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ANNUAL REPORT

OF

THE DIRECTOR

OF THE

MUSEUM OF COMPARATIVE ZOOLOGY

AT HARVARD COLLEGE

TO THE

PRESIDENT AND FELLOWS OF HARVARD COLLEGE

FOR

1925-1926.

CAMBRIDGE, U. S. A.:

PRINTED FOR THE MUSEUM.

1926.

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MUSEUM OF COMPARATIVE ZOÖLOGY.

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REPORT.

TO THE PRESIDENT AND FELLOWS OF HARVARD COLLEGE: —

DURING the year generous additions to the William and Adelaide Barbour Fund have been made by Thomas Barbour (\$2,000), and William Warren Barbour and Robert Barbour (\$1,000 each); and sundry contributions and subscriptions have provided for additional material, for expenses incidental to field-work, and for the salaries of Assistants working upon the collections of mammals, birds, and reptiles.

Toward the acquisition of the La Touche collection of Chinese birds there has been received \$3,450 (Thomas Barbour, and Theodore Lyman \$1,000 each; Gerald D. Boardman and William P. Wharton \$500 each; Francis R. Bangs, I. Tucker Burr, Arthur H. Milliken, and Gorham G. Peters \$100 each; and Winsor M. Tyler \$50).

With Dr. Barbour's coöperation, Mr. F. H. Kennard during February and March, 1926, collected in Panama. Accompanied by Mr. J. D. Smith he secured and has presented to the Museum a beautifully prepared series of bird skins. The region visited, the lowlands and mountains in the vicinity of Almirante, had been previously worked but little ornithologically, and the report upon the collection will furnish geographic data of interest. Mr. H. S. Blair and other officials of the United Fruit Company were most hospitable and helpful to Mr. Kennard.

The Museum is also indebted to Dr. Barbour for the field-work of Messrs. Loveridge, and E. M. and H. C. Schlaikjer. The result of Mr. Loveridge's collecting while with the Chrysler-Smithsonian Expedition to Africa and subsequently, must await his return to Cambridge. The Schlaikjers working in the Oligocene and Pliocene beds of South Dakota secured much valuable material for research; owing to their skill in developing, some of this material makes notable additions to the exhibition cases.

Dr. G. M. Allen left Cambridge in June, and though unable to remain with Dr. R. P. Strong's African Expedition for its full time, will have several months for collecting in Liberia, the mammalian fauna of which is not represented in the Museum.

Dr. Barbour spent two months in Cuba and Central America, and Dr. Bigelow's connection with the scientific work of the U. S. Bureau of Fisheries necessitates his partaking of some of the cruises along the Atlantic Coast.

Mr. Banks and Dr. Chamberlin made short collecting trips, the former in the White Mountains with Randolph as the base, and the latter in Utah and northern New England; each secured material for the collections in his care.

Prof. P. E. Raymond was in charge of the Harvard Summer School of Field Geology during the 1925 session; working at several localities (new and old), among the Canadian Rockies, many valuable fossils were collected from Middle Cambrian formations; from other formations in Maine, New York, and Pennsylvania, and from Permian deposits at Elmo, Kansas, similar results were obtained. Mr. F. M. Carpenter was associated with the collecting at Elmo, where a small, but representative, series of well-preserved fossil insects was secured.

Mr. R. W. Sayles continued his investigations of the fossil soils of Bermuda, and in the Pleistocene deposits of southern Maine. In Bermuda new localities were found, and additional soils identified; in Maine beaches of Post-Wisconsin age and three distinct tills were discovered. Prof. T. H. Clark collaborated with Mr. Sayles in Bermuda.

Mr. Arthur C. Bent has deposited his valuable ornithological collection, stipulating in his letter of 30 December, 1925, that it is to remain his property during his life time, but at his death is to become the property of the Museum. Mr. Bent's conditions as to the use, exchange, and loan of the specimens are wholly in accord with those of the Museum. Though well known to ornithologists, it should be stated that Mr. Bent's collection is of especial value in that it excels in skins, showing birds in the downy young, the various nuptial, seasonal, and obscure plumages.

The additional facilities described in last year's Report give ample room for the convenient storage of Mr. Bent's collection, and for

the continuation of his publication on the life-histories of North American birds.

Taking advantage of the opportunity to contribute toward the expense of Prof. William Rowan's expedition to Athabasca, the Museum secured the skin and skeleton of a fine adult male of the Woodland Bison, *Bison athabasca* Rhoads, an accession of importance, as the purity of the two forms is endangered by the unfortunate introduction of the Plains Bison into the range of the Woodland Bison.

The Museum has to thank Dr. W. E. Castle for an interesting addition for exhibition among its special collections. The specimens, rabbits, illustrate the linkage of characters in heredity. Such characters are apt to persist, from generation to generation associated with each other. The linked characters in the specimens shown are *spotted coat* and *short hair* and *unspotted coat* and *long hair*.

Through Dr. Barbour's interest and generosity, many hundred specimens have been added to the research collections of mammals and birds, all selected as forms new to the Museum series, or desirable to round out a series from a taxonomic or geographic point of view. Dr. Barbour has also contributed largely toward the entomological and conchological collections, while the all but daily additions to the collections under his immediate charge make the series of reptiles and amphibians representative, and give ample opportunity for investigation.

The Museum is indebted to Dr. R. T. Jackson for his constant interest in the palaeontological collections, which benefit each year from this interest, owing to his intimate knowledge of the Museum's lacunae, together with a true valuation of fossils of unusual importance.

