



ANNUAL REPORT
OF
THE DIRECTOR
OF THE
MUSEUM OF COMPARATIVE ZOOLOGY
AT HARVARD COLLEGE
TO THE
PRESIDENT AND FELLOWS OF HARVARD COLLEGE
FOR
1912-1913.

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

1913.

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, LIEUTENANT COMMANDER L. M. GARRETT, U. S. N., COMMANDING, PUBLISHED OR IN PREPARATION:—

- A. AGASSIZ. V.¹ General Report on the Expedition.
- A. AGASSIZ. I.¹ Three Letters to Geo. M. Bowers, U. S. Fish Com.
- A. AGASSIZ and H. L. CLARK. The Echini.
- H. B. BIGELOW. XVI.¹⁰ The Medusae.
- H. B. BIGELOW. XXIII.²³ The Siphonophores.
- H. B. BIGELOW. XXVI.²⁶ The Ctenophores.
- R. P. BIGELOW. The Stomatopods.
- O. CARLGRÉN. The Actinaria.
- S. F. CLARKE. VIII.⁸ The Hydroids.
- W. R. COE. The Nemertean.
- L. J. COLE. XIX.¹⁹ The Pycnogonida.
- W. H. DALL. XIV.¹⁴ The Mollusks.
- C. R. EASTMAN. VII.⁷ The Sharks' Teeth.
- S. GARMAN. XII.¹² The Reptiles.
- H. J. HANSEN. The Cirripeds.
- H. J. HANSEN. XXVII.²⁷ The Schizopods.
- S. HENSHAW. The Insects.
- W. E. HOYLE. The Cephalopods.
- W. C. KENDALL and L. RADCLIFFE. XXV.²⁵ The Fishes.
- C. A. KOFOID. III.³ IX.⁹ XX.²⁰ The Protozoa.
- C. A. KOFOID and J. R. MICHENER. XXII.²² The Protozoa.
- C. A. KOFOID and E. J. BIGDEN. XXIV.²⁴ The Protozoa.
- P. KRUMBACH. The Sagittae.
- R. VON LENDENFELD. XXI.²¹ The Siliceous Sponges.
- H. LUDWIG. The Holothurians.
- H. LUDWIG. The Starfishes.
- H. LUDWIG. The Ophiurans.
- G. W. MÜLLER. The Ostracods.
- JOHN MURRAY and G. V. LEE. XVII.¹⁷ The Bottom Specimens.
- MARY J. RATHBUN. X.¹⁰ The Crustacea Decapoda.
- HARRIET RICHARDSON. II.² The Isopods.
- W. E. RITTER. IV.⁴ The Tunicates.
- ALICE ROBERTSON. The Bryozoa.
- B. L. ROBINSON. The Plants.
- G. O. SARS. The Copepods.
- F. E. SCHULZE. XI.¹¹ The Xenophyphoras.
- H. R. SIMROTH. The Pteropods and Heteropods.
- E. C. STARKS. XIII.¹³ Atelaxia.
- TH. STUDER. The Alcyonaria.
- JH. THIELE. XV.¹⁵ Bathysciadium.
- T. W. VAUGHAN. VI.⁶ The Corals.
- R. WOLTERECK. XVIII.¹⁸ The Amphipods.
- R. V. CHAMBERLIN. The Annelids.

¹ Bull. M. C. Z., Vol. XLVI., No. 4, April, 1905, 22 pp.

² Bull. M. C. Z., Vol. XLVI., No. 6, July, 1905, 4 pp., 1 pl.

³ Bull. M. C. Z., Vol. XLVI., No. 9, September, 1905, 5 pp., 1 pl.

⁴ Bull. M. C. Z., Vol. XLVI., No. 13, January, 1906, 22 pp., 3 pls.

⁵ Mem. M. C. Z., Vol. XXXIII., January, 1906, 90 pp., 96 pls.

⁶ Bull. M. C. Z., Vol. L., No. 3, August, 1906, 14 pp., 10 pls.

⁷ Bull. M. C. Z., Vol. L., No. 4, November, 1906, 26 pp., 4 pls.

⁸ Mem. M. C. Z., Vol. XXXV., No. 1, February, 1907, 20 pp., 15 pls.

⁹ Bull. M. C. Z., Vol. L., No. 6, February, 1907, 48 pp., 18 pls.

¹⁰ Mem. M. C. Z., Vol. XXXV., No. 2, August, 1907, 56 pp., 9 pls.

¹¹ Bull. M. C. Z., Vol. LI., No. 6, November, 1907, 22 pp., 1 pl.

¹² Bull. M. C. Z., Vol. LII., No. 1, June, 1908, 14 pp., 1 pl.

¹³ Bull. M. C. Z., Vol. LII., No. 2, July, 1908, 8 pp., 5 pls.

¹⁴ Bull. M. C. Z., Vol. XLIII., No. 6, October, 1908, 285 pp., 22 pls.

¹⁵ Bull. M. C. Z., Vol. LII., No. 5, October, 1908, 11 pp., 2 pls.

¹⁶ Mem. M. C. Z., Vol. XXXVII., February, 1909, 243 pp., 48 pls.

¹⁷ Mem. M. C. Z., Vol. XXXVIII., No. 1, June, 1909, 172 pp., 5 pls., 3 maps.

¹⁸ Bull. M. C. Z., Vol. LII., No. 9, June, 1909, 26 pp., 8 pls.

¹⁹ Bull. M. C. Z., Vol. LII., No. 11, August, 1909, 10 pp., 3 pls.

²⁰ Bull. M. C. Z., Vol. LII., No. 13, September, 1909, 48 pp., 4 pls.

²¹ Mem. M. C. Z., Vol. XLI., August, September, 1910, 323 pp., 56 pls.

²² Bull. M. C. Z., Vol. LIV., No. 7, August, 1911, 38 pp.

²³ Mem. M. C. Z., Vol. XXXVIII., No. 2, December, 1911, 232 pp., 32 pls.

²⁴ Bull. M. C. Z., Vol. LIV., No. 10, February, 1912, 16 pp., 2 pls.

²⁵ Mem. M. C. Z., Vol. XXXV., No. 3, April, 1912, 98 pp., 8 pls.

²⁶ Bull. M. C. Z., Vol. LIV., No. 12, April, 1912, 38 pp., 2 pls.

²⁷ Mem. M. C. Z., Vol. XXXV., No. 4, July, 1912, 124 pp., 12 pls.

ANNUAL REPORT

OF

THE DIRECTOR

OF THE

MUSEUM OF COMPARATIVE ZOOLOGY

AT HARVARD COLLEGE

TO THE

PRESIDENT AND FELLOWS OF HARVARD COLLEGE

FOR

1912-1913.

CAMBRIDGE, U. S. A.:

PRINTED FOR THE MUSEUM.

1913.

FEBRUARY
1913
CAMBRIDGE, MASS.

MUSEUM OF COMPARATIVE ZOÖLOGY.

Faculty.

ABBOTT LAWRENCE LOWELL, *President.*
HENRY P. WALCOTT. GEORGE L. GOODALE.
SAMUEL HENSHAW, *Director.* JOHN E. THAYER.

Committee on the Museum.

HENRY P. WALCOTT. GEORGE L. GOODALE.

Officers.

SAMUEL HENSHAW *Director.*
WALTER FAXON *Curator of Crustacea and Mollusca.*
SAMUEL GARMAN *Curator of Reptiles, Amphibians, and
Fishes.*
WILLIAM BREWSTER *Curator of Birds.*
OUTRAM BANGS *Curator of Mammals and Associate
Curator of Birds.*
HUBERT L. CLARK *Curator of Echinoderms.*
HENRY B. BIGELOW *Curator of Coelenterates.*
ROBERT W. SAYLES *Curator of the Geological Collections.*
PERCY E. RAYMOND *Curator of Invertebrate Palaeontology.*
THOMAS BARBOUR *Associate Curator of Reptiles and Amphibi-
ans.*
RALPH V. CHAMBERLIN . *Curator of Arachnids, Myriopods, and Worms.*
JOHN C. PHILLIPS *Associate Curator of Birds.*
FRANCES M. SLACK *Librarian Emerita.*
GEORGE NELSON *Preparator.*
WALTER R. ZAPPEY *Preparator.*

REGINALD A. DALY *Sturgis Hooper Professor of Geology.*
EDWARD L. MARK *Hersey Professor of Anatomy.*
GEORGE H. PARKER *Professor of Zoölogy.*
WILLIAM E. CASTLE *Professor of Zoölogy.*
WILLIAM M. WHEELER . . *Professor of Economic Entomology.*
ROBERT DE C. WARD *Professor of Climatology.*
WALLACE W. ATWOOD . . . *Professor of Physiography.*
LOUIS C. GRATON *Professor of Mining Geology.*
JAY B. WOODWORTH *Associate Professor of Geology.*
HERBERT W. RAND *Assistant Professor of Zoölogy.*
PERCY E. RAYMOND *Assistant Professor of Palaeontology.*
CHARLES T. BRUES *Assistant Professor of Economic Entomology.*

REPORT.

TO THE PRESIDENT AND FELLOWS OF HARVARD COLLEGE:—

THE courses of instruction in Zoölogy, Geology, and Geography during the Academic year 1912–1913 were given, as in past years, in the Laboratories and Lecture rooms of the Museum.

The nineteen courses in Zoölogy were taken by 407 students in Harvard University, and in Radcliffe College the nine courses were taken by 56 students.

In 1911–1912 these numbers were:—

Harvard:— 19 courses, 263 students;

Radcliffe:— 5 courses, 34 students.

In Geology and Geography during the year 1912–1913, fifteen courses were offered in Harvard University and were attended by 232 students, and three courses were taken by 24 Radcliffe College students.

During 1911–1912 there were seventeen courses in Harvard University and three courses in Radcliffe College, taken by 268 and 23 students respectively.

The working force of the Museum has been increased by the appointment of Dr. Ralph V. Chamberlin as Curator of Worms, Arachnids, and Myriopods, and of Dr. John C. Phillips as Associate Curator of Birds.

Dr. Chamberlin's appointment brings to the Museum one of the most valuable collections of American myriopods extant, together with a large amount of research material in other groups. His time for the present will be divided between the study and care of the myriopods and the preparation of the Report on the annelids of the 1891, 1899–1900, and 1904–1905 Albatross Expeditions, a work left unfinished by the late Dr. W. McM. Woodworth.

