

THE AMERICAN MUSEUM
OF NATURAL HISTORY

EIGHTY-SECOND ANNUAL REPORT
JULY, 1950, THROUGH JUNE, 1951

THE AMERICAN MUSEUM OF NATURAL HISTORY

EIGHTY-SECOND ANNUAL REPORT
JULY, 1950, THROUGH JUNE, 1951



THE CITY OF NEW YORK
1951

EIGHTY-SECOND ANNUAL REPORT OF THE PRESIDENT

*To the Trustees of
The American Museum of Natural History
and to the
Municipal Authorities of the City of New York*

IN June, 1951, a change of command took place at the Museum, Trubee Davison turning over the helm to me after eighteen years of leadership. They had not been easy years for any institution, covering as they did the depression period of the thirties and World War II. Despite the discouraging atmosphere of operating under financial strain and mounting inflation and having to deal with hot and cold war restrictions, our Museum not only survived but made real progress in its long-range development program. We are deeply indebted to Mr. Davison and to the late A. Perry Osborn, our First Vice-President, for successfully piloting the ship through this stormy period.

Our Director, Dr. Albert E. Parr, will present in the following pages his report for the scientific departments, which is quite properly the important section of our Annual Report. My remarks will be restricted to brief comments on our general situation.

As the new officers assumed their duties, a decision was reached by the Board to retain the services of the management consultant firm of Cresap, McCormick and Paget to prepare an objective study of our entire operation and to point out ways, if any, in which we might conduct our affairs more efficiently. As we have been in existence since 1869 and have grown to a point where our budget called for an annual expenditure of over \$2,600,000 and the employment of 550 people, it seemed the course of wisdom to have competent

doctors take our pulse. The men retained for this survey have had wide institutional experience, through which they have been able to show organizations not dissimilar from ours (universities, public libraries, government departments, etc.) the methods by which important savings could be made without interfering with objectives. This study, which will last several months, is now under way and has been financed through the generosity of several of our Trustees. Seeking support as we do every year from the public, we felt it essential to put ourselves in the position of conducting our affairs as economically as possible without sacrificing our effectiveness.

It is interesting to look briefly at our financial picture for the last decade. In 1942 the securities in our general endowment fund had a market value of approximately \$12,100,000 and our pension fund of \$1,500,000. Today the former has a value of approximately \$18,500,000 and the latter \$3,600,000. Bear in mind that this has been accomplished despite seven deficit years (running into the red for a total of \$1,000,000) and after making appropriations for the rehabilitation and development programs and for retiring the RFC debt on the Planetarium with the generous help of the Hayden Foundation. Of course, our increased security income must deal with the far higher costs of an inflationary period, yet we are very much a going concern. This has been made possible largely by the substantial annual support given to our work by the City of New York and to the backing given to us through our public Contributors' Program. We must continue to depend on this backing and to increase the number of annual members. Last year Mrs. George Harrison and Mr. August Belmont actively led the Women's and Men's Committees to raise a total of \$140,000. For the coming fiscal year Mrs. Paul E. Peabody and Mr. Belmont have agreed to head these committees.

At this point, it might be asked, where can we obtain

further sources of revenue to carry on our work? We must do more to interest business corporations in our behalf. And it seems to me that we can, without improperly commercializing ourselves, derive real earning power from the avenues opened up to us by television, by film rentals, by increasing the circulation of "Natural History" Magazine to a point where it will attract national advertising, and by other methods.

In order to keep our supporters informed on what we are doing, John O'Reilly (better known as "Tex") is writing monthly a brief activity report entitled "Museum Memo," which we are sending to the several thousand friends on our mailing list.

Our Board and the City have appropriated the necessary funds and approved plans for our new library building, although construction has been delayed owing to the current restrictions on materials for all new building purposes. The development of our new exhibition halls will be reported on by the Director. It should be noted here that the example set by Trustee Frederick Warburg in financing the new Landscape Hall has stimulated others to help us with our plan for the new Forestry and Botany exhibitions.

We have lost some of our most loyal and generous Trustees, in the year which ended June 30, in the deaths of A. Perry Osborn, Dr. Leonard C. Sanford, Lincoln Ellsworth, and William Procter. The record of their years of service will be a continued inspiration to those of us, including many new younger Trustees, who constitute the present Board.

Although many problems face us, they are not beyond solution. I believe I am not being overly optimistic in thinking that the Museum is entering on a new era in its history with unparalleled opportunity to capitalize on the great work that has been done in the past.

Alexander M. White

PURPOSES AND PROGRESS

REPORT OF THE DIRECTOR

A. E. Parr

As a virtue of necessity a natural history museum must always be aiming at long-range goals. Its exhibits are not simply acquired objects, put on display. They must be patiently created by the museum's own staff of artists and scientists working in painstaking cooperation. Being a long time in the making, the exhibits cannot be made for short service, and must be primarily devoted to the more enduring aspects of scientific knowledge and of public interest. The temporary displays, which play such a large role in many other institutions of visual education, must always remain a lesser element in the program of the natural history museum, although increasing and successful efforts are directed also towards the presentation of subjects of current but less permanent interest.

In research, it is the primary object of the natural history museum to advance our knowledge of life as it is actually lived in nature, where conditions are not under the investigators' control, and where a full understanding of the life of the individual organism can be arrived at only by a study of the entire environment and its changes with the seasons and over the years. The research problems of the museum are therefore also long-range problems, requiring a vast and slow accumulation of material and continuous observation of environments. While the field-work that is the essence of museum research is increasingly supplemented and supported by experiments in our museum laboratories, work of this type does not advance towards its goal by such clearly defined and readily reported steps as those that

characterize the progress of investigations relying entirely upon laboratory experiments for their results. Years may pass with little of obvious interest or significance to report, until the final conclusions are reached and presented as a major contribution to our knowledge of nature.

For an institution committed to long-range projects, annual reports arbitrarily limited to the events and achievements of a twelve-month period—not a day more, not a day less—will unavoidably suffer from a lack of balance and perspective. Each report becomes a chapter out of context, lending a haphazard appearance to the march of events by failing to reveal the continuity of progress under long-term plans.

To give a really meaningful account of the functions of a natural history museum it is therefore necessary to relate the work of the year to that of the past, to the evolving philosophy of purposes, and to the plans for the future. There are few beginnings to report, and few finishes to write, to activities in any particular year. The bulk of the work is in a continuous line of progress from the past towards the future.

As it is several years since a similar report has been published, it seems particularly opportune and desirable to attempt a rather broad survey of the Museum's plans and purposes in connection with this report on the work done during 1950-1951. It also seems very appropriate to do so at this time, because the opening of the Felix M. Warburg Memorial Hall to the public in the spring of 1951 is the first major result in public exhibition of a new trend in the Museum's activities in education and research and in the over-all concept of the Museum's purposes that has gradually been developing in recent times.

In this new hall the Museum takes cognizance of an elementary duty to teach the children and the general public of a large metropolitan area the simplest basic facts

of life in the natural environment and in nature under human cultivation. It explains how a flower is pollinated and how it changes into a fruit, why man must fertilize his fields because he harvests its growth, while nature need not do the same because it does not remove its crops. It shows the animal life below ground as well as the life above the surface. It demonstrates the internal structure of a lake and the relationship between plants and soil. To give meaning to the contents of the hall in the daily lives of the visitors also outside the Museum, it has taken for its subject a familiar landscape within week-end picnic distance from the city. The new hall also departs from previous tradition in that it attempts to deal with the totality of nature from the geological past of the landscape to its present-day life, and in that it introduces the history and effects of human settlement as part of the history of nature.

The Museum has good reason to be very pleased by the reception given to this new hall both by educators and by the general public, and to be very grateful to Mr. Frederick M. Warburg for having made the hall possible by his generous gift.

In order to understand the current program of the Museum, of which the Felix M. Warburg Memorial Hall is the newest expression, it is necessary to realize that the original narrow concept of the purposes of a natural history museum has undergone a tremendous evolution and growth, particularly in recent years.

ECOLOGY IN THE MUSEUM

From the study of the forms of dead specimens, museum scientists have turned their attention more and more towards the problems of the living species. It is perhaps not generally realized that reliable evidence concerning some of the most fundamental aspects of life in nature can be

obtained only from dead and preserved collections. The stomach contents revealing natural feeding habits will quickly disappear in specimens kept alive under the artificial conditions of captivity. Their mortality rate is certain to change; their rate of growth, maturation, and reproduction are very likely to be altered. Age, growth, food habits, mortality, reproduction, and, at least for most of marine life, even the migrations of the species in nature must therefore be investigated by the study of properly collected and immediately preserved samples such as those in museum collections. The natural history museums have therefore gradually become centers of ecological research as well as of the systematic and anatomical research with which they started.

As an example of the turn towards ecology in the zoological departments of the Museum, one might mention the work on swordfishes and mackerel-like fishes carried forward by Miss LaMonte during 1950-1951. The scope of these investigations is not limited to questions of the anatomy and classification of the species, but embraces their distribution, migrations, feeding, choice of bottom, abundance, size and growth, and other aspects of their biology, of great interest both to anglers and fishermen, scientists and general public.

Studies of a similar nature are also carried on in many other departments on such subjects as the migrations of butterflies, the choice of environment, relative abundance, and temperature levels among the salamanders of Virginia, and the effects of temperatures upon the growth rate of toads.

Two events of outstanding importance in the advance of this trend towards ecology were the opening of the Lerner Marine Laboratory at Bimini, Bahamas, in 1948, and the establishment of the Lerner Endowment Fund for Marine Research in the spring of 1951, as gifts to the

Museum created and donated by the initiative and generosity of Michael Lerner and his friends.

In the first four years of its existence the Lerner Laboratory has accommodated 110 research workers from many departments of the Museum and from other institutions, who spent an average of thirty-seven days each at the laboratory. During 1950-1951 the laboratory was used by twenty-eight investigators for an average of forty-five days each, and seventeen scientific papers were published on the basis of work done there.

The work carried on at the Lerner Laboratory covers a very wide range of biological studies, including such subjects as the effects of chemicals upon cell divisions in eggs of marine animals, many aspects of the behavior of marine fishes, the vegetation, insects, birds, and reptiles of Bimini, the gases in the swim-bladders of fishes, and many other topics.

Of particular importance in the program of the Lerner Laboratory has been the development of research on cancer in lower animals, as an aid to our understanding of cancer in man, for which the laboratory has created an exceptionally fine opportunity. This will also be mentioned elsewhere in this report.

In the course of the last year extensive new construction, designed to double the laboratory space in response to a growing demand, was undertaken and completed at the Lerner Laboratory.

