAM, ERNEST R.	SPRAGUE, ALBERT A.
HARRIS, ALBERT W.	STONE, MELVILLE E.
KEEP, CHAUNCEY	STRAWN, SILAS H.
KELLEY, WILLIAM V.	WHITE, HOWARD J.
	WRIGLEY, WILLIAM, JR.

DECEASED, 1928

BLAIR, WATSON F.
 BUTLER, EDWARD B.
 DAVIES, D. C.

LIFE MEMBERS

Those who have contributed \$100 to the Museum

- ABBOTT, JOHN JAC
 ABBOTT, ROBERT S.
 ALDER, ARTHUR T.
 ALEXANDER, WILLIAM A.
 ALLERTON, ROBERT H.
 AMES, JAMES C.
 AMES, KNOWLTON I.
 ARMOUR, ALLISON V.
 ARMOUR, A. WATSON.
 ARMOUR, LEONOR.
 AVERY, HERBERT J.
- BAKER, FREDERICK H.
 BAKER, EDWARD EDWARDSON, JR.
 BAKER, ALEXANDER F.
 BARRETT, MRS. A. D.
 BARRETT, ROBERT I.
 BARNFORD, LOWELL C.
 BENTLEY, VIRGINIA.
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 BILLINGS, C. M. G.
 BILLINGS, MRS. FRANK.
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 BLACK, HENRY A.
 BLAIR, MRS. WATSON F.
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 BLOOM, PHILIP D.
 BOOTH, W. VERNON.
 BOURN, JOHN.
 BOURN, MRS. WALLER.
 BOURLAND, CHANNING B.
 BRANNAN, GEORGE E.
 BREWSTER, WALTER S.
 BROWN, MRS. MASON.
 BROWN, CHARLES EDWARD.
 BROWN, WILLIAM L.
 BUSHMAN, J. W.
 BUSH, HENRY J.
 BUSHINGTON, EDWARD J.
 BURHAM, JOHN.
 BURT, WILLIAM G.
 BUTLER, JULIUS W.
 BYRAM, HARRY E.
- CARPENTER, ALBERT A.
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 CARR, ROBERT F.
 CARR, EDWARD F.
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 CHAMBERS, EDWARD T.
 CHASE, ALBERT W.
 CHASE, JOHN.
 CHASE, MRS. ALBERT W.
 CHASE, WILLIAM C.
 CHASE, MRS. WILLIAM C.
 CHASE, W. FREDERICK.
 CHASE, WILLIAM L.
 CHESNEY, EDWARD M.
 CHESTNUT, GEORGE JOHN (DECEASED IN 1914).
 CHERRY, F. B.
 CHERRY, ALBERT.
 CHERRY, JAMES.
 CHERRY, J. W.
 CHERRY, MRS. KATHARINE J.
 CHERRY, CHARLES J.
 CHERRY, RICHARD C. JR.
 CHESNUTT, EDWARD W.
 CHESNUTT, THE REVEREND.
 CHESNUTT, MISS THEODORE.
 CHESNUTT, M. F.
 CHESNEY, EDWARD A.
 CHESNEY, EDWARD A., JR.
 CHESNEY, JAMES M.
 CHESNEY, J. MARY.
 CHESNEYHAM, FRANK J.
 CHESNEYHAM, JAMES T.
 CHERRY, MRS. ROBERT M.
 CHERRY, ALBERT W.
- CHASE, J. J.
 CHASE, MRS. H. C.
 CHASE, CHARLES A.
 CHASE, ALBERT M.
 CHERRY, ALBERT.
 CHERRY, JAMES H.
 CHERRY, FREDERICK A.
 CHERRY, WILLIAM C.
 CHERRY, ALBERT FRANK.
 CHERRY, JAMES W.
 CHERRY, GEORGE W.
 CHERRY, FREDERICK L.
 CHERRY, JAMES H.
 CHERRY, FREDERICK E.
 CHERRY, JAMES H.
 CHERRY, JOHN H.
 CHERRY, THOMAS V.
 CHERRY, MARY.