Thanks are due to Mr. W. S. Brooks for specimens collected during his visits to various parts of Africa and the West Indies. When in South Africa, Mr. Brooks enlisted the coöperation of many residents, whose sendings have given the herpetological collections much desirable material.

The Museum is indebted to Dr. John C. Phillips for mammals and birds from Alaska and the Aleutian Islands, and for African fishes, including the types of new species; also

To Mr. John E. Thayer for mammals and birds from New Zealand, Guatemala, and Mexico.

To Prof. Manton Copeland for mammals from Baffin Land.

To the American Museum of Natural History for a series of Jerboas from Mongolia.

To Mr. Outram Bangs for 278 birds, mostly sea-birds, from Ireland.

To Mr. W. A. Jeffries for a series, 50 specimens, of the Ipswich Sparrow.

To Mr. Walter Koelz for birds from Greenland and Labrador.

To Prof. W. M. Wheeler for insects from Morocco.

To Messrs. J. G. Myers and George Salt for insects from New Zealand and Cuba.

To Mr. L. H. Weld for a collection of Cynipidae, including types of new species.

To Mrs. E. W. Rorer for Lepidoptera from Ecuador.

To Mr. A. P. Morse for Orthoptera from Nebraska.

To Mrs. Langdon Pearse for a large collection of shells.

To Mr. Cary Croneis for a number of fossil cephalopods, including types and figured specimens.

To Mr. H. C. Stetson for Cambrian invertebrates and anaspid fishes from the Downtonian of Scotland.

The Library contains 63,979 volumes and 72,476 pamphlets, and is in its field one of the most complete in America, and is so considered, if the frequent requests for interlibrary loans received and fulfilled can be taken as a criterion. It should be borne in mind, however, that the field is primarily *zoölogy* and secondly geology; as its resources and present physical limitations are barely adequate to provide the Curators with the purely zoölogical publications needed for their curatorial work and investigations, it is quite impossible to add by purchase the text-books, serials, and other publications required by the University instructors and students in Biology.

The accessions for the year, 1,024 volumes and 1,914 pamphlets, are somewhat larger than last year. I would point out, however, that a mere increase in the number of accessions is not indicative of progress, satisfactory or otherwise, and that comparison on a percentage basis between libraries with aims and resources so dis-

similar as a School of Business Administration and a Zoölogical Museum is misleading, as the accession of a single volume of any one of a number of zoölogical serials, or the report of an exploration, entails a far greater expense than the acquisition of several hundred reports of business corporations.

The publications for the year, include one volume of the *Memoirs*, eight numbers of the *Bulletin*, and the *Annual Report*, a total of 454 (244 quarto and 210 octavo) pages, illustrated by 45 (30 quarto and 15 octavo) plates.

Within the Museum year (in March, 1925), the final volume of what undoubtedly will be for many years *the Natural History of Ducks* was published. In a little more than two years Dr. Phillips has seen through the press four quarto volumes of text, nearly 1,600 pages, illustrated by over 200 plates and maps. The scope and plan of the work left little room for criticism, and the several volumes have been most favorably received. Dr. Phillips's thorough and equitable handling of the literature of his subject (there are more than 3,300 titles in his bibliography), tends to conceal the very considerable amount of original matter he has himself contributed, a tendency not diminished by his own modest estimate of the same.

Dr. R. V. Chamberlin's resignation took effect 31 December, 1925. He had been in charge of the collections of worms, myriopods, and arachnids since March, 1913, and by his personal field-work and through his correspondents, had increased the size and enhanced the scientific value of these collections, the Myriopoda ranking among the most important extant. An enthusiastic, rapid worker, his numerous publications contain descriptions of a large number of new forms, well illustrated by drawings from his facile pencil.

Though without official connection with the Museum, the late J. B. Woodworth was much interested in its work and aims; he made important contributions to its publications and collections, and was helpful at all times with critical comments and suggestions as to its library and publications. He died in Cambridge, 5 August, 1925.

SAMUEL HENSHAW,
Director.

REPORT ON THE MAMMALS.

BY GLOVER M. ALLEN.

The number of accessions for the year received by gift or exchange totals about 335 specimens of recent mammals (50 alcoholics and 288 skins, with skulls or skeletal parts), and about 160 specimens of fossil species.

Notable among the accessions are:—

About 100 skins, with skulls, from peninsular Alaska and the Aleutian Islands, the gift of Dr. J. C. Phillips.

A skeleton of the cetacean *Orcaella* sp., a rare deer from Szechnan, several forms selected to fill *lacunae* in the research series, and many Oligocene and Pliocene fossils from South Dakota, collected by E. M. and H. C. Schlaikjer, presented by Dr. Thomas Barbour.

A fine series of Jerboas from Mongolia, from the American Museum of Natural History.

Twenty-seven specimens from Baffin Land, collected by the MacMillan Expedition, a gift of Dr. Manton Copeland.

Small series or single specimens have been received from the Boston Society of Natural History, Messrs. G. M. Allen, C. A. Cutter, C. E. Keeler, F. H. Kennard, Enrique Naranjo, George Nelson, J. L. Peters, E. M. Schlaikjer, George Schwab, G. C. Shortridge, and J. E. Thayer.

A number of excellent skins with skulls from South Africa, western China, and Central America, and desirable series of Nearctic and Palearctic forms have been added by exchange.