During 1950-1951 ecological research also received very significant encouragement from another source within the Museum, by the distribution of the first grants made from the Frank M. Chapman Memorial Fund. This fund has been created and built up over a number of years primarily through the initiative and generosity of Mr. and Mrs. Walter W. Naumburg and has also received contributions from many other friends of the late Dr. Chapman, for half

a century the head of our Department of Birds. The capital fund now exceeds \$40,000. The grants made during 1950-1951 went mainly towards the support of such ecological research projects as a faunal and ecological investigation of bird life in Tamaulipas, Mexico; studies of the life histories of chimney swifts and of gulls; and an investigation of the range and habits of the Northern Black Swift.

PALEONTOLOGY TURNS TO THE STUDY OF THE LIVING

The turn towards ecology has not been limited to the Museum departments dealing only with the contemporary forms of life. It has also taken place in paleontology. We form our ideas of the natural conditions, the climates, the oceans, the lakes, and the land of the past from our knowledge of the ecological requirements of the living relatives of the organisms of earlier geological ages. The study of contemporary ecology has therefore become an essential element also of paleontological research.

Sometimes this may lead to the participation of paleontologists in the research projects of the zoologists, as in the study of the temperature requirements and adjustments of alligators in which Dr. Colbert, of the Department of Geology and Paleontology, recently joined his efforts with those of Mr. Bogert, of the Department of Amphibians and Reptiles.

But because their purposes and needs are not wholly identical with those of the zoologists, it is at other times necessary for the paleontologists themselves to take the initiative also in the study of living forms, with zoologists joining under their leadership. This is particularly true for marine bottom invertebrates, which are of extremely great importance both to paleontology and to general and applied geology, while the support for zoological positions

in this field is ridiculously inadequate. At the Museum we therefore find both the Department of Micropaleontology and the Department of Geology and Paleontology entering on their own into the study of living marine forms.

During the summer of 1950, Dr. Newell, Curator of Fossil Invertebrates, led a party of geologists on an investigation of the barrier coral reef of Andros Island in the Bahamas. Field work was resumed in the spring of 1951. These studies were undertaken to provide a background of biological knowledge for the interpretation of the fossil Permian limestone reef deposits, on which intensive research was also conducted at the same time in western Texas, also under Dr. Newell's leadership. Apart from its great scientific interest, the knowledge obtained from such investigations is also of great practical value to the industrial geologists, particularly in the oil industry, which has acknowledged its importance by underwriting all the field expenses. Among the records brought back from the field were about two thousand still photographs and about one thousand feet of colored moviefilm of the life in shoal water, about half of it actually taken under water, and a detailed reconnaissance map covering approximately one hundred square miles of coral reef. As a supplement to the collections of specimens, such material is of tremendous value in any attempt to understand the life in the sea and is also of great usefulness in instruction.

In the fall of 1950 the Department of Micropaleontology, jointly with the Department of Geology of New York University, also entered into the field of contemporary biological research by initiating a program of experimental ecological investigations of living Foraminifera, having for their purpose a determination of the living conditions required by these minute, single-celled organisms in order to interpret the geological records in which their shells play such an important role. Dr. Ellis, chairman of the

department, hopes to find opportunity to expand these activities still further by a study at sea of the Foraminifera faunas of the continental shelf along our Atlantic coast.

When the reasoning and conclusions developed from the study of living forms are subsequently applied to the interpretation of the fossil evidence of past ages, the paleontologists are able to recreate for us not only the shapes of beasts long dead but also their ways and conditions of life. In such investigations as the study of the Triassic dinosaurs of New Mexico, undertaken jointly by Dr. Colbert, of our Department of Geology and Paleontology, and Dr. Harshbarger, of the University of Arizona, the scientists concern themselves as much with the ecology of the past as with the systematics of its species.

In all the work of our paleontologists a very close cooperation exists between the Museum and Columbia University.

LIFE AND THE CHEMISTRY OF THE ENVIRONMENT

As one thing leads to another, the study of ecology by Museum paleontologists as well as zoologists results in a need to examine more closely the physical and chemical properties of the environment itself. The study of the physics and chemistry of the stable inorganic solids found in nature is one of the oldest functions of the natural history museums carried on by their mineralogy departments.

The current research program of the Division of Mineralogy, in the Museum's Department of Geology and Paleontology, is particularly concerned with the occurrence of minerals in relation to their environment, a study known as mineral paragenesis. The earth's elements are not uniformly distributed through the crust, but are localized by various special geological conditions which may result in the precipitation of ore veins, the intrusion of igneous

bodies, or the deposition of sedimentary strata. Each formation is characterized by its own range of temperature, pressure, and atmospheric conditions, and therefore contains its own special group of minerals. It is the familiarity with the minerals which may form in each of these environments that saves wasteful, fruitless prospecting. It is also a simple guide to the identification of minerals when they are found, for like-appearing substances may be mutually exclusive in a geological occurrence. Today trace-element and isotope studies, which often depend for their standards upon the exhausted mines of the past, are making this aspect of mineralogy of increasing importance in the accelerated search for the less obvious economic mineral deposits.

But the progress of ecology demands that similar attention should also be paid to the liquid chemistry and physics of nature—since it is only through liquid solution that the chemicals of the environment can affect the processes of life—and to the substances leading a less stable existence in the constant interchange between life and the inanimate environment.

Five years ago gifts received from Mr. George M. Moffett and Mr. Robert Earll McConnell enabled the Museum to undertake a fundamental task in this field by launching a Survey of Contemporary Knowledge of Biogeochemistry, with Professor G. E. Hutchinson in charge. It is the primary purpose of this survey to attempt to bring together and present in a comprehensive and systematic manner all existing knowledge of the biological significance of the various chemical elements and of the biological need for each; of the distribution of each element on the surface of the earth in a biologically usable form; of the effect of this distribution upon the distribution of life; and of the effect of life upon the redistribution of the elements and the transformation of their compounds in the environment.

Although a great deal of information has been gathered in many fields, it is so widely scattered through technical and nontechnical literature on such a wide variety of subjects, from geology to horticulture, from medicine to engineering, that it is largely inaccessible as a body of knowledge even to the research worker. By bringing all this information together in a series of comprehensive reports, the Museum hopes to help lay the foundations for future work in one of the most promising new fields for research in the natural sciences.

The secondary purpose of the survey is to conduct or attempt to arrange for such research as is needed to fill the worst gaps in our knowledge, revealed by its primary task. Excellent progress has been made in both activities. A large volume by G. E. Hutchinson on the "Biogeochemistry of Vertebrate Excretion" was published by the Museum in 1950, as the third monographic report resulting from the survey. This, as well as the previous reports, has met with an enthusiastic reception and world-wide demand. The reports on iodine, bromine, and strontium are now approaching completion, those on vanadium and isotopic phenomena, as well as many minor contributions, having been published previously.

The liquid chemistry and physics of the environment are also under study in the Department of Fishes and Aquatic Biology. During the summer of 1950 Mr. Armstrong carried out a detailed examination of the physical oceanography of Tongue of the Ocean, the deep-sea basin adjacent to the Great Bahama Bank and the coral reefs off Andros Island, which were under simultaneous study by Dr. Newell and his group from the Department of Geology and Paleontology. Temperature records and water samples for chemical analysis were obtained from various levels down to a depth of twelve hundred fathoms at twenty-seven stations. Marine life was collected with bottom dredge

and mid-water townets down to a depth of nine hundred fathoms. A deep-sea camera was used to obtain photographs of the bottom and of bottom life down to depths of over a mile. The observations have been analyzed by the methods of physical oceanography and are now in the process of being correlated with the biological data and collections, in order to advance our understanding of deep-sea as well as shallow-water life.

THE MUSEUM STUDIES ANIMAL BEHAVIOR

We have seen why the study of living specimens in captivity cannot give us the true statistics of their life in nature. But a thorough knowledge of the normal reactions and behavior of the individuals is essential in order to understand the ecology of the species revealed to us by the statistics of the dead specimens. It is only through such an understanding of the individual as well as the species that ecological knowledge becomes truly significant to science and useful to man in his fight against pests and vermin and in his efforts to protect and derive the greatest possible benefit from nature and natural resources.

About sixteen years ago the Museum pioneered with the establishment of the Department of Animal Behavior, which has contributed in a very prolific manner to our knowledge of a great many subjects, such as the sensory impressions involved in sex recognition and mating activities, the functions of endocrine glands and of the brain in reproductive behavior, the sensory processes in lower vertebrates, the phenomenon of individual dominance in animal societies, to name only a few.

In the development of its program the department has enjoyed the support of many outside organizations, such as the National Research Council, the Office of Naval Research, the American Academy of Arts and Sciences, and many others.

In recent years the activities of the department have been steadily expanded, both through the work of its own staff and through the investigations of the many associates from other institutions which the growing prestige of the department has drawn into its efforts. The department's program at present is particularly concentrated upon the study of reproductive behavior and parental behavior. Other activities, such as learning, aggregation in schools and herds, the methods by which animals find their way, etc., are also treated, but less intensively. The subjects used for these investigations are ants, fishes, birds, and mammals. In earlier years amphibians and reptiles were also included.

Reproductive and parental behavior has been selected because it is by the study of these activities that we can most readily contribute to the clarification of broad biological principles of major concern to many branches of the natural sciences, with which the Museum is also dealing in other departments. The importance to all students of evolution and systematics of isolation by behavior will be mentioned elsewhere. It is chiefly by the reproductive behavior that such isolation is attained.

In the comparative study of reproductive and parental behavior we are, in addition, dealing with the fundamental nature and development of "instincts" also related to the behavior of man and may thereby contribute to deepening our understanding of ourselves. This is especially true of studies now in progress on the manner in which infantile experience may influence the reproductive and parental behavior of the subjects as adults. In these days, when our children are being bombarded with questionable radio, television, motion picture, and comic programs, the actual influence of early experience has become one of the foremost problems of education psychology. Practical applications of social science are often questionable and unsound because they depend mainly upon vague assumptions concerning

development and "instincts" in the animal world. Such assumptions are likely to be dangerous to sound public welfare as long as they survive, untested by such investigations as those now under way in the Department of Animal Behavior.

During 1950-1951 seven scientific papers were published on work done in the Department of Animal Behavior. Among these are included a further report by Schneirla and Brown on the life and behavior of army-ants; an account of the sexual behavior of the common guppy which has served to correct many misconceptions concerning the ecology of this useful, mosquito-fighting fish; and a paper by Schneirla on the relationship between observation and experimentation in the field study of behavior, making a significant contribution to the improvement of research methods.