- ECKHART, B. A.
EDMUNDS, PHILIP S.
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- FARNUM, HENRY W.
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FARRINGTON, DR. OLIVER C.
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FARWELL, FRANCIS C.
FARWELL, JOHN V.
FARWELL, WALTER
FAY, C. N.
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FENTON, HOWARD W.
FERGUSON, LOUIS A.
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FIELD, JOSEPH NASH, II
FIELD, CAPTAIN MARSHALL
FIELD, NORMAN
FIELD, MRS. NORMAN
FIELD, MRS. SARA CARROLL
FIELD, STANLEY
FLEMING, JOHN C.
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FYFFE, COLIN C. H.
- GARDNER, PAUL E.
GARDNER, ROBERT A.
GARTZ, A. F.
GARTZ, A. F., JR.
GARY, MRS. JOHN W.
GETZ, GEORGE F.
GLESSNER, JOHN J.
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GOODRICH, A. W.
GOODSPEED, CHARLES B.
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GRAHAM, ERNEST R.
GRIFFITHS, JOHN
GRISCOM, CLEMENT A.
- HACK, FREDERICK C.
HAMILL, ALFRED E.
HARRIS, ALBERT W.
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HASKELL, FREDERICK T.
HASTINGS, SAMUEL M.
HECHT, FRANK A., JR.
HIBBARD, FRANK
HILL, LOUIS W.
HINDE, THOMAS W.
HINKLEY, JAMES OTIS
HIPBACH, LOUIS A.
HOPKINS, J. M.
HOPKINS, L. J.
- HOROWITZ, L. J.
HOYT, N. LANDON
HUGHES, THOMAS S.
HURLEY, EDWARD N.
- INSULL, SAMUEL
INSULL, SAMUEL, JR.
- JARNAGIN, WILLIAM N.
JELKE, JOHN F.
JELKE, JOHN F., JR.
JOHNSON, MRS. ELIZABETH AYER
JONES, MRS. ARTHUR B.
JONES, MISS GWETHALYN
JONES, THOMAS D.
- KEEP, CHAUNCEY
KELLER, THEODORE C.
KELLEY, MRS. DAPHNE FIELD
KELLEY, RUSSELL P.
KELLEY, WILLIAM V.
KING, CHARLES GARFIELD
KING, FRANCIS
KING, JAMES G.
KIRK, WALTER RADCLIFFE
KNICKERBOCKER, CHARLES K.
KUPPENHEIMER, LOUIS B.
- LAMONT, ROBERT P.
LANDON, MRS. JESSIE SPALDING
(N. R.)
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LEONARD, CLIFFORD M.
LEOPOLD, MRS. HAROLD E.
LEVY, MRS. DAVID M.
LINN, W. R.
LOGAN, SPENCER H.
LORD, JOHN B.
LOWDEN, FRANK O.
LYTTON, GEORGE
LYTTON, HENRY C.
- MACDOWELL, CHARLES H.
MACVEAGH, FRANKLIN
MARK, CLAYTON
MARKHAM, CHARLES H.
MARSHALL, BENJAMIN H.
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MASON, WILLIAM S.
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McCORMICK, MRS. EDITH
ROCKEFELLER
McCORMICK, HAROLD F.
McCORMICK, STANLEY
McCUTCHEON, JOHN T.
McILVAINE, WILLIAM B.
McINNERNEY, THOMAS H.

MCKINLAY JOHN
 MCKINNON, GEORGE A.
 McLAUGHLIN, FREDERICK
 McLAUGHLIN, GEORGE J.
 McLENNAN, D. B.
 McLENNAN, EDWARD
 McNEELY, T. J.
 MEYNE, GERHARDT F.
 MINER, W. H.
 MITCHELL, WILLIAM H.
 MORSE, EDWARD S.
 MORSE, CHARLES H., JR.
 MORTON, JOE
 MORTON, MARY
 MUNROE, CHARLES A.

