ANNUAL REPORT

OF

THE DIRECTOR

OF THE

MUSEUM OF COMPARATIVE ZOÖLOGY

AT HARVARD COLLEGE

TO THE

PRESIDENT AND FELLOWS OF HARVARD COLLEGE

FOR

1929-1930.

CAMBRIDGE, U. S. A.:
PRINTED FOR THE MUSEUM
1930.

PUBLICATIONS

OF THE

MUSEUM OF COMPARATIVE ZOÖLOGY

AT HARVARD COLLEGE

There have been published of the BULLETIN Vols. I. to LIV, LVI to LXX; of the MEMOIRS Vols. I to LI.

The BULLETIN and MEMOIRS are devoted to the publication of original work by the Officers of the Museum, of investigations carried on by students and others in the different Laboratories of Natural History, and of work by specialists based upon the Museum Collections and Exploration.

These publications are issued in numbers at irregular intervals. Each number of the Bulletin and of the Memoirs may be sold separately. A price list of the publications of the Museum will be sent on application to the Director of the Museum of Comparative Zoölogy, Cambridge, Massachusetts.

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MUSEUM OF COMPARATIVE ZOÖLOGY

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REGINALD A. DALY — *Sturgis Hooper Professor of Geology*

REPORT OF THE DIRECTOR
1929–1930

To the President and Fellows of Harvard College:—

I have long suspected that the natural history collections of Harvard University, which with the various accretions now constitute this Museum, represent the earliest efforts made in this country to form a cabinet or museum of natural history.

It is well known that Professor Benjamin Waterhouse had a considerable cabinet of minerals as early as 1784, while Professor William Dandridge Peck began to accumulate botanical and zoölogical specimens at least as early as 1785. During the course of the year a large number of his fishes, curiously sliced through, dried, varnished and mounted on cards, after the fashion of herbarium material, were found, by chance, among the fossil fishes. Many of these specimens have been destroyed by neglect but many others are in extraordinarily good preservation and are now on exhibition. Professor Peck visited Europe and was in close touch with European naturalists — indeed a number of these fishes were prepared in England and Scotland — and it is not unlikely that he got the idea for this curious method of mounting directly or indirectly from Reaumur. This versatile genius advocated the standardization of methods for storing natural history specimens by drying them out through baking and mounting them on sheets, even birds having been split and prepared in this way. Washington's diaries report his calling upon Professor Peck while in Portsmouth, New Hampshire, no doubt to see the very fish which we have now on exhibition and which Professor Peck secured in the "Piscataqua Flumen." I only cite these facts to show that the foundations of our museums were laid before the museums at Charleston, Salem or Philadelphia came into being.

Further progress in getting the exhibition collections into permanently improved condition was made possible by Mr. George R. Agassiz, who has enabled us to recase with plate glass and rearrange the main synoptic Hall of Mammals. This has resulted in a con-

siderable increase in the number of visitors and in a better chance to use the collection to illustrate Dr. Allen's course. Mr. Coolidge is, in great part, responsible for the excellent appearance which this collection now makes.

Early in the year Dr. John C. Phillips gave the Museum his great collection of horns and antlers. This has been placed on exhibition in the main entrance hallway, outside the Hall of Mammals, and makes an imposing and most effective exhibition.

During the year Mr. Augustus Hemenway generously enabled us to buy several mammals from Rowland Ward which were needed to replace faded or badly mounted specimens and which have added greatly to the appearance of the exhibition rooms.

Mr. George Nelson continued to devote his attention exclusively to the preparation of vertebrate fossils with the result that a number of new specimens, most beautifully restored, have been added to the exhibits. Professor Raymond, especially, has aided greatly in increasing the teaching value of the palaeontological exhibitions.

This year has been notable in that more than the usual amount of exploration has been carried on. In each case the trips have been laid out with a view to securing material which bears some definite relation to material already in hand or which is desirable for some special purpose. Thus, through the kind offices of Mr. William Phillips, formerly Minister to Canada, permission was courteously granted by the authorities of the Canadian National Parks to allow us to reopen the so-called Walcott Quarry in the Yoho Park area. Here Professor Raymond, with the aid of Messrs. Stetson, Schevill and Burgess, had the great good fortune to find an almost unrivalled series of these highly important, little understood and very early invertebrates.

Mr. Schlaikjer, accompanied by Messrs. Graham Bell Fairchild, Louis DuPont Irving, Jr., David Cheek and James Dennison, returned to the Badlands, working this time at a new locality in Wyoming, where discoveries of great interest were made. It seems now that some new light has been unexpectedly shed upon the question of the evolution of the horse, a topic of perennial interest.

Messrs. Archer, Bowen and Dow visited Cuba, in part aided by

grants from the Atkins Fund. The two latter men, working at Harvard House, secured a number of specially desired invertebrates during their spare time.

Mr. Brues continued his studies of the fauna of hot springs, especially in the far west.

Dr. Bequaert added to our collections while assisting in the medical survey of Yucatan.

Mr. Clench and Messrs. Rehder and Schevill visited the island of Navassa, a locality of the most extraordinary zoögeographical interest, and secured much interesting material from this inaccessible spot. Through the courtesy of the Honorable Charles Francis Adams, Secretary of the Navy, a government vessel took the party to Navassa from the Guantanamo Naval Station in Cuba and returned them to the same point after their stay on the island.

Members of the Museum Staff have been engaged in important explorations in Africa. Mr. Arthur Loveridge, continuing his studies of the relationships of the East African mountain forests with the West African lowland forest, visited the Livingston ranges of southern Tanganyika Territory, a region hitherto but little known, where his unique knowledge of East African conditions and languages made it possible for him to secure enormous collections. This exploration was aided by a grant from the Carnegie Foundation, a courtesy which we all greatly appreciated, as we did also the aid which the Carnegie Institution gave in support of Dr. Clark's explorations which are mentioned later on. Dr. J. H. Sandground, while working out the life history of a dangerous human parasite in Rhodesia and Portuguese East Africa, at the same time secured large collections in a number of different animal classes which are most welcome, as they come from a region from which material was greatly desired.

Dr. Hubert Lyman Clark returned from his long journey to western Australia, where he studied especially the Echinoderms, with not only a valuable collection but a most useful field experience, having received extraordinary courtesy and assistance from the scientists resident in Australia.

Dr. Afranio do Amaral, to whom the Museum has been so frequently beholden in the past, again has put us in his debt through

the courtesy and assistance which he gave Dr. Allen on his journey to the Serra de Paranapiacaba in southern Brazil.

By the most fortunate chance, Dr. J. Stanley Gardiner of Cambridge University gave a course of Lowell Institute Lectures in Boston last winter. He spent most of his time in the Museum, a sage counselor indeed and a charming companion. He worked over, relabelled and sorted a large part of our collection of oceanic bottom samples and wrote a most excellent paper which has appeared in the Bulletin.

It is a pleasure to report other visitors whose advice and interest has been greatly appreciated. Among these I may mention Mr. Stanley Field, President of the Field Museum in Chicago, and Mr. Charles M. B. Cadwalader, Director of the Museum of the Academy of Natural Sciences in Philadelphia. President Ruthven of the University of Michigan and Dr. and Mrs. Gaige of the Museum at Ann Arbor are frequent visitors. Dr. Baini Prashad of the Zoölogical Survey of India, Dr. Zimmer, Director of the Berlin Museum and Dr. Drevermann of the Senckenberg Museum at Frankfurt am Main, have not only been most enjoyable company but have enabled us to inaugurate extensive programs for the exchange of material.

Last winter I attended the International Congress of Universities at Havana, visited Soledad and spent a short time in Panama.

By great good fortune it was possible to dispose of an unusually large number of Museum publications last year by sale and this fact has enabled us to publish and to prepare for publication this year a considerable number of important manuscripts which have long been awaiting publication. However, this good fortune may not fall to our lot every year and it must be emphasized that added funds for publication are among the greatest of the Museum's needs. The greatest need of all continues to be funds for salaries which are still grotesquely small. If it were not a fact that a number of the officers of the Museum serve the University without remuneration, it would be impossible to pay the others even the pittance which they now receive.

Several times Mr. George R. Agassiz has kindly volunteered to assist in reading manuscript offered for publication and has offered other welcome editorial assistance.

Many of the older members of the Museum Staff recall with pleasure their acquaintance with Mr. J. D. Sornborger who worked in the Museum years ago. This year he died at Rowley and his widow most generously presented his zoölogical collections to the Museum. These were noteworthy since he had one of the most extensive series of bones of the Great Auk in existence.

As I mentioned in last year's report, the coöperative arrangement, whereby the Bureau of Fisheries stations a number of their field biologists to work in association with the members of the Museum Staff and with headquarters at the Museum, has been continued. This arrangement is heartily to be praised and works to very great mutual benefit.

Mr. Columbus O'D. Iselin, while maintaining an office in the Museum, is no longer on our staff, since he has accepted a position with the new Woods Hole Oceanographical Institution now being built. Of this institution Dr. Henry B. Bigelow is Director and a Trustee, while I am likewise serving as a Trustee and a member of the Executive Committee. It is perfectly certain that this Museum, along with many others, will benefit greatly by the impetus which has been given to the study of oceanography by the founding of this new institution. The ship now being built will serve many museums as a means of increasing their deep sea collections. The distinguished report, which, at least in part, brought about the endowment of the Oceanographic Institution by the Rockefeller Foundation, was written by Dr. Bigelow and reflects great credit not only upon him but upon the Museum.

In the Domestic Animal Room we have placed on exhibition the series of splendid Japanese prints by the renowned artist Utomaro which Mrs. William M. Wheeler had formerly hung in the Bussey Institution and which she and Professor Wheeler have now given to this Museum — a priceless gift indeed. The prints show the stages in silk worm culture and raw silk production.

The display of recent accessions has been changed frequently during the year. At this moment a number of Dr. Clark's Australian invertebrates are shown, as well as some of the gorgeous exotic butterflies from the Paine Collection, the gift of Mrs. Richard T. Fisher, and sundry other series of shells and fossil fishes. The hall

where these objects are shown has also been made much more attractive by repainting, closing in the old chimney flue, and hanging there the portrait of Audubon received by bequest of Mr. William Brewster, while near by hang portraits of Louis Agassiz, Humboldt and Professor J. D. Whitney. These have been renovated at the Fogg Museum and, having previously hung inconspicuously in the library, now serve to make more attractive this public hall.

Miss Elizabeth Deichmann has been appointed Alexander Agassiz Fellow in Oceanography and, having completed her studies of the Blake Alcyonaria, will continue the reorganization and classification of several groups of marine animals which have long been in need of special attention.