The value of a Department of Animal Behavior within the Museum's own organization depends not only upon its own work, but even more upon the encouragement, guidance, and facilities it offers to all departments whose studies force them to look for an answer to their problems in the ecology and behavior of the species. Many other departments have responded to the favorable circumstances created by having a Department of Animal Behavior among them and have greatly enriched their research programs by the study of living animals in Museum laboratories.

Mr. Bogert, Chairman of the Department of Amphibians and Reptiles, has for several years been conducting an investigation of the behavior of reptiles and amphibians in relation to their ability to control their temperature. These so-called cold-blooded animals are not capable of maintaining a constant internal body temperature by physiological processes. In spite of this fact, our expeditions and field-work had shown them to be distributed in nature with surprisingly little regard for the external temperatures of the climate. This was a phenomenon that was very difficult to

explain, until the laboratory experiments began to reveal that, in the absence of physiological controls, the reptiles are able to maintain body temperatures nearly as constant as those of the warm-blooded animals by adjusting their behavior and the pose of their bodies in relation to light and shade, dry and moist, hot and cold, and the direction of the sun, with such precision that one could almost tell the time of day in a desert by looking at the desert reptiles.

In the Department of Insects the study of insect behavior has enabled Dr. Curran to play a leading role in the development of a rational use of modern insecticides. The early indiscriminate use of insecticide was extremely wasteful of material and often equally dangerous to our friends as to our foes in nature. Through a study of the behavior of the insects we are fighting, it is possible to develop strategic plans for each species, with application limited to critical areas and times. Much better results are obtained with much less expenditure of effort and supplies and with greatly reduced danger to the insects and animals we do not wish to injure. As an example Dr. Curran has been able to demonstrate, in experiments conducted at Bear Mountain, that application limited to the special locations habitually preferred by the common house-fly, and to the minimum strength necessary, would accomplish as good results as those that had previously been obtained from the use of one hundred times as much of the chemical involved.

During 1950-1951 Dr. Curran continued to serve as a consultant and adviser to the chemical industry and to organizations and individuals concerned with problems of insect control. He was also appointed Lecturer in Medical Entomology in the School of Public Health of the College of Physicians and Surgeons.

EVOLUTION, HEREDITY, AND BEHAVIOR

Evolution might be described as a process of modification of the biological inheritance of the species. When genetics, or the study of heredity, recently advanced from the investigation of pure-bred lines to the examination of heredity in natural populations it therefore entered upon the fields of systematics and evolution which have long been the primary concern of museum research. This fusion of interests between systematists, paleontologists, and students of heredity has had a very invigorating influence upon scientific activities in the Museum and has already resulted in several major contributions to the progress of general biological thought by various members of the Museum staff, notably Dr. Simpson and Dr. Mayr.

In "Tempo and Mode in Evolution" and "The Meaning of Evolution" Dr. Simpson has brilliantly influenced both scientific and lay thought on the broad principles of the theory of evolution and its significance for man and has established himself as an international leader in this field. During 1950-1951 a French edition of "Tempo and Mode in Evolution" was published in Paris, and Dr. Simpson received recognition of his leadership by many honors bestowed upon him, both here and abroad, such as the Hayden Medal of the Academy of Natural Sciences of Philadelphia and honorary degrees from the Universities of Oxford, Glasgow, and Durham.

Dr. Mayr's "Systematics and the Origin of Species" marked a new milestone in the progress of our understanding of the systematic relationships of the living world. The significance of this work has been attested to by expressions received from distinguished leaders in the biological sciences both here and abroad. During 1950-1951 Dr. Mayr received invitations to lecture at universities in Pavia, Zürich, Leiden, Oxford, London, and Copenhagen, and at the new Free University of Berlin, which he was

able to accept in connection with a trip to examine collections in European museums during the summer of 1951. The success and usefulness of his work have made it desirable to prepare for publication a greatly expanded presentation of Dr. Mayr's ideas, in two volumes. The manuscript for the first volume on "Methods and Principles of Taxonomy," prepared with the collaboration of Professors Linsley and Usinger of the University of California, is now in the hands of the publishers. The manuscript for the second volume, dealing with animal species and evolution, is now being written by Dr. Mayr.

The importance of genetics for the work of our systematic and paleontological departments also gives added importance to the parallel study of animal behavior. For a population of a species to develop into a different race and ultimately become a new species, it is necessary for it to become isolated from the other populations of its old relatives, otherwise its new features would constantly be washed out by cross-breeding, and the accumulation of new combinations of characters would become too slow even for the process of evolution, if not entirely impossible. Nevertheless new races are found to develop without geographic separation. To find the answer to this puzzle it becomes necessary to turn to a study of the behavior of the species and its different varieties in order to see if there are not differences in habits that keep the varieties isolated from each other for breeding purposes, even though they are not separated by the environment.

In the preparation of his work on "Systematics and the Origin of Species" Dr. Mayr pioneered in the study of isolation by behavior, through a series of experiments on banana flies kept alive in the Museum. These investigations proved so successful in revealing the various ways in which nature can achieve isolation without separation, that similar studies, following Dr. Mayr's example, are

now being conducted intensively in half a dozen different places in the world, and Dr. Mayr was able to finish his own research on this material during 1950-1951, with final results soon to be published.

A specific problem of this sort was also encountered by Dr. Breder when he brought back from subterranean waters in Mexico a number of blind and colorless fishes that seemed to differ in no way, except by the loss of all vision and color, from the normal members of the species living in the open parts of the same continuous watershed. This also required the study of living specimens, in a series of investigations of habits, heredity (by cross-breeding between blind and seeing forms), and the effects of darkness upon the development of the eye and the body pigments.

CANCER IN NATURE AND IN MUSEUM LABORATORIES

The study of the blind cave fishes and their seeing relatives is still continuing and has developed some particularly interesting results from a line of inquiry begun two years ago.

Placing seeing specimens in total darkness was found to upset the functioning of the pituitary gland, which by internal secretions, or hormones, exercises a controlling influence on the growth processes of the body. The disturbance of the pituitary therefore also upset the normal controls of growth, and cancerous growths began to appear in organs which, at first thought, would not seem to be in any way affected by light or darkness.

These findings also create interesting new problems for further study by geneticists, systematists, and evolutionists, since the naturally blind specimens living in total darkness do not develop these cancers, although they differ so little from the seeing ones that they can be cross-bred with them and produce a fertile offspring.

The Museum has also for a number of years had a share in genetic research in an entirely different connection, through the investigations on hereditary elements of cancer in fishes conducted in our laboratories by Dr. Myron Gordon of the New York Zoological Society, Research Associate of the Department of Animal Behavior. By these studies, which are still carried forward, Dr. Gordon has contributed in a fundamental way to our understanding of malignant growths. Incidentally, his investigations have also helped draw attention to the usefulness of fishes for the study of cancer in general and may thus be regarded as forerunners for the cancer research now carried on by the Lerner Foundation of our Museum.

The ideal organism for the study of widely distributed diseases and abnormalities of form and growth must have a combination of the following characteristics. On the practical side it must be inexpensively and abundantly available, hardy, and easy to deal with experimentally. It must also have a fairly high incidence of the abnormality to be studied. On the biological side it is desirable that the organism itself should be among the simplest in which the phenomenon is found, and also that it should show the abnormality in its simplest possible form. In fishes these requirements may be almost ideally fulfilled. They are among the simplest of living vertebrates, hardy, and abundantly available. Many species show an astoundingly high natural incidence of cancerous growths, coupled, at least in some cases, with a considerably simpler pathological picture than that seen in mammals and man.

In these circumstances it is not surprising that the organizations devoted to cancer research have supported the use of the new facilities offered by the Lerner Marine Laboratory and Foundation of the Museum for the continued study of malignant growths in fishes, with a greatly

expanded program as a natural outgrowth of the Museum's own work.

With the generous support of the Damon Runyon Memorial Fund, the American Cancer Society, the United States Public Health Service, and many private friends, a staff of investigators and assistants has been engaged in cancer research at Bimini and at the Museum. Among the many subjects under investigation during 1950-1951 were the evolution and occurrence of the so-called "mast" cell throughout the animal kingdom. The mast cell is a very primitive cell of unknown functions, which appears in certain types of skin cancer. Until its nature is established by such comparative studies it leaves a gap of unknown significance in our knowledge of malignant growths. Other investigations included various studies on pigment cells, which play a prominent role in many types of cancer; their migrations in the body of fishes; the normal disintegration of black pigment areas during the growth of certain fishes; endocrine influences on the eye pigments of Crustacea; and similar subjects.

CONSERVATION

It was only natural that an institution devoted to the preservation, display, and study of specimens of all aspects of nature should also feel a strong concern for the conservation of the living species. Our Museum has therefore played a prominent part in the conservation movement from its earliest beginnings in this country. The knowledge of wild life accumulated by our Departments of Mammals and Birds has long been of immeasurable value to those concerned with the protection of nature. The Museum and the public are particularly indebted to Dr. Harold Anthony, Chairman of the Department of Mammals, for the devotion and energy with which he has brought the scientific authority of the Museum to bear upon conservation

problems before the general public, governmental and private agencies, in his capacity of Secretary to the Committee on Conservation, and out of his personal interest.

As the tasks of conservation have broadened from the preservation of species to the protection of entire environments, of soils and forests, and of plant and animal communities, the simultaneous trend towards ecological research in the Museum has enabled more and more departments to bring their advice to bear upon conservation problems. As the demands from the general public and from special groups for guidance in conservation increased, they also became more widely scattered among the Museum departments, until it became a wastefully disorganized burden, making it difficult for many members of the staff to carry on with their other work, without failing the public in its legitimate search for information from the Museum. Through the generosity of individual trustees the Museum therefore, a couple of years ago, secured the excellent assistance of Mr. Richard H. Pough in organizing the Museum's channels of inquiry and information on conservation, supervising our treatment of the subject in public exhibits, and coordinating our efforts in a general way. This experiment proved very successful by improving and greatly increasing our services to the public, at the same time as it substantially reduced the burdens of many departments. During 1950-1951 the arrangement was therefore formalized by the creation of the position of Co-ordinator for Conservation and Use of Natural Resources, now occupied by Mr. Pough.

SYSTEMATICS AND CLASSIFICATION: THE MUSEUM'S PERMANENT TASKS

Along with the newer developments the Museum is also carrying on with its fundamental and permanent tasks of helping to bring systematic order in our knowledge of all

the living and dead contents of nature, and to advance our understanding of the processes of evolution.

The publication of Dr. William King Gregory's "Evolution Emerging" in the spring of 1951 was a major event in the history of the Museum's work in this field. The knowledge and conclusions developed through a lifetime of distinguished research are here brought together and presented to the general public and scientists alike in two great volumes.