 NEWELL, A. B.
 NICHOLAS, G. J.
 NIEL, JOSEPH H.

 OARLEY, HOWARD S.
 O'BRIEN, JOHN J.
 OGDEN, J. R. OLIVER J.
 OKE, ROBERT M.

 PALMER, CHARLES A.
 PALMER, HENRIE
 PALMER, HENRIE
 PATTEN, HENRY J.
 PATTEN, MRS. JAMES A.
 PATTERSON, JOSEPH M.
 PAYNE, JOHN BARTON
 PAYSON, GEORGE S.
 PEABODY, AUGUSTUS S.
 PEABODY, HERBERT F.
 PEEB, ALBERT
 PIERCE, CHARLES J.
 PIER, CHARLES
 PIER, CHARLES B.
 PIER, FREDERICK R.
 PIPPENHURST, GEORGE H.
 PORTER, FRANK W.
 PORTER, GILBERT E.
 PORTER, H. H.

 RAMSON, FREDERICK H.
 RAYMOND, MRS. JAMES NELSON
 REA, MRS. ROBERT L.
 REVELL, AUGUSTUS H.
 REYNOLDS, ANTHONY
 REYNOLDS, EARLE H.
 REYNOLDS, GEORGE M.
 RILEY, HARRISON B.
 ROBINSON, THOMPSON W.
 ROBINSON, MISS ALICE
 ROEMAN, MRS. KATHERINE FRED

ROEMAN, FRANK LORENZO
 ROEMER, GEORGE
 ROEMER, GEORGE J. (N. H.)
 ROEMER, WILLIAM
 ROEMER, LEO
 ROEMER, JOHN C.
 ROEMER, EDWARD L.
 ROEMER, EDWARD F.
 ROEMER, MRS. SARAH H.
 ROEMER, THOMAS J., JR.
 ROEMER, MARTIN A.

 SARGENT, FRANK WENLEY
 SARGENT, EDWARD H.
 SAFF, FRANK JACOBINE
 SAFF, GEORGE J.
 SAFF, EDWARD J.
 SAFF, JOHN W.
 SAFFER, JOHN C.
 SAFFER, JOSEPH H.
 SAFFER, JAMES
 SAFFER, WILLIAM B.
 SMITH, ALEXANDER
 SMITH, SULLIVAN A.
 SMITH, JAMES F.
 SPALDING, EDITH
 SPALDING, MRS. EDWARD H., JR.
 SPRAUE, ALBERT A.
 STERN, MRS. ALBERT K.
 STERN, MRS. EDWARD H. (N. H.)
 STEINER, GEORGE A.
 STEWARD, ROBERT W.
 STEINER, ROBERT C.
 STEIN, W. E.
 STEWART, FRANK J.
 STEWART, JOHN
 STEWART, H. THOMAS
 STRAWS, NILES H.
 STUBBARD, CLAYTON, JR.
 STUBBS, GEORGE
 STUBBS, MRS. EDITH C.
 STUBBS, E. F.
 SWIFT, CHARLES H.
 SWIFT, EDWARD F.
 SWIFT, G. E., JR.
 SWIFT, HARRY M.
 SWIFT, LOUIS F.

 THORNTON, CHARLES H.
 THORNTON, ROBERT J.
 THORNTON, MILDRED A.
 TREE, EDWARD S. F.
 TRING, EDWARD

 TULLOCH, EDWARD J.
 UNDERWOOD, MERRILL F.

VALENTINE, LOUIS L.
VEATCH, GEORGE L.
VERNAY, ARTHUR S. (N. R.)
VILES, LAWRENCE M.

WACKER, CHARLES H.
WANNER, HARRY C.
WARNER, EZRA JOSEPH
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WETMORE, FRANK O.
WHEELER, CHARLES P.
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WILLARD, ALONZA J.
WILLITS, WARD W.
WILSON, JOHN P., JR.
WILSON, OLIVER T.
WILSON, THOMAS E.
WILSON, WALTER H.
WINSTON, GARRARD B.
WINTER, WALLACE C.
WOOLLEY, CLARENCE M.
WRIGLEY, WILLIAM, JR.