The great diligence of the Museum Staff and the widespread generosity of its friends is well attested by the individual reports of the several departments which follow.

Respectfully submitted,

T. Barbour

REPORT ON THE BIRDS

By Outram Bangs

The past year has been an unusually profitable one. The total number of accessions amounts to 8,795 skins, including a number of genera and species not previously represented in the collection. The generic desiderata according to Sharpe's Handlist have been reduced to 86. Of the 18,939 species listed in that work we have 11,249.

The most important single addition is the Penard Collection of birds from Surinam which totals 2,684 specimens. H. Wedel stationed in eastern Panama has sent in 1,329 skins, including a number of rarities. An additional installment of the La Touche Collection amounting to 501 birds, practically completes the acquisition of this important collection. Other additions by purchase aggregate 679 skins, including 125 from the state of Maranhão and 181 from the state of Santa Catherina, Brazil. Seven hundred and fifty-one specimens were obtained by exchange.

Through the kind interest of Mr. Huntington R. Hardwick of Boston, Mr. W. S. Brooks was able to accompany him on the yacht *Acadia* to the Galapagos Islands in March and April, 1929. Mr. Brooks collected 154 birds that were brought back in the *Acadia's* refrigerator and were made up into skins by Mr. J. D. Smith, but were not received at the Museum in time to be included in last year's report. Dr. G. M. Allen returned from São Paulo, Brazil about the twentieth of September with 57 bird skins as a part of the material he collected on a brief trip.

Thanks to the generous interest of Mr. H. J. Coolidge, Jr., Mr. Peters accompanied him to Porto Rico and secured 32 birds during their short stay. A specimen of the rare Porto Rican Short-eared Owl was obtained by this party through the energetic coöperation of Mr. F. A. Potts of La Fortuna.

Mrs. Alfred Hawes of Sherborn, Massachusetts presented 469

skins of birds collected in Bechuanaland, South Africa by Mr. Hawes during the years 1874–1875.

At the request of Mr. Sidney F. Tyler, Jr., Harvard 1928, the American Museum of Natural History presented a set of the duplicates from the Tyler Duida Expedition, including nearly all of the new genera and species recently described by Dr. Chapman. This accession amounts to 340 skins, and is of the highest interest.

Mr. Griscom has spent much time in the department working on the Dwight Collection of Guatemala birds. It was Dr. Dwight's wish that Mr. Griscom should report on this collection, and in accordance with that wish the American Museum forwarded the birds to Cambridge, shortly after Dr. Dwight's death. From this magnificent collection, the Museum has been able to retain 1,239 skins.

The collection made in Szechuan for the Field Museum, by Mr. Harry Stevens, was entrusted to me for identification; the report is now in press and will appear as a publication of the Field Museum. One hundred and five duplicates were retained from this collection.

Small lots and single specimens totalling 55 skins have been presented by Oliver L. Austin, Jr., Outram Bangs, A. C. Bent, P. J. Darlington, Jr., E. E. Farnham, G. Alton Griffith, Arthur Jacot, F. H. Kennard, Walter Koelz, J. L. Peters, W. C. Schroeder, John E. Thayer, H. C. Thompson, University of Michigan and Park Department of the City of Boston. An anonymous friend has also aided the department by purchasing birds as the opportunity offered.

Messrs. Kennard and Bent are continually adding to and improving their collections. The former made a special trip to the Sacramento Valley in California to secure additional material for his study of the Geese. Mr. Bent has acquired the Pierce collection of birds from California, about 3,000 skins. He also collected a number of birds while spending the winter in Florida.

There is still need for additional cases to care for the rapid growth of the collection. The new construction in the present space occupied by the department will soon be taken up by the numerous accessions. It is to be hoped that when the new biological building is completed that the bird department will profit by the corresponding vacancies created in the present building to the extent of se-

curing Room 505 as an additional room for the storage of its collection and Room 503 as an office, which will permit an orderly and more serviceable arrangement of such items as the accession and card catalogues, books and pamphlets and correspondence files. Transferring the departmental library to the proposed office will also make it possible to construct a full height case against the west wall of Room 504.

The number of birds carded during the year is 6,113. The card catalogue has progressed well into the Formicariidae, and the number of skins actually carded to date is 62,369.

To Mrs. Bowen must be given the credit not only for carding nearly 6,000 birds and for cataloguing most of the accessions but also for typing a tremendous amount of manuscript most accurately and painstakingly.

The Tracheophonae have been rearranged according to the classification proposed by Hellmayr in the third and fourth parts of the "Catalogue of the Birds of the Americas!" A first series of this group has also been selected.

During August Mr. W. R. Spofford was engaged to assist in placing the gallinaceous birds and pigeons in a new case in Room 507.

Dr. Josselyn Van Tyne, Assistant Curator of Birds at the Museum of Zoölogy, University of Michigan, has spent considerable time at the Museum in working jointly with me on a report on the birds collected by himself as ornithologist of the Field Museum Kelley-Roosevelt Expedition to Indo-China, the ornithological material of the expedition having been entrusted to us for identification and report.

Mr. Peters has been working actively in the preparation of a new checklist of the birds of the world. It is expected that the manuscript of the first volume will be ready for the press by the first of January. This proposed list had its inception in the card catalogue, where a list of species is maintained that have been described since the publication of Sharpe's Handlist. Now that this catalogue has reached into the Passeres, it seems well to proceed with its amplification into a new "list."

As usual, some material has been borrowed from other institutions for the use of the staff, and a large amount has been loaned to ornithologists elsewhere to aid their researches.

REPORT ON MARINE INVERTEBRATES

By Hubert Lyman Clark

The opening of the year found the Curator on the northwestern coast of Australia, where he was engaged in collecting echinoderms for the Museum and studying their distribution and habits. From May 19 to June 4, 1929 he was the delegate from Harvard University to the Fourth Pan-Pacific Scientific Congress in Java, meetings of which were held at Batavia, Bandoeng and Sourabaya.

Mr. Arthur A. Livingstone, of the Australian Museum, Sydney, joined the Curator at Darwin, Northern Territory, Australia, on June 17 and our laboratory, generously provided without cost by Mr. J. Horsborough, Chairman of the Board of Commissioners for the Northern Territory, was established there for six weeks. The collecting was poor but of great interest and importance, as very little was known of the marine fauna in that region. As the funds for our work were generously provided by the Carnegie Institution of Washington, the National Research Council of Australia, and the Museum of Comparative Zoölogy, we made use of the title the "Carnegie-Australian-Harvard Expedition," and a brief general account of our work was published in *Science*, February 21, 1930.

On July 29, we left Darwin and went to Broome, western Australia, where we remained two months. Our laboratory here was provided for us without cost by Captain A. C. Gregory, the Chairman of the town's governing body. Broome proved to be an extraordinarily good center for marine collecting and a large amount of very valuable material was secured. Early in October we continued our journey westward and southward, and, after a day's collecting at Geraldton, reached Perth on October 8. Here three very profitable weeks were spent, the large amount of material collected being generously supplemented by gifts from Mr. L. Glauert of the Perth Museum and Mr. E. W. Bennett of the University of Western Australia.

At Adelaide, Melbourne and Hobart, similar generous assistance from Messrs. Hale, Kershaw, Chapman, Lord and Flynn not only added to the collections but gave the Curator unusual opportunities for seeing the marine fauna of the southern coast of Australia. Sydney was reached on November 19, and the following days were spent in four collecting trips to the best accessible spots, and in examination of material in the Australian Museum. The generous hospitality of that Museum and its staff passes description. I left Sydney November 30 and spent December 2 at Brisbane, where Mr. Longman, director of the Queensland Museum, gave us the usual cordial Australian welcome. On the return journey to Cambridge, a month was spent in China and important contacts with zoölogists were made at Hong Kong, Foochow and Nanking.

Since my return to Cambridge, my time has been given chiefly to curatorial duties. The material collected in Australia has all arrived at the Museum in first class condition. A considerable supplementary collection, made up by the British Barrier Reef Expedition, 1928–29, at Low Island, has also been received for study and report, while a small but interesting collection sent by the Museum at Nanking promises to be the beginning of important additions to our scanty Chinese material. The rearrangement of our sea star collection to accord with W. K. Fisher's authoritative monographs on that group and the resulting checking of catalogue numbers and rewriting of cards has taken much time. The task of looking after the alcohol on the collections in the basement is also under way.

The chief additions to our collections during the year, aside from those made by the Curator and not yet incorporated, are as follows: from Mr. Morris E. Caruthers, sea urchins from southern California in exchange for mollusks; from Mr. Stanley L. Larnach, a large number of Australian sea stars, as a gift; from Mr. W. C. Schroeder, sea stars, brittle stars and sea urchins from off the coasts of New England and New Jersey, as gifts.

REPORT OF THE DEPARTMENT OF OCEANOGRAPHY

By H. B. Bigelow

During the year studies on the biology of various North Atlantic fishes have been carried on in the Museum by the following members of the staff of the United States Bureau of Fisheries: O. E. Sette, R. A. Nesbit, William C. Schroeder, E. W. Bailey and V. E. Heffelfinger. Mr. Schroeder's report on the Migrations of the Cod has been completed and will appear in the Bulletin of the Bureau.

The survey of the coastal waters off the eastern United States, mentioned in previous reports, was continued by the United States Fisheries steamer *Albatross* on its periodic cruises in February, April, May, June and July.

The generosity of Mr. H. L. Shattuck made it possible for the Museum to coöperate with the Bureau in running a profile to Bermuda on the *Albatross* in August, with C. O. Iselin and Dr. Roderick Macdonald in charge of the scientific program. Physical data were obtained at 18 stations; oxygen and phosphate determinations were made for the deep strata. Unfortunately an accident to the ship's engines curtailed the cruise, and prevented the securing of extensive collections.

The coöperation with the International Ice Patrol continues along the line mentioned in previous reports, and Lt. Commander N. G. Ricketts, oceanographer to the Patrol, prepared in the Museum the annual report on the activities of the season.

Mr. Iselin, while Alexander Agassiz Fellow of Oceanography, spent the autumn and winter abroad visiting the oceanographic laboratories at Plymouth, Paris, Monaco, Geneva, Berlin, Hamburg, Copenhagen and Bergen.

Dr. Macdonald continued his plankton study until October, when he returned to England. Miss Mary Sears and Miss Alice Beale worked on the collections of plankton, and I completed the report on the *Arcturus* Siphonophores.