Another source of pride was the appearance in the fall of 1950 of "The Anatomy of the Gorilla," in which articles by many scientists were published as a handsome and important memorial volume for Henry Cushier Raven, whose untimely death a few years ago put an abrupt end to the distinguished work of a beloved member of the Museum staff.

Altogether some eighty scientific papers on questions of systematics and classification were published by the Museum staff and its associates in the zoological and geological departments. Among these may be particularly mentioned: "A Classification of Recent Birds" by Drs. Mayr and Amadon; four papers by Dr. Zimmer continuing his comprehensive account of the birds of Peru; a monograph on the Hawaiian honeycreepers by Dr. Amadon; Dr. Curran's synopsis of North American flies of the genus *Spilomya*; and Mrs. Vaurie's paper on the blister beetles of north central Mexico, representing the first scientific report on a continued program of field work sponsored by Mr. David Rockefeller. The general works on the broader principles of evolution and systematics by Simpson and by Mayr have already been mentioned elsewhere.

The scientific collections continued their vigorous growth during 1950-1951. The Department of Mammals added 5760 specimens. By bequest of Dr. Leonard C. Sanford the Department of Birds received his incomparable

collection of North American birds, comprising 16,200 specimens of 1400 kinds. More than 80,000 additional specimens brought the collections of the Department of Insects above 2,800,000 items. Dr. Newell and his associates brought back from Texas to the Department of Geology fifteen tons of limestone containing silicified invertebrates from the Permian. This material gives particularly beautiful examples for both study and display, because the limestone can be removed by acids which leave the quartz-like substance of the fossils entirely untouched, so that the specimens are entirely freed from the rocks, with complete preservation of even the finest spines and details of their structure. Specimens so treated are indeed a startling sight after millions of years buried in the rocks.

Of particular interest is also the acquisition by the Bird Department of the virtually complete skeletons of five species of the extinct moas of New Zealand, which were received during 1950-1951 as a result of Dr. Murphy's field-work in New Zealand in 1949.

An expedition to the Central Highlands of New Guinea, led by Mr. E. Thomas Gilliard of the Department of Birds, achieved great success under very difficult circumstances and brought back to the Museum very valuable collections, particularly of birds and mammals.

Other field-work by the natural history departments during 1950-1951, not already mentioned, included ecological research and collection in southwestern United States and Mexico, by Mr. Bogert, Chairman of the Department of Amphibians and Reptiles; similar work in Jamaica, British West Indies, by Mr. and Mrs. Hecht, of the same department; collecting in Utah, Arizona, New Mexico, and Texas by Drs. Cazier and Gertsch, of the Department of Insects and Spiders; continued field-work in southwestern United States by Drs. Simpson, Colbert, Schaeffer, and others from the Department of Geology and Paleontology,

with very important additions to the Museum's paleontological collections; intensive work in western Texas under the leadership of Dr. Newell, coordinated with Dr. Newell's work in the Bahamas, which has already been mentioned elsewhere; and research by various members of the Museum staff at the Lerner Marine Laboratory.

ANTHROPOLOGY

A trend to go beyond the limitations of the inanimate specimens in museum research, exhibition, and education has also long been apparent in anthropology and is already so well recognized in this section of the Museum program that its development need not be considered in such detail as the more recent developments in the natural history subjects. Perhaps one might say that, since the artifacts of the ethnographic and archeological collections are expressions of man's choice and skills and not the direct results of immutable natural laws of which they themselves are evidence, the possibilities of the physical specimens, alone, were much more quickly exhausted in anthropology than in natural history. To the ethnographer and archeologist the study of man's behavior and of the development of his civilizations therefore took the place of the study of evolution in zoology and paleontology, and it dates back almost as far. The current program of the Department of Anthropology is one of great variety and great general interest, making many important contributions to our understanding both of the past and the present, and of the future of man. In many of these activities the department functions in close cooperation with Columbia University.

Since 1948, Dr. Margaret Mead, Associate Curator of Ethnology, has served as director of Columbia University Research in Contemporary Culture and has likewise directed a special project of Studies in Soviet Culture. In the general project on contemporary culture, in which one

hundred and twenty-five research workers were engaged, seven areas were subjected to intensive study, namely: Great Russia before 1917; French culture, as an example of the western tradition; Chinese culture, with special emphasis upon the Cantonese from which the Chinese element in New York City is largely drawn; Syria, which has contributed the largest Near Eastern population to the United States; Poland; Czechoslovakia; and the vanished culture of eastern European Jews. During 1950-1951, the final reports on these important studies were in course of preparation.

The special project on Soviet culture carried the methods of the general project one step farther in an attempt to present an analysis of human character in Russia, as it has evolved under the Soviet system. A report on "Soviet Attitudes Towards Authority" is soon to be published.

The public importance of these efforts to apply the techniques of anthropological science to the study of the contemporary cultures with which we have to deal need scarcely be enlarged upon.

During 1950-1951 Dr. Shapiro carried forward his studies of the Hawaiian physical type, and also his investigation of Chinese-Hawaiian race mixture, through which he hopes to shed new light both upon the problems of heredity in man and upon the effects of environment upon the human type.

The question of the origin of human populations in the Western Hemisphere, especially in South America, has recently received a great deal of public and scientific attention and has for several years been the focal point of the investigations conducted by Mr. Junius B. Bird, of the Department of Anthropology. The oldest remains previously found in South America, also by our Museum, are those of nomadic hunters who lived at the Strait of Magellan between nine and ten thousand years ago. Mr. Bird

recently discovered similar remains in Peru, which were under continued study during 1950-1951.

Of even greater interest are Mr. Bird's discoveries of the remains of somewhat later communities, which first appeared on the coast of Peru around 2500 B.C. Although these people had tools only of early stone-age type and they had not yet learned to make pottery from clay, they had nevertheless discovered the art of weaving textiles, and lived a sedentary existence practicing a primitive agriculture, with cotton among the plants under cultivation. It was only exceptionally favorable conditions for the survival of perishable materials which made these discoveries possible, and they point the important lesson that crude stone implements do not by themselves give adequate evidence of the cultural development of a people, and that such inventions as weaving may be far more ancient than one had previously thought. Mr. Bird continued his investigations of this culture during 1950-1951, applying such modern methods as an analysis of Carbon 14 contents to the determination of its age.

The Department of Anthropology has also, for more than half a century, had a very strong interest in the study of the ancient civilizations of Central America. Dr. Gordon Ekholm is now engaged upon the preparation of a monographic account of the archeology of eastern Mexico.

Other current activities in the program of the Department of Anthropology include Dr. Tschopik's studies of the present-day Indians of Peru; and Dr. Ford's investigations of the prehistory of the Mississippi Valley, which only a little over a decade ago formed the largest blank spot in our knowledge of the archeology of the eastern United States. Good progress was made along both of these lines of research during 1950-1951.

A major event in the activities of the Department of Anthropology was the Second Afghan Expedition under

the leadership of Mr. Walter A. Fairservis, Jr. The expedition was in the field from August, 1950, to May, 1951, and met with great success in its search for evidence of the ancient civilizations of that area. Several hundred archeological sites were located, many of them never before reported, and large collections were made, but it is still too early to offer a definite interpretation of their meaning. The expedition also made ethnological, linguistic, and geological studies, on which reports are now being prepared.

Among the many additions to the collections of the Department of Anthropology the following gifts were particularly noteworthy: a unique ethnological collection from the Indians of Eastern Peru, comprising some fifteen hundred items from fourteen tribal groups, received from the Munitalp Foundation; an ethnological collection of over four hundred objects, mainly from the Solomon Islands, collected by the late Commander John Burke and presented by the Department of the Navy, Office of Naval Records and History; a large series of archaeological specimens, consisting of pottery, clay and stone sculptures, glass, gold objects, etc., of Syrian, Roman, Greco-Roman, Peruvian, Costa Rican origin, including well-known objects described and illustrated in Erich P. Schmidt's volume on the "Excavations at Tepe Hissar" (Iran), received as a gift from the estate of Gertrude Hickman Thompson.

IN THE SERVICE OF EDUCATION

The Queeny Education Film Fund continued the processing and editing of the splendid documentary film records of ethnographic subjects taken, with sound and color, in Africa on Mr. Queeny's expedition for the Museum during the preceding year. The first full-length feature, "Latuko," was released in regular theaters in St. Louis in the spring of 1951 and had an immediate popular

success. A second feature-length film on native life in Africa, "Wakamba," is now being prepared for showing.

The Museum is also taking full advantage of the opportunities offered by the funds and the earlier film material donated by Mr. Queeny as part of the Queeny Educational Film Fund. Under the supervision of Mr. Richard Garton, of the Museum's Department of Education, "Grouse of the Grasslands" was completed during 1950-1951 for special distribution to schools and other educational institutions, and two other films, on North American Indians and on conservation, were approaching completion for similar use.

The Department of Education, under the leadership of Dr. Charles Russell, plays an important part in interpreting the Museum's exhibits and other materials both to children and to adults.

The Platoon Program for elementary school children, carried on in cooperation with the Board of Education of the City of New York, is now in its tenth successful year. This program was designed to give the children a whole day in the Museum under the guidance of the Department of Education, with tours of the exhibits, and other activities intended to give the pupils a better understanding of the world in which they must live, to develop their own interests in the subjects with which the Museum deals, and to show them how to obtain greater satisfaction from the interests they develop. During 1950-1951, attendance at the Platoon Program accounted for 235,668 student hours.

Of special interest in the activities with children during 1950-1951 was a series of experiments with smaller groups, in which the pupils themselves were encouraged to take the lead by their questions and other indications of their interests and preferences, without the adherence to set

schedules that is necessary for the normal operation of the larger classes under the Platoon Program. The results of these experiments were most promising, with a very lively participation by the children. As with nearly all significant improvements in educational method, it suffers from the drawback of higher cost per pupil, since only smaller groups can be handled in this manner by each teacher, and a greater flexibility in the scheduling of the teacher's time is also necessary. It is therefore uncertain when this method of instruction can become part of the normal educational program of the Museum, but it is to be hoped that means can be found to make it a regular feature of our activities. In the meantime the experience gained from the experiments has made a valuable contribution to our understanding of how best to deal with the young people who come here to learn. It is planned to carry the experiments forward to high school levels during the current year.

Special programs or exhibits offered, or sponsored and supervised, by the Department of Education had a total attendance of 814,405 individuals, of whom 185,000 were visitors to the Trailside Museums. Collections, slides, and films circulated by the department outside the museum, mainly in the schools of New York City, were seen by over seventeen million persons.