YATES, DAVID M.

DECEASED, 1928

BLACKSTONE, MRS. T. B.
BLAIR, WATSON F.
BRADLEY, J. DORR
BUTLER, EDWARD B.

DAVIES, D. C.

HARVEY, FORD F. (N. R.)

HEYWORTH, JAMES O.
HUGHITT, MARVIN

KITTLE, C. M.

MANIERRE, MRS. GEORGE

RYERSON, EDWARD L.

ASSOCIATE MEMBERS

Those who have contributed \$100 to the Museum

AARON, CHARLES
ABBOTT, DONALD P., JR.
ABBOTT, GORDON C.
ABBOTT, W. R.
ABBOTT, WILLIAM L.
ABRAMS, PROFESSOR DUFF A.
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ADAMICK, GUSTAV H.
ADAMS, BENJAMIN STEARNS
ADAMS, JOSEPH
ADAMS, MRS. S. H.
ADAMS, WILLIAM C.
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ADLER, DAVID
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ALLING, CHARLES
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ALTER, HARRY
ANDERSON, ARTHUR
ANDREWS, ALFRED B.
ANNAN, MRS. MIRIAM ORMSBY
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ARMBRUSTER, C. A.
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ARMSTRONG, ARTHUR W.
ARMSTRONG, MRS. FRANK H.
ARNOLD, WILLIAM G.
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ASHBY, W. B.
ASHENHURST, HAROLD S.
ASHER, LOUIS E.
ATWATER, WALTER HULL
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AUSTIN, HENRY W.
AUSTIN, DR. MARGARET HOWARD
AUSTRIAN, ALFRED S.

BAACKES, MRS. FRANK
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- BARNON, HENRY B.
 BARN, JAMES H.
 BARN, MERVIN K.
 BARN, WALTER S.
 BARHALEY, WILLIAM BLAKE
 BARRE, CHRISTIAN S.
 BARRE, HARRY K.
 BARRE, MRS. ALBERT J.
 BARRE, FRANK H.
 BARRE, L. K.
 BARDWIN, VINCENT ALBERT
 BARDELMANN, OTTO W.
 BARDIN, LOUIS
 BARR, DR. FRED E.
 BARR, SIDNEY S.
 BARKER, THOMAS L.
 BARKER, ANDREW T.
 BARKER, HARRY A.
 BARKER, JAMES J.
 BARKLEY, MISS MATILDA A.
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 BARNETT, OTTO B.
 BARNHART, MRS. A. M.
 BARNHART, MRS. CLARE S.
 BARNHART, MISS GRACIA M. F.
 BARTHELE, JOHN H.
 BARTHELEMAE, MRS. EMMA
 BARTHELEMAE, HENRY
 BARTHELEMAE, MISS WILLIAM JR.
 BARTLEY, MISS FLORENCE D.
 BARTLEY, FREDERICK C.
 BARR, JOHN F.
 BARR, MRS. FERRIS
 BARTAN, CHARLES L.
 BARTMAN, FRED L.
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 BATTY, P. D.
 BAUER, A.
 BAUM, MRS. JAMES
 BAUM, MERVIN
 BAUMGARTEN, C.
 BAUSER, WILLIAM C.
 BAUER, MISS BESS E.
 BAUER, HERBERT
 BAUER, BENJAMIN F.
 BAUER, BENJAMIN V.
 BAUER, FREDERICK G.
 BAUER, H. T.
 BAUER, LOUIS
 BAUER, MRS. EDITH
 BAUER, FRANCIS D.
 BAER, LOUIS A.
 BAER, ROBERT W.
 BAENDER, G. J.
 BAER, HARRY
 BAERHART, WILLIAM E.
 BAER, JOHN
 BAER, ALBERT
 BAERTS, JOHN
 BAERTS, JOHN
 BAERTS, MISS MARY M.
 BAERTSDORF, EDWARD
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 BAERTSDORF, JOHN B.
 BAERTSDORF, ELMER G.
 BAERTS, MRS. T. DE.
 BAERTS, DR. ARTHUR LEON
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 BAERTS, JOHN W.
 BAERTS, MRS. ANNE J.
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 BAERTS, MISS VERONICA
 BAERTS, GEORGE H.
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 BAERTS, HARRY F.
 BAERT, HOWARD J.
 BAERTS, MRS. MARTHA S.
 BAERTS, JAMES F.
 BAERTS, MRS. FRANK J.
 BAERT, EDWARD RICHARD
 BAERT, DR. ARTHUR J.
 BAERTMAN, NATHAN L.
 BAERT, EDWARD J.
 BAERT, FREDERICK
 BAERTS, CARL
 BAERTS, N. H. SR.
 BAERTS, THOMAS C.
 BAERTS, DR. ROBERT
 BAERTS, WILLIAM E.
 BAERT, GEORGE
 BAERT, MISS AMELIA M.
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 BAERT, FREDERICK S.
 BAERTS, MRS. LEAH
 BAERT, JOHN
 BAERT, HARRY E.
 BAERT, J. E. JR.
 BAER, ALBERT
 BAERMAN, MISS LOUISE
 BAERTS, MRS. ANNA
 BAERT, MISS MARTHA BOWEN
 BAERT, JAMES C.
 BAERT, FREDERICK
 BAERTS, DR. PAUL
 BAERT, WILLIAM J.
 BAERT, ALBERT
 BAERT, GEORGE F.
 BAERTS, MRS. HELEN
 BAERT, MRS.
 BAERT, CHARLES