Much of my own time during the year has been devoted to the organization of the Woods Hole Oceanographic Institution, of which I have been appointed director. The incorporation of this new institution has been an outgrowth from the study of the status of oceanography in America that was carried out by a committee of the National Academy of Sciences (see last year's report), and its financial support has been provided by the Rockefeller Foundation. Its purpose is to prosecute and encourage the study of the sea in the broadest sense, including both the biological and the physical-chemical aspects. Arrangements will also be provided for the instruction of graduate students in the field methods of oceanography. It is to own and operate a sea-going ship, capable of long voyages, equipped for work in the various divisions of oceanography, this being the material feature which most sharply differentiates it from other marine laboratories in America. It is planned to keep the laboratory open and ship in commission the year round.

Like some of the most successful marine laboratories in this country and abroad, it is an independent institution but with liaison with universities assured through their representation on its Board of Trustees.[1]

At this writing, construction of the building at Woods Hole has been commenced and the contract let for the ship, while the initial program of research is in process of development. The Trustees hope the new institution will open its doors to investigators in the summer of 1931.

[1] See Science, vol. 71, p. 277.

REPORT OF THE ENTOMOLOGICAL DEPARTMENT

By Nathan Banks

The more notable accessions are the collection of Chilian Hymenoptera formed by the late Paul Herbst and purchased by an anonymous friend, and the C. T. Paine collection of Lepidoptera, both New England and exotic, presented by Mrs. R. T. Fisher. Dr. W. M. Wheeler gave his fine collection of myrmecophilous insects. The Costa Rican material gathered by Professor C. W. Dodge, W. F. Thomas, and F. Nevermann, and a lot of East African insects from Mr. A. Loveridge also formed especially welcome additions. The Herbst collection is of particular importance as it contains the types of a number of bees and wasps and is especially rich in bees. Mr. Suydam Cutting, through Mr. H. J. Coolidge, Jr., gave some fine insects, collected by Major Kingdon Ward in Upper Burma and Laos. For other additions we are indebted to J. Bequaert, E. B. Bryant, B. P. Clark, E. T. Cresson, P. J. Darlington, J. H. Emerton, C. W. Johnson, A. Jacot, A. C. Kinsey, M. C. Lane, A. P. Morse, M. Valerio, and L. Worley. An exchange with the University of Michigan added about a dozen species of Orthoptera.

Miss E. B. Bryant has been engaged in revising three genera of spiders and in identifying Florida spiders particularly some for Mr. W. S. Blatchley's report on the fauna of Royal Palm Park.

During the past year great progress was made in housing insects in the new boxes and in arrangement. All of the miscellaneous exotic Coleoptera were transferred to the new drawers and most of them arranged by families. The Dietz Curculionidae and the duplicate Chrysomelidae given by Mr. F. C. Bowditch were also put in the new boxes. A new arrangement of the Hymenoptera in the new boxes was begun, Mr. Creighton working on the ants and Mr. Dow on the Sphecoids. Mr. Fairchild continued his work arranging the Nearctic Lepidoptera and is about halfway through

the Noctuidae. The European Hemiptera and part of the European Hymenoptera were also arranged; the foreign Diptera of the Johnson collection were transferred to new boxes and the duplicate American Orthoptera were put in storage boxes. A large amount of alcoholic material was transferred to upright vials. About 300 types have been verified and marked and a catalogue arranged systematically was prepared for over 5,000 of the marked types.

The Curator devoted about five months to taxonomic work. Much material that had accumulated was identified, most of it returned and papers prepared on the following: the large collection of Neuropteroids from the Malay Peninsula and from North Borneo, both sent by the Federated Malay States Museum, a valuable collection of Psocidae sent by F. X. Williams from Hawaii, Trichoptera collected in Cape Breton by Mr. Fairchild, Arachnida collected in the Galapagos Islands in 1925 by the Norwegian Museum and Psammocharidae from Yucatan collected by Dr. Bequaert. Papers were also prepared on the classification of the Psocidae, on the Philippine species of Myrmarachne, on various new Neuroptera and on new species of spiders. Descriptions were prepared of over 100 new species. Besides the above the following collections were determined: Opiliones for the University of Florida; Neuroptera, Psammocharidae and Opiliones from Nantucket; spiders for Miss Patton of Richmond, Indiana; Neuroptera for the Cuban Experiment Station; Philippine spiders for the National Museum; two lots of spiders from Costa Rica for Professor Valerio; Chrysopidae for the University of Illinois; Cerceris for a student of the University of Oregon; Trichoptera for the American Museum; and scorpions collected in Yucatan by Dr. Bequaert.

Loans returned include Cuban Asilidae by Stanley Bromley, American Dolerus from Mr. Ross, U. S. Cicadas from Mr. Davis, part of the Australian termites by Mr. Hill and some Orthoptera by Mr. Hebard.

Among the visitors may be mentioned J. C. Bridwell, D. Blake, R. Hopping, W. M. T. Forbes, and M. C. Lane.

Review of the Entomological Collection

The collection today is the second in America; in several groups it stands first. The Coleoptera lead, our Museum containing the Leconte, Melsheimer, Ziegler, Dietz, Hayward, Blanchard, Bowditch, Doubleday Harris and Carnochan collections, a set of the Biologia Centrali America and a set of the Bishop Hawaiian material and an immense number from various other sources. There are types of well over 10,000 species, about one-half yet to be catalogued. A new Nearctic collection, based on the old, with the Bowditch, Dietz, Hayward and miscellaneous accessions added, is in progress of arrangement by Mr. Darlington. When this is done and the exotic material is more completely arranged we will have a collection of which we may well be proud. The Chrysomelidae of Bowditch and the Cicindelidae of Harris are particularly valuable; the Cerambycidae and Curculionidae also contain a vast number of determined species.

Among the Lepidoptera the most valuable parts are the Geometridae (of Packard and Swett), the Microlepidoptera (largely Chambers and Dietz) and the Scudder butterflies. There is a great number of butterflies but much of the exotic material is still unmounted. There are types of fully 1,200 species, almost all of them catalogued. Mr. Cassino's gift of much of the Doll collection and the C. T. Paine collection are most useful recent additions.

The Diptera collection is especially valuable, containing the American material of Loew, Osten Sacken and Johnson. There are types of about 2,800 species, all catalogued, except those of the Johnson collection. There is not much recent material from the western states and the exotic collection is very weak and undetermined, the Antillean being the best. There is a good European collection.

In the Hymenoptera we have a fair amount of the larger species but the collection of micro- and parasitic Hymenoptera is very weak, with the exception of the Cynipidae. Thanks to Dr. Wheeler, we have a good collection of ants, and the United States Psammocharidae and Philanthidae are good and increasing in value. The Paul Herbst collection of Chilian Hymenoptera gives us a fine series from that country, otherwise the collection of exotic Hymenoptera

is not much better than the Diptera. There are fully 1,200 types nearly all catalogued.

The Hemiptera is the weakest (of the large orders) in typical material, there being hardly more than 200 types. There is a considerable amount of United States material, largely of Banks and Morse collecting. For the exotics there is a large amount of material but mostly unstudied. The Meyer-Dür European collection is very good and has some types.

In the Orthoptera there are the rich collections of Scudder and Morse, about 1,000 types. The exotic forms are numerous but mostly unnamed and unarranged. There is a generic card index for the Nearctic portion.

In Neuroptera there are the Hagen and Banks collections, now joined and forming one of the finest collections in the world, including about 2,500 types. This is in numbered boxes and there is a generic card index. In the exotic Odonata there is quite a lot of unnamed material. The collection is growing steadily by original work as well as by exchanges and gifts.

In the smaller orders the Thysanura and Collembola have the types of Packard and Banks and some of Folsom and MacGillivray. It is doubtless as good as any Museum collection in the country. In the Anoplura, Mallophaga, Siphonaptera, and Thysanoptera, our collections are as poor as in most museums.

The Arachnida is the best collection in America, with about 2,500 types. It contains the Emerton, Peckham, Bryant and Banks collections and many of Chamberlin's types. The spiders are in numbered trays with a generic card index. The Opiliones have been arranged in the new trays, but the other groups are largely as they have been for some years. There is a vast amount of exotic material, much undetermined.

The collection of Muriopoda also contains much valuable material, largely of Chamberlin and Attems, probably about 700 or 800 types. The vials have been arranged in numbered trays and there is a generic card index to the named material. There is a large amount yet unstudied.

The fossil insects have been spread out by Mr. Carpenter and many are catalogued but the work is not yet finished. Most of the Scudder types are here, in all about 1,500 types.

The exotic insects came largely from expeditions, such as the Thayer Brazilian Expedition; the Uhler Hayti trip; the Hassler voyage; the Barbour East and West Indian trips; the several collections of Brooks in Bermuda, Jamaica, Trinidad, Falkland Islands, South Africa and West Australia; the numerous collections of W. M. Wheeler in Cuba, Panama, Costa Rica, British Guiana, Australia, Morocco and Hawaii; the W. M. Mann material from the Solomons, Fiji, Mexico, Hayti and Brazil; the Davis Argentine collection; the Brues Grenada and Jamaica material, the Wight collection from Jamaica, the Banks Panama collection, the Allen and the Loveridge collections from East Africa; the Schwab and the Bequaert collections from West Africa; the Wulsin collections from China, West Africa and Madagascar; and particularly the great series of specimens gathered or purchased by Dr. Thaxter; and many smaller lots from others.

The insect collection is now in about 5,000 drawers; the Blanchard, Bowditch Chrysomelidae and Harris Cicindelidae in Schmitt type boxes; part of the Hymenoptera is in Schmitt boxes but is being transferred. The Johnson collection is still in the original boxes and so is much of the Bowditch general collection. There are still several hundred storage boxes with good material. The collection of galls and the duplicate Orthoptera is also in storage boxes. The Arachnida, Myriopoda and much of the alcoholic insects are in upright vials arranged in trays.

REPORT ON MAMMALS

By Glover M. Allen

The work of the department has long since outgrown the single-handed efforts of the Curator on half-time, for the mere care of the collection, looking after new material, cataloguing, labelling and preparing skulls or skeletons calls for much time, to say nothing of frequent requests for assistance in identifying specimens or for the loan of specimens. It is a pleasure, therefore, to record the coming of Mr. Harold J. Coolidge, Jr. as Assistant Curator of Mammals, in the latter part of 1929, on his return from a year's expedition in the Far East for the Field Museum. He has particularly devoted himself to improving the exhibition collection of mammals, has aided in replacing many of the older specimens with new and excellently mounted ones, has prepared many new labels, and enhanced the interest of the exhibition through the addition of neatly framed photographs in association with many of the mounted specimens. He has further undertaken the remodeling of the Systematic Hall of Mammals, making an entire rearrangement of the mounted specimens, retiring many of the poorer ones, and greatly improving the former crowded appearance by doing away with shelving and mounting the specimens on small brackets against the wall.