The accession of Dr. Phillips as an active Curator makes the Ornithological Department the most adequately equipped Department in the Museum. Both of these appointments add to the strength of the research work of the Museum.

By Mr. George R. Agassiz's generosity, the permanent funds of the Museum have been increased by his gift of twenty-five thousand dollars (\$25,000.—), the income to be available for the general purposes of the Museum.

Gifts for present use for which grateful acknowledgements are due have been received from Miss A. A. Sprague, Col. John E. Thayer, Drs. Thomas Barbour and John C. Phillips, and Mr. Louis Agassiz Shaw.

From its own resources and from the voluntary aid of the U. S. Bureau of Fisheries, Col. John E. Thayer, Dr. J. C. Phillips, Dr. Thomas Barbour, Prof. Theodore Lyman and others, the Museum has benefited by the field work of several of its staff and of others engaged temporarily.

Professor Lyman's trip to the Altai Mountains was referred to in the Report for 1911-1912; it has added to the collection a fine series of about 150 mammals and 287 birds. Mr. Bangs has published (*Bull. M. C. Z.*, **54**, p. 461-474) a report on the birds, and Mr. Hollister has described some of the mammalian novelties in advance of a complete review of all the species obtained. This trip of Professor Lyman's also added a few specimens in groups other than birds and mammals.

Dr. John C. Phillips accompanied by Dr. G. M. Allen spent the winter months in the Sudan. Their collections, which Dr. Phillips has presented to the Museum, contain more than 500 vertebrates, including a number of skeletons of large mammals, interesting series of birds and small mammals (skins and skulls), together with a number of insects and terrestrial invertebrates.

By the generosity of Col. John E. Thayer, Mr. C. J. Maynard was engaged to visit the Bahamas. As the Museum already has extensive suites of Bahaman material in many groups, Mr. Maynard's object was selective rather than general collecting. On account of his earlier explorations among the Bahamas, important results were anticipated from Mr. Maynard's visit, but unfortunately, after a few days' work in New Providence, he met with a serious accident, and was obliged to abandon the trip and return north.

Dr. Thomas Barbour made another successful trip to Cuba early in the year, (January-March, 1913). He was accompanied during part of the time by Prof. W. M. Wheeler and Mr. Louis Agassiz Shaw, and during his entire stay in Cuba had the benefit of the enthusiastic coöperation of Dr. Carlos de la Torre. Dr. Barbour secured, in addition to many interesting invertebrates,

large series of reptiles and amphibians, and many of the rarest birds and mammals still extant on the island. Dr. Barbour and Mr. Shaw also purchased and presented to the Museum a series of Cuban Lepidoptera.

Prof. P. E. Raymond's field work has added a large number of valuable invertebrate fossils to the collection of the Museum. This material is from the Ordovician of Ontario and Quebec, from the Upper Cambrian and other formations in New York, and from the Upper Ordovician of Ohio and Indiana, and the Silurian about Chicago and Milwaukee.

As in 1912 the Museum is indebted to the U. S. Bureau of Fisheries for the use of the U. S. F. C. Schooner GRAMPUS during July and August, 1913. In charge of Dr. H. B. Bigelow with Mr. W. W. Welsh as Assistant, the field of work of the GRAMPUS ranged from Nova Scotia to the Chesapeake. Serial temperatures and water samples were taken, currents measured, and collections of plankton made. With the coöperation of the Bureau of Fisheries and of Capt. John MacFarland of the Schooner VICTOR, Dr. Bigelow continued his oceanographic studies during the winter of 1912-1913 and the spring of 1913.

Dr. R. V. Chamberlin has carried on field work in the west in Arizona and California, and in New England in Massachusetts, Vermont, and New Hampshire. This work, though directed largely toward the myriopod and arachnid fauna, has contributed valuable collections in other groups.

Mr. W. F. Clapp, by the courtesy of the Bay State Fishing Company and with the cordial aid of Captain Steele and the crew of the trawler RIPPLE, spent a week in February, 1913, off the eastern side of George's Bank. The material obtained, though less extensive than that secured in 1913 from the western side of George's, adds several new records to the molluscan fauna of the Banks, as well as many invertebrates of interest to the collections of the Museum.

Mr. George Nelson's third trip to Swan Island in March and April, 1913, yielded additional material for both the research and exhibition collections. Mr. Nelson also collected for the Gray Herbarium a representative set of the plants of Swan Island.

In the interest of the Museum, Mr. W. M. Mann visited Haiti, during November and December, 1912, and January and February, 1913, working at widely separated points. The collections, principally reptiles, insects, myriopods, and spiders, though not thoroughly examined, contain many rare and new species and

supplement the earlier collections of Weinland (1860), Uhler (1866), and Frazar (1883), also in the Museum.

Though the collections of the Museum have been enriched by the bequest of the late Frederick Blanchard of Tyngsboro, entomology is the poorer by his death which occurred on 2 November, 1912. Mr. Blanchard was appointed an Associate in Entomology in the University Museum in 1911, but his interest in the Museum of Comparative Zoölogy antedated his official connection with the University by more than a quarter of a century. Since the accession of the great John L. Leconte collection of North American Coleoptera in July, 1884, Mr. Blanchard worked during his too infrequent visits to the Museum more for the benefit of the Museum and for the scientific publications of others than for his own reputation; few systematic papers of value relating to North American Coleoptera have been published during the past two decades that have not benefited by his unselfish work. His collection of North American beetles, one of the two or three most valuable collections in private hands, contains more than six thousand species, in series sufficient in many cases to illustrate variation in structure and in distribution. It is not, however, the size of the collection, but the study it represents, that is the chief value of the Blanchard collection. A collector since his boyhood, Mr. Blanchard was also one of the keenest and most accurate of students and the neatest of preparators. It is no exaggeration to state that his collection will bear comparison with any, in the close separation of nearly allied forms and in the nicety of mounting and of labeling.

To every interest of the Museum, the collections both research and exhibition, the library, and the publications, Col. John E. Thayer gives his constant and generous support.

For a gift of much scientific value, a series of specimens illustrating the development of three ancient types of fishes, Lepidosiren, Protopterus, and Polypterus, the Museum is indebted to Prof. J. Graham Kerr. This material, which is still unique, is of great morphological interest.

One of the most important acquisitions received during the year is the large collection of Attidae, (Jumping spiders), the joint gift of Dr. George W. Peckham and Mrs. Elizabeth G. Peckham of Milwaukee. Several years ago, in 1908, Mr. and Mrs. Peckham gave the Museum the types of many North American Attidae described by themselves. The collection presented this year contains a very large number of species from Europe, Asia, Africa, Australia, and South America. Its great value consists in the authentic

determination of the species, the large number of types described by the donors, and many cotypes of Count Keyserling, Simon, and others. This collection, combined with that previously formed, makes one of the most important of the family in existence.

Dr. Roland Thaxter's stay in Grenada and Trinidad has added much desirable material to many departments of the Museum; his beautiful series of more than two dozen specimens of *Peripatus* is especially noteworthy.

To Prof. Harrison W. Smith of the Massachusetts Institute of Technology, the Museum is indebted for a valuable series of vertebrates and invertebrates obtained during his trip to Sarawak, Borneo. Probably the specimen most worthy of note received from Professor Smith is shown on Plate 1. This species, *Lanthanotus borneensis*, of which until recently there were but two specimens, one in the Museum at Sarawak and the other in Vienna, is related to the poisonous Helodermatidae of North America, and is the only representative of the Lanthanotidae.

The Museum is also indebted to the Hon. W. C. Forbes for many desirable vertebrates, principally birds, obtained in the Philippines, a number of which were new to the Museum collection; to Prof. J. I. Westengard for an excellent specimen of *Herpetodon tentaculatum*, an aquatic snake peculiar to the brackish waters of Siam and Cochin China; to Mr. L. W. Swett for the types of 78 species of Geometridae described by himself and others in recent years; to Prof. F. W. Putnam for a large series of fishes brought together many years ago; and to Col. John Caswell for a number of birds and mammals collected during his recent trip to Eastern Africa.

Acknowledgement for gifts to the collections are also due Miss H. E. Hooker, Miss M. R. Rotch, Drs. W. S. Bigelow, A. C. Coolidge, and W. M. Wheeler.

The details of the work accomplished in the several departments, and the additions to the same received during the year, will be found in the reports of the Curators.

Through the zeal of Miss Elizabeth B. Bryant, the collection of Araneinae continues in excellent condition, with recent accessions properly incorporated, and the whole well labeled and arranged.

Mr. George Nelson's work has been continued along the same lines as in recent years. He has mounted for exhibition a number of fishes, reptiles, and mammals, one of the latter group, a series of

North American Squirrels, Chipmunks, and Spermophiles is shown on Plate 2.

Mr. Walter R. Zappey's work also varies little from year to year; owing to circumstances, his time during the year has been devoted very largely to the research collections of birds and mammals. He has finished a few mounts for exhibition, among which a fine Japanese Deer, *Cervus sika*, the gift of Mr. Louis A. Shaw, may be noted.

In addition to the regular staff of the Museum, Miss Elvira Wood, Dr. G. M. Allen, Mr. W. F. Clapp, and Mr. J. D. Sornborger have been employed during the greater part of the year. Miss Wood has finished labeling the research collection of crinoids, and has verified the identifications and relabeled the exhibition series in the systematic room. She has made some progress with the card catalogue of the crinoids, in addition to regular curatorial work. Dr. Allen accompanied Dr. J. C. Phillips on an expedition to the Sudan, working wholly for the Museum during this time; for the remainder of the year, he devoted three days of each week to the research collection of mammals. With the exception of a few skins of large mammals and some of the latest acquisitions, the whole collection of mammals is catalogued and systematically arranged. As in previous years, Dr. Allen has given some time to investigation. Mr. Clapp has effected many advantageous exchanges, and has kept recent accessions identified, labeled, and arranged. When not thus occupied, he has given his time wholly to similar work upon the research collection of Gasteropoda. Mr. Sornborger has worked throughout the year upon the osteological specimens received in the rough; he has finished the greater part of the skeletons of large mammals received from the African expedition of Dr. W. L. Smith in 1909, and also all recent accessions.

The Library consists of 50,296 volumes and 46,568 pamphlets; 1,141 volumes and 1,033 pamphlets have been added during the year.

To assist in the publication of Contributions from the Zoölogical and Geological Laboratories, the sum of \$350. was granted by the Corporation.