A fine adult bull (skin and skeleton), of the Wood Bison, from Athabasca, was purchased.

All of the accessions are identified, labeled, and catalogued.

I have aided in the development of the Schlaikjer fossils, have completed a report on the Wilson and Frost collections of South Carolina fossils, and have commenced a study of the canid remains

from the excavations at Pueblo Bonito, conducted under the direction of Dr. N. M. Judd.

The greater part of the Frost collection was presented to the Museum jointly by the Misses Susan P., Mary P., Rebecca M. Frost, and the Rev. Francis L. Frost, in memory of their brother William Pringle Frost, who, during his life, showed a great and intelligent interest in the natural history of South Carolina.

The duplicate set of cards prepared at the U. S. National Museum, recording recent mammalian literature, is a great advantage to the Department; it is received as a gift of Dr. Thomas Barbour.

REPORT ON THE BIRDS.

BY OUTRAM BANGS.

During the year, 3,242 specimens, including twenty-two (22) genera and many species new to the collection, have been received; more than half of these accessions are due to the generosity and persistency of Dr. Thomas Barbour. Dr. Barbour's material, though principally from Africa and the Americas, contains desirable specimens from Cyprus, Sardinia, Siberia, Russia, and other parts of Europe.

Mr. F. H. Kennard, in concert with Dr. Barbour, secured for the Museum a series of nearly 300 specimens, 135 species and subspecies, of birds. Mr. Kennard, who was accompanied by Mr. J. D. Smith, collected during February and March in Panama, working chiefly among the lowlands, and the mountains up to an altitude of 4,500 feet. The region covered by Mr. Kennard's work has been worked but little ornithologically; a report upon the collection is in preparation.

Acknowledgements are due to:—

Dr. J. C. Phillips for 154 specimens from Alaska (O. J. Murie, 1925 coll.).

Col. J. E. Thayer for 132 specimens from New Zealand, Mexico, and Guatemala, from the collection of W. E. Bryant.

Mr. Walter Koelz for 46 specimens from Greenland and Labrador, collected during the summer of 1925.

Mr. W. A. Jeffries for a series of 50 Ipswich Sparrows (J. A. and W. A. Jeffries, coll.).

Mr. H. S. Shaw for 21 specimens from Oregon (A. K. Woodcock, coll.).

Mr. Outram Bangs for 278 specimens, mostly sea-birds, from Ireland (H. D. Knox, coll.).

Single specimens or short series were received from Mrs. S. E.

Gates, Messrs. Outram Bangs, Thomas Barbour, E. H. Forbush, the late M. A. Frazar, C. W. Gates, R. B. Harding, F. H. Kennard, Arthur Loveridge, the late S. J. Mixter, T. E. Penard, J. L. Peters, J. C. Phillips, C. A. Porter, H. S. Whitehead, the Boston Society of Natural History, and the Franklin Park "Zoo."

The following material has been purchased:—

One hundred and three specimens from the Cameroons, from Mr. George Schwab.

One hundred and seventy-four specimens from Crete (Paul Spatz, coll.). This collection contains representatives of all forms peculiar to the island.

Mr. A. C. Bent has deposited his valuable collection of North American birds, a collection rich in birds of obscure plumage, moulting individuals, and downy young of sea-birds, ducks, and shore-birds. Mr. Bent's future scientific work will thus be closely associated with the Museum.

Extensive interchanges have been effected with a few ornithologists, and with a number of American, European, African, and Australian Museums, and many mutual loans have been carried out.

Mr. J. L. Peters has continued the card catalogue of bird skins, which contains the record of seventy-one (71) families, 1,072 species, and 22,310 specimens, fourteen (14) families, 763 species, and 8,342 specimens having been added during the year.

Dr. Herbert Friedmann spent a large part of the year in the preparation of a report upon the parasitic birds which he had collected in Texas, Argentine, and eastern and southern Africa. A considerable series of Dr. Friedmann's African birds is among this year's accessions.

REPORT ON THE REPTILES AND AMPHIBIANS.

BY THOMAS BARBOUR.

During the year I spent some time in Cuba and Central America. In coöperation with the United Fruit Company, several thousand snakes were received from Tela, Honduras, and some from other points, for use in connection with determining the incidence of venomous species. A similar census for the Panama Canal Zone is being made, with aid from the Medical Department of the Panama Canal. Dr. Afranio do Amaral returned from Brazil, and has worked most carefully on certain groups of Neotropical and African genera of snakes, and has also organized a Serum-therapeutic Institute for the production of antivenines, in connection with the Mulford Laboratories at Glenolden, Peru. Dr. Amaral will retain his Lectureship in the University, and work in conjunction with the Museum, and with the Department of Bacteriology, so that all material may be useful, and a detailed study made of the venomous species which are not dangerous to man.

Mr. Loveridge spent nearly half the year collecting in Africa, with the Chrysler-Smithsonian Expedition. During the year, several students taking the research course in herpetology assisted effectively in routine identifications. In Mr. Loveridge's absence, Miss Thelma MacIntyre has assisted with routine cataloguing and in the preparation of a card catalogue of types; 691 species are represented by holotypes, cotypes, or paratypes.

The collection has grown satisfactorily during the year, forty-seven (47) genera, previously unrepresented, having been added.