Especial thanks are also due to Miss Carolyn Sheldon, who has volunteered her services for the greater part of the year in the work of cataloguing, numbering and labelling. Through her assistance, thus generously given, it has been possible to catch up with the past accumulations that had been awaiting attention. It is a pleasure also to make grateful acknowledgment of similar help given as occasion allowed by Miss Helen C. Hunt, Miss Ellen Wales, and Mrs. William C. Pierce.

A mammal collection differs from one of other vertebrates in the vast amount of laborious preparation needed in cleaning skulls

or other skeletal material before it is ready for labelling and filing. This year again it has been possible to make much progress with cleaning past accumulations of such material through the part-time work of two young men, while a small amount of more exacting work of this kind has been sent to Ward's Natural Science Establishment. The tanning of large skins has progressed, so that at present the accumulation of raw material of this nature is greatly reduced, with still, however, a good deal yet remaining to be done. The proper storage of tanned skins is a matter soon to need attention.

In August and September, 1929, the Curator went to southern Brazil where a small collection of mammals and birds was made, and reciprocal relations established with the Museu Paulista, through the generous efforts of Dr. Afranio do Amaral of the Instituto Butantan. Already the contacts thus made are proving helpful.

An important addition is the splendid collection of horns and antlers given last year by Dr. John C. Phillips. It was brought together by Dr. Phillips in the course of a good many years and contains many selected specimens, a number of which are given prominent place in Rowland Ward's *Records of Big Game.* The greater part of this collection has been placed on exhibition in the hallway of the Divinity Avenue entrance, and explanatory labels have been prepared by Mr. Coolidge. Other important gifts include a collection of over one hundred specimens from Tanganyika Territory, prepared and presented by Mr. F. G. Carnochan; about twenty mammals from Mrs. Alfred Hawes, collected in South Africa many years ago; a series of coyote and wolf skulls from the United States Biological Survey; two mountain lions from Arizona, given by Dr. J. C. Phillips; Alaskan Caribou and sheep, given by Mr. Edward Mallinkrodt, Jr.; a series of skins and skeletal parts from Shantung, China, given by Dr. Arthur Jacot; several bats secured in Costa Rica by Mr. Stephen Thomas while accompanying Dr. C. W. Dodge's expedition; and additional Chinese and Mongolian skins and skulls from the American Museum of Natural History in continuation of previous gifts, in connection with the identification of the specimens secured by the Asiatic Expeditions.

Other valuable gifts have been received from Dr. Thomas Barbour, H. R. Colburn, Dr. Robert T. Jackson, F. H. Kennard, Lawrence Kilham, James L. Peters, the heirs of James Sturgis Pray, George Schwab, the estate of J. D. Sornborger, Dr. Ralph E. Wheeler, and James Zetek.

Exchanges of material have been made with the Russian Academy of Sciences, the Zoölogical Museum of Amsterdam, and for topotypes of *Evotomys gapperi rhoadsi* with Mr. Morris M. Green. Specimens have been loaned for study to nine persons representing six institutions.

Mention should also be made of the fact that the collection of bird bones is under revision. Miss Sheldon has catalogued and numbered a great many that were unentered or unnumbered, and the Curator has rearranged a part of them and revised their names to accord with those in use by the Bird Department. Much yet remains to be done in organizing the material already on hand and in the preparation of roughed-out specimens now awaiting cleaning.

REPORT ON THE MOLLUSKS

By William J. Clench

During the past year 10,301 lots have been accessioned. The major portion of this number was derived from several very important collections. These are as follows:

Approximately 1,000 lots collected by Dr. Peter Okkelberg and the curator in Georgia, Florida, and Cuba during the summer of 1929.

About 1,000 lots from Dr. Joseph Bequaert, collected in Liberia and the Congo. This collection is especially rich in genera and species not previously represented in the Museum. These were very kindy donated to the university by Dr. Bequaert.

A very important collection of marine shells, comprising 750 lots collected by Dr. Hubert L. Clark on his expedition during the past year in Australia. The Museum possessed but little from the region of western Australia prior to the accession of Dr. Clark's material.

Through the generosity of a friend, another very large and valuable collection of Liguus, containing 310 lots (8,183 specimens), was obtained. This entire collection was made by the late J. N. Farnum, of Miami, Florida, during 1929. This material has been added to the Museum collection, making it unrivaled among collections of this group. The importance of this collection cannot be overestimated. Many localities from which this material was obtained are now destroyed and within a few years these mollusks will have disappeared from all but a very few remote and inaccessible localities.

A collection of 1835 lots was obtained from the Boston Society of Natural History, containing for the most part material of considerable historical and scientific value, mainly from Africa, West Indies, Central and South America.

By purchase, by an anonymous friend, a collection of 2,600 lots of

Clausiliidae was obtained from Mr. Walter F. Webb. Considerable value is attached to this material in as much as many of the leading European malacologists have determined the greater portion of it, and much published record is based upon the shells in this collection.

The remaining lots have been added to the Museum collection by gift and exchange, the more important from Dr. H. A. Pilsbry of the Academy of Natural Sciences, Philadelphia, and Mr. Calvin Goodrich of the Museum of Zoölogy, University of Michigan.

Two field trips were undertaken during the past museum year, the first to Georgia, Florida, and Cuba, and the second to Navassa Island in the West Indies.

Dr. Peter Okkelberg of the University of Michigan and the curator spent two months during the summer of 1929 making a survey of the freshwater shells of Georgia. Large collections were made in sections of the state hitherto unexplored for these forms. Studies were also made to determine as far as possible the faunal relations of the river systems of the region dividing the Atlantic slope from the interior drainage area. The *Pleuroceridae* of this trip have all been determined and a paper is now in preparation by Mr. Calvin Goodrich of the Museum of Zoölogy, University of Michigan. A third month on this trip was devoted to a study of the *Liguus* in Lower Florida and Cuba. All the shells obtained in Florida and Cuba have been determined and papers are now in preparation covering the important material studied.

Through the courtesy of the Honorable Charles Francis Adams, Secretary of the Navy, an expedition was made possible to Navassa Island in the West Indies. Mr. William E. Schevill, an assistant in the Museum, Mr. Harald A. Rehder, a student in the department, and the curator left Cambridge the latter part of December for Guantanamo, Cuba. The tug *Montcalm* stationed at the Guantanamo base transported the personnel and their baggage to this small island some ninety-six miles due south of the station. A complete study was made as far as possible of the entire fauna and flora, and collections of the biota were made for the Museum and Arnold Arboretum. Twelve days were spent on the island and five days more were devoted to the study of the land and marine fauna in the vicinity of Guantanamo Bay.

Mr. N. W. Lermond spent six months during the year as an assistant, doing considerable routine work, cataloguing and making exchanges for the department.

Grateful thanks are due to Allen F. Archer, Graham Fairchild, and Mr. Harald A. Rehder for much voluntary work in the department.

Mr. Harald A. Rehder entered upon his studies of the *Succiniidae* at the beginning of the college year. His objective is to monograph the North, Central American, and West Indian forms of this complex group. In this study the anatomy, relationship, geographical distribution and taxonomy will be considered.

During the past year 450 species and 4 genera were added, which were new to the collection, with addition of 10 holotypes, 88 paratypes, 13 cotypes and 30 topotypes.

A résumé of our collection stands as follows:

Total number of lots catalogued and uncatalogued . . .	109,000 (approx.)
Total number of lots catalogued	59,137
Total number of species in the collection	20,534

REPORT OF THE RESEARCH CURATOR OF ZOÖLOGY

By Ludlow Griscom

My activities for the year can be arranged under three main headings.

1. The routine work connected with purchases, finances, sales and exchanges of publications took perhaps a quarter of my time. The third financial year of the new administration closed on June 30, 1929, and it closed with a small surplus in the unrestricted funds. Sale of publications and duplicate specimens during the year amounted to the surprising total of nearly $5,000. This sum included the sale of a practically complete set of the bulletin to India. It is no longer possible to supply a complete set, and it does not seem probable that the receipts for the year can be equaled annually. In connection with the sale of publications, the completion of stock rooms in the basement made it possible for the first time in decades to store the Museum publications in one place in exact chronological order. Mr. Eric Batten assembled piles of bulletins from innumerable scattered stores, and arranged them with efficiency and despatch. We now know exactly what we have in stock, and were rewarded by the discovery of several papers supposed to be out of print for years, which sell at a premium.

2. One memoir, the four concluding numbers of Volume 69 of the Bulletin, and Volume 70 complete were seen through the press during the year, while several other articles now in press were edited or otherwise prepared for publication. This has consumed about another quarter of my time.

3. The balance of the year has been devoted to the study of the great Dwight Collection of Guatemala birds. The identification of the 8,000 specimens was completed in May, and the collection was returned to New York. Seven papers describing new forms or critically revising certain groups have been published during the year, and two others are now in press. During the course of the work,

14 types were added to the Museum collection. The duplicate series retained by the Museum amounts to 1,639 specimens, and 50 species new to the collection were thus secured. I was writing the final report steadily until the close of the year, when the entire systematic portion, the synonymy and bibliographical references were completed.

During the course of the year, active local field work, both ornithological and botanical, was continued in conjunction with various clubs and societies.

REPORT ON REPTILES AND AMPHIBIANS

By A. Loveridge

Owing to my being absent from the Museum for a full year, the work of the department has been carried on entirely by Dr. Barbour and Miss H. M. Robinson, who have attended to the dispatching and receipt of exchanges and taken care of the great mass of material received.

Among the more important of these accessions was a further collection of Mexican reptiles made by W. W. Brown and Dr. Malcolm Smith's collection of Chelonia. These were purchased and presented to the department by a friend.

Members of the Museum and College staff contributed many specimens, among which might be mentioned Dr. G. M. Allen's from Brazil; Prof. C. T. Brues, a snake; Dr. H. L. Clark's Australian collection; W. J. Clench's from Navassa Island; H. J. Coolidge's from North Carolina; P. J. Darlington's from Panama and the Santa Marta Mountains; Dr. G. C. Shattuck's from Yucatan; and Dr. W. M. Wheeler's from the Hawaiian Islands.

Dr. W. Popenoe, Dr. W. M. White, Brother Nicéforo Maria, and Mr. S. Kress donated collections which furnished many valuable additions to the Museum series. Of genera new to the collection *Trachyboa* and *Clothonerpeton* deserve special mention.

Among the visitors who have utilized the collection in connection with their studies are Dr. H. L. Babcock, Mrs. M. T. Gaige, and Prof. T. I. Storer, Messrs. C. V. MacCoy and T. E. White.

Series, or small collections, have been lent for special study to the National Museum, University of Michigan, and British Museum.

Cataloguing and card indexing having been in abeyance, the usual census of the collection cannot be given until next year.