The publications of the year include three numbers of the Memoirs, seven numbers of the Bulletin, and the Annual Report, a total of 725 (410 quarto, 315 octavo) pages, and 63 (16 quarto, 47 octavo) plates. Two of the Bulletins by Professor Woodworth were issued in the Geological series, and one of the Memoirs by

Dr. Barbour appears as a Contribution from the Zoölogical Laboratory; five of the Bulletins and two of the Memoirs represent work upon the collections of the Museum.

SAMUEL HENSHAW,
Director.

REPORT ON THE ZOÖLOGICAL LABORATORY.

BY E. L. MARK.

The instruction in zoölogy was altered rather fundamentally in the year 1912-1913. Zoölogy 2 was established several years ago as a part of a course in Biology,— then designated Natural History 5,— and was intended to give students seriously interested in biological subjects an opportunity to get substantial and accurate knowledge of the morphology of all the chief types of animals by means of dissections. Much stress was laid upon laboratory work, though not to the exclusion of formal lectures intended to supplement and correlate the information got in the laboratory. Originally the work was inseparable from a correspondingly organized course in botany. The rule that students to count either the botanical or zoölogical part of the course must take both, was relaxed. It has now been decided to give up Zoölogy 2, and to incorporate so much of it as is possible in Zoölogy 1, a course hitherto given to large numbers of students desiring a general-survey course in the subject.

A further reduction in the formal instruction offered primarily for undergraduates was effected by reducing the time given to the Comparative Anatomy of Vertebrates (Zoölogy 3) from a full course to a half course.

The title of Zoölogy 4 was changed from Microscopical Anatomy to General Histology, thus expressing a change in the content of the course, which was described in the Report for 1911-1912.

A new course, taking the number of the abandoned Zoölogy 2, Genetics and Eugenics, was given by Professor Castle and was made accessible to students who had had any elementary course in biology (zoölogy, botany, or physiology).

Aside from the changes noted above, the courses in Zoölogy were substantially the same as those offered in previous years.

The enrollment in courses is given below, as usual, in tabular form. Table I gives the statistics for students in Harvard University, Table II for those in Radcliffe College.

TABLE I.

Courses for 1912-1913	Graduate			Sen.	Jun.	Soph.	Fresh.	Spec.	Uncl.	Total
	A. & S.	Ap. Sci.	Busi.							
Zoölogy 1				9	19	36	56	5	7	132
" 2	1		1	31	32	41	20	3	5	134
" 3				5	10	4		2	3	24
" 4	4	2		3	7	2		1		19
" 5a	2			3	2	1				8
" 7a	4	5		2	2					13
" 7b	2	5		2	2					11
" 7c		1								1
" 7d		7								7
" 11	6	2		2	4					14
" 12	4	1								5
" 14b	7	3		2	2	1				15
" 17	5									5
" 20b	2									2
" 20c	5									5
" 20d		4								4
" 20e	2									2
" 20f	1	4								5
" 20g	1									1
Sums	46	34	1	59	80	85	76	11	15	407

TABLE II.

Courses 1912-1913	Gr.	Sen.	Jun.	Soph.	Fresh.	Spec.	Incl.	Total
Zoölogy 1			7	10	12	4	4	37
" 3	1		2	4	2	1		10
" 4	1			1				2
" 5a				1				1
" 14b	1		1					2
" 17	1							1
" 20b	1							1
" 20c	1							1
" 20g	1							1
Sums	7		10	16	14	5	4	56

Zoölogy 1 was, as usual, conducted by Professor Parker, who repeated the course for Radcliffe students. The laboratory work in Harvard was in charge of two chief assistants, Austin Teaching Fellows, Messrs. J. Risser and D. H. Wenrich, and of four sub-

assistants, Messrs. L. B. Arey, F. H. Allport, C. H. Richardson, and H. R. Hunt; that in the Radcliffe course was in charge of Instructor C. T. Brues and sub-assistant Mr. F. H. Allport.

The new half-course, Zoölogy 2, was given by Professor Castle without laboratory work.

The half-course Zoölogy 3 was given in the second half year by Professor Rand, whose assistant in Harvard was Mr. L. B. Arey, in Radcliffe, Mr. A. C. Redfield. The laboratory work was limited to the dissection of a fish, an amphibian, and a mammal.

Professor Rand also gave Zoölogy 4, making use of both invertebrate and vertebrate material in the laboratory. The assistant in Harvard was Mr. A. C. Redfield, in Radcliffe, Mr. B. M. Patten.

The lectures in Zoölogy 5a and 12 were given by Professor Mark, and the laboratory work of both courses was in charge of Austin Teaching Fellow, Mr. J. W. Mavor. Six students not enrolled attended the lectures in Zoölogy 5a.

Professor Wheeler's formal courses, Zoölogy 7a and 7b were given in Cambridge, the laboratory work, in the supervision of which Mr. Brues participated, was at the Bussey Institution.

The same arrangement was followed in Mr. Brues's Forest Entomology (Zoölogy 7d): but in Zoölogy 7c all the work was done at the Bussey Institution.

Zoölogy and Botany 11 was given by Professor Castle and Assistant Professor East in Cambridge.

The lectures in Zoölogy 14b were given by Professor Parker to a class composed of both Harvard and Radcliffe students. Five of these wrote theses in place of laboratory work. Five other students, not enrolled, attended the lectures. Three of those doing laboratory work combined that with the work in Zoölogy 20c. Two students wrote papers that will be published.

Zoölogy 17, by Professor Rand, was likewise given to a class composed in part of Harvard students, in part of Radcliffe students. Three Harvard students took the work as a laboratory course, all the others as a thesis course. One of the theses, that of Mr. E. W. Sinnott, was awarded a Bowdoin Prize. The work of one student was continued in the second half-year as Zoölogy 20g.

In the Teachers' School of Science, Professor Parker gave at the Zoölogical Laboratory a course in zoölogy to twenty-six teachers on Saturday afternoons during the first half year.

There were twenty-two enrollments of students engaged in research. Of these, eleven were of students registered in the Graduate School of Arts and Sciences, eight in the Graduate

Schools of Applied Science, and three in Radcliffe College. Three were enrolled in Zoölogy 20b under Professor Mark, six in Zoölogy 20c under Professor Parker, four in Zoölogy 20d under Professor Castle, five under Professor Wheeler in Zoölogy 20f, and two each in Zoölogy 20e and Zoölogy 20g under Professor Rand. Two of these fulfilled the requirements for the degree of Doctor of Philosophy. Mr. Reynold Albrecht Spaeth, whose thesis was on The physiology of the chromatophores of fishes, received the degree in February; and Mr. James Watt Mavor, whose thesis was entitled Studies on Myxosporidia found in the gall bladder of fishes from the eastern coast of Canada, in June. Mr. Donald Walton Davis, the title of whose thesis was given in the report a year ago, also received the degree in February.

Three students, two in Harvard and one in Radcliffe, were granted aid from the income of the Humboldt Fund to the amount of \$185.16, while pursuing work at the Bermuda Biological Station. In the Bermuda Biological Station for Research there were enrolled nine persons, four of whom were connected with Harvard and one with Radcliffe. The Station was open from June 6 till August 5.

In January, Professor Parker read a paper on Adaptation in animal reactions, at the Cleveland meeting of the American Society of Naturalists, and in February, lectured on The Evolution of the nervous system, at the Vassar Brothers Institute, Poughkeepsie. In May, he delivered an address entitled A biological forecast, at the annual banquet of the Brown University chapter of the Sigma Xi Society.

Eighteen meetings were held by the Zoölogical Club, at which seventeen original papers and reviews of nine others were read. A complete record of the attendance was not kept by the Secretary, but the estimated average attendance was about twenty.

PUBLICATIONS. AUGUST 1, 1912—JULY 31, 1913.

Contributions from the Zoölogical Laboratory.

231. BARBOUR, T.—A contribution to the zoögeography of the East Indian Islands. *Mem. M. C. Z.*, November, 1912, **44**, p. 1-204, 8 pls.
232. CHESTER, W. M.—Wound closure and polarity in the tentacle of *Metridium marginatum*. *Journ. exp. zööl.*, October, 1912, **13**, p. 451-470.

233. PARKER, G. H., and PATTEN, B. M.—The physiological effect of intermittent and of continuous lights of equal intensities. *Amer. journ. phys.*, October, 1912, **31**, p. 22-30.
234. PALMER, S. C.—The numerical relations of the histological elements in the retina of *Necturus maculosus* (Raf.). *Journ. comp. neurol.*, October, 1912, **22**, p. 405-446, 3 pls.
235. GROSS, A. O.—The reactions of arthropods to monochromatic lights of equal intensities. *Journ. exp. zööl.*, May, 1913, **14**, p. 467-514.
236. CHESTER, W. M.—The structure of the gorgonian coral *Pseudoplexaura crassa* Wright and Studer. *Proc. Amer. acad. arts & sci.*, May, 1913, **48**, p. 737-774, 4 pls.
237. PARKER, G. H.—Notes on Röntgen-ray injection masses. *Anat. record*, July, 1913, **7**, p. 247-249.

Contributions from the Bermuda Biological Station for Research.

25. MARK, K. L.—Preliminary study of the salinity of sea-water in the Bermudas. *Proc. Amer. acad. arts & sci.*, April, 1913, **48**, p. 669-678.
26. SMALLWOOD, W. M., and CLARK, E. G.—*Chromodoris zebra* Heilprin: a distinct species. *Journ. morph.*, December, 1912, **23**, p. 625-636.

Other Publications.

- PARKER, G. H.—The relations of smell, taste, and the common chemical sense of vertebrates. *Journ. Acad. nat. sci. Philadelphia*, September, 1912, ser. 2, **15**, p. 219-234.
- Adaptation in animal reactions. *Amer. nat.*, February, 1913, **47**, p. 83-89.
- A brief survey of the field of organic evolution. *Theol. rev.*, July, 1913, **6**, p. 245-266.
- PARKER, G. H., and SHELDON, R. E.—The sense of smell in fishes. *Bull. U. S. bureau fisheries*, May, 1913, **32**, p. 33-46.
- PARKER, G. H., and STABLER, E. M.—Taste, smell and allied senses. *Science*, February, 1913, n. s., **37**, p. 269.

REPORT OF THE STURGIS HOOPER PROFESSOR OF GEOLOGY.