During 1950-1951 the Department of Education re-organized the services of the Museum Bookshop in order to relate to the Museum's own educational and exhibition program the choice of literature and of objects offered for sale, thereby making of the Bookshop itself a planned extension of the Museum's educational services. This undertaking proved very successful not only from the educational but also from the economic point of view, increasing gross sales from \$35,000 to \$80,000 per year.

The Department of Education also carries on a very active participation in educational affairs beyond the

Museum itself, both on a nation-wide and on an international level. Particularly notable instances of this extension of the Museum's influence in education during 1950-1951 were Dr. Russell's conduct of a meeting on adult education in the museums, held in Austria, and four months spent by Dr. William Burns working in museums in Holland as a practical demonstration of educational method developed here.

In addition to the completion of the Felix M. Warburg Memorial Hall the Department of Preparation, in collaboration with the Staff Architect and the curatorial departments, also made great progress on a number of other projects, notably on the completion of exhibits in the Whitney Hall of Oceanic Birds and the North American Mammal Hall. The first section of the new Forestry Hall was also nearly completed, and work was begun on exhibits in the main section.

A complete renovation of the South Asiatic Mammal Hall, with rearrangement of many exhibits, resulted in a marked improvement of its impact upon the visitors.

In the twelve-month period covered by this report the Museum had a total attendance of 2,103,840, exclusive of the Planetarium.

HAYDEN PLANETARIUM

The Hayden Planetarium had a very successful year under the able leadership of its chairman, Mr. Robert C. Coles. Paid attendance during 1950-1951 was substantially increased over the previous years, from 322,129 to 355,643 admissions. The shows themselves were notably improved, with several entirely original effects never before achieved in a planetarium, such as the use of an animated horizon to bring to life before the eyes of the visitors the collision and

explosion of a meteor against the surface of the earth, leaving a tremendous meteor crater after the dust has settled.

Another innovation, which has proved of great popular interest, was an exhibit illustrating the principles of the force of gravity by means of six specially calibrated scales showing the actual weight of the visitor on different planets. In this undertaking the Planetarium enjoyed the cooperation of the Toledo Scales Company.

Work got under way on a large sky map called "The Current Sky Picture," which will accurately show the day-by-day changes in the sky, give the times of sunrise and sunset, and other facts of interest to the visitors.

The Planetarium continued its program of special courses on navigation, star identification, and other astronomical subjects with a total attendance of 5063, and nearly doubled the attendance at lectures for special groups (from 609 during 1949-1950 to 1092 during 1950-1951).

THE AMERICAN MUSEUM OF NATURAL HISTORY
AND THE AMERICAN MUSEUM OF NATURAL HISTORY
PLANETARIUM AUTHORITY

Financial Statements

For the Fiscal Year ended June 30, 1951

THE AMERICAN MUSEUM
BALANCE
June 30

ASSETS:

Endowment and other funds:				
Cash			\$ 256,567.17	
Investments (Notes 1 and 2):				
Marketable securities:	At Market	Book Amounts		
Bonds	\$ 6,335,002.12	\$ 6,500,849.40		
Preferred stocks	3,014,175.00	3,085,431.89		
Common stocks	7,883,141.62	5,993,978.09		
	<u>\$17,232,318.74</u>	<u>15,580,259.38</u>		
Other investments (market quotations not readily available):				
Real estate mortgages, bonds and stocks		91,105.74		
Promissory notes (unsecured)		<u>33,253.16</u>		
		<u>124,358.90</u>	15,704,618.28	\$15,961,185.45
Investment in The American Museum of Natural History Planetarium Authority, at cost (Note 3):				
Bonds (\$570,000 face amount)			425,000.00	
Promissory notes			<u>72,545.62</u>	497,545.62
Current funds:				
General Funds:				
Cash		224,550.36		
Temporary investments:				
U. S. Government bonds (at market quotations \$697,265.62)		700,000.00		
Accounts receivable		142,816.51		
Inventories, principally publications		82,402.73		
Deferred charges		<u>34,306.46</u>	1,184,076.06	
Special funds:				
Cash		350,901.19		
Temporary investments:	At Market			
U. S. Government bonds	Quotations			
Common stocks	\$ 122,311.56	123,000.00		
	<u>10,950.00</u>	<u>15,000.00</u>		
Accounts receivable		<u>35,350.46</u>	524,251.65	1,708,327.71
Agency funds:				
Pension funds:				
Cash			53,405.47	
Investments, at cost:	At Market	Book Amounts		
Bonds	\$ 2,068,989.37	2,131,741.65		
Preferred stocks	755,541.25	803,447.07		
Common stocks	668,575.25	601,737.04		
	<u>\$ 3,493,105.87</u>	<u>3,536,925.76</u>		
Real estate mortgages		<u>7,200.77</u>	3,544,126.53	
Loans receivable			<u>210.00</u>	3,597,742.00
Total assets				<u>\$21,764,800.78</u>

The accompanying notes are an integral part of this balance sheet.

OF NATURAL HISTORY SHEET

1951

FUNDS AND LIABILITIES:

Endowment and other funds:

Endowment funds as to which income is available for:

Restricted purposes	\$7,752,899.55	
Unrestricted purposes	<u>4,070,120.49</u>	\$11,823,020.04

Funds functioning as endowment as
to which both principal and
income are available for:

Restricted purposes	302,089.66	
Unrestricted purposes (Notes 2 and 4)	<u>3,836,075.75</u>	<u>4,138,165.41</u> \$15,961,185.45

Funds invested in the indebtedness of The American
Museum of Natural History Planetarium Authority
(Note 3) (no change during year)

497,545.62

Current funds:

General funds:

Pay roll taxes withheld, accounts payable, etc.	34,097.78	
Deferred income	<u>115,113.97</u>	
	149,211.75	
Deduct, Deficit	<u>95,831.26</u>	
	53,380.49	

Funds appropriated by trustees:

Exhibition Hall Rehabilitation Program	\$ 835,766.35	
Museum Building Program	<u>250,000.00</u>	
	1,085,766.35	
Publications Program	<u>44,929.22</u>	<u>1,130,695.57</u> 1,184,076.06

Special funds:

Contributions from donors, endowment income (restricted), etc.	<u>524,251.65</u>	1,708,327.71
--	-------------------	--------------

Agency funds:

Pension funds:

Fund balances		3,597,742.00
---------------	--	--------------

Total funds and liabilities

\$21,764,800.78

STATEMENT OF ENDOWMENT AND OTHER FUNDS
for the year ended June 30, 1951

Balance, June 30, 1950			\$15,621,188.07
Additions:			
Gifts and bequests	\$ 224,042.50		
Net profit on sales and redemptions of investments	394,130.08		
Transfer from Special Funds	<u>45,000.00</u>		<u>663,172.58</u>
			16,284,360.65
Deductions:			
Transfers to General Funds:			
For custodian fee, etc.	9,200.00		
To dispose of operating deficits, General Funds and Cafeteria, for the year ended June 30, 1950	63,975.20		
Appropriation for Museum Building Program	<u>250,000.00</u>		<u>323,175.20</u>
Balance, June 30, 1951			<u>\$15,961,185.45</u>

The accompanying notes are an integral part of this statement.

STATEMENT OF GENERAL FUNDS
for the year ended June 30, 1951

Income:

Appropriations from the City of New York	\$1,033,771.48	
Income from endowment and other funds	754,264.25	
Income from Planetarium Authority and temporary investments	21,375.00	
Portion of royalties from mining properties (Note 2)	50,000.00	
Income from outside trusts and foundations	46,578.07	
Income from bequests pending settlement	6,499.19	
Contributions of trustees, members and friends	123,735.40	
Membership dues	56,645.00	
Sales and services	90,776.45	
Other income	31,907.80	\$2,215,552.64
Natural History Magazine	193,136.11	
Junior Natural History Magazine	83,442.94	
Man and Nature Publications	25,260.50	
Natural History Book Club	95,843.39	
Museum Shop	76,052.83	
Museum Cafeteria	102,436.68	576,172.45
		<u>2,791,725.09</u>

Expenses:

Administrative and general	\$553,292.77	
Care and use of collections, supervision and preparation of exhibitions, scientific publications and library	596,991.97	
Education	306,656.46	
Operation and maintenance of physical plant	859,879.75	
Exhibition Hall Rehabilitation	85,200.81	2,402,021.76
Natural History Magazine	187,182.69	
Junior Natural History Magazine	101,723.78	
Man and Nature Publications	30,138.21	
Natural History Book Club	94,179.47	
Museum Shop	68,827.03	
Museum Cafeteria	107,706.84	589,758.02
Excess of expenses		<u>2,991,779.78</u>
		200,054.69

Deduct:

Transfer from special funds	\$ 1,507.21	
Transfer from unrestricted funds functioning as endowment	9,200.00	
Transfers from funds appropriated by trustees:		
Exhibition Hall Rehabilitation Program	85,200.81	
Publications Program	8,315.41	104,223.43
		<u>95,831.26</u>

Deficit, General Funds and Cafeteria, balance, June 30, 1950	63,975.20	
Deduct, Transfer from unrestricted funds functioning as endowment	63,975.20	
Deficit, balance, June 30, 1951		<u>\$ 95,831.26</u>

The accompanying notes are an integral part of this statement.

STATEMENT OF FUNDS APPROPRIATED BY TRUSTEES
for the year ended June 30, 1951

	Exhibition Hall Rehabilitation Program	Museum Building Program	Publications Program	Totals
Balances, June 30, 1950	\$920,967.16		\$53,244.63	\$ 974,211.79
Add, Transfer from unrestricted funds functioning as endowment		\$250,000.00		250,000.00
	<u>920,967.16</u>	<u>250,000.00</u>	<u>53,244.63</u>	<u>1,224,211.79</u>
Deduct, Transfers to general funds:				
For rehabilitation expenditures	85,200.81			85,200.81
For excess of expenses over income of publications			8,315.41	8,315.41
	<u>85,200.81</u>		<u>8,315.41</u>	<u>93,516.22</u>
Balances, June 30, 1951	<u>\$835,766.35</u>	<u>\$250,000.00</u>	<u>\$44,929.22</u>	<u>\$1,130,695.57</u>

STATEMENT OF SPECIAL FUNDS
for the year ended June 30, 1951

Balance, June 30, 1950		\$ 449,477.77
Income:		
Income from endowment and other funds	\$ 67,235.08	
Income from temporary investments	3,498.75	
Contributions of trustees, members and friends	377,624.11	
Sales and services	116,314.95	
Other income	<u>1,325.43</u>	<u>565,998.32</u>
		1,015,476.09
Expenditures:		
Administrative and general	8,467.02	
Care and use of collections, supervision of exhibitions, scientific publications and library	377,754.12	
Education	<u>43,496.93</u>	
Exhibition hall rehabilitation	<u>14,999.16</u>	<u>444,717.23</u>
		570,758.86
Transfers:		
To restricted funds functioning as endowment	45,000.00	
To general funds	<u>1,507.21</u>	<u>46,507.21</u>
Balance, June 30, 1951		<u>\$ 524,251.65</u>

The accompanying notes are an integral part of this statement.