I have spent eight and a half months in East Africa (Tanganyika,

northern Rhodesia, Uganda, and Kenya) investigating problems of distribution of the high plateaux and rain forest in the southwest. Incidentally a considerable number of undescribed species were found. Approximately the total number of species collected is as follows: crocodiles 1; chelonians 6; lizards 50; chameleons 18; snakes 56; caecilians 2; frogs and toads 52. Total 85.

REPORT ON INVERTEBRATE PALEONTOLOGY

By Percy E. Raymond

The rearrangement of the room devoted to the exhibition of invertebrate fossils was completed during the year by Mr. W. E. Schevill and the Curator. This room is used regularly by students in Harvard and Radcliffe as part of the laboratory work in Geology 5 (Historical Geology), and Paleontology 1 and 2. The exhibit and the labels for the specimens were planned with this use in view. The labels are, therefore, explanatory and if brought together would amount to an abridged textbook on invertebrate paleontology. Specimens were selected to show the morphology of the various organisms, rather than any attempt at systematic arrangement by families or genera. Charts illustrated by specimens were prepared to show relationships of extinct and living groups of cephalopods and echinoderms.

The Curator spent ten weeks in the summer of 1929 in Jasper and Robson Parks and the Crowsnest region of the Canadian Rockies. The geology of parts of these regions had been very little studied, hence much new information was acquired. Good collections, containing many undescribed species, were acquired from the Lower and Upper Cambrian, Lower Ordovician, Devonian, Mississippian, Triassic, and Jurassic. During the winter two articles descriptive of results were written and have been accepted for publication. This work was in coöperation with Professors Leon Collet and Kirtley F. Mather, assisted by Dr. Edward Parejas, Mr. A. Lombard, Mr. Forbes Hutchins, and for a part of the time by members of the Harvard Summer School of Field Geology. It was supported by a grant from the Shaler Memorial Fund.

Through the good offices of the Hon. William Phillips, formerly Minister to Canada, the Museum received permission to reopen the Walcott Quarry in Yoho Park, near Field, B. C., in 1930. Fifteen days were spent in this work by Messrs. H. C. Stetson,

W. E. Schevill, C. H. Burgess, and the Curator. The productive layer was reached after blasting off about fifteen feet of overburden, and a good collection, representing a large proportion of the species described by Dr. Walcott, was secured. A second layer, higher up the mountain, proved to be very fossiliferous, yielding many excellently preserved worms, sponges and crustaceans. A preliminary survey of the collection indicates the presence of some elements new to the fauna of the locality and many specimens showing structural features which will supply additional information about previously described forms.

Our thanks are due to the Hon. J. D. Harkin, Commissioner of Parks, and Captain Russell and Mr. Hill of the Yoho Park for favors and assistance in this work.

After finishing the work in the Walcott Quarry the Curator spent some time in the Crowsnest region, visiting some localities he was unable to reach during the previous season. Small collections were made in the Ordovician at Sinclair Canyon and in the Mississippian near Elko.

Through the support of Mr. Edward Mallinckrodt, Jr., of St. Louis, the curator was able to spend ten days in the vicinity of Birmingham, Alabama, in May. Some very good material was obtained from Ordovician formations in that region. Special thanks for this are due to Mr. Charles Butts of the United States Geological Survey, who pointed out the best localities for collecting.

While returning from the west, Mr. Shevill spent a week in the vicinity of Charlevoix, Michigan, and made a collection of the Devonian fossils of the Traverse group. This is a very acceptable addition to our collections, as we previously had nothing from that region. Mr. Schevill was also a member of the Navassa expedition earlier in the year and brought back invertebrate fossils from that island.

During the year, Dr. Rudolf Ruedemann of Albany returned to the Museum five boxes of graptolites which he was good enough to identify for us. This determination of the species of this large collection involved a great deal of labor on Dr. Ruedemann's part and we are very grateful to him. Dr. G. A. Cooper of Yale studied a series of brachiopods from our collection, Dr. August Foerste visited

the Museum to study the Ordovician cephalopods from Newfoundland and Dr. Ralph Stewart returned the Californian pelecypods from the Whitney collection.

The following are the principal accessions other than those mentioned above, which have been received during the year: by donation: six lobster-like crustaceans from Point Darwin, Australia, the gift of Mr. O'Sullivan, through Dr. H. L. Clark; specimens of *Stramentum tabulatum* from the Cretaceous of Kansas and *Coralliochama orcutti* from the Lower Cretaceous of Baja, California, the gift of Dr. Barbour; Lower Cambrian and Lower Ordovician fossils from the Robson district, British Columbia, including the type of a new Mesonacis and the plesiotype of a graptolite, the gift of M. A. Lombard of Geneva, Switzerland; Pleistocene invertebrates from Foochow, China, from Dr. H. L. Clark; and Devonian brachiopods and corals from near Boulogne-sur-mer, France, the gift of Dr. A. Benoit, Lille, France. Forty specimens of Proetids from the Pennsylvanian of Kansas and three Phacopids from the Lower Devonian of Germany were obtained by purchase.

REPORT ON VERTEBRATE PALEONTOLOGY

By Henry C. Stetson

This year Mr. George Nelson's time has been almost entirely occupied with two very complicated and difficult mounts. Changes had to be made in the mount of Dinichthys, one of the large armored fishes of the Devonian, which took most of the fall. He has devoted the rest of the year to preparing and mounting a large Diadectes, one of the primitive reptiles from the Permian of Texas, in storage since 1882. This is an exceedingly time-consuming job, as this group of reptiles is very imperfectly known, and the mounting requires constant alteration and rearrangement. In addition, Mr. Nelson mounted four Solenhofen fishes from the storage collection, two of which required considerable preparation.

Accessions to the collection of fossil fishes, all valuable material, include: several specimens of Thelodus from New Brunswick collected by W. E. Schevill and myself, two good examples of the jaws of Rhizodus, a very large Carboniferous ganoid by exchange with Amherst College, a collection of the oldest known ostracoderms from the bone bed at Canyon City, Colorado, by Mr. Norman Hinchey, and lastly four perfect ganoids from the famous Wurtemberg locality, which will be prominent additions to the exhibits.

A large Testudo from the recently acquired Singleton collection from the Pleistocene of Melbourne, Florida was mounted by Mr. Miller and has been placed in the entrance hall. Mr. H. C. Bumpus has presented the Museum with some tracks from the Permian of the Grand Canyon, Colorado.

Mr. Henry Seton spent last summer in Wyoming and returned with an Eocene tapir, the skull of which is complete. It promises to be of importance as regards the early history of this group, as well as for the fact that it is a new species.

Mr. George Nelson has also mounted the following mammalian material: a large shoulder blade and a set of dorsal vertebrae from

a large elephant from the Pleistocene of Florida collected by Mr. Barbour, and two small skulls in a very good state of preservation, one an Oligocene rabbit from South Dakota, and the other a lemur from the French Phosphorites.

Mr. E. M. Schlaikjer spent the summer of 1929 in South Dakota and Nebraska and returned with much good material. Several slabs of Agate Spring material were obtained, from which was taken material for three complete skeletons of Dicoeratherium. He was also fortunate in finding a perfect skeleton of the little camel, Stenomylus, which will be a great addition to the exhibits. Much representative material was also secured from the Bad Lands, Mr. Schlaikjer is again in the field and reports good results, including valuable horse material from Wyoming.

Mr. W. E. Schevill has completed the type catalogue of fossil fishes, a laborious task as the material has lain untouched since Eastman's day. Many surprising discoveries were made during the course of it, and many long lost types, borrowed years ago from other institutions, have been restored to their owners.

My own time has been largely occupied with early Devonian fishes. I also accompanied Professor P. E. Raymond on an expedition to the famous Walcott Quarry in British Columbia.

REPORT OF THE HELMINTHOLOGICAL DEPARTMENT

By J. H. Sandground

Absence in the field from November of last year right up to within a day or two of the Museum report's going to press necessarily reduces the account of the activities of the Helminthological Department to a brief statement of the work done abroad.

Thanks to the Shattuck bequests to the Department of Tropical Medicine in the Medical School, sufficient funds were available to permit of an investigation of *Ternidens deminutus*, a nematode parasite of man, material of which was sent to me from the American Board Mission at Mt. Silinda in southern Rhodesia. Such information as was hitherto available concerning the prevalence of this parasite was undependable and questions relative to the criteria of diagnosis, life history, pathology and treatment were wholly unstudied. To this end I proceeded to South Africa and investigated the subject intensively in the native hospitals of the Witwatersrand gold mines, in southern Rhodesia, northern Rhodesia, and Portuguese East Africa. The results of these studies are to be published in due course.

Use was also made of the opportunity of this extended expedition to procure specimens from regions hitherto unrepresented in the Museum, and several large cases of mammals, birds, insects and mollusks were brought back. Much parasitological material was collected and contacts were made with a number of foreign workers in the field with whom exchanges are to be made in the future.

REPORT ON THE FISHES

By N. Borodin

The work of rearrangement and reorganization of the collection of fishes was continued according to the general plan outlined in the previous report (p. 32). The index of genera and families by their topographical arrangement and the alphabetical card index were completed. They include the bottled specimens in the cases as well as those placed in the tanks (copper containers and coffins).

This could be accomplished only after thorough examining of the contents of 195 tanks, which took most of the time. Many specimens in them were found dried up or rotten and were thrown away as useless; many common fishes, sometimes several dozens of the same species, were also eliminated and at the present time there are in the study fish collection of the Museum of Comparative Zoölogy 116 tanks, all registered by numbers, arranged in a taxonomic system, with outside labels showing briefly their contents.

Several type specimens and some rare fishes were discovered in these tanks and were bottled and placed in the storage cases.

The completing of these two important works make the finding of any genus in the huge collection very easy; an alphabetical index gives the number of the case and of its sections, which are all numbered — the cases with Roman figures, the sections with Arabic figures. Thus an indication found in the alphabetical index, for example, Case XX, Section 10, guides to the respective case and section within which the desired species can be found on one of the trays of the indicated section.

If the specimen is in one of the tanks or in the coffin, it is also indicated on the card of the alphabetical index.

A task mentioned in the previous report — relabeling many thousands of bottles and cleaning the coal dust and dirt off the bottles and trays — is started, and according to the suggestion of Dr. Barbour is combined with picking out and registering the type

specimens, in which the Museum of Comparative Zoölogy is very rich. There are many types, cotypes and paratypes of Agassiz, Girard, Poey, Gilbert, Garman, Steindachner, Eigenmann and other ichthyologists. When all of the cards of the types are written and supplied with the needed bibliographical references, a list of types, arranged systematically, will be prepared for publication.