As a result of Mr. W. S. Brooks's visit to South Africa, additional material has been received, and Mr. Loveridge has com-

pared the collection of the British Museum with the Museum of Comparative Zoölogy series. His result follows:—

	B. M.	M. C. Z.
Chelonia	17	13
Lizards	123	117
Chamaeleons	10	7
Snakes	87	77
Frogs and Toads	52	53
	<hr/> 289	<hr/> 267

A number of specimens have been borrowed, notably the series of Anoles, collected in Guatemala, by Mr. J. R. Slevin, of the California Academy of Sciences.

The general exchange of duplicate material with the University of Michigan Museum, etc., without reference to the exact number of specimens, given or received, has been mutually beneficial, and has saved much recording. Exchanges, as usual, have been numerous.

Gifts have been made by the following persons:— Messrs. Allan Brooks, E. F. Carpenter, L. Giovannoli, L. U. Harris, F. H. Kennard, C. H. Lankester, H. P. Loding, Niceforo Maria, L. L. Mowbray, Robert Schacht, E. M. Schlaikjer, W. R. Singleton, and several officials of the United Fruit Company, especially Drs. N. P. Macphail, R. B. Nutter, and Messrs. H. Clark, and L. S. Sisto.

REPORT ON THE FISHES.

BY SAMUEL GARMAN.

Effort has been concentrated upon improving the condition of the earlier collections, rather than increasing the number of the later ones. As might be expected, the coolness of the season has had an effect in lowering the amount of evaporation.

There has been the usual amount of correspondence, with requests for identifications to aid studies.

REPORT ON THE ENTOMOLOGICAL DEPARTMENT.

BY NATHAN BANKS.

The more notable accessions are the Cuban and New Zealand insects from Messrs. J. G. Myers and George Salt, the Moroccan insects from Dr. W. M. Wheeler, about 1,000 Nebraskan Orthoptera from Mr. A. P. Morse, a collection of Cynipidae, containing twenty (20) paratypes, from Mr. L. H. Weld, and 350 Ecuadoran Lepidoptera from Mrs. E. W. Rorer. Other material was received from Messrs. C. P. Alexander, C. F. Baker, Thomas Barbour, Joseph Bequaert, W. S. Blatchley, F. M. Brown, P. W. Claassen, T. D. A. Cockerell, C. W. Dodge, M. L. Fernald, E. Jacobson, C. W. Johnson, C. H. Paige, and Roland Thaxter.

Exchanges in Neuroptera and Diptera were made with the Canadian National Museum.

Mrs. D. H. Blake has named various species of Oedionychis, Mr. F. H. Chittenden the unnamed Phyllotreta, Dr. Joseph Bequaert the species of Ancistrocerus, and Mr. T. B. Mitchell those of Megachile.

Neuroptera have been identified for the Kansas Agricultural College, the University of Illinois, the Nova Scotia Department of Agriculture, Messrs. C. F. Baker, and F. M. Schott; fossorial Hymenoptera for the South Dakota State College, and Prof. J. C. Bradley.

Panamanian Locustidae and Gryllidae were loaned to Mr. Morgan Hebard, the unnamed Thyreocorinae to Mr. W. L. McAtee, unnamed Odontaeus to Mr. J. W. Wallis, and unnamed Oribatidae to Mr. A. Jacot. Mr. H. W. Allen has returned the Miltogramminae, with several types.

The usual inspections show the collection in good condition.

Through the kindness of Mr. J. H. Emerton, the Curator spent a week in the White Mountains, and collected about 1,000 insects and spiders.

Labeling of the Morse collection was finished, and progress made on the Bowditch and Jacob Doll collections. Over 400 types have been verified and marked. Several families of the Diptera have been rearranged, the Tenthredinidae were put into new Schmitt boxes, several parts of the Bowditch Chrysomelidae were united, part of the Agrionidae was rearranged, and most of the unnamed United States specimens identified. The manuscript of a revision of the North American Myrmeleonidae was completed, and further studies made on the classification of the genera of the world.

Besides numerous visits from local entomologists, fifteen persons have consulted the collections.

REPORT ON THE MYRIOPODS, ARACHNIDS, AND WORMS.

BY RALPH V. CHAMBERLIN.

Field-work during the early part of the year consisted of some supplementary collecting of myriopods and spiders in Utah, and of myriopods in Vermont, New Hampshire, and Maine, all of which material was later identified. An effort was made to clear up the numerous smaller sendings which had accumulated. In addition, various collections, chiefly of immigrant forms, were named for the U. S. Horticultural Board, and a larger series of arachnids and myriopods for the Bureau of Biological Survey. Some time was given to work on a collection of Hawaiian arachnids, and on myriopods from the Hawaiian and other Pacific islands, received from the Bishop Museum. A beginning was made on a rearrangement of the chilopod and diplopod collections.

For specimens received, the Museum is indebted to the Misses Grace Smith and Dixie Young, Messrs. C. F. Baker, S. C. Bishop, C. R. Crosby, Alexander Petrunkevitch, J. O. Snyder, F. X. Williams, and the U. S. Horticultural Board.

REPORT ON THE ECHINODERMS.

BY HUBERT L. CLARK.

The completion of the rearrangement of the dry sea-urchins occupied the early part of the year, after which, study of the collection of echinoderms (other than holothurians), belonging to the South Australian Museum, was taken up. A report on this collection, which contains many undescribed species, is approaching completion. Two months were given to the rearrangement of the collection of dry sea-stars, to bring it into accord with modern classification, and in this connection, an outline classification of echinoderms, including all genera, living and fossil, was prepared. The latter part of the year was devoted chiefly to the study of a very large and notable collection of fossil sea-urchins from Jamaica.