- BOSCH, MRS. HENRY
 BOTH, WILLIAM C.
 BOTTS, GRAEME G.
 BOURNE, RALPH H.
 BOUSA, DR. B.
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 BOWEY, MRS. CHARLES F.
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 BOYD, THOMAS M.
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 BOYNTON, F. P.
 BRADLEY, MRS. A. BALLARD
 BRADLEY, MRS. NATALIE BLAIR
 HIGINBOTHAM
 BRAMBLE, DELHI G. C.
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 BRAND, MRS. RUDOLPH
 BRANDES, A. G.
 BRANDT, CHARLES H.
 BRANSFIELD, JOHN J.
 BRASSERT, HERMAN A.
 BRAUER, MRS. PAUL
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 DOWLING, T. F.
 DOYLE, EDWARD J.
 DOYLE, EDWARD V.
 DOYLE, LEO J.
 DRAKE, LYMAN M., JR.
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 DRYNAN, WILLIAM G.
 DUCE, ALBERT
 DUDLEY, W. W.
 DUGGAN, MRS. HENRY
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 DUNCAN, W. S.
 DUNER, DR. CLARENCE S.
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 DUNLAP, MRS. SAMUEL A.
 DUNLAP, MRS. T. M.
 DUNN, EDWARD J.
 DUNNING, N. MAX
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 DUPEE, EUGENE H.
 DUPUIS, MISS J. L.

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DERRAM Miss Anna (Mrs.)

DERRAM Joseph

DERRAM John F. J.

DERRAM Miss Mary

DERRAM William A.

DERRAM A. C.

DERRAM Mrs. Elizabeth W.

DERRAM Miss Mary W.

DERRAM Miss Anna

DERRAM J. Nathan

DERRAM Edward

DERRAM M. J.

DERRAM William E.

DERRAM John Paul J. W.

DERRAM John W.

DERRAM Miss Harvey J.

DERRAM John J. J.

DERRAM Miss Mary W.

DERRAM Joseph J.

DERRAM Miss M. A.

DERRAM H. Wray

DERRAM John

DERRAM Miss Thomas

DERRAM Miss Thomas W.