STATEMENT OF PENSION FUNDS
for the year ended June 30, 1951

Balances, June 30, 1950			\$3,352,363.06
Income:			
Contributions by subscribing members	\$	98,005.36	
Contributions by trustees and others		127,053.30	
Income from investments		127,527.73	
Net profit on sales and redemptions of investments		43,852.51	
Reimbursement of prior year expenditure		200.00	
			<u>396,638.90</u>
			3,749,001.96
Expenditures:			
Payments to members and beneficiaries:			
Pension allowances		123,282.21	
Death benefits		1,874.46	
Refunds of contributions and interest thereon		22,778.61	
		<u>147,935.28</u>	
Expenses		3,324.68	151,259.96
Balances, June 30, 1951			<u><u>\$3,597,742.00</u></u>

NOTES TO FINANCIAL STATEMENTS

1. The land, buildings and equipment utilized by the Museum are either owned by the City of New York or were charged off at the time of purchase and, therefore, are not reflected in the balance sheet. Also, no valuation of exhibits, collections, library, etc., has been established for balance sheet purposes.

Investments are recorded at cost in respect of those purchased and at market valuations at the date of acquisition, probate court valuations or valuations established by the trustees in respect of those acquired by gift, bequest or otherwise.

2. The Museum owns an interest in certain mining properties acquired through a bequest. No valuation had been recorded on the books for these properties, as such, and therefore they are not reflected in the balance sheet. However, the Museum receives royalties from this source and such royalties are recorded, when received, as additions to unrestricted funds functioning as endowment (as bequests) or to current general funds. Royalties received during the current fiscal year aggregated \$87,945.53, of which \$50,000.00 was credited to general funds.
3. Planetarium Authority is operated under the supervision of the Museum's management and its corporate charter continues only until all its liabilities, including all its bonds (\$570,000 face amount), have been paid in full or have otherwise been discharged. At that time, title to its real property passes to the City of New York to be maintained and operated in the same manner as other city property occupied by the Museum and title to its personal property passes to the Museum for its corporate purposes. Its real property, including donated land carried at no value, is stated in the Planetarium Authority's balance sheet at a cost of \$569,209.64 (provision for depreciation is considered unnecessary because of the nature of the ownership of the property). At June 30, 1951, other net assets of the Authority, before consideration of its bonded debt and its liability on advances from the Museum, amounted to \$105,493.03, including \$40,619.44 equipment at cost, less depreciation. Its income for the year ended June 30, 1951, before interest on its bonds and debt to the Museum and before \$5,866.66 provision for depreciation on its equipment, amounted to \$33,891.70. During the year the Authority paid the Museum \$10,125.00 on account of interest in arrears and such amount was credited by the latter to its general funds income.
4. Unrestricted funds in the amount of \$800,000 have been conditionally appropriated for the construction of additional buildings subject to appropriation of a like sum by the City of New York.

LYBRAND, ROSS BROS. & MONTGOMERY

Certified Public Accountants

To the Board of Trustees,
The American Museum of Natural History,
New York, N. Y.

We have examined the balance sheet of THE AMERICAN MUSEUM of NATURAL HISTORY as of June 30, 1951 and the related statements of funds for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

Gifts, bequests and contributions are stated on the basis of the recorded receipts. Such income is not generally susceptible of independent verification, and our examination thereof consisted primarily of testing selected items by comparing the recorded receipts with minutes of the Board of Trustees, correspondence or other data available in the files.

In our opinion, the accompanying balance sheet and related statements of funds present fairly the financial position of the Museum at June 30, 1951 and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Lybrand, Ross Bros. & Montgomery

New York, September 18, 1951.

THE AMERICAN MUSEUM
PLANETARIUM
BALANCE

June 30,

ASSETS:

Cash in bank and on hand:	
Operating fund	\$ 60,211.04
Surplus fund	1,425.00
	<hr/> 61,636.04
Accounts receivable	344.73
Inventory of publications	6,190.71
	<hr/> 68,171.48

Land, building and equipment at cost, less reserves
for depreciation:

	Assets	Reserves	
Land (donated by the City of New York)		(Note)	
Building	\$569,209.64	\$ 30,182.22	
Plant equipment, machinery and tools	68,221.75	36,292.16	
Furniture and fixtures	38,870.07	126,432.73	
Zeiss planetarium instrument	126,433.73	30,434.54	
Copernican planetarium instrument	30,435.54		
	<hr/> <u>\$833,170.73</u>	<hr/> <u>\$223,341.65</u>	609,829.08
Prepaid and deferred charges			351.50

\$678,352.06

Note: The Authority's corporate charter terminates when all its liabilities, including its bonds, have been paid in full or have otherwise been discharged. At that time title to its real property and personal property, respectively, pass to the City of New York and to The American Museum of Natural History. Because of the nature of the ownership of the property, provision for depreciation of the building is considered unnecessary.

OF NATURAL HISTORY
AUTHORITY
SHEET
1951

LIABILITIES:

Accounts payable, etc.		\$ 3,649.39
4½% Refunding Serial Revenue Bonds and interest thereon:		
Interest:		
Unpaid coupons, past due	\$182,475.00	
Interest accrued on bonds not yet due	1,740.00	
Interest accrued on past due unpaid bonds	<u>84,660.00</u>	268,875.00
Principal:		
Past due	338,000.00	
Due May 1, 1952	29,000.00	
Due in annual instalments from May 1, 1953 to May 1, 1959	<u>203,000.00</u>	570,000.00
		<u>842,524.39</u>
Advances from The American Museum of Natural History and interest thereon (subordinate in all respects to liability under 4½% Refunding Serial Revenue Bonds):		
Advances	72,545.62	
Interest	<u>20,634.77</u>	93,180.39
		<u>935,704.78</u>
Deferred income, etc.:		
Special funds, contributions, etc.	1,408.34	
Unused subscription tickets	550.20	
Miscellaneous	<u>24.34</u>	1,982.88

CONTRIBUTED CAPITAL AND DEFICIT:

Contributed capital, June 30, 1951:			
Charles Hayden	\$156,869.27		
Charles Hayden Foundation	<u>130,924.55</u>	287,793.82	
Deficit, June 30, 1951, as annexed		<u>547,129.42</u>	259,335.60
			<u>\$678,352.06</u>

STATEMENT OF INCOME AND DEFICIT

for the year ended June 30, 1951

Income:

Admission fees	\$166,245.49	
Fees from special courses and lectures	5,617.65	
Net income from publications (as annexed)	864.11	
Miscellaneous rentals, commissions, etc.	313.26	\$173,040.51
Operating expenses	\$96,518.84	
Administrative expenses	32,565.71	
Publicity expenses	10,064.26	
Total operating, administrative and other expenses		139,148.81
Income before interest and depreciation		33,891.70

Interest expense:

On 4¼% Refunding Serial Revenue Bonds:		
Coupons due November 1, 1950 and May 1, 1951	\$9,787.50	
Accrued on bonds not yet due	1,740.00	
Accrued on past due bonds	14,122.50	
On advances from The American Museum of Natural History	1,838.82	27,488.82
Income before provision for depreciation		6,402.88
Provision for depreciation (see note to accompanying balance sheet)		5,866.66
Net income for the year ended June 30, 1951		536.22
Deficit, June 30, 1950		547,665.64
Deficit, June 30, 1951		\$547,129.42

STATEMENT OF INCOME FROM PUBLICATIONS

for the year ended June 30, 1951

Sales	\$26,505.72	
Less, Cost of sales	16,655.93	
Gross profit on sales		\$9,849.79
Deduct, Sales booth expenses:		
Salaries	7,276.07	
Other expenses	1,709.61	8,985.68
Net income		\$ 864.11

LYBRAND, ROSS BROS. & MONTGOMERY

Certified Public Accountants

The Members of The American Museum of
Natural History Planetarium Authority,
New York, N. Y.

We have examined the balance sheet of THE AMERICAN MUSEUM of NATURAL HISTORY PLANETARIUM AUTHORITY as of June 30, 1951 and the related statement of Income and Deficit for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying balance sheet and related statement of Income and Deficit present fairly the financial position of the Authority at June 30, 1951 and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Lybrand, Ross Bros. & Montgomery
New York, September 18, 1951.