BY REGINALD A. DALY.

On assuming his duties on September 1, 1912, the writer was engaged on two pieces of work which were begun during his term of office at the Massachusetts Institute of Technology as Professor of Physical Geology. The autumn months were partly occupied with the proof-reading of a final report on the Geology of the North American Cordillera at the Forty-ninth parallel of latitude, in two volumes with a portfolio of maps and plates. The work on this subject was begun in 1901 under the Canadian Commissioner of International Boundary Surveys, but the final report was largely written at the Institute of Technology. The writer's sincere thanks are due to the Institute's Corporation for their generosity in providing all available facilities for this work and to several members of the Institute's Faculty for stimulus and suggestion freely given in the years occupied with the writing.

The second investigation noted is a study of the Canadian Cordillera along the line of the Canadian Pacific railway. Begun in 1911, the field work was finished in September, 1912. During the winter a preliminary report of the 1912 season was sent to press and a fuller account of the Cordilleran geology in this section was prepared for the guide book of the International Geological Congress. The writer, as delegate of the University and of the Museum, attended the Congress at Toronto, August, 1912, and took part in four of the official excursions, acting as guide for the Congress party traversing the Selkirk and Columbia ranges and the Interior Plateaus, British Columbia.

Most of the year was occupied with the writing of a book on Igneous rocks and their origin; the manuscript, with 205 text figures and 2 plates, was sent to the publisher in July.

Owing to the kindness of Prof. E. L. Mark, the writer was enabled to study the core of a 1280-foot boring in Bermuda. It was found that the Recent and Tertiary limestones of that island rest on a basaltic volcano, the lava of which is remarkably fer-

ruginous and magnetic. The local magnetic anomalies discovered by the CHALLENGER expedition, and the nature of the island are therewith explained. It was intended to report in detail to the Bermuda Biological Station regarding the subject, but the publication of a preliminary note on the same boring by Drs. T. W. Vaughan and L. V. Pirsson showed that it was being carefully studied by competent observers and the writer has withdrawn from the investigation.

At the request of the President of the University the writer has acted as Chairman of the Geological Department and has assumed charge of Geology 4, the elementary course in geology. He also conducted an advanced course on the Geology of the igneous rocks and another, research, course on the same subject.

This year the Corporation voted a special fund to furnish the Sturgis Hooper room, hitherto not used, and it is now equipped as an office and as a lecture room for small, advanced classes. The unappropriated balance of the Sturgis Hooper fund has been chiefly expended on drawings for the work on Igneous rocks and their origin.

PUBLICATIONS. AUGUST 1, 1912—JULY 31, 1913.

Geology of the North American Cordillera at the forty-ninth parallel of latitude. 2 vols. *Appendix 2 of the Report of the chief astronomer for Canada in 1910.* Ottawa, 1913, 2 vols., xxv+857 pp., with 17 maps and 2 plates.

Reconnaissance of the Shuswap Lakes and vicinity (south-central British Columbia). *Summary rept. Geological survey. Dept. mines Canada, for 1911, 1912,* p. 165-174.

Some chemical conditions in the Pre-cambrian ocean. *Compte rendu 11th Congr. géol. intern.,* 1912, 7 pp.

Sills and laccoliths illustrating petrogenesis. Toronto, 1913. 15 pp.

Transcontinental excursion C 1, Toronto to Victoria and return, via Canadian Pacific and Canadian Northern Railways. Introduction to the geology of the Cordillera. Annotated guide. (Golden to Savona). *Excursions of the 12th International geological congress, Guide book, no. 8,* p. 105-167; 202-234. (Also Editor of the book).

REPORT OF THE DEPARTMENT OF GEOLOGY AND GEOGRAPHY.

BY REGINALD A. DALY.

The staff of this Department has been greatly strengthened by new appointments during the year 1912-1913. Prof. Wallace Walter Atwood of Chicago University and Secretary of the Chicago Academy of Sciences, has been appointed Professor of Physiography. He is an able, inspiring teacher and his numerous publications show a very high order of capacity on the research side of his special field. His experience has been unusually broad, extending over the geographical sciences, glacial geology, general dynamical geology, and certain phases of economic geology. Professor Atwood's appointment means a rapid development of the geographical activities of the Department, which were established under the masterly leadership of Professor Davis.

The appointment of Prof. Alexander George McAdie as Professor of Meteorology and Director of the Blue Hill Meteorological Observatory is noted in a following paragraph, in connection with the statement of the new, closer relation of the Observatory to this Department.

On February 15 Prof. Louis Caryl Gratton first assumed his duties as Professor of Mining Geology in this Department. He has already shown his great value to the Department by organizing a laboratory for instruction and research in his field. Through his own prestige with mining corporations he has secured a large fund for a special, highly important investigation which is now under way. The results already accomplished show that the expectations raised by his appointment are amply justified.

Mr. Edward J. Whittaker was appointed assistant in Geology but resigned to take a position in the Geological Survey of Canada. Mr. Ignacio Bonillas was appointed in his place.

Owing largely to the lack of an instructor in the geographical courses the number of takings in this Department was, this year, only 232 (distributed through 15 courses and half courses of instruction) as against 268 takings last year. Three half courses in Radcliffe College were attended by 24 students, as against 23 students last year.

Four men passed the preliminary examination for the degree of Doctor of Philosophy.

The Department has been generously aided by the members of its Visiting Committee, who have personally donated the sum of \$650 for equipping the laboratory of economic geology. Mr. Robert W. Sayles has continued his long list of benefactions by meeting the heavy costs of completing the exhibition geological collection, which is of increasing value to the Department. Through the generosity of Mr. Sayles a large model of Kilauea, the volcano in Hawaii, is being made by Mr. George C. Curtis. Mr. Curtis has spent several months securing the required data in the field. Mr. R. A. F. Penrose kindly subscribed the sum of \$50 for the purchase of special books.

Professor Gratton has presented to the section of mining geology one Sauveur metallographic microscope and one Zeiss vertical illuminator. Messrs. Phelps, Dodge and company, New York, have donated one petrographic microscope. The plant in economic geology has been further increased by appropriations from the Secondary enrichment investigation fund, to the extent of \$718 expended for office and field equipment and \$59 expended for thin sections.

The student palaeontological collection has received the following additions:— many invertebrate fossils and three Lower Devonian fossil fishes, donated by Prof. J. B. Woodworth; four specimens of *Botriolepis* from Quebec and invertebrate fossils from Nova Scotia, donated by Mr. Edward Wigglesworth; other fossils donated by Professor Raymond; a collection of recent shells and corals, donated by this Museum from the Miss M. R. Rotch collection; fifty specimens and fifty thin sections of Palaeozoic Bryozoa, by purchase.

Mr. Edward Wigglesworth, Curator of the Gardner collection of photographs, reports as follows:—

	Photographs	Slides	Negatives
Accessions since last report	37	37	244
Unidentified views	150	0	155
Duplicates	116	0	0
Broken	0	4	0
Last accession number	7,342	6,904	0
Number now in collection	7,231	7,204	1,084
Card catalogued	0	7,204	0

The more important acquisitions during the year were as follows:—

244 negatives of South America and the Southern Pacific Islands, the gift of Dr. Thomas Barbour;

A set of photographs showing the effect of the Omaha tornado;

A set of photographs of the Grand Coulee District of Washington.

During the year six electric-light fixtures were installed over the slide case and two over the photograph cases. These have been fitted with special reflectors and powerful tungsten lamps, greatly facilitating the use of the collection on dark days.

The Josiah Dwight Whitney scholarships were awarded as follows:—\$100 to Mr. George Belchic, student in the Rocky Mountain summer course in geology; \$100 and the balance of the income to Mr. W. G. Foye, 2G, for geological and geographical studies in Ontario.

Professors Wolff and Palache continued instruction in the economic geology of non-metalliferous substances, but this course now extends throughout the year and is to be given by Professors Graton and Palache, with lectures also by Professors Wolff, Smyth, and Jeffrey. A new half course, on the geology of iron ores, under Prof. H. L. Smyth, has been added to the Departmental program.

Professor Ward was absent on sabbatical leave during the first half year. From August 22 to October 18 he took part in the transcontinental excursion of the American Geographical Society. The early part of the winter was spent in preparing two papers for publication, and in the revision of lectures. During the second half year Professor Ward gave Geology B (29 students); Geology 19 (4 students); Geology 20e (2 students); and Geology B at Radcliffe College (8 students). During February he also gave at the request of the Graduate School of Business Administration, a course of six illustrated lectures on the geography of South America, for the students in the course on commercial relations with South America. These lectures were also attended by students in Spanish-American history. Much time was spent during the entire year in connection with Blue Hill Observatory, of which, after May 1, Professor Ward was unofficially in charge.

Mention was made in the last report of the death of Prof. A. Lawrence Rotch, in April, 1912. The endowment fund of \$50,000 which was left by him for the maintenance of the Blue Hill Observatory not being available until the end of April, 1913, Mrs. Rotch very generously agreed to pay all the running expenses of the Observatory for one year. Her generosity made it possible to continue the work at Blue Hill without interruption, thus adding

another year of complete records to the already long period of observations. Mr. A. L. Wells, who had been connected with the Blue Hill Observatory staff for several years, has continued as Observer in charge. Mr. C. F. Brooks, a graduate student in Meteorology, has been Research assistant at the Observatory. With the coming of the new Director, Professor McAdie, and with the close affiliation between the Department and the Observatory, made possible by the bequest of the late Professor Rotch and the further assistance given by Mrs. Rotch, the University will be able to offer its students unusually favorable opportunities for practical meteorological work. Professor McAdie will bring to his work here not only his experience as a teacher of meteorology but also the practical knowledge gained during many years of service in the Weather Bureau. The Department will be greatly strengthened by the addition of Professor McAdie to its staff.

Professor Daly assumed charge of Geology 4 (113 students), opened a new half course on the Geology of the igneous rocks (6 graduate students), collaborated in the research course 20c, and acted as Chairman of the Department during the year. His other work of the year is recorded in the Report of the Sturgis Hooper Professor.