The accessions were neither numerous nor notable, about 210 specimens in all. The more noteworthy were a series of sea-stars from the South African Fisheries Board, and a very desirable lot of the rare New Zealand sea-urchin, *Goniocidaris umbraculum*, from Mr. M. W. Young. For other accessions, thanks are due to the Australian Museum, Sydney, and the Victoria Memorial Museum, Ottawa; to Mrs. Langdon Pearse, and to Messrs. B. W. Arnold, Thomas Barbour, W. A. Hilton, R. T. Jackson, Theodor Mortensen, G. H. Parker, and E. F. Ricketts.

REPORT ON ZOÖLOGICAL RESEARCH.

BY HENRY B. BIGELOW.

The Museum has received from Mr. William Beebe for study the Medusae and Siphonophorae of the ARCTURUS Expedition to the Sargasso Sea and the Tropical Pacific. This is one of the most extensive collections of pelagic coelenterates received in late years, numbering about 350 lots, and it is especially interesting on account of the large number of oceanic species, seldom obtained except by the major deep-sea expeditions.

The Museum is indebted to Mr. P. E. Pieris Deraniyagala for Medusae from Ceylon.

Oceanographic exploration of the Gulf of Maine and the neighboring Atlantic has been continued, in coöperation with the U. S. Bureau of Fisheries. Serial observations were taken on a north-south profile of the Gulf of Maine, near the coast, and on Nantucket shoals.

The study of the circulation of the Gulf, by drift bottles, has been continued, through the kindness of Messrs. H. C. Stetson and T. E. Graves, who put out lines of bottles in the Massachusetts Bay region, and off Cape Nedick, from their yachts. During the past summer, Mr. C. O. Iselin has carried on research in the coast waters of Newfoundland and Labrador, the Museum planning the exploration, and providing a part of the apparatus.

Most of my own time has been devoted to the preparation and delivery of two courses of Lowell lectures, and to the general report on the Gulf of Maine explorations.

I have also continued to serve as scientific adviser to the International Ice Patrol, and as Chairman of the North American Committee on Fisheries Investigations.

The acquisition, by the Bureau of Fisheries, of ALBATROSS II.

to replace the HALCYON (Science, 1926, **63**, p. 500), allowed an extension of the cod-tagging program to Georges Bank, where about 1,100 cod, pollock, and haddock were tagged on the initial cruise. The tagging record up to date is as follows:—

Tagged	Cod	Pollock	Haddock	Total
1923.....	7,618	2,215	411	10,244
1924.....	6,209	916	3,224	10,349
1925.....	10,420	949	3,891	15,260
1926.....	2,727	36	253	3,016
Total	26,974	4,116	7,779	38,869

About 1,700 returns have now been received, enough to justify a general report on the movements of the cod of the Nantucket shoals region, and Mr. W. C. Schroeder is now preparing this report. The tagging cruise to Georges Bank also gave opportunity for oceanographic observations and towings, which were interesting, as they proved the neritic nature of the plankton over shoal water so far from land, and the constancy of temperature there from summer to summer.

REPORT ON INVERTEBRATE PALAEONTOLOGY.

BY P. E. RAYMOND.

The Curator was again in charge of the Harvard Summer School of Field Geology in 1925, and was able to make further collections from some of the localities in the Canadian Rockies visited the previous summer, paying particular attention to the rarer forms. New localities were visited near Banff, Alberta, and excellent material obtained from the Middle Cambrian at Ross Lake and Burgess Pass, B. C. At the latter, one of the students found the second known specimen of the very interesting isopod-like crustacean, *Mollisonia gracilis* Walcott. This, and another unusual specimen, the Curator was able to purchase and present to the Museum. The *Mollisonia* has been made the subject of a brief memoir, now ready for publication. Mr. H. C. Stetson, the Assistant in the course, very generously presented to the Museum many valuable specimens which he collected. As last year, the Museum is again indebted to the Hon. J. B. Harkin, Commissioner of Parks, for permission to collect fossils in the Canadian National Parks.

In August, 1925, the Curator spent eight days with Mr. F. M. Carpenter, at Elmo, Kansas, collecting from the Permian deposits previously exploited for fossil insects by Sellards and Dunbar. At this locality, the specimens occur in pockets, which are not readily found in the soil-covered pasture, but our test pits produced thirty-three well-preserved wings, two bivalved crustaceans, and considerable numbers of pelecypods. Some of the wings, including three new species, have been described by Mr. Carpenter (Bull. M. C. Z., 1926, 67, no. 13).

In October, 1925, one day was spent in collecting Silurian graptolites, at Waterville, Maine, and in July, 1926, small collections of

Oriskany fossils from Glen Eyrie, N. Y., and of Trenton fossils from Crown Point, N. Y., were made in the course of a brief trip.