BOARD OF TRUSTEES

1951-1952

President Emeritus

F. TRUBEE DAVISON

President

ALEXANDER M. WHITE

First Vice-President

MALCOLM P. ALDRICH

Treasurer

E. ROLAND HARRIMAN

Second Vice-President

FREDRICK M. EATON

Secretary

CLARENCE L. HAY

ELECTIVE TRUSTEES

Class of 1952

MALCOLM P. ALDRICH

GILMORE D. CLARKE

F. TRUBEE DAVISON

CLARENCE L. HAY

DEAN SAGE

H. NELSON SLATER

ALEXANDER M. WHITE

Class of 1953

ROBERT E. BLUM

EDWARD C. CHILDS

FREDRICK M. EATON

ARCHER M. HUNTINGTON

ROBERT G. PAGE

FREDERICK M. WARBURG

Class of 1954

AUGUST BELMONT

SUYDAM CUTTING

CHAUNCEY J. HAMLIN

WILLIAM H. HARKNESS

ROBERT EARLL McCONNELL

EDGAR M. QUEENY

Class of 1955

S. SLOAN COLT

COLUMBUS O'D. ISELIN

MICHAEL LERNER

RICHARD K. MELLON

DANIEL E. POMEROY

CORNELIUS V. WHITNEY

Class of 1956

W. DOUGLAS BURDEN

BENJAMIN S. CLARK

CLEVELAND E. DODGE

CHILDS FRICK

E. ROLAND HARRIMAN

A. PERRY OSBORN, JR.

JOHN D. ROCKEFELLER, 3RD

JOHN J. THEOBALD

EX-OFFICIO TRUSTEES

VINCENT R. IMPELLITTERI
MAYOR OF THE CITY OF NEW YORK

LAZARUS JOSEPH
COMPTROLLER OF THE CITY OF NEW YORK

ROBERT MOSES
COMMISSIONER OF PARKS OF THE CITY OF NEW YORK

WILLIAM JANSEN
REPRESENTATIVE OF THE BOARD OF EDUCATION OF THE CITY OF NEW YORK

HONORARY TRUSTEES

ROBERT WOODS BLISS
H. B. CLARK
LEWIS W. DOUGLAS
JOHN J. McCLOY

GEORGE M. MOFFETT
A. HAMILTON RICE
KEITH SPALDING
ARTHUR S. VERNAY

THE STAFF, 1951-1952

ALBERT E. PARR, Sc.D., Director

WAYNE M. FAUNCE, Sc.B., Vice-Director and Executive Secretary

WALTER F. MEISTER, Assistant Treasurer

DEPARTMENTS OF SCIENCE AND EDUCATION

Anthropology

H. L. SHAPIRO, Ph.D., Chairman, Curator of Physical Anthropology

MARGARET MEAD, Ph.D., D.Sc., Associate Curator of Ethnology

BELLA WEITZNER, Associate Curator of Ethnology

JUNIUS B. BIRD, Associate Curator of Archaeology

GORDON F. EKHOLM, Ph.D., Associate Curator of Archaeology

JAMES A. FORD, Ph.D., Assistant Curator of North American Archaeology

HARRY TSCHOPIK, JR., Ph.D., Assistant Curator of Ethnology

CLARENCE L. HAY, A.M., Research Associate

ROBERT VON HEINE-GELDERN, Ph.D., Research Associate

RALPH LINTON, Ph.D., Research Associate

WILLIAM DUNCAN STRONG, Ph.D., Research Associate

FREDERICK H. OSBORN, Litt. D., Sc.D., LL.D., Honorary Associate

ANTOINETTE K. GORDON, Associate

Mammals

HAROLD E. ANTHONY, D.Sc., Chairman and Curator

CHILDS FRICK, D.Sc., Honorary Curator of Late Tertiary and Quaternary Mammals

G. H. H. TATE, D.Sc., Curator

GEORGE G. GOODWIN, Associate Curator

T. DONALD CARTER, Assistant Curator

CHARLES H. FALKENBACH, Field and Laboratory Associate, Frick Laboratory

RICHARD ARCHBOLD, Research Associate

J. HOWARD MCGREGOR, Ph.D., Research Associate, Comparative Anatomy

DUDLEY J. MORTON, M.D., Research Associate, Comparative Anatomy

ARTHUR S. VERNAY, Field Associate

WILLIAM D. CAMPBELL, Field Associate

Birds

ROBERT CUSHMAN MURPHY, Sc.D., Chairman and Lamont Curator of
Birds

JOHN T. ZIMMER, D.Sc., Curator

ERNST MAYR, Ph.D., Curator of the Whitney-Rothschild Collections

DEAN AMADON, Ph.D., Associate Curator

CHARLES E. O'BRIEN, Assistant Curator

E. THOMAS GILLIARD, Assistant Curator

ELSIE M. B. NAUMBURG, Research Associate

CHARLES K. NICHOLS, Research Associate and Honorary Librarian

JEAN DELACOUR, Lic. Sci., Research Associate

CHARLES VAURIE, D.D.S., Research Associate

WILLIAM H. PHELPS, Dr. Hon. Causa, Research Associate

Amphibians and Reptiles

CHARLES M. BOGERT, A.M., Chairman and Curator

BESSIE MATALAS HECHT, A.B., Scientific Assistant

JOHN A. MOORE, Ph.D., Research Associate

JAMES A. OLIVER, Ph.D., Research Associate

EMMETT R. DUNN, Ph.D., Research Associate

ROGER CONANT, Research Associate

ARCHIE F. CARR, JR., Ph.D., Research Associate

LLEWELLYN THOMAS EVANS, Ph.D., Research Associate

Fishes and Aquatic Biology

C. M. BREDER, JR., Sc.D., Chairman and Curator

JOHN T. NICHOLS, A.B., Curator of Fishes

FRANCESCA R. LAMONTE, B.A., Associate Curator of Fishes and Mu-
seum Secretary for International Game Fish Association Affairs

JOHN C. ARMSTRONG, A.B., Assistant Curator of Invertebrates

PRISCILLA RASQUIN, A.B., Scientific Assistant

MARSHALL BISHOP, Resident Naturalist-Lerner Marine Laboratory

WILLIAM BEEBE, Sc.D., Research Associate in Fishes

CHRISTOPHER W. COATES, Research Associate in Fishes

DANIEL MERRIMAN, Ph.D., Research Associate in Oceanography

HORACE W. STUNKARD, Ph.D., Research Associate in Parasitology

LIBBIE H. HYMAN, Ph.D., Sc.D., Research Associate in Invertebrates

H. E. CRAMPTON, Ph.D., Sc.D., Research Associate in Mollusks

WILLIAM J. CLENCH, M.S., Research Associate in Mollusks

ROSWELL MILLER, JR., C. E., Field Associate

Insects and Spiders

MONT A. CAZIER, Ph.D., Chairman and Associate Curator
C. H. CURRAN, D.Sc., Curator
WILLIS J. GERTSCH, Ph.D., Curator
FREDERICK H. RINDGE, Ph.D., Assistant Curator
ALICE GRAY, B.S., Scientific Assistant
HERBERT F. SCHWARZ, M.A., Research Associate
ERNEST L. BELL, Research Associate
CYRIL F. DOS PASSOS, LL.B., Research Associate
ALFRED E. EMERSON, Ph.D., Research Associate
E. IRVING HUNTINGTON, Research Associate
ALEXANDER B. KLOTS, Ph.D., Research Associate
HERMAN T. SPIETH, Ph.D., Research Associate
WILLIAM P. COMSTOCK, B.A., Research Associate
JAMES H. McDUNNOUGH, Ph.D., Research Associate
CHARLES D. MICHENER, Ph.D., Research Associate
CHARLES L. FLUKE, Ph.D., Research Associate
FRANK M. HULL, Ph.D., Research Associate
CLARENCE J. GOODNIGHT, Ph.D., Research Associate
LIONEL LACEY, Research Associate
JOHN PALLISTER, Research Associate

Animal Behavior

LESTER R. ARONSON, Ph.D., Chairman and Associate Curator
T. C. SCHNEIRLA, Sc.D., Curator
FRANK A. BEACH, Ph.D., Research Associate
MYRON GORDON, Ph.D., Research Associate
CARYL P. HASKINS, Ph.D., Research Associate
BERNARD F. RIESS, Ph.D., Research Associate
EUGENIE CLARK, Ph.D., Research Associate
W. DOUGLAS BURDEN, M.A., Honorary Associate

Forestry and General Botany

HENRY K. SVENSON, Ph.D., Chairman and Curator
CLARENCE L. HAY, A.M., Honorary Curator
CHARLES RUSSELL, Ph.D., Associate
RICHARDSON L. WRIGHT, M.A., Research Associate

Geology and Paleontology

GEORGE GAYLORD SIMPSON, Ph.D., Sc.D., Chairman and Curator of
Fossil Mammals and Birds
EDWIN H. COLBERT, Ph.D., Curator of Fossil Reptiles and Amphibians
NORMAN D. NEWELL, Ph.D., Curator of Historical Geology and Fossil
Invertebrates
FREDERICK H. POUGH, Ph.D., Curator of Physical Geology and Mineralogy
OTTO H. HAAS, Ph.D., LL.D., Associate Curator of Fossil Invertebrates
BOBB SCHAEFFER, Ph.D., Associate Curator of Fossil Fishes
RACHEL HUSBAND NICHOLS, A.M., Scientific Assistant
HORACE ELMER WOOD, 2ND, Ph.D., Research Associate in Fossil Mammals
ERICH M. SCHLAIKJER, Ph.D., Research Associate in Fossil Reptiles
LOUIS HUSSAKOF, Ph.D., Research Associate in Fossil Fishes
J. BROOKES KNIGHT, Ph.D., Research Associate in Fossil Invertebrates
ARTHUR K. MILLER, Ph.D., Research Associate in Fossil Invertebrates

Micropaleontology

BROOKS F. ELLIS, Ph.D., Chairman and Curator
ANGELINA R. MESSINA, M.A., Associate Curator
ELEANOR S. SALMON, Ph.D., Assistant Curator
STANLEY G. WISSLER, M.A., Research Associate
J. J. GALLOWAY, Ph.D., Research Associate
MARTIN F. GLAESSNER, Ph.D., Research Associate
CAMERON D. OVEY, B.Sc., Research Associate

Astronomy and the Hayden Planetarium

ROBERT R. COLES, Chairman
CATHARINE E. BARRY, Assistant Curator
ROBERT G. KNITTEL, Supervising Technician
FRANK H. FORRESTER, Supervisor of Guest Relations
SHIRLEY I. GALE, B.S., Special Lecturer
CLARENCE V. LEE, M.A., Special Lecturer
HENRY M. NEELY, Special Lecturer
JOSEPH CHAMBERLAIN, Special Lecturer
JAMES S. PICKERING, Special Lecturer
HUGH S. RICE, Ph.D., Research Associate

Education

CHARLES RUSSELL, Ph.D., Chairman
GRACE FISHER RAMSEY, Ph.D., Curator of School Relations
JOHN R. SAUNDERS, M.A., Associate Curator
GEORGE F. MASON, Associate Curator
WILLIAM A. BURNS, Ed.D., Associate Curator
JOHN C. ORTH, Assistant Curator
MARGUERITE R. ROSS, M.A., Assistant Curator
ETTA FALKNER, M.A., Assistant Curator
RICHARD I. GARTON, B.A., Assistant Curator
FARIDA A. WILEY, Instructor
ALMEDA JOHNSON, Instructor
LUCY W. CLAUSEN, Ph.D., Instructor
INEZ E. BORDNER, B.A., Instructor
MIRIAM C. STRYKER, Instructor
LOIS HUSSEY, B.A., Instructor
HAZEL L. MULLER, B.A., Supervisor of Dance and Lecture Programs
ANNA MONTGOMERY, Supervisor of Guest Services
MARGUERITE NEWGARDEN, M.A., Supervisor of Museum Service Center
HESTER RICH HOPKINS, M.A., Supervisor of Educational Research
MADELEINE A. CAREY, Supervisor of The American Museum Shop
ALICE POLLAK, B.A., Supervisor of Sales and Services

Library

HAZEL GAY, Librarian
HELEN M. GUNZ, B.A., Assistant Librarian

OFFICE OF THE DIRECTOR

ALBERT E. PARR, Sc.D., Director

Conservation and Use of Natural Resources

RICHARD H. POUGH, B.S., Co-ordinator
FRANK E. EGLER, Ph.D., Research Associate
PAUL A. ZAHL, Ph.D., Research Associate