Routine work of filling in missing names in the catalogue and excluding from it specimens discarded, as well as of identifying the specimens of old collections and of new accessions, was continued.

The collection of South American characins of the genus *Anastomus* was worked on in detail, and a paper on this subject prepared for publication.

The deep-sea fish collections made by Mr. C. O'D. Iselin in 1928 and 1929 were studied. The paper is prepared for publication, while preliminary papers about new species found in those collections were published in the New England Zoölogical Club, 1929 and 1930.

Accessions: The Museum of Comparative Zoölogy received: (1) deep-sea fishes, collected by Mr. C. O'D. Iselin and his associates in 1929 on their summer cruise. (2) Russian fresh-water herrings from the Zoölogical Museum of the Russian Academy of Sciences in exchange for American flatfishes. (3) Another considerable collection of Russian Far Eastern fishes, an exchange with the Pacific Fisheries Research Station at Vladivostok, is on its way to Cambridge.

Besides that, the Museum received: 5 bottles of fishes (mostly young specimens) from Mr. J. A. Dawson, collected at Cienfuegos Bay, Cuba, in 1925; 2 bottles of young fishes from S. Macleod, collected in Lake Ontario, Canada, in 1929; 1 puffer fish from Mr. Wilcox, Rhode Island; 3 bottles of fishes from Mr. W. J. Eyerdam, collected in 1928 at Kamchatka; several specimens from Mr. G. Nelson, collected in Florida, from Dr. H. C. Smith, Dr. W. H. White, and the Scripps Institution for Oceanography.

The large collection of fish skeletons has been added to the Study Collections of this department. This collection, when put in systematic order, will prove to be an important asset of the Museum,

especially needed by the anatomists and paleontologists. The Museum has received a request from the American Museum of Natural History to share with it, on the basis of exchange, some skeletons of the fishes not represented in its collection. The collection needs revising, putting in order, and registering, which will be one of the next jobs of the department.

Exchanges: Besides the two mentioned exchanges with Russian institutions, which it is hoped will be continued and enlarged in the future, the Museum of Comparative Zoölogy has arranged a large exchange with the British Museum, which wants to have North and South America flatfishes and offers in exchange African fishes.

Seventeen specimens of 7 species of deep-sea fishes were supplied, at his request, to Prof. Smith of Johns Hopkins University for his studies on fish kidneys.

Visitors: Mr. Stanley Field, the President of the Field Museum of Chicago, during his visit to the Museum of Comparative Zoölogy looked over the study collection of fishes. He was particularly interested in the system of arrangement of fishes in cases and in the construction of the cases themselves. A full explanation of the system, catalogues and indexes to case and tank contents was given to Mr. Field. The whole collection, occupying five rooms in the basement, was inspected by this visitor.

Miss Francesca LaMonte, assistant curator of the American Museum of Natural History, Department of Ichthyology, visited the Museum. She was interested in the arrangement and methods of keeping in order the study collection of fishes and in the systems of cataloguing and indexing. Detailed information was also given to her.

During the vacation period of 1929 the curator had an opportunity to visit the Zoölogical Museum of the University of Michigan, Ann Arbor, and the Buffalo Museum of Natural History.

REPORT ON BIRDS' EGGS AND NESTS

By Winthrop S. Brooks

The cleaning, cataloguing, and arranging of the egg collection has, with various interruptions, been carried on throughout the year. The work, in the arrangement of Sharpe's Handlist, has been completed through the Alaudidae. Thus far 98 families, 649 genera, and 956 species are represented. Unfortunately in many instances the specimens are not up to modern standards.

Additions have come to hand through the generosity of Messrs. A. C. Bent and F. H. Kennard. Some excellent foreign material has been acquired through purchase.

REPORT ON THE FOSSIL ECHINODERMS

By Robert T. Jackson

The Curator spent considerable time revising parts of the collection of fossil crinoids, also the collection of asteroids and ophiuroids, the Palaeozoic Echini and the clypeastoids. To assist Dr. H. L. Clark, in whose department the material belongs, the Curator unpacked, from tin cans, the large collection of Recent Echini that he gave the Museum some twenty years ago. This collection, now stored in cases and available, includes some 30,000 specimens, the results of the study of which were embodied in the Curator's *Phylogeny of the Echini,* published in 1912.

Considerable new material was received during the year. As a gift from Francis A. Cudmore, Esq., of Victoria, Australia, through Dr. H. L. Clark, was received a choice lot of fossil Echini from the Tertiary of Australia. This lot consists of 80 specimens, including 15 species. In addition, from near Adelaide, South Australia, was received a lot of 49 specimens of Tertiary Echini collected on his recent expedition by Dr. H. L. Clark of this Museum, with the assistance of Mr. H. M. Hale. Some desirable Tertiary Echini from Antigua, British West Indies, were received as a gift from W. R. Forrest, Esq., of Antigua. Fossil Echini were also received from Messrs. C. C. Allen of St. Petersburg, Florida, W. J. Clench, and the Curator. A number of selected Echini from the Cretaceous of Texas were purchased of J. B. Litsey, of Austin, Texas.

REPORT ON THE LIBRARY

By Eleanor K. Sweet

From August 1, 1929 to July 31, 1930, 1,635 volumes, 2,511 pamphlets and many parts of volumes have been added to the Library.

The total number of volumes in the Library is now 70,085; the total number of pamphlets 79,748.

Five hundred and fifty-nine volumes have been bound, and 845 pamphlets put into covers or into pamphlet boxes.

From Harvard College Library we have received 231 new titles. Other contributors of twenty or more titles were: Thomas Barbour (167 titles), William M. Davis (123 titles), William M. Wheeler (105 titles), Henry B. Bigelow (82 titles), Nathan Banks (68 titles), Hubert L. Clark (53 titles), Joseph Bequaert (23 titles), and Peabody Museum (21 titles). Dr. Barbour has continued to give us regularly several serial publications. A large collection of pamphlets from Professor Wheeler, received this year, await sorting and cataloguing.

The cataloguing of the Garman Library continues; the bound volumes are practically completed, totaling 687. We are working constantly on the pamphlets, of which 895 were catalogued this year, making the total to date 992.

This year for the first time we have made a count of our circulation, the figures being as follows: 4,532 books were borrowed from the Library, 1,234 by members of the museum staff and 3,298 by teachers not on the museum staff, by students and others not connected with the museum. These figures do not include books used in the Library. About fifty requests for books were received from other institutions. It is estimated that about 3,000 volumes are used in the Library, being books which are taken from the shelves and replaced by the user. This use is principally by members of the staff of the Museum.

PUBLICATIONS

FOR THE YEAR 1929–1930

(1 AUGUST, 1929 — 31 JULY, 1930)

MUSEUM OF COMPARATIVE ZOÖLOGY

Publications.— The following articles have been printed during the year.

BULLETIN: —

Vol. LXIX

No. 11. Birds of the Cayo district, British Honduras. By Oliver L. Austin, Jr. September, 1929.

No. 12. An ornithological survey in the Caribbean lowlands of Honduras. By James L. Peters. 84 pp. October, 1929.

No. 13. The status of Bothriocidaris. By Robert Tracy Jackson. 34 pp. December, 1929.

No. 14. Some new parasitic nematodes from Yucatan (Mexico), including a new genus of Strongyle from cattle. By J. H. Sandground. 12 pp., 2 pls. December, 1929.

No. 15. A report on some cirripeds collected by the S.S. "Albatross" in the eastern Pacific during 1891 and 1904. By Roderick Macdonald. 14 pp., 3 pls. December, 1929.

Also title page and contents to volume.

Vol. LXX

No. 1. The fossil ants of North America. By Frank M. Carpenter. 66 pp., 11 pls. January, 1930.

No. 2. The Lower Permian insects of Kansas. Pt. 1, 35 pp., 5 pls. February, 1930.

No. 3. The Anoles. I. The forms known to occur on the Neotropical islands. By Thomas Barbour. 42 pp. April, 1930.

No. 4. Types of birds now in the Museum of Comparative Zoölogy. By Outram Bangs. 282 pp. March, 1930.

No. 5. Reconnaissance of the waters and plankton of Monterey Bay, July, 1928. By Henry B. Bigelow and Maurine Leslie. 155 pp. May, 1930.

Also title page and contents to volume.

MEMOIRS:—

Vol. XLII

No. 5. The American Characidae. By Carl H. Eigenmann and George S. Myers. pp. 429–558, 11 pls. September, 1929.
Also title page and contents to volume.

Vol. L

No. 4. A revision of the genus Gorilla. By Harold Jefferson Coolidge, Jr. 91 pp., 21 pls., 2 maps. August, 1929.
Also title page and contents to volume.

Publications by the Museum Staff

ALLEN, G. M.

Bovidae from the Asiatic Expeditions. *Amer. Mus. Novitates,* **410,** pp. 1–11, March 19, 1930.

History of the Virginia Deer in New England. *New England Game Conference,* Boston, pp. 19–41, 1930.

Review. Miller, Gerrit S., Jr. The Controversy over Human Links. *Journ. Mammalogy,* **11,** p. 91, February, 1930.

The Walrus in New England. *Journ. Mammalogy,* **11,** pp. 139–145, May, 1930.

BANGS, O.

A Trembler New to Science. *Proc. New Eng. Zoöl. Club,* **11,** pp. 39–41. August 30, 1929.

An Undescribed Form of the Greater Vasa Parrot. *Proc. New Eng. Zoöl. Club,* **11,** pp. 49, 50, October 31, 1929.

Types of Birds Now in the Museum of Comparative Zoölogy. *Bull. Mus. Comp. Zoöl.,* **70,** no. 4, pp. 147–426, March, 1930.

Descriptions of Five New Indo-Chinese Birds. *Field Mus. Nat. Hist. Publ.,* Zoöl. ser., **18,** no. 1, pp. 3, 4, April 9, 1930.

A New Race of *Pomatorhinus ruficollis* from South Central Szechuan. *Occ. Papers Boston Soc. Nat. Hist.,* **6,** p. 293, June 14, 1930.

The Screech Owls of Eastern North America. *Auk,* **47,** no. 3, pp. 403–404, July, 1930.

BANKS, N.

Fauna of the Batu Caves, Selangor, XIII; Neuroptera. *Journ. Fed. Malay States Museums,* **14,** pp. 372, 373, 1929.

A Classification of the Psocidae. *Psyche*, **36**, pp. 321–325, 1929.

Four New Species of Psammocharidae. *Psyche*, **36**, pp. 326, 327, 1929.

Trichoptera from Cape Breton, Nova Scotia. *Bull. Brooklyn Ent. Soc.*, **25**, pp. 127–132, 1930.