Prof. J. B. Woodworth gave the instruction in the following courses:—

Geology 5, (47 students); Geology 8 (6 students); Geology 16 (5 students); Radcliffe College, Geology 4 (14 students); Radcliffe College, Geology 8 (2 students). In Geology 20c, research course, Mr. Foye made a resurvey of certain faults in the Boston area, in the preparation of a special map designed to show the presumed points of yielding to seismic stress. Mr. Foye also carried out certain experiments in seismology and designed and superintended the manufacture of a model horizontal pendulum for demonstration in the laboratory. Mr. D. C. Barton continued his studies on the origin, distribution, and interpretation of arkose. In June he set out, with the aid of a grant from the Sheldon fund, upon a field study of the described localities of arkose in the British Islands, France, and Egypt. Mr. Donald B. MacMillan in the fall of 1912 was given some instruction in the recognition of glacial deposits, as a preparation for his Arctic explorations.

Professor Woodworth also took charge of the field work of one student in Mining 28 for the Department of mining.

Professor Woodworth during the year saw through the press his report on the Shaler Memorial Expedition to Chile, and pre-

pared and published a biographical notice of the late Prof. R. S. Tarr. A paper on the installation and management of a seismographic station, and another on field geology were also written for publication in current journals. He continued the work of the Harvard Seismographic Station, issuing mimeographed monthly bulletins of earthquakes recorded at the Station, and establishing an exchange of data with the principal observatories in Germany, Austria, Australia, etc. A detailed report of the work of the station will be found in a forthcoming Bulletin of the Museum. Mr. G. M. Flint performed the ordinary routine work of the changing of records, etc., in the instrument room.

In July, 1913, Professor Woodworth, being relieved of the charge of the Rocky Mountain course in field work, attended the International Geological Congress in Canada.

Professor Graton, on half-time appointment, conducted Geology 10 (4 students) and Geology 20b (4 students). Much of his time was occupied with organizing and directing an investigation on the secondary enrichment of the copper ores of the United States. With a large staff of expert assistants he has begun the task of assembling in the Museum the great amount of ore and rock material from the leading mines. The field work will continue several seasons. The very considerable cost of the undertaking is defrayed by the generous help of the copper-producing corporations throughout the country. During the summer Professor Graton carried on geological work in the copper mines of Butte, Montana, and in the winter he made professional visits to the mining districts of Bisbee and Globe, Arizona. He presented papers before the American and Canadian Mining Institutes, the Geological Society of Washington, and the Southwestern Conference of Mining Geologists.

Professor Raymond gave Palaeontology 1 (4 students); Palaeontology 20 (2 students). In the research course Mr. Winthrop P. Haynes prepared an article on the Brachiopoda of the Upper Devonian of Montana, and Mr. Donald C. Barton finished a paper on A new genus of the Cheiruridae, with descriptions of new species.

During the Easter recess, Professor Raymond, accompanied by Mr. Winthrop P. Haynes, took a small party of students to some of the typical exposures of fossiliferous Palaeozoic strata in eastern New York. During the three days occupied by this trip, the party collected from most of the formations from the Upper Cambrian to the Middle Devonian.

In the summer Professor Raymond attended the session of the 12th International Geological Congress at Toronto as one of the delegates of the University and of the Museum, and took part in two of the excursions, acting as a guide on the maritime excursion and as leader on the Montreal-Ottawa Excursion.

Mr. W. P. Haynes was assistant in Geology 4 and 5 (Harvard), Assistant in Geology 4 (Radcliffe) and Instructor in Geology 5 (Radcliffe). During the summer he conducted the field course S 5, in Geology in southwestern Montana. Six students took this course,—four undergraduates at Harvard, one from State College, Pennsylvania, and one a graduate of Amherst. After completing the course, Mr. Haynes, accompanied by Mr. W. W. Rice, a student in the advanced summer course, did some extensive geological mapping and fossil collecting in the region around Three Forks and the headwaters of the Missouri River. On the return journey, Mr. Haynes visited southern California, the Grand Cañon and Pike's Peak.

Mr. George M. Flint has been a most efficient preparator for the Department, organizing its various collections, and rendering other expert assistance to the staff.

PUBLICATIONS. AUGUST 1, 1912—July 31, 1913.

DALY, R. A.— See page 16.

GRATON, L. C. (with J. MURDOCH).— The sulphide ores of copper; some results of microscopic study — *Trans. Amer. inst. min. eng.*, 1913.

HAYNES, W. P. Discovery of bivalve Crustacea in Coal measures near Pawtucket, R. I.— *Science*, January 31, 1913, n. s., **37**, p. 191–192.

RAYMOND, P. E.— See page 39–40.

SAYLES, R. W.— See page 41.

WARD, R. DEC. Four climatic snap-shots in the United States. *Journ. geogr.*, December, 1912, **11**, p. 109–114.

Abbott Lawrence Rotch. *Proc. Amer. acad. arts & sci.*, 1913, **48**, p. 807–813.

Meteorology and climatology. *American year book*, 1912, p. 613–615.

The influence of forests upon climate. *Pop. sci. monthly*, April, 1913, **82**, p. 313–331.

- Two climatic cross sections of the United States. *Monthly weather rev.*, December, 1912, p. 1909-1917.
- Notes on climatology. *Bull. Amer. geogr. soc.*, throughout the year.
- WOODWORTH, J. B. Geological expedition to Brazil and Chile, 1908-1909. *Bull. M. C. Z.*, November, 1912, **46**, p. 1-138, 37 plates.
- Harvard seismographic station. Fourth annual report for the year, 1 August, 1911-31 July, 1912. *Bull. M. C. Z.*, February, 1913, **55**, p. 25-52.
- Memoir of Ralph Stockman Tarr. *Bull. Geol. soc. Amer.*, March, 1913, **24**, p. 29-43, portrait.

REPORT OF THE MAMMALS.

 BY OUTRAM BANGS.

By gift the more important additions to the collection are:— a fine series of about 150 specimens from the Altai Mountains from Prof. Theodore Lyman; a similar series of Sudanese mammals from Dr. J. C. Phillips, this series includes the skins and skeletons of ten species of antelopes; a series of Lower Californian pronghorns and coyotes also from Dr. Phillips, specimens from the Pinte Mountains, southern California, from Col. J. E. Thayer; about fifty bats and a valuable series of three species of *Capromys* from Dr. Thomas Barbour; and West Indian bats from Prof. Roland Thaxter and Dr. J. A. Cushman.

Single specimens have been received from Mrs. Thomas Barbour, Drs. L. S. Hapgood, G. C. Shattuck, and H. W. Smith, Col. John Caswell and from Messrs. E. H. Baynes, M. L. Church, W. C. Forbes, Samuel Henshaw, George Nelson, J. L. Peters, R. W. Sayles, L. A. Shaw, and J. D. Sornborger.

In exchange specimens have been received from Prof. Wily Kükenthal, the U. S. National Museum, and the American Museum of Natural History.

A collection of about forty skins and skulls from Yunan and Tonkin was obtained by purchase. This series contains several new and rare species.

PUBLICATIONS. AUGUST 1, 1912—JULY 31, 1913.

JOHN E. THAYER and OUTRAM BANGS. Some Chinese vertebrates.

Aves. *Mem. M. C. Z.*, August, 1912, **40**, p. 137–200, pl. 3–6.

OUTRAM BANGS. Some birds from the Highlands of Siberia. *Bull.*

M. C. Z., January, 1913, **54**, p. 461–474.

New birds from Cuba and the Isle of Pines. *Proc. N. E. zööl. club*, 31 March, 1913, **4**, p. 89–92.

The green heron of the Maldives. *Proc. Biol. soc. Washington*, 3 May, 1913, **26**, p. 93–94.

A new warbler from western China. *Proc. Biol. soc. Washington*, 3 May, 1913, **26**, p. 95–96.

The land mammals of Newfoundland. *Bull. M. C. Z.*, July, 1913, **54**, p. 507–516.

REPORT ON THE BIRDS.

BY WILLIAM BREWSTER.

Upwards of twenty-six hundred bird skins have been added to the Museum collection within the year. Some twelve hundred of these were acquired by gift. We are indebted to Prof. Theodore Lyman for two hundred and eighty-seven, obtained by him and Mr. Ned Hollister in the Altai Mountains, representing fifty-three species or subspecies, of which three were new to science and twenty-three to the collection; to Dr. John C. Phillips, for three hundred and forty-five — the total avian spoils of the expedition made by him, in company with Dr. Glover M. Allen, into the Sudan — spoils which comprised many species hitherto not in the collection and at least two not before described; to Mr. Clarence L. Hay, for three hundred and seventy-four collected in the extreme southern part of Mexico, along the borders of Honduras, by Mr. J. L. Peters; to Mr. W. Cameron Forbes, for one hundred and six secured by him in the Philippines, and including seventeen species not before represented; to Dr. Thomas Barbour and Mr. Louis A. Shaw, for one hundred obtained by them in Cuba, among which are some of the rarest forms known to still exist on that island; to Col. John E. Thayer, for fifty-four — including Kirtland's Warbler and other rarities — procured in the Bahamas by Mr. C. J. Maynard, and for seventeen — representing sixteen species of which two were new to us — taken in Porto Rico by Mr. W. W. Worthington; to Mr. George V. Leverett, for an excellent skin of the well-nigh extinct Eskimo Curlew; to Mr. Gardner Perry, for a Bahama Pintail (*Poecilonetta bahamensis*) shot by him at Cape Canaveral, Florida, and the first of its kind known to have occurred within the United States (recorded in *The Auk* for January, 1913). Additional contributions of skins have been received from Messrs. Barbour, Phillips, Quincy A. Shaw 2nd, George C. Shattuck, Harrison W. Smith, J. D. Sornborger, John E. Thayer, Carlos de la Torre, and W. R. Zappey. The Museum is indebted to Mr. G. W. Stevens for the gift of ten sets of two eggs each of the Mississippi Kite, collected by him in Oklahoma.

Thirteen hundred and sixty-six bird skins obtained in Yunnan, China, have been purchased with Museum funds helped out by contributions from Dr. Phillips, Dr. Barbour, and Miss A. A. Sprague. The type specimens, male and female, of Mr. Maynard's *Dendroica vigorsii florida* have been secured by purchase.

Forty-one bird skins have been obtained by exchanges. For purposes of study, upwards of six hundred birds have been loaned to the U. S. National Museum, the Philadelphia Academy, the Carnegie Museum, and the U. S. Biological Survey.

PUBLICATION. AUGUST 1, 1912—JULY 31, 1913.

[Eggs of *Passerculus* from Grand Manan]. *Ibis*, April, 1913, ser. 10, 9, p. 332.