Mr. H. C. Stetson visited Scotland in July, 1926, for the purpose of collecting from the Downtonian. He obtained several anaspids and other fossil "fishes," which he has given to the Museum, and arranged for further search in these beds by an enthusiastic local collector, who has made several collections from them. Thanks are due to Director MacGregor of the Scottish Geological Survey, Mr. D. Tait, and Mr. D. S. Stitt, for valuable assistance in this matter. Mr. Ralph Stewart, of the University of California, studied the gastropods in the J. D. Whitney collection, and succeeded in identifying a number of Gabb's types of Cretaceous and Tertiary shells. He also had figures prepared of some of the better preserved specimens, to illustrate a forthcoming memoir. Mr. Carey Croneis, a graduate student, presented to the Museum the types and figured specimens of a new genus and three new species of cephalopods, from the Mississippian of Arkansas (see Bull. M. C. Z., 1926, 67, no. 10). He has also presented the types of several other species, to be described elsewhere.

The Curator spent several weeks in the study of a number of unusually well-preserved trails from the Silurian of central Maine, in an effort to ascertain the nature of the animals which made them. Almost identical trails have been found in England, Wales, Spain, and Germany, and their probable stratigraphic value warrants more attention than has previously been paid to them. Much time was devoted in an attempt to get together the stratigraphic results of the Shaler Memorial Expeditions of 1917, 1918, and 1921. The manuscript on the correlation of the Ordovician formations was brought to an advanced state, and all of the palaeontologic evidence assembled.

Besides the accessions already mentioned, a collection of Pleistocene fossils from Montreal, and Ordovician graptolites and sponges from Quebec, has been received by exchange with the Peter Redpath Museum, through Prof. T. H. Clark; a small collection of invertebrate fossils from the Windsor series of Cape Breton, by donation from Prof. K. F. Mather, and a number of Cretaceous (Pierre) fossils from Dr. Thomas Barbour.

REPORT ON THE GEOLOGICAL COLLECTIONS.

BY R. W. SAYLES.

Two noteworthy additions to the collection have been received, one a very fine striated boulderet from the Permo-Carboniferous tillite of Bachus Marsh, southern Australia, the gift of Prof. E. C. Jeffrey, and the other from the Curator, specimens from the coast of Maine, illustrating probable seasonal banding, supposed to be of Carboniferous age.

Prof. T. H. Clark and the Curator continued their study of the fossil soils of Bermuda. Four new localities, where three distinct fossil soils were identified, and fifty-seven new fossil soils, were discovered; the total of fossil soils is 116, and of three-soil localities seven. The oldest soil observed (the so-called sea-level soil), occurred so frequently above a sandstone, a few feet above sea-level, as to indicate the erosion to this level of most of the islands, except the Walsingham district, during the Middle Pleistocene; Bermuda having been built to its present height by dune-formation since this soil was formed. The Walsingham formation may be older than this sea-level soil horizon, and if so may represent Nebraskan and Aftonian stages of the Pleistocene. If this relation holds, the sea-level soil above the marine sandstone would be of Yarmouth age. Many fossils were collected by Professor Clark. In July, I worked on the Pleistocene deposits in southern Maine. Post-Wisconsin beaches at 160 and 215 feet above present sea-level were found. Working with Dr. Ernst Antevs, three distinct tills were located in a gravel pit at Elms. The two lower tills have been folded with the beds of gravel and sand, and resemble the folds of Cape Cod and Martha's Vineyard. It seems evident that glacial stages, older than the Wisconsin, are represented here.

REPORT ON THE LIBRARY.

BY ELEANOR K. SWEET.

During the Museum year from August 1, 1925 to July 31, 1926, inclusive, 1,024 volumes, 1,683 parts of volumes and 1,914 pamphlets have been added to the Library.

The total number of volumes in the Library is 63,979, the total number of pamphlets is 72,476.

Two hundred and twenty-eight volumes have been bound; four hundred pamphlets have been separately bound.

Many hours have been required for the checking of the National Union List of Serials; work on the Checking edition has now been completed, and work on the Provisional edition is in progress.

From the Harvard College Library the Museum has received 153 titles; other contributors are William M. Wheeler (408 titles), Nathan Banks (246 titles), Edward A. Boyden (144 titles), William M. Davis (130 titles), Morgan Hebard (118 titles), Samuel Henshaw (117 titles), Outram Bangs (71 titles), Thomas Barbour (47 titles), Henry B. Bigelow (45 titles), Peabody Museum of American Archaeology and Ethnology (36 titles), Harry C. Oberholser (29 titles), Reginald A. Daly (20 titles).

PUBLICATIONS

FOR THE YEAR 1925-1926.

(1 AUGUST, 1925 — 31 JULY, 1926).

MUSEUM OF COMPARATIVE ZOÖLOGY.

BULLETIN: —

Vol. LXVII.

- No. 7. New genera of Megapodagrioninae, with notes on the subfamily. By Clarence H. Kennedy. 24 pp. 1 plate. November, 1925.
- No. 8. New species of fossil corals from the Dominican Republic. By Thomas W. Vaughan and John E. Hoffmeister. 14 pp. 4 plates. November, 1925.
- No. 9. Psammocharidae from Panama. By Nathan Banks. 12 pp. November, 1925.
- No. 10. New cephalopods from the Fayetteville shale. By Carey Croneis. 14 pp. 2 plates. February, 1926.
- No. 11. Review of the Engraulidae, with descriptions of new and rare species. By David S. Jordan and Alvin Seale. 66 pp. May, 1926.
- No. 12. A collection of birds from southwestern New Guinea (Merauke coast and inland). By Outram Bangs and James L. Peters. 16 pp. July, 1926.
- No. 13. Fossil insects from the Lower Permian of Kansas. By Frank M. Carpenter. 10 pp. 3 plates. July, 1926.
- No. 14. Fossil mammals from South Carolina. By Glover M. Allen. 24 pp. 5 plates. July, 1926.