West Indian Neuroptera. *Psyche*, **37**, pp. 183–191, 1930.

BARBOUR, T.

Another New Cuban Anolis. *Proc. New Eng. Zoöl. Club*, **11**, pp. 37, 38, August 9, 1929.

The Phillips Collection of Horns and Antlers. *Harvard Alumni Bull.*, **32**, 4, pp. 108–110, October 17, 1929.

Prize Day Speech. *Groton School Quarterly*, **5**, 2, pp. 257–261, December, 1929.

Some Faunistic Changes in the Lesser Antilles. *Proc. New Eng. Zoöl. Club*, **6**, pp. 73–85, January 10, 1930.

Some Faunistic Changes in the Lesser Antilles (an abstract of paper in Proc. New Eng. Zoöl. Club). *Bull. Antivenin Inst. of Amer.*, **3**, 4, pp. 91–93, February, 1930.

Observaciones. Published by the University of Havana, pp. 3–14, February, 1930.

Discurso de Gracias. Published by the University of Havana, pp. 13–16, February, 1930.

The Anoles. I. The Forms Known to Occur on the Neotropical Islands. *Bull. Mus. Comp. Zoöl.*, **52**, 3, pp. 105–144, April 11, 1930.

An Historical Note. *Proc. New Eng. Biol. Soc.*, **10**, pp. iii, iv, January 25, 1930.

Nuevo Batracio Colombiano, *Crytobatrachus incertus* sp. nov. Revista de la Sociedad Colombiana de Ciencias Natureles, Ano 19, Tomo 4, no. 105, pp. 54, 55, April and May, 1930. (A translation of description in "New Amphibia," *Occ. Papers Boston Soc. Nat. Hist.*, **5**, p. 193, 1926.)

The Bushmaster in the Canal Zone. *Bull. Antivenin Inst. Amer.*, **4**, no. 1, p. 11, May, 1930.

Haphazard Transfers of Species. *The Field*, London, **156**, no. 4,046, p. 63, July 12, 1930.

BEQUAERT, J.

Podalonia violaceipennis (Lepeletier), a Dimorphic Fossorial Wasp. *Bull. Brooklyn Ent. Soc.*, **24**, pp. 220, 221, 1929.

The Folded-winged Wasps of the Bermudas, with Some Preliminary Remarks on Insular Wasp Faunae. *Ann. Ent. Soc. Amer.*, **22**, pp. 555–582, 1929.

Stylopized Vespidae (with G. Salt). *Psyche*, **34**, pp. 249–282, 1929.

Amazonian Myrmecophytes and Their Ants (with W. M. Wheeler). *Zoöl. Anzeiger*, **82**, pp. 10–39, 1929.

Some Additional Remarks on the Masarid Wasps. *Psyche*, **34**, pp. 364–369 (1929), 1930.

On the Generic and Subgeneric Divisions of the Vespinae. *Bull. Brooklyn Ent. Soc.*, **25**, pp. 59–70, 1930.

Nesting Habits of Isodontia, a Subgenus of Chlorion. *Bull. Brooklyn Ent. Soc.*, **25**, pp. 122, 123, 1930.

Are Ants Better Protected Against the Attacks of their Predaceous Enemies than Other Arthropods? *Zoöl. Anzeiger*, **38**, pp. 163–176, 1930.

The Insect Carrier of *Onchocerca volvulus* in Libraria. *Fourth Inter. Congr. Ent.* (Ithaca, 1928), *Trans.*, **2**, pp. 605–607.

Tsetse Flies — Past and Present. *Ent. News*, **41**, pp. 158–164, 202–203, 227–233, 1930.

Ticks Collected by the American Museum Congo Expedition, 1909–1915, with Notes on the Parasites and Predacious Enemies of These Arthropods. *Amer. Mus. Nov.*, no. 426, pp. 1–12, 1930.

BIGELOW, H. B.

A Developing Viewpoint in Oceanography. *Science*, **71**, pp. 84–89. January 24, 1930.

The Woods Hole Oceanographic Institution. *Harvard Alumni Bull.*, **32**, pp. 749–750, March 27, 1930.

The Woods Hole Oceanographic Institution. *Science*, **71**, pp. 277–278, March 14, 1930.

Reconnaissance of the Waters and Plankton of Monterey Bay, July, 1928. *Bull. Mus. Comp. Zoöl.*, **70**, 5, pp. 247–581, May, 1930.

BORODIN, N.

Note on the Sucking Fishes and Their Hosts. *Proc. New Eng. Zoöl. Club*, **11**, pp. 27, 28, August, 1929.

Some More New Deep Sea Fishes. Ibid., **11**, pp. 87–82, January, 1930.

A New Deep Sea Fish. *Occas. Papers Boston Soc. Nat. Hist.*, **5**, pp. 285, 286, June, 1930.

Fishes Collected by W. K. Vanderbilt's "Ara" Expedition in 1929. *Bull. of the Vanderbilt Marine Museum*, **1**, art. 2, 1930.

Russian Fisheries. *The Russian Student*, pp. 15–18, February, 1930.

Brooks, W. S.

A Description of the Nest and Eggs of the Rufous-necked Sandpiper (*Pisobia ruficollis* (Pall.)). *Auk*, **47**, p. 76, January, 1930.

Brues, C. T.

The Food of Insects Viewed from the Biological and Human Standpoint. *Psyche*, **37**, no. 1, pp. 1–14, March, 1930.

A New Myrmecophilous Phorid from the Philippines. *Psyche*, **37**, no. 2, pp. 163–166, June, 1930.

Clark, H. L.

A New Miocene Echinoid from California. *Trans. San Diego Soc. Nat. Hist.*, **5**, no. 17, pp. 257–262, pl. 31, August 5, 1929.

The Carnegie-Australian Harvard Expedition to Northwestern Australia. *Science*, n.s., **71**, p. 180, February 21, 1930.

Clench, W. J.

Concerning a Policy. *Nautilus*, **43**, pp. 69, 70, October, 1929.

A New Species of *Stropheilus* from Brazil. *Nautilus*, **43**, pp. 75–77, January, 1930. (With Allan F. Archer.)

A New Variety of *Achatina panthera* from Madagascar. *Nautilus*, **43**, pp. 85, 86, January, 1930. (With Allan F. Archer.)

Physa and *Bulinus* of Mauritius. *Nautilus*, **43**, pp. 92, 93, January, 1930.

Litorina littorea Linn. *Nautilus*, **43**, p. 105, January, 1930.

The Harvard Expedition to Navassa Island. *Harvard Alumni Bull.*, **32**, pp. 684–687, March, 1930.

On the Status of Penion Fischer. *Journ. of Conchology*, **19**, p. 21, April, 1930.

A New Humboldtiana from Texas. *Nautilus*, **44**, pp. 10–13, pl. 2, fig. 1–4, July, 1930. (With Harald A. Rehder).

Additional Notes on the Colony of *Helix nemoralis* at Marion, Mass. *Nautilus*, **44**, pp. 13, 14, July, 1930.

Two New Varieties of *Urocoptis livida* Torre. *Nautilus*, **44**, pp. 15, 16, pl. 2, figs. 5–9, July 1930. (With Carlos de la Torre).

The Venus, a New Quarterly Journal on Mollusks, a Review. *Nautilus*, **44**, pp. 34, 35, July, 1930.

New Land Snails from Tanganyika Territory. *Occas. Papers Boston Soc. Nat. Hist.*, **5**, pp. 295–300, pl. 16, July, 1930. (With Allan F. Archer.)

COOLIDGE, H. J., JR.

Liberia and the Belgian Congo. *Geog. Journ.*, **73**, 3, pp. 238, 239, March, 1929.

A Revision of the Genus Gorilla. *Mem. Mus. Comp. Zoöl.*, **50**, no. 4, pp. 291–381, 21 plates, 2 maps, August, 1929.

Conservation: International Wild Life Protection (unsigned), *Natural History*, **33**, no. 3, May–June, 1930, pp. 327–328.

Brief History of the Formation of the American Committee for International Wild Life Protection. *Boone and Crockett Club*, pp. 41–44, June, 1930.

GRISCOM, L.

The Central American Races of *Rupornis magnirostris*. *Proc. New Eng. Zoöl. Club*, **11**, pp. 43–48, 1929. (With J. L. Peters.)

Studies from the Dwight Collection of Guatemala Birds. I. *Amer. Mus. Novitates*, no. 379, pp. 1–13, 1929.

A Review of *Eumomota superciliosa*. *Proc. New Eng. Zoöl. Club*, **11**, pp. 51–56, 1929.

Notes on the Rough-winged Swallow (*Stelgidopteryx serripennis*) and Its Allies. *Proc. New Eng. Zoöl. Club*, **11**, pp. 67–72, 1929.

Christmas Census (Essex County, Mass.). *Bird-Lore*, p. 23, January, 1930.

The Marbled Godwit (*Limosa fedoa*) in Essex County, Mass. *Auk*, p. 85, January, 1930.

New Name for *Caprimulgus ridgwayi minor*. *Auk*, p. 85, January, 1930.

The European Black-headed Gull (*Larus ridibundus*) in North America. *Auk*, p. 243, April, 1930. (With S. Gilbert Emilio.)

Studies from the Dwight Collection of Guatemala Birds. II. *Amer. Mus. Novit.*, no. 414, pp. 1–8, 1930.

Critical Notes on Central American Birds. *Proc. New Eng. Zoöl. Club,* **12**, pp. 1–8, 1930.

The Ornithological Year 1926 in the New York City Region. Abstract, *Proc. Linn. Soc. New York*, p. 20, 1930.

The Ornithological Year 1927 in the New York City Region. Ibid., pp. 41, 1930. (With Warren F. Eaton.)

Field Identification of Massachusetts Gulls. *Bull. Essex Ornith. Club,* pp. 13–26, 1930.

ISELIN, C. O'D.

Recent Work on the Dynamic Oceanography of the North Atlantic, American Geophysical Union, National Research Council, National Academy of Sciences, Washington, D. C., June, 1930.

JACKSON, R. T.

Shaler on the Fossil Brachiopods of the Ohio Valley. *Science,* **70**, pp. 214–216, August 30, 1929.

The Status of Bothriocidaris. *Bull. Mus. Comp. Zoöl.*, **69**, no. 13, pp. 479–512, 10 text-figs, December, 1929.

The Harvard Union. *Harvard Alumni Bull.*, **32**, pp. 849–850, April 24, 1930.

Preparing Echinoderms and Other Invertebrates with Corrosive Sublimate. *The Museums Journal* [London], **29**, pp. 385, 386, May, 1930.

A Cypripedium Long in Cultivation. *Horticulture,* **8**, 14, p. 345, July 15, 1930.