DERRAM Miss Mad

DERRAM Alfred M.

DERRAM Miss William J.

DERRAM Miss Frank M.

DERRAM John A. H.

DERRAM Miss E. N.

DERRAM Frank J.

DERRAM Miss John

DERRAM Miss John Thomas

DERRAM John Thomas J.

DERRAM Joseph W.

DERRAM William J.

DERRAM Howard A.

DERRAM William M.

DERRAM Frank C.

DERRAM Miss Fred A.

DERRAM John Nathan W.

DERRAM Thomas W.

DERRAM Miss William

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DERRAM Joseph J.

DERRAM Frederick J.

DERRAM Anthony A.

DERRAM Miss E. J.

DERRAM Frank

DERRAM H. B.

DERRAM Thomas W.

DERRAM Miss Charles W.

DERRAM John W.

DERRAM, Miss E. J.

DERRAM J. A.

DERRAM Miss Thomas W.

DERRAM John A.

DERRAM Miss Mary W.

DERRAM John Thomas W. A.

DERRAM Thomas

DERRAM Miss William

DERRAM Miss Thomas William

DERRAM Thomas W.

DERRAM Miss E. J.

DERRAM Miss John W.

DERRAM Alfred

DERRAM John Paul J.

DERRAM Thomas J.

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- FISHER, MRS. VORIES
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 FITZGERALD, DR. J. E.
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 FLOESSLER, ARTHUR M.
 FLYNN, MAURICE J.
 FOCKLER, L. H.
 FOLEY, HARRY B.
 FOLEY, JOHN M.
 FOLTZ, HARRY G.
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 FORD, T. A.
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 HOPKINS, ALVAH S.
 HOPKINS, W. M.
 HORN, ALBIN O.
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 HORNADAY, THOMAS F.
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 HORNSTEIN, LEON
 HORNUNG, JOSEPH J.
 HORTON, HIRAM T.
 HORTON, RALPH
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 HORWICH, PHILIP
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 HRYNIEWEICKI, DR. STEFAN
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 HUBBARD, JOHN M.
 HUBBARD, WILLIAM C.
 HUBBELL, ARTHUR C.
 HUBBELL, WILLIAM J.
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 HULBERT, MRS. CHARLES PRATT
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 HULL, ROBERT W.
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 HUNTERSON, LOUIS C.
 HUNTER, FREDERICK
 HUNT, W. FREDRICK, JR.
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 HURLEY, EDWARD S., JR.
 HURLEY, FRANK J.
 HURDINGTON, A. H.
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IRVING, EDWARD
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 INGRAM, HAROLD S.
 INGRAM, MARTIN J.
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 ISAACS, MICHAEL H.
 IVERSON, RALPH H.

JACKSON, JOHN B.
 JACKSON, MRS. FREDA B.
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 JACKSON, WILLIAM P.
 JACOB, CHARLES W.
 JACOB, HARRY
 JACOB, MRS. C. H.
 JACOB, H. G.
 JACOB, HARVEY F.
 JACOB, MRS. HOWARD D.
 JACOB, JULIUS
 JACOB, NATE
 JACOB, WALTER H.
 JACOB, WHITTLE
 JACOBSON, EUGENE G.
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 JACOBSON, RICHARD
 JACOB, EDWARD W.
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 JACOB, MRS. STANLEY J.
 JAMES, CHARLES B.
 JAMES, HENRY D.
 JAMES, MRS. HALPH H.
 JAMES, ROBERT E.
 JAMESON, CLARENCE W.
 JAMIESON, NORMAN H.
 JAMIESON, W. J.
 JAMISON, MRS. MARY
 JANATA, LOUIS J.