MEMOIRS: —

Vol. XLIX.

Reports on an exploration off the west coasts of Mexico, Central and South America, and off the Galapagos Islands, in charge of Alexander Agassiz, by the U. S. Fish Commission Steamer "Albatross," during 1891, Lieut.-Commander Z. L. Tanner, U. S. N., commanding. XXXIX. Reports on the scientific results of the expedition to the Eastern Tropical Pacific, in charge of Alexander Agassiz, by the U. S. Fish Commission Steamer "Albatross," from October, 1904 to March, 1905, Lieut.-Commander L. M. Garrett, U. S. N., commanding. XXXIV. The pelagic nemerteans. By Wesley R. Coe. 244 pp. 30 plates. June, 1926.

REPORT: —

1924-1925. 30 pp. December, 1925

ALLEN, G. M.

Ernest Harold Baynes. *Journ. mammalogy*, August, 1925, **6**, p. 203.

Birds and their attributes. Boston, [1925], 13, 338 pp., ills.

Schiöler's 'Birds of Denmark.' *Auk*, April, 1926, **43**, p. 218-227.

Rats (genus *Rattus*) from the Asiatic expeditions. *Amer. mus. novitates*, 16 June, 1926, no. 217, 16 pp.

Bats and their habits. *Bull.* **40**, *Boston soc. nat. hist.*, July, 1926, p. 1-7.

See also p. 25, *Bull.* **67**, no. 14.

BANGS, OUTRAM.

A new race of Pelzeln's weaver-finch. [With J. C. Phillips]. *Occ. papers Boston soc. nat. hist.*, 18 December, 1925, **5**, p. 177.

A new *Berneria* from Madagascar. [With J. L. Peters]. *Proc. N. E. zoöl. club*, 21 July, 1926, **9**, p. 43-44.

The validity of *Nisuides morelii* Pollen. [With J. L. Peters]. *Auk*, July, 1926, **43**, p. 369-370.

See also p. 25, *Bull.* **67**, no. 12.

BANKS, NATHAN.

Descriptions of a few new American Diptera. *Psyche*, April, 1926, **33**, p. 42-44.

See also p. 25, *Bull.* **67**, no. 9.

BARBOUR, THOMAS.

New Amphibia. *Occ. papers Boston soc. nat. hist.*, 30 January, 1926, **5**, p. 191-194, pl. 12-14.

Dr. Samuel Jason Mixter. *Mass. Guernsey bull.*, January, 1926, 1 p., portr.

Remarks concerning Professor Edward S. Morse, sometime President of the Boston Society of Natural History. *Bull.* **38**, *Boston soc. nat. hist.*, January, 1926, p. 8-9.

Notes from Massachusetts and New Hampshire. [With W. S. Brooks]. *Auk*, January, 1926, **43**, p. 104.

[Harvard Glee Club]. *Harvard alumni bull.*, 4 February, 1926, **28**, p. 548-549.

A note on Tertiary alligators. *Copeia*, 25 February, 1926, no. 151, p. 109.

Reptiles and amphibians. Their habits and adaptations. Boston, etc., 1926, 20, 125 pp., ills.

BIGELOW, H. B.

Oceanic circulation. *Science*, 9 October, 1925, **62**, p. 317-319.

The Albatross II. *Science*, 14 May, 1926, **63**, p. 500.

CHAMBERLIN, R. V.

New North American spiders. *Proc. Cal. acad. sci.*, 14 August, 1925, ser. 4, **14**, p. 105-142.

Expedition of the California academy of sciences to the Gulf of California in 1921. The Phalangida. *Proc. Cal. acad. sci.*, 14 August, 1925, ser. 4, **14**, p. 171-173.

Notes on some centipeds and millipeds from Utah. *Pan-Pacific ent.*, October, 1925, **2**, p. 55-63.

Notes on North American spiders heretofore referred to Coleotes. *Proc. Biol. soc. Washington*, 13 November, 1925, **38**, p. 119-124.

A new species of the lithobiid genus Nampabius from Tennessee. *Canad. ent.*, December, 1925, **57**, p. 291.

Two new American chilopods. *Proc. Biol. soc. Washington*, 23 February, 1926, **39**, p. 9-10.

CLARK, H. L.

Some sea-stars from the Riksmuseum, Stockholm. *Arkiv för zoologi*, 16 November, 1925, **18A**, no. 8, p. 1-8.

A new Clypeaster from Angola. *Ann. S. Afric. mus.*, December, 1925, **20**, p. 317-318, pl. 33.

Echinoderms from the South African fisheries and marine biological survey. Part 2. Sea-stars (Asteroidea). *Rept. 4, Fish. and mar. biol. surv. Union S. Africa*, 1925, 1 May, 1926, p. 1-34, pl. 1-7.

Echinoderms other than sea-stars [of the Tropical Central Pacific]. *Bull. 27, Bernice P. Bishop mus.*, [July, 1926] p. 89-111, pl. 9-11.

LOVERIDGE, ARTHUR.

A mite pocket in the gecko, *Gymnodactylus lawderanus* Stoliczka. *Proc. Zool. soc. London*, January, 1926, 1925, p. 1431.

PETERS, J. L.

A new grackle from St. Vincent, Lesser Antilles. *Occ. papers Boston soc. nat. hist.*, 18 December, 1925, **5**, p. 175-176.