LOVERIDGE, A.

East African Reptiles and Amphibians in the United States National Museum. *United States Nat. Mus. Bull.*, **151**, pp. 1–135, pl. 1, November 26, 1929.

On Some Skinks of the Genus *Eumeces* from North America. *Copeia,* no. 173, pp. 111, 112, January 16, 1930.

Preliminary Description of a New Tree Viper of the Genus *Atheris* from Tanganyika Territory. *Proc. New Eng. Zoöl. Club,* **11**, pp. 107, 108, March 12, 1930.

A List of the Amphibia of the British Territories in East Africa (Uganda, Kenya Colony, Tanganyika Territory and Zanzibar), together with keys for the diagnosis of the species. *Proc. Zoöl. Soc. London*, pp. 7–32, May 9, 1930.

Reptiles and Amphibians in the Tanganyika Territory Handbook, pp. 447–460, 1930.

PETERS, J. L.

The Central American Races of *Rupornis magnirostris*. *Proc. New Eng. Zoöl. Club*, **11**, pp. 43–48, August 30, 1929. (With L. Griscom.

An Ornithological Survey in the Caribbean Lowlands of Honduras. *Bull. Mus. Comp. Zoöl.*, **69**, no. 12, pp. 397–478, October (=2 November), 1929.

The Type Species of the Avian Genus Harpiprion. *Occas. Papers Bost. Soc. Nat. Hist.*, **6**, pp. 255, 256, February 24, 1930.

Two Undescribed Races of *Phaethon aethereus*. *Occas. Papers Bost. Soc. Nat. Hist.*, **5**, pp. 261, 262, April 15, 1930.

The Identity of the Toucans Described by Linnaeus in the 10th and 12th Editions of the Systema Naturae. *Auk*, **47**, no. 3, pp. 405–408, July, 1930.

PHILLIPS, J. C.

The Essex County Shooting Season of 1928. *Bull. Essex County Ornith. Club*, pp. 19, 20, 1928.

Shooting Stands of Eastern Massachusetts. *Amer. Game*, **18**, no. 4, p. 65, July, 1929.

Shooting Stands of Eastern Massachusetts. Priv. printed, Riverside Press, Cambridge, Mass., pp. 1–158, July, 1929.

John Rowe, An Eighteenth Century Boston Angler. Priv. printed, The Cosmos Press, Cambridge, Mass., pp. 1–32, 1929.

Fish, Game and Politics. *Boston Evening Transcript*, December 26, 1929.

Bag Limit Controversy. *American Field*, December 28, 1929.

Wanted, A Long Term Policy in Game Administration. *Boston Evening Transcript*, January 11, 1930.

Wanted, A Long Term Wild Life Policy. *New Eng. Game Conference, Report of Proceedings*. Printed for the Association by The Cosmos Press, Cambridge, Mass., pp. 63–66, April, 1930.

House Bill No. 1025. The Commonwealth of Massachusetts, Report of the Special Commission Directed to Study the Laws Relating to Game and Inland Fish. Printed January 9, 1930. (With Elbert M. Crockett, Ernest J. Dean, Sydney M. Williams, Jacob M. Haigis, Gerald J. Callahan and Raymond J. Kenney.)

Editorial on the Subject of the Haugen Bill and Radical Restrictions on Duck Shooters Proposed in Congress. (Unsigned.) *The Sportsman*, pp. 30, 32, March, 1930.

A Jumbled-up Lecture. (Unsigned.) *The Sportsman*, **7**, no. 6, pp. 37, 38, June, 1930. Reprinted in the *Game and Fish Conservationist*, Commonwealth of Virginia, July, August, 1930.

Sheldon's "The Wilderness of Denali" (review). *The Sportsman*, **7**, no. 6, p. 128.

The Shooting Season of 1929 in Essex County. *Bull. Essex County Ornith. Club*, pp. 31–34, 1929.

Grouse Shooting in Donegal. *The Sportsman*, pp. 49–51, August, 1930. Reprinted *Boston Evening Transcript*, August 14, 1930.

A Bit about Game Systems. *American Field*, pp. 99, 100, August 2, 1930.

SANDGROUND, J. H.

A Consideration of the Relation of Host Specificity of Helminths and Other Metazoan Parasites to the Phenomena of Age Resistance and Acquired Immunity. *Parasitology*, **11**, no. 3, September 30, 1929.

Some New Parasitic Nematodes from Yucatan (Mexico), including a New Genus of Strougyle from Cattle. *Bull. Mus. Comp. Zoöl.*, **69**, no. 14, pp. 513–524, December, 1929.

Helminthological Findings of Yucatan Expedition of Harvard Medical School. *Journ. of Parasitology*, **14**, p. 165, April, 1930.

WHEELER, W. M.

Ants Collected by F. Silvestri in Formosa, the Malay Peninsula and the Philippines. *Boll. Lab. Zoöl. gen. agr. R. Istit. sup agr. Portici*, **24**, pp. 27–64, 1929.

Two Interesting Neotropical Myrmecophytes (*Cordia nodosa* and *alliodora*). *Intern. Congr. Entom. Ithaca*, **2**, pp. 342–353, August, 1928.

The Bussey Institution, 1871–1929. *The Development of Harvard*, edited by Samuel Eliot Morison, chap. 31, University Press, Cambridge, Mass., 1929.

Amazonian Myrmecophytes and Their Ants. *Zoöl. Anzeiger*, **82**, pp. 10–39, 1929. (With J. Bequaert.)

Is *Mecrophylus Arenarius* Roux the Larva of *Pterocroce Storeyi* Witleycombe. *Psyche*, **34**, no. 4, pp. 313–320, 1929.

Review of Auguste Forrel's "The Social World of Ants." *Journ. of Social Psychology*, **1**, pp. 170–177, 1930.

A Second Note of Gesomyrmex. *Psyche*, **37**, no. 1, pp. 35–41, 1930.

Two New Genera of Ants from Australia and the Philippines. *Psyche*, **37**, no. 1, pp. 41–48, 1930.

Two Mermithergates of Ectatomma. *Psyche*, **37**, no. 1, pp. 38–54, 1930.

A New Parasitic Crematogaster from Indiana. *Psyche*, **37**, no. 1, 1930.

The Ant *Prenolepis Imparis* Say. *Ann. Ent. Soc. Amer.*, **37**, no. 1, pp. 1–26, 1930.

A New Emeryella from Panama. *Proc. New Eng. Zoöl. Club*, **12**, pp. 9–13, April 3, 1930.

Ant-Tree Notes from Rio Frio, Colombia. *Psyche*, **37**, no. 2, pp. 107–117, 1930.

Philippine Ants of the Genus Aenictus, with Descriptions of the Females of Two Species. *Journ. New York Entom. Soc.*, **38**, pp. 193–212, June, 1930.

INVESTED FUNDS OF THE MUSEUM

In the Hands of the Treasurer of Harvard College

Gray Fund (1859)	$55,000.00
Permanent Fund (1859)	129,216.27
Sturgis Hooper Fund (1865)	119,563.38
Humboldt Fund (1869)	11,651.77
Agassiz Memorial Fund (1875)	327,726.41
Teachers and Pupils Fund (1875)	8,353.41
Virginia Barret Gibbs Fund (1892)	10,029.06
Willard Peeler Hunnewell Memorial Fund (1901)	7,331.48
Maria Whitney Fund (1907)	9,485.62
Alexander Agassiz Fund (1910)	105,450.00
Alexander Agassiz Expedition Fund (1910)	120,980.16
George Russell Agassiz Fund (1911)	55,000.00
George Russell Agassiz Fund Special (1912)	55,000.00
Maria Whitney and James Lyman Whitney Fund (1912)	1,770.59
Louis Cabot Fund (1917)	7,050.06
Harvard Endowment Fund (1917)	1,100.00
William and Adelaide Barbour Fund (1923)	27,979.01
William Brewster Fund (1924)	68,458.01
Anonymous No. 7 Fund (1924)	58,729.17
Alexander Agassiz Fellowship in Oceanography Fund	27,743.84
	$1,207,618.24

The payments on account of the Museum are made by the Bursar of Harvard University, on vouchers approved by the Director or by his delegated authority. The accounts are annually examined by a committee of the Overseers. The income of funds which are restricted is annually charged in an analysis of the accounts, with vouchers, to the payment of which the incomes are applicable.

The income of the Gray Fund can be applied to the purchase and maintenance of collections, but not for salaries.

The income of the Humboldt Fund (about $500) is to be applied for the benefit of one or more students of Natural History for special work, out of course, in the Museum.

The income of the Virginia Barret Gibbs Scholarship Fund, of the value of $400, is assigned annually with the approval of the Faculty of the Museum, on the recommendation of the Professors of Zoölogy and of Comparative Anatomy in Harvard University, "in supporting or assisting to support one or more students who may have shown decided talents in Zoölogy, and preferably in the direction of Marine Zoölogy."

The income of the Whitney Fund can be applied for the care (binding) and increase of the Whitney Library.

The Alexander Agassiz Expedition Fund was bequeathed by Alexander Agassiz for the publication of reports on collections brought together by the expeditions with which he was connected.

The income of the Louis Cabot Fund can be applied to the purchase of books on travel, sport, and natural history.

The income of the William and Adelaide Barbour Fund is "expended wholly at the discretion of the Director of the Museum of Comparative Zoölogy * * * to increase the collections of the Museum either by exploration or the purchase of desirable material."

Three quarters of the income of the William Brewster Fund can be used for the salary of a competent ornithologist and one quarter "at the discretion of the Director of the Museum for the increase of the collection by purchase, or for the renewal or repair of the cases, or for the publication of matter contained in my manuscripts."

The income of the Alexander Agassiz Fellowship in Oceanography Fund is awarded each year by the Faculty of the Museum to some person, or persons, working at the Museum in the field of Oceanography.

The income of Anonymous No. 7 Fund is devoted to increasing the salaries of such of the curators as the Faculty of the Museum may select.

Applications for facilities to work either at the Harvard Biological Laboratory and Botanic Garden at Soledad, Cuba, or at the Barro Colorado Island Laboratory in the Panama Canal Zone may be addressed to the Director. A limited number of Fellowships are available for workers at Soledad. Details concerning the concessions allowed to workers in the Canal Zone may be had upon application to the Director. This laboratory is administered by the Executive Committee of the Institute for Research in Tropical America. Harvard is one of several institutions supporting the institution and the Director of the Museum at present is Chairman of the Committee.

Applications for the tables reserved for advanced students at the Woods Hole Station, of the United States Bureau of Fisheries, should be made to the Faculty of the Museum before the first of May. Applications should state their qualifications, and indicate the course of study they intend to pursue.