JANIA, HAZEL
 JANNEY, THOMAS W.
 JAQUES, LOUIS T.
 JARVIS, ALFRED W.
 JARVIS, CHARLES C.
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 JARVIS, WILLIAM D., DR.
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 JEFFERS, DR. JACOB W.
 JENKS, FREDERICK
 JENSEN, CARL F.
 JENSEN, JOHN
 JENSEN, C. FRANK
 JENSEN, JOHN J.
 JENSEN, THOMAS
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 JENSEN, JOHN J.
 JENSEN, THOMAS H.
 JENSEN, JOHN J.
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 JENSEN, JOHN
 JENSEN, MRS. FRANK ALBERT
 JENSEN, FREDERICK G.
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 JENSEN, M.
 JENSEN, MARTIN A.
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 JENSEN, DR. WALTER W.
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 JENSEN, JOHN H.
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 JENSEN, MRS. THOMAS S.
 JENSEN, VICTOR H.

- JONES, WALTER CLYDE, JR.
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 JORGENSEN, EMIL O.
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 JOSEPH, A. G.
 JOSEPH, ARTHUR W.
 JOSEPH, W. S.
 JOY, JAMES A.
 JOYCE, MARVIN BERNARD
 JOYCE, THOMAS F.
 JUDAH, MRS. NOBLE BRANDON
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 JUDD, HARRY L.
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- KAEMPFER, FRED
 KAERCHER, ALBERT W.
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 KAHN, DAVID
 KAHN, I. W.
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 KAHNWEILER, ALEXANDER
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 KELLY, EDWARD T.
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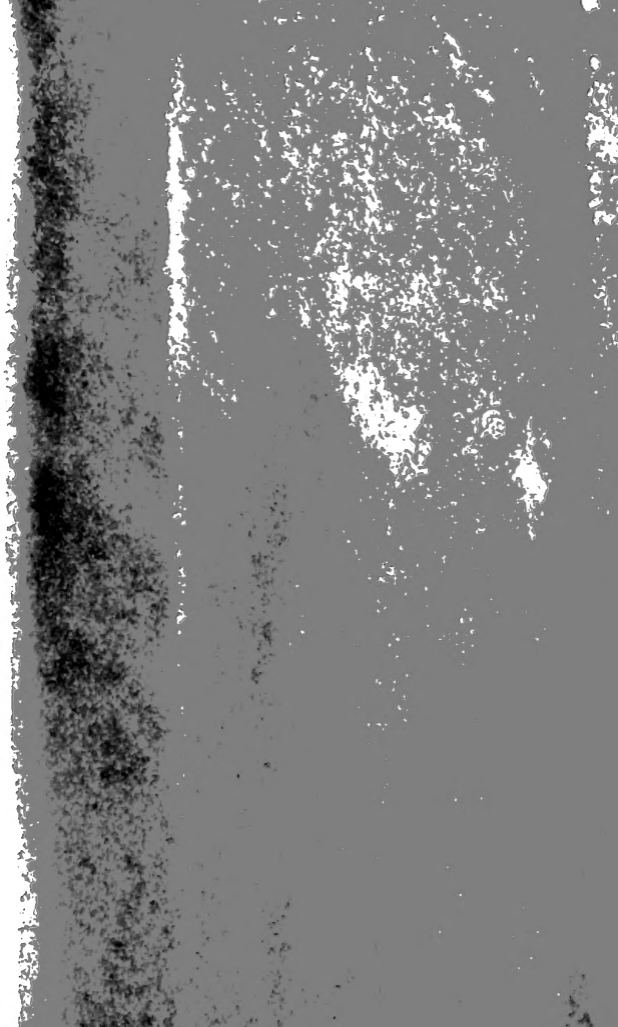