Two new birds from Argentina. *Occ. papers Boston soc. nat. hist.*, 30 January, 1926, **5**, p. 195-196.

A new race of the Golden Warbler from the West Indies. *Proc. N. E. zool. club*, 17 February, 1926, **9**, p. 41.

A review of the races of *Elaenia martinica* (Linné). *Occ. papers Boston soc. nat. hist.*, 7 June, 1926, **5**, p. 197-202.

Also with Outram Bangs, *Proc. N. E. zoöl. club*, 21 July, 1926, **9**, *Auk*, July, 1926, **43**.

See also p. 25. *Bull.* **67**, no. 12. [With Outram Bangs].

PHILLIPS, J. C.

The Pére David deer herd. *Journ. mammalogy*, November, 1925, **6**, p. 283-284.

The 1925 Essex County shooting season. *Bull. Essex county ornith. club*, December, 1925, **7**, p. 10-13.

Further studies of the Harvard birth-rate—classes 1891-1900. *Harvard grad. mag.*, March, 1926, **34**, p. 385-394.

A natural history of the ducks. Vol. 4. Boston, etc., 1926, [11], 489 pp., pl. 71-102, map 96-118.

Also with Outram Bangs, *Occ. papers Boston soc. nat. hist.*, 18 December, 1925, **5**.

RAYMOND, P. E.

The Anaspida and the problem of the origin of the vertebrates. *Amer. journ. sci.*, November, 1925, ser. 5, **10**, p. 433-436.

Two new fossil fishes from Alberta. *Amer. journ. sci.*, December, 1925, ser. 5, **10**, p. 551-555.

A new oyster from the Cretaceous of Cuba. *Occ. papers Boston soc. nat. hist.*, 18 December, 1925, **5**, p. 183-185, pl. 7.

SAYLES, R. W.

Jay Backus Woodworth. *Harvard grad. mag.*, March, 1926, **34**, p. 395-401, portr.

George Carroll Curtis. *Geogr. review*, April, 1926, **16**, p. 332-333.

INVESTED FUNDS OF THE MUSEUM.

IN THE HANDS OF THE TREASURER OF HARVARD COLLEGE.

Gray Fund (1859)	\$50,000.00
Permanent Fund (1859)	117,469.34
Sturgis Hooper Fund (1865)	108,542.92
Humboldt Fund (1869)	9,691.31
Agassiz Memorial Fund (1875)	297,933.10
Teachers and Pupils Fund (1875)	7,594.01
Virginia Barret Gibbs Fund (1892)	8,656.20
Willard Peele Hunnewell Memorial Fund (1901)	5,666.24
Maria Whitney Fund (1907)	8,027.72
Alexander Agassiz Fund (1910)	99,500.00
Alexander Agassiz Expedition Fund (1910)	106,317.95
George Russell Agassiz Fund (1911)	50,000.00
George Russell Agassiz Fund. Special (1912)	50,000.00
Maria Whitney and James Lyman Whitney Fund (1912)	1,187.84
Louis Cabot Fund (1917)	6,401.22
Harvard Endowment Fund (1917)	1,000.00
William and Adelaide Barbour Fund (1923)	22,071.30
William Brewster Fund (1924)	60,316.68
Anonymous No. 7 Fund (1925)	50,716.77
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	\$1,061,092.60

The payments on account of the Museum are made by the Bursar of Harvard University, on vouchers approved by the Director. 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.) can be applied for the benefit of one or more students of Natural History, either at the Museum, the United States Fish Commission Station at Woods Hole, the Stations at Bermuda, or the Tortugas.

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."

Applications for the tables reserved for advanced students at the Woods Hole Station should be made to the Faculty of the Museum before the 1st of May. Applicants should state their qualifications, and indicate the course of study they intend to pursue.

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

PUBLICATIONS
OF THE
MUSEUM OF COMPARATIVE ZOÖLOGY
AT HARVARD COLLEGE.

There have been published of the BULLETIN Vols. I. to LIV., LVI. to LXV.; of the MEMOIRS, Vols. I. to XLII., and also XLIV. to XLVIII.

Vols. LV., LXVI. and LXVII. of the BULLETIN, and Vols. XLIII., XLIX., L. and LI. of the MEMOIRS, are now in course of publication.

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 Explorations.

The following publications are in preparation: —

Reports on the Results of Dredging Operations from 1877 to 1880, in charge of Alexander Agassiz, by the U. S. Coast Survey Steamer "Blake," Lieut. Commander C. D. Sigsbee, U. S. N., and Commander J. R. Bartlett, U. S. N., commanding.

Reports on the Results of the Expedition of 1891 of the U. S. Fish Commission Steamer "Albatross," Lieut. Commander Z. L. Tanner, U. S. N., commanding, in charge of Alexander Agassiz.

Reports on the Scientific Results of the Expedition to the Tropical Pacific, in charge of Alexander Agassiz, on the U. S. Fish Commission Steamer "Albatross," from August, 1899, to March, 1900, Commander Jefferson F. Moser, U. S. N., commanding.

Reports on the Scientific Results of the Expedition to the Eastern Tropical Pacific, in charge of Alexander Agassiz, on the U. S. Fish Commission Steamer "Albatross," from October, 1904, to April, 1905, Lieut. Commander L. M. Garrett, U. S. N., commanding.

These publications are issued in numbers at irregular intervals. Each number of the Bulletin and of the Memoirs is 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, Mass.