REPORT ON THE REPTILES AND AMPHIBIANS.

BY THOMAS BARBOUR.

The condition of the collection has improved considerably during the past year. The lizards have been rearranged, the specimens entered in a card catalogue, and the jars arranged for convenience, according to the system of Boulenger's British Museum catalogue.

The collections have increased very materially during the year. Advantageous exchanges have been effected with the Museum of the University of Michigan, with the British Museum, with Mr. Julius Hurter Sr., and with the Academy of Natural Sciences of Philadelphia.

Acknowledgements are due to Mr. W. M. Mann for tailed Amphibia from Powell County, Montana, while this department has also benefited materially as a result of his successful collecting trip to Haiti; to Prof. E. L. Mark for an excellent series of lizards from Bermuda; to Mr. Samuel Henshaw for species of tailed Amphibia; to Prof. Theodore Lyman for a small collection of reptiles and amphibians from the Altai Mountains; to Prof. H. W. Smith for an excellent collection of reptiles and amphibians made by him in the Baram River district of Sarawak; to Prof. W. M. Wheeler for reptiles and amphibians collected by him in Central America; to Prof. A. C. Coolidge for reptiles from the Oasis of Figuig, Algiers; to Prof. J. I. Westengard, for some very desirable species from Bangkok; to Prof. Wily Kükenthal for a collection of European reptiles and amphibians; to Mr. C. F. Batchelder for a collection of reptiles and amphibians made on the islands on the coast of Maine; to Mr. C. T. Ramsden for a large number of extremely rare reptiles and amphibians from eastern Cuba; to Dr. J. C. Phillips for a collection of reptiles and amphibians made by himself and Dr. G. M. Allen in the Dinder River district, Eastern Anglo-Egyptian Sudan; to Dr. R. V. Chamberlin for a fine collection of American reptiles and amphibians made by himself in many interesting localities; to Prof. Roland Thaxter for an important series of reptiles and amphibians from the islands of Grenada and Trinidad.

The collection has also been increased by purchase of material from a number of other sources. From the middle of January to the middle of March, I had the pleasure of accompanying Prof. Carlos de la Torre upon a successful zoölogical excursion through the Cienaga de Zapata and the mountain region of eastern Cuba to Cabo Cruz. The thanks of the Museum are due to the many persons who assisted in making this expedition a success; and especially to Prof. W. M. Wheeler and Mr. L. A. Shaw, who were with me during the first part of the trip, and who were zealous in their aid.

PUBLICATIONS. AUGUST 1, 1912—JULY 31, 1913.

Some Chinese vertebrates. Reptilia and Amphibia. *Mem. M. C. Z.*, August, 1912, **40**, p. 125–136, pl. 1–2.

A contribution to the zoögeography of the East Indian islands. *Mem. M. C. Z.*, November, 1912, **44**, p. 1–204, 8 pls.

Two preoccupied names. *Proc. Biol. soc. Washington*, 24 December, 1912, **25**, p. 187.

Physignathus cocincinus and its subspecies. *Proc. Biol. soc. Washington*, 24 December, 1912, **25**, p. 191–192.

Reptiles and amphibians from eastern Sudan. *Proc. Biol. soc. Washington*, 30 June, 1913, **26**, p. 145–150.

REPORT ON THE FISHES.

BY SAMUEL GARMAN.

The accessions in this department were gathered in widely separated regions. Species from Africa were received from Dr. J. C. Phillips, from Australia from Mr. Joseph Gabriel, from the East Indies from Messrs. W. C. Forbes, H. W. Smith, and R. V. Chamberlin, and the comprehensive series of duplicates from the collections made by Messrs. Owen Bryant and William Palmer in Java. Various fishes of the Atlantic were presented by Drs. Thomas Barbour, H. B. Bigelow, J. S. Kingsley, and Mr. W. F. Clapp. Dr. Roland Thaxter secured an important series in northern South America. West Indian species were obtained by Prof. W. M. Wheeler, and Mexican species by Mr. C. L. Hay. Prof. F. W. Putnam's large collection was in reality made up of a number of distinct collections, one from North Carolina, another from the Cave region of Kentucky, and another, known as the McNeil collection, from Central America. Besides these he had numerous specimens from different parts of New England and the Mississippi Valley. The dates at which his fishes were taken gives them a particular value in determining changes that may have taken place in recent times in the same localities.

The labor bestowed on the fishes has been devoted to sorting, cataloguing, and identifying, and to the preparation of future publications.

Aside from its growth, the condition of this collection has changed comparatively little.

REPORT ON THE ENTOMOLOGICAL DEPARTMENT.

The collection of North American Coleoptera, the bequest of the late Frederick Blanchard of Tyngsboro, is the most important entomological accession of recent years; it contains more than six thousand species, is well labeled and identified, and of permanent value. Mr. L. W. Swett's types of Geometridae and Prof. W. M. Wheeler's series of Formicidae (ants) are noteworthy. The West Indian collections made by Messrs. Barbour, Shaw, Thaxter, and Wheeler add many species previously unrepresented in the Departmental series. Other accessions include material, the gift of Messrs. Outram Bangs (large series of Odonata), Henry Bird, W. E. Britton, A. C. Coolidge, J. H. Emerton, W. G. Farlow, C. A. Frost, W. D. Hunter, Sinclair Kennedy, Theodore Lyman, F. A. McDermott, E. L. Mark, H. W. Smith (very many of all orders from Sarawak), and E. B. Williamson.

Collections varying in numbers from a few specimens to several thousands have been secured by purchase from Europe, Africa, the East and West Indies.

Considerable revisional work among the Coleoptera (Curculionidae) and the Microlepidoptera has been effected.

REPORT ON THE MYRIOPODS AND WORMS.

BY RALPH V. CHAMBERLIN.

The first seven weeks after March 1, when I became a member of the Museum staff, were devoted to field work in parts of California and Arizona, a careful study of the myriopod and arachnid fauna of Santa Cruz Island and of the opposite mainland being a special object. The trip was wholly successful, yielding important new information on the distribution of the myriopods, and adding to the collections numerous new and little known forms.

The remaining time was devoted chiefly to studying, relabeling, and arranging the extensive material in several divisions of the Lithobiomorpha, contributed in the main from my own collections. In connection with this work two revisional papers, previously under way, were completed. Brief field trips to different parts of Massachusetts, Vermont, and New Hampshire added considerably to the known New England myriopod fauna.

The collection of West Indian myriopods was considerably increased through the material obtained by Mr. W. M. Mann in Haiti, and through donations by Dr. Thomas Barbour, Dr. W. A. Hilton, and Mr. C. T. Ramsden of specimens from Cuba, and by Mr. C. T. Brues of specimens from Jamaica. A valuable collection from Forrester Island, Alaska, was contributed by Prof. Harold Heath and Mr. Ronald W. Heath. For important additions from other localities, the Museum is under obligations to the following persons:—Miss Elizabeth B. Bryant, Drs. C. C. Adams, Thomas Barbour, T. D. A. Cockerell, W. A. Hilton, A. G. Ruggles, W. M. Wheeler, and to Messrs. J. H. Emerton, W. M. Mann, A. P. Morse, and P. W. Whiting. Profitable exchanges were made with Professor Ribaut of the University of Toulouse.

PUBLICATIONS. MARCH 1—JULY 31, 1913.

Notes on Chilopoda from the Galapagos Islands. *Ent. news*, March 1913, **24**, p. 121–123.

Place and personal names of the Gosiute Indians of Utah. *Proc. Amer. philos. soc.*, April, 1913, **52**, p. 1–20.

REPORT ON THE CRUSTACEA AND MOLLUSCA.

BY WALTER FAXON.

Specimens of Crustacea have been received during the year from the following sources:—

Dr. Thomas Barbour, living specimens of *Cambarus bartonii* and *C. robustus* from St. Lawrence Co., N. Y., and a small collection from Cuba; Mr. W. F. Clapp, miscellaneous collections from Rockland, Me., George's Bank, Brown's Island, Plymouth, Mass., and off Wellfleet, Mass.; Mrs. Nellie A. Clapp, *Carcinides maenas* from Duxbury, Mass.; Mr. H. B. Dulin, *Carcinides maenas* from Kettle Island, Magnolia, Mass.; Mr. W. P. Hay, *Cambarus ortmanni* Williamson, from Bluffton, Ind., one paratype; Mr. Bernhard Hoffmann, *Cambarus immunis spinirostris* from Stockbridge, Mass.; Mr. W. M. Mann, *Epilobocera haytensis* from Manneville, Haiti; Mr. Geo. Nelson, miscellaneous specimens from Swan Island, Caribbean Sea; Mr. J. B. Norton, *Cambarus immunis spinirostris* from Walden Pond, Concord, Mass.; Dr. Roland Thaxter, *Carcinides maenas* from Kittery, Me.; Prof. Carlos de la Torre, *Palaemonetes cubensis* from Prov. Pinar del Rio, Cuba; U. S. National Museum, seven species (18 specimens) of crayfishes.

All of the Astacidae which have accumulated in the U. S. National Museum since the publication of my paper on these animals in the Proceedings of the United States National Museum, 1898, 20, have been sent to me for identification and returned to Washington. Together with the material recently acquired by this Museum they form the subject of a memoir completed some time since, but delayed in publication by the slow execution of the plates.

Mr. W. F. Clapp records the following accessions:—

Miss Mary R. Rotch, the James Arnold collection, containing over 2,100 species; Dr. Carlos de la Torre, 127 species from Cuba, including several cotypes; Mr. Olaf Nylander, 30 species from Aroostook co., Me.; the U. S. Bureau of Fisheries, 20 species of Pteropoda, Nudibranchiata, and Cephalopoda, and a few speci-

mens of Bryozoa, Tunicata, and Brachiopoda, from the Gulf of Maine; Mr. George H. Clapp, 18 species of American pulmonates; Mr. George Nelson, land and marine species from Swan Island; Mr. N. W. Lermond, 51 species from Rockland, Maine; Mr. W. C. Forbes, 200 species from the Philippine Islands; Mr. L. S. Frierson, 36 species of Unionidae, 30 of which were new to the collection.

Donations have also been received from Mrs. N. A. Clapp, Miss Elizabeth B. Bryant, Miss Ruth Thomas, Messrs. G. M. Allen, F. N. Balch, Outram Bangs, Thomas Barbour, J. H. Blake, E. C. Clapp, Walter Faxon, H. C. Higgins, C. W. Johnson, C. J. Maynard, E. S. Morse, J. C. Phillips, R. C. Rush, H. W. Smith, V. Sterki, H. W. Winkley, and the U. S. National Museum.