Biogeochemistry

G. EVELYN HUTCHINSON, M.A., Consultant

Architectural Design

JOHN E. PARADIS, Staff Architect

JOSEPH M. GUERRY, Assistant to the Staff Architect

KATHARINE BENEKER, Supervisor of Display and Temporary Exhibitions

Preparation

GEORGE E. PETERSEN, Chief

RAYMOND H. DE LUCIA, B.F.A., Assistant Chief

GEORGE H. CHILDS, Ph.D., Staff Associate

JAMES PERRY WILSON, B.A., B.Ar., Staff Associate

GEORGE ADAMS, Staff Assistant

Illustrators Corps

THOMAS W. VOTER, Supervisor

Scientific Publications

RUTH TYLER, M.A., Editor

POPULAR PUBLICATIONS

ALBERT E. PARR, Sc.D., Director

WAYNE M. FAUNCE, Sc.B., Vice-Director, In Charge of Publications

Natural History Magazine

EDWARD MOFFAT WEYER, JR., Ph.D., Editor

ROBERT EDGAR WILLIAMSON, Production Manager

CHARLES J. O'CONNOR, B.S., Manager of Circulation and Advertising

The Junior Natural History Magazine

DOROTHY E. SHUTTLESWORTH, Editor

MARION B. CARR, Associate Editor

CHARLES J. O'CONNOR, B.S., Manager of Circulation and Advertising

Man and Nature Publications

RICHARD I. GARTON, B.A., Editor

OFFICE OF THE VICE-DIRECTOR

WAYNE M. FAUNCE, Vice-Director and Executive Secretary

WALTER F. MEISTER, Assistant Treasurer

Business Administration

EDWIN C. MEYENBERG, Bursar

ROBERT J. SEIBERT, Chief Accountant

ADRIAN L. WARD, Personnel Officer

WILLIAM F. MUSSIG, Purchasing Agent

CHARLES J. O'CONNOR, Membership Secretary

ELLA B. RANSOM, Executive Assistant to the President

MARGUERITE D. PHILLIPS, Assistant Executive Secretary

DOROTHEA C. SMITH, Executive Assistant, Museum Contributors
Program

RUTH NORTON, Supervisor of Public Relations

Building Operation and Maintenance

REX P. JOHNSON, General Superintendent

WILSON L. TODD, Plant Engineer

LOUIS W. KINZER, Custodian

HENRY H. RAMSHAW, Mechanical Superintendent

BLANCHE PRESTON, Manager of Food Service

Print Shop

EDWARD A. BURNS, Supervisor

EMERITI

ROY CHAPMAN ANDREWS, Sc.D., Honorary Director

BARNUM BROWN, Sc.D., Curator Emeritus of Fossil Reptiles

JAMES P. CHAPIN, Ph.D., Associate Curator Emeritus of Birds; Research
Associate in African Ornithology

JAMES L. CLARK, D.Sc., Director Emeritus, Preparation and Installation

WILLIAM K. GREGORY, Ph.D., Sc.D., Curator Emeritus of Fishes and of
Comparative Anatomy

E. W. GUDGER, Ph.D., Honorary Associate in Fishes and Librarian of
Dean Memorial Library

ROY WALDO MINER, Ph.D., Sc.D., Curator Emeritus of Invertebrates

CHARLES C. MOOK, Ph.D., Associate Curator Emeritus of Fossil Reptiles

NELS C. NELSON, M.L., Curator Emeritus of Prehistoric Archaeology

WILLARD G. VAN NAME, Ph.D., Associate Curator Emeritus of Recent
Invertebrates

CORRESPONDING MEMBERS

*Through honorary election by the Board of Trustees, for
five-year periods, on recommendation of
the Council of the Scientific Staff*

DR. KAJ BIRKET-SMITH

National Museum, Copenhagen, Denmark

DR. DANIEL F. RUBIN DE LA BORBOLLA

Museo Nacional de Antropologia, Moneda 13, Mexico, D.F.,
Mexico

DR. J. A. BROGGI

Director, Instituto Geologico del Peru, Lima, Peru

SIR PETER BUCK

Director, Bernice P. Bishop Museum, Honolulu 7, Hawaii

PROFESSOR DR. ÁNGEL CABRERA

Professor of Zoology, University of Buenos Aires, Calle 64, No.
584, La Plata, Argentina

DR. ALFONSO CASO

Secretary, Biennes Nacionales e Inspección Administrativa, 312
Avenida Suderman in Colonia, Chapultepec-Morales, Mexico,
D.F., Mexico

PÈRE TEILHARD DE CHARDIN

15 Rue Monsieur, Paris VII, France

PROFESSOR V. GORDON CHILDE

Institute of Archaeology, University of London, Inner Circle,
Regent's Park, London, N.W. 1, England

PROFESSOR YUANTING T. CHU

Professor of Biology, St. John's University, Shanghai, China

DR. G. A. COOPER

Curator, Invertebrate Paleontology and Paleobotany, United
States National Museum, Washington, D. C.

DR. RAYMOND B. COWLES

Department of Zoology, University of California, Los Angeles 24,
California

- PROFESSOR CARL O. DUNBAR**
Director, Peabody Museum of Natural History, Yale University,
New Haven, Connecticut
- DR. EMMETT REID DUNN**
Department of Biology, Haverford College, Haverford, Pennsylvania
- DR. H. C. EFFLATOUN BEY**
Head, Department of Zoology, Egyptian University, Cairo, Egypt
- DR. PENTTI EELIS ESKOLA**
Director, Institute of Geology, Helsinki University, Helsinki,
Finland
- DR. E. B. FORD**
Reader in Genetics, Oxford University, Oxford, England
- DR. NILS (COUNT) C. G. FERSEN GYLDENSTOLPE**
Section of Vertebrates, Royal Natural History Museum, Stockholm
50, Sweden
- DR. RAFAEL LARCO HOYLE**
Hacienda Chiclaín, Trujillo, Peru
- DR. ARCHIBALD G. HUNTSMAN**
Professor of Marine Biology, University of Toronto, Toronto,
Ontario, Canada
- DR. R. JEANNEL**
Director, Laboratory of Entomology, Muséum National d'Histoire
Naturelle, Paris, France
- DR. KARL JORDAN**
Curator of Tring Museum, Tring, England
- SIR ARTHUR KEITH**
Buckston Browne Farm, Downe, Kent, England
- DR. LAURENCE M. KLAUBER**
Curator of Reptiles, Zoological Society of San Diego, San Diego,
California
- PROFESSOR A. L. KROEBER**
Professor of Anthropology, Emeritus, University of California;
Visiting Professor, Department of Social Relations, Emerson Hall,
Harvard University, Cambridge 38, Massachusetts

- DR. KARL S. LASHLEY**
Director, Yerkes Laboratory of Primate Biology, Orange Park,
Florida
- DR. E. D. MERRILL**
Director, Arnold Arboretum, Harvard University, Jamaica Plain,
Massachusetts
- DR. ROBERT MERTENS**
Kustos, Senckenberg Museum, Senckenberg-Anlage 25, (16) Frank-
furt-am-Main, American Zone, Germany
- DR. JOSÉ OITICICA, FILHO**
Museu Nacional, Rio de Janeiro, Brazil
- PROFESSOR CHARLES PALACHE**
Harvard University, Cambridge, Massachusetts
- MR. H. W. PARKER**
Keeper of Reptiles, British Museum (Natural History), Cromwell
Road, London, S.W. 7, England
- DR. ALEXANDER PETRUNKEVITCH**
Professor Emeritus of Zoology, Osborn Zoological Laboratory,
Yale University, New Haven, Connecticut
- DR. OLIVERIO M. DE OLIVEIRA PINTO**
Director, Department of Zoology, Bureau of Agriculture, São
Paulo, Brazil
- DR. NORMAN DENBIGH RILEY**
Keeper of Entomology, British Museum (Natural History), London
England
- PROFESSOR ALFRED SHERWOOD ROMER**
Director, Museum of Comparative Zoölogy, Harvard College,
Cambridge, Massachusetts
- MR. KARL P. SCHMIDT**
Chief Curator of Zoology, Chicago Natural History Museum,
Chicago 5, Illinois
- DR. HARLOW SHAPLEY**
Director, Harvard College Observatory, Cambridge, Massachusetts

DR. ERWIN STRESEMANN

Keeper of Ornithological Department, Zoological Museum,
Invalidenstrasse 43, Berlin, N.4, Germany

PROFESSOR ELIS STRÖMGREN

Royal Danish Observatory, Copenhagen, Denmark

DR. NIKOLAAS TINBERGEN

Department of Zoology, University Museum, Oxford, England

DR. ETHELWYNN TREWAVAS

Department of Zoology, British Museum (Natural History),
Cromwell Road, London, S.W. 7, England

PROFESSOR DAVID MEREDITH SEARES WATSON

University College, Gower Street, London, England

PROFESSOR T. S. WESTOLL

Professor of Geology, University of Durham at King's College,
Newcastle-upon-Tyne, England

PROFESSOR ROBERT M. YERKES

Professor of Psychology, Yale University, New Haven, Connecticut

CAPITAL FUNDS

The Capital Funds were established in 1884. They now amount to \$15,961,185.45 (book value). The Trustees especially desire to insure the permanent growth and welfare of the Museum through an increase of the General Endowment Fund. The additional sum of \$10,000,000 is needed at present.

FORM OF BEQUEST

I do hereby give and bequeath to "THE AMERICAN MUSEUM OF NATURAL HISTORY" of the City of New York

.....

.....

GIFTS AND BEQUESTS EXEMPT FROM TAXATION

Gifts to the American Museum of Natural History are deductible for income tax purposes. Gifts and bequests in any amount to the American Museum of Natural History are exempt from Federal Gift and Estate Taxes.

MEMBERSHIP, CONTRIBUTORY AND HONORARY

ASSOCIATE MEMBERS	(annually)	\$5	LIFE MEMBERS	.....	\$1,000
ANNUAL MEMBERS	(annually)	15	PATRONS	.....	5,000
SUSTAINING MEMBERS	(annually)	25	ASSOCIATE BENEFACTORS	.....	10,000
CONTRIBUTING MEMBERS	(annually)	50	ASSOCIATE FOUNDERS	.....	25,000
SUPPORTING MEMBERS	(annually)	100	BENEFACTORS	.....	50,000
FELLOWS	.....	500	ENDOWMENT MEMBERS	.....	100,000
HONORARY LIFE MEMBERS			HONORARY FELLOWS		
CORRESPONDING MEMBERS					

FOR INFORMATION APPLY TO THE SECRETARY OF
THE AMERICAN MUSEUM OF NATURAL HISTORY
Central Park West at 79th Street
New York 24, N. Y.