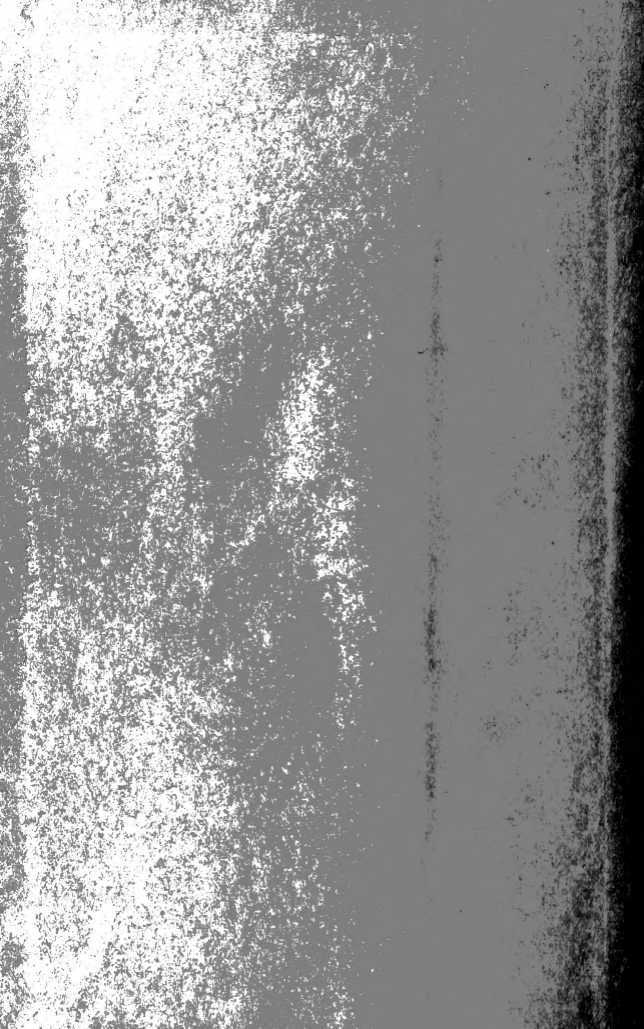
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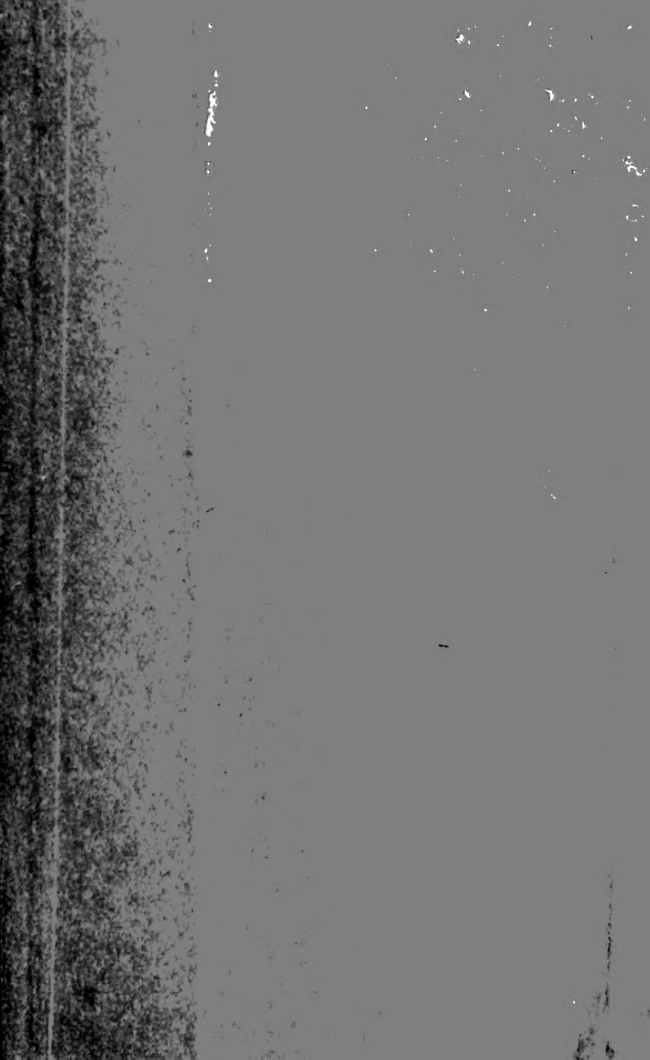
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