By exchange, the Museum has secured from Mr. W. F. Webb, a portion (800 species, 8,000 specimens) of the Quadras collection from the Philippine Islands, over 200 of these are new to the collection; from Mr. Alvin Seale, 84 species from the Philippine Islands.

By purchase, from Mr. Olaf Nylander, a small collection of the rarer forms from Aroostook co., Maine; from Mr. W. M. Mann, specimens from Haiti; from Rev. George Schwab, specimens from Kamerun, Africa.

Mr. Clapp spent one week (6-13 February, 1913) dredging on the eastern side of George's Bank; 90 species were obtained, several of which had not been recorded from the Bank; otherwise his time has been wholly occupied with recent accessions and with the systematic collection of univalves. Mrs. N. A. Clapp has given much valuable assistance.

REPORT ON THE ECHINODERMS.

BY HUBERT LYMAN CLARK.

The routine work of the year has consisted of the determination and special labeling of type material, the moving of the collection of dry Echini, and the incorporation of the numerous accessions into the study collections. The types among the crinoids are now all determined, but among the starfishes the work has progressed more slowly, so much of the material is old and so few specimens have any indication of their use as types. The transfer of the dry Echini into new and far more commodious quarters is a decided improvement and greatly increases the accessibility of that collection.

The additions for the year amount to 1,417 specimens, representing 170 species, of which 52 species and 10 genera are new to the collections. From the United States National Museum, 775 specimens of 108 species were received in return for identification of material; of these, 418 were received through the courtesy of the American Museum of Natural History. From the U. S. Bureau of Fisheries, also in return for determination of material, 41 specimens of 6 species have been received. A very valuable collection of 29 specimens, representing 25 species, 13 new to the collection and 11 paratypes, was received from the Western Australian Museum, in return for a report on their echinoderms. The Imperial University, Tokyo, sent three cotypes of Echini in exchange. From Mr. A. J. Sidney, 39 beautifully prepared dry specimens were purchased. A desirable series of crinoids, starfishes, and brittle-stars was donated by Mr. J. Gabriel, Melbourne. Other gifts have been received from Miss Mary R. Rotch, from Drs. R. T. Jackson and Th. Mortensen, and from Messrs. W. F. Clapp, T. M. Douthart, and George Nelson.

PUBLICATIONS. AUGUST 1, 1912—JULY 31, 1913.

Investigations on echinoderms at Montego Bay. *Carnegie institution year book*, 1912, p. 134-135.

Notes on the Panama thrush-warbler. *Auk*, January, 1913, **30**, p. 11-15.

Banding birds to more closely study their habits. *New York times*,
23 February, 1913, p. 14.

Anatomical notes on some genera of passerine birds. *Auk*, April,
1913, **30**, p. 262-267.

The quest of the vital force. *Amherst graduates' quarterly*, June,
1913, **2**, p. 294-301.

Autotomy in *Linckia*. *Zool. anz.*, June, 1913, **42**, p. 156-159.

Echinoderms from Lower California, with descriptions of new species.
Bull. Amer. mus. nat. hist., 1913, **32**, p. 185-236.

Anatomical notes on *Todus*, *Oxyruncus* and *Spindalis*. *Auk*, July,
1913, **30**, p. 402-406.

REPORT ON THE COELENTERATES.

BY HENRY B. BIGELOW.

The most important accession received during the past year is a series of slides of British hydroids, representing 53 species, 26 of which are new to the Museum collection. Other accessions are a small, but interesting series of Medusae from the Arctic Ocean near Point Barrow, presented by Mr. J. M. Jessup; the duplicate series of Medusae and hydroids collected by the GRAMPUS during the summer of 1912; a series of hydroids collected by Mr. W. F. Clapp on George's Bank, and a few hydroids and Medusae from the same region, obtained by Mr. Dowthart, of the Bureau of Fisheries; a large series of a few species of Medusae obtained near Gloucester by Mr. W. W. Welsh, of the Bureau of Fisheries, and a few ctenophores from San Diego, Cal., presented by Dr. C. O. Esterly.

A large collection of plankton from the Gulf of Maine has been loaned for study by the United States National Museum.

During the year the hydroids have been reidentified, rearranged, and added to the card catalogue.

During the winter I was occupied with the report on the oceanography and plankton of the cruise of the GRAMPUS in the Gulf of Maine last summer.

Through the courtesy of the United States Bureau of Fisheries I was enabled to occupy stations in Massachusetts Bay, with the steamer BLUE WING, bimonthly from November until April, at which temperatures, water samples, and tows were taken.

In the spring the coöperation of Capt. John McFarland, of the schooner VICTOR was enlisted in oceanographic work, and since that time he has collected a considerable number of water and plankton samples.

From July 7 until August 15, I was again in charge of the U. S. Fisheries Schooner GRAMPUS, on an oceanographic cruise, from Nova Scotia to the Chesapeake, accompanied by Mr. W. W. Welsh as assistant. As last year, the work consisted in taking

serial temperatures, serial water samples, measurements of ocean currents, and collections of plankton.

The first field was the cold coastal water between the coast and the Gulf Stream, from Cape Cod to Chesapeake Bay, which was covered in a zig-zag course, making three sections across the coastal bank. Ocean currents were measured off Long Island, off Cape May, and off Chincoteague Inlet, observations being taken hourly, for six hours, at each station, the times being chosen so as to include both ebb and flood tides. The GRAMPUS returned to Gloucester from this first cruise, on August 5; and after refitting, put to sea on the ninth for a cruise in the Gulf of Maine, to repeat, in a general way, the stations of 1912, to discover how closely oceanographic conditions might reproduce those of the preceding season, the opportunity being unusually good, for the air temperatures of the winter of 1911-1912 had been exceptionally low, those of 1912-1913 exceptionally high. The course lay from Cape Ann to Cape Sable, thence across the mouth of the Bay of Fundy, and parallel to the coast to Gloucester, besides a station on Jeffreys Bank, and one in the deep basin off Platt's Bank.

During the summer, complete oceanographic observations were taken at fifty stations, 165 tows made with the various plankton nets, while the Otter trawl was used at ten stations.

The plankton collections are much richer than those of 1912, and extremely varied, as might have been expected from the large extent of ocean covered. The trawl hauls revealed a rich bed of the sea scallop, *Pecten magellanicus*, between the 20 and 40 fathom curves, from off Montauk to the latitude of the Chesapeake. This bed is of considerable commercial importance.

PUBLICATIONS. AUGUST 1, 1912-JULY 31, 1913.

Preliminary account of one new genus and three new species of Medusae from the Philippines. *Proc. U. S. nat. mus.*, November, 1912, **43**, p. 253-260.

Medusae and Siphonophorae collected by the U. S. Fisheries Steamer "Albatross" in the Northwestern Pacific, 1906. *Proc. U. S. nat. mus.*, March, 1913, **44**, p. 1-120, 6 pl.

A new closing-net for horizontal use, with a suggested method of testing the catenary in fast towing. *Int. rev. hydrobiol. hydrogr.*, April, 1913, **5**, p. 576-580, 8 figs.

REPORT ON INVERTEBRATE PALAEOLOGY.

BY PERCY E. RAYMOND.

Two months of the summer of 1912 were spent in the field in Canada, finishing work which was begun while in the employ of the Geological Survey of that country, and in preparing material for the guide books for the excursions of the 12th International Geological Congress. In connection with this work, large collections were made from the Ordovician of Ontario and Quebec, and these have been assorted and identified during the winter. By arrangement with the Director of the Geological Survey of Canada, the Museum will retain a set of the duplicates, which will add a large suite of specimens from formations and localities not previously represented in the collections.

During the Easter recess, the writer, in company with Mr. Winthrop P. Haynes, Assistant in Geology, and a small party of students, spent three days in collecting near Saratoga, in the lower Mohawk Valley, and in the Helderbergs. We succeeded in getting a quantity of material from the Upper Cambrian, Lower Beekmantown, and Lower Trenton, including fossils from the typical localities of the Tribes Hill and Saratoga formations.

The last two weeks in June were spent in visiting the Upper Ordovician strata in the vicinity of Cincinnati, Ohio, and Richmond, Indiana, and the Silurian about Chicago and Milwaukee. The Museum possesses, in the Dyer and Day collections, very large quantities of material from these localities, and the trip was made primarily to see in the field the strata from which these collections came. Incidentally, a number of interesting specimens were collected. The writer is indebted to Dr. Ray S. Bassler of the United States National Museum for guidance and information about Cincinnati and to Mr. A. W. Asmuth for similar favors at Milwaukee.

During July the writer took part in the Maritime excursion of the International Geological Congress, acting as one of the guides on this trip, and as leader on the Montreal-Ottawa excursion which

followed it. Later I attended the session of the Congress at Toronto, as one of the delegates of Harvard University and of the Museum of Comparative Zoölogy.

The part of the year devoted to Museum work was largely used in the continuation of the sorting, identifying, and labeling of the collection of trilobites, and the identification of the Canadian material mentioned above. Some time was also spent in selecting a series of Mesozoic fossils for exhibition, and in the identification of the Crustacea in that series. Among the trilobites, all specimens belonging to the Illaenidae and Calymenidae, and the European species of the Trinucleidae and Conocoryphidae were arranged and labeled, as were also a considerable number of specimens of Asaphidae and Cheiruridae which were overlooked when going over those families last year.

The following accessions have been received during the year:—

By donation:— Two trilobites from Dr. C. D. Walcott, eighteen Lower Helderberg fossils from Mr. Olaf O. Nylander, one gastropod from Mr. J. H. Hustis, two trilobites from Mr. A. W. Asmuth, one Trenton trilobite and twelve Brazilian fossils from Mr. Winthrop P. Haynes, one trilobite, and one *Arthropycus* from Miss M. R. Rotch, and one slab of trilobites from the Curator.

By exchange:— One trilobite from Mr. Winthrop P. Haynes, and a collection of unidentified fossils from Mr. L. E. Trout.

By collection:— Fossils from the Cambrian, Devonian, Mississippian, and Pennsylvanian of central Montana, Mr. Winthrop P. Haynes; from the Upper Cambrian and Lower Ordovician near Saratoga, N. Y., Ordovician at Tribes Hill, and Pattersonville, N. Y., Cincinnati, Ohio, and Richmond, Indiana, and Silurian at Chicago, Illinois, and at Racine and near Milwaukee, Wisconsin, the Curator.

PUBLICATIONS. AUGUST 1, 1912—JULY 31, 1913.

On two new Paleozoic starfish (one of them found near Ottawa), and a new crinoid. *Ottawa naturalist*, October, 1912, 26, p. 77–81, pl. 5.

[Report on invertebrate paleontology]. *Summary rept. Geological survey. Dept. mines Canada, for 1911*, November, 1912, p. 351–357.

On the nature of the so-called covering plates in *Protopalaeaster narrawayi*. *Ottawa naturalist*, December, 1912, 26, p. 105–108, pl. 6.

- Some changes in the names of genera of trilobites. *Ottawa naturalist*, February, 1913, **26**, p. 137-142.
- A further note on *Cryptolithus* versus *Trinucleus*. *Ottawa naturalist*, May, 1913, **27**, p. 26-30.
- Quebec and vicinity. *Excursions of the 12th International geological congress, Guide book no. 1*, pt. 1, June, 1913, p. 25-48, 4 maps and diagrams.
- Ordovician of Montreal and Ottawa. *Excursions of the 12th International geological congress, Guide book no. 3*, June, 1913, p. 137-160.

REPORT ON THE GEOLOGICAL COLLECTION.

BY ROBERT W. SAYLES.

During the past year the southeast exhibition room has been furnished with new cases. This room is devoted to relief maps, physiographical and geological models, and meteorology. At present there are on exhibition six reliefs and seven models. Of these, a relief of southern New England including Massachusetts, Rhode Island, and Connecticut was purchased. Prof. Robert DeC. Ward has given, in exchange for a large rainfall map of the United States, a relief of Italy made to scale on the natural curvature of the earth. Mr. G. C. Curtis has kindly deposited a geological model of the Sentis, a high peak in north-eastern Switzerland. This model was made by him at Zurich under the direction of Prof. A. Heim and copied from Heim's original which was awarded the gold medal at the Paris Exposition in 1900. A naturalistic model of Pulpit Rock, Nahant, made by Mr. Curtis, was purchased.

In addition to the reliefs and models, there is an exhibit of meteorological instruments and instructive charts, selected and loaned by Professor Ward. It is planned to change this exhibit from time to time.

In the room devoted to Dynamical and Structural Geology a platform for exhibiting large rock specimens has been built. A glacial boulder chemically weathered into a shape approximating that of an hour-glass, may be seen. This boulder was collected by the Curator in 1912 at Sugar Hill, N. H.

The room devoted to Economic Geology contains a nucleus of an economic exhibit given by Prof. Charles Palache.

On account of the embarrassment which the loss of a catalogue might entail, a duplicate catalogue has been made and brought up to date.

PUBLICATIONS. AUGUST 1, 1912—JULY 31, 1913.

The history of Lost River. *Science*, April 18, 1913, n. s., 37, p. 611-613.

Earthquakes and rainfall. *Bull. Seismological soc. Amer.*, June, 1913, 3, p. 51-56.

REPORT ON THE LIBRARY.

During the year from August 1, 1912, to July 31, 1913, inclusive, 1,141 volumes, 1,818 parts of volumes, and 1,033 pamphlets have been added to the Library.

The total number of volumes in the Library is 50,296, the total number of pamphlets is 46,568.

Four hundred and twelve volumes have been bound.

PUBLICATIONS
OF THE
MUSEUM OF COMPARATIVE ZOÖLOGY
FOR THE YEAR 1912-1913.

BULLETIN:—

Vol. LIV.

No. 15. Some Cuban Crustacea. By Mary J. Rathbun. With notes on the Astacidae, by Walter Faxon, and a list of Isopoda, by Harriet Richardson. pp. 12. 5 Plates. October, 1912.

No. 16. Some birds from the highlands of Siberia. By Outram Bangs. pp. 14. January, 1913.

No. 17. The ants of Cuba. By William Morton Wheeler. pp. 32. May, 1913.

No. 18. The land mammals of Newfoundland. By Outram Bangs. pp. 10. July, 1913.

Vol. LV. (Geological series, vol. IX).

No. 2. Harvard Seismographic Station. Fourth annual report for the year, 1 August, 1911 — 13 July, 1912. By J. B. Woodworth. pp. 28. February, 1913.

Vol. LVI. (Geological series, Vol. X. Shaler Memorial series, No. 1).

No. 1. Geological expedition to Brazil and Chile, 1908-1909. By J. B. Woodworth. pp. 138. 37 Plates. November, 1912.

Vol. LVII.

No. 1. The Henicopidae of America north of Mexico. By Ralph V. Chamberlin. pp. 36. 5 Plates. December, 1912.

MEMOIRS:—

Vol. XL.

No. 4. Some Chinese vertebrates. Introduction. By Samuel Henshaw. Pisces. By Samuel Garman. Amphibia and Reptilia. By Thomas Barbour. Aves. By John E. Thayer and Outram Bangs. Mammalia. By Glover M. Allen. pp. 146. 6 Plates. August, 1912.

No. 5. Zaglossus. By Glover M. Allen. pp. 60. 2 Plates. October, 1912.

Vol. XLIV.

No. 1. A contribution to the zoögeography of the East Indian Islands. By Thomas Barbour. pp. 204. 8 Plates. November, 1912.

REPORT:—

1911-1912. pp. 45. December, 1912.

INVESTED FUNDS OF THE MUSEUM.

IN THE HANDS OF THE TREASURER OF HARVARD COLLEGE.

Gray Fund	\$50,000.00
Permanent Fund	117,469.34
Humboldt Fund	8,052.24
Sturgis Hooper Fund	107,442.24
Agassiz Memorial Fund	297,933.10
Teachers and Pupils Fund	7,594.01
Virginia Barret Gibbs Fund	6,285.93
Willard Peele Hunnewell Memorial Fund	5,605.49
Maria Whitney Fund	6,184.33
Alexander Agassiz Fund	99,500.00
Alexander Agassiz Expedition Fund	81,985.79
George Russell Agassiz Fund	75,000.00
Maria Whitney and James Lyman Whitney Fund	110.14
	<hr/>
	\$863,162.61

The payments on account of the Museum are made by the Bursar of Harvard College, on vouchers approved by the Director. The accounts are annually examined by a committee of the Overseers. The only funds the incomes of which are restricted, the Gray, the Humboldt, the Whitney, and the Alexander Agassiz Expedition Funds, are 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.

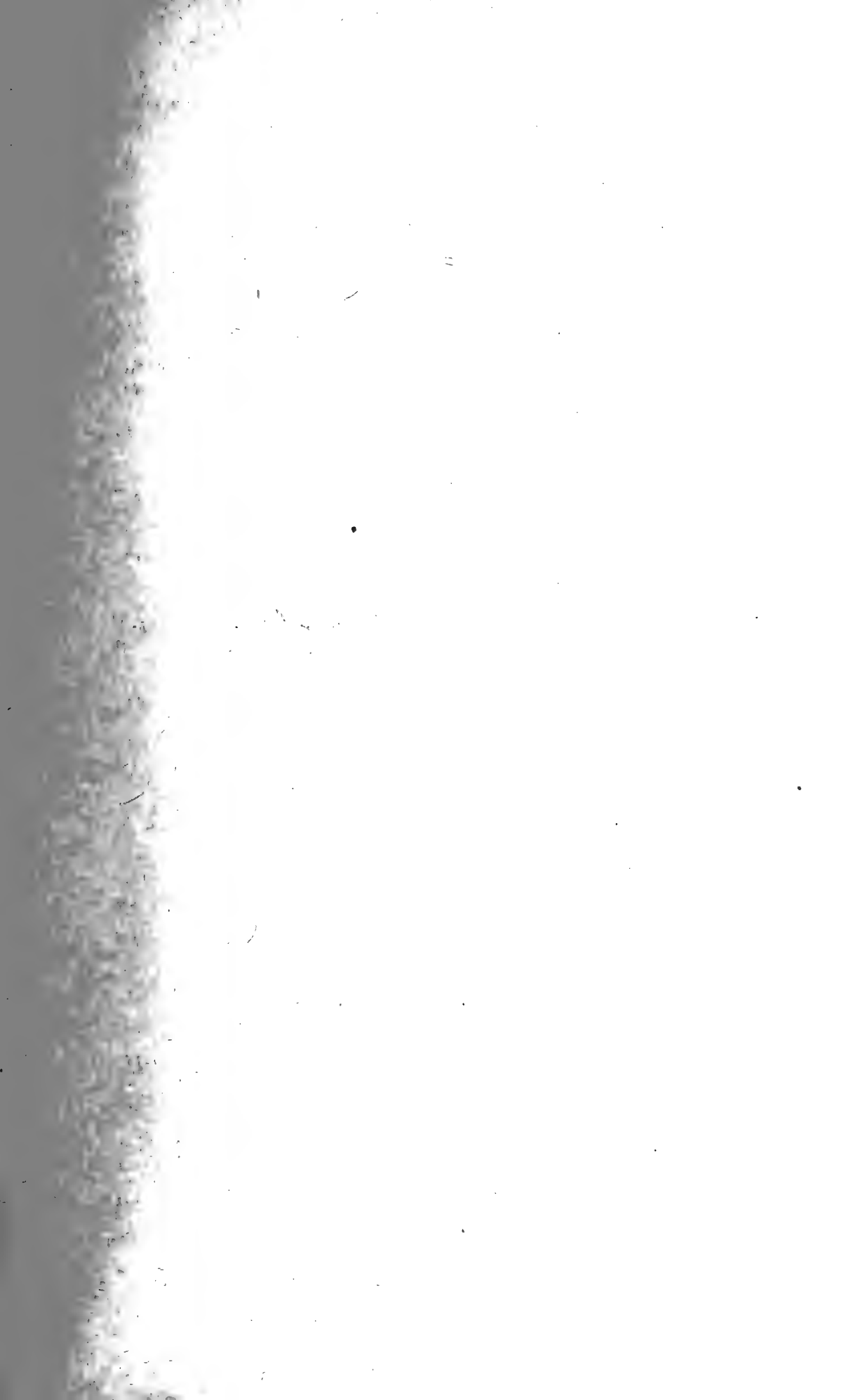
The income of the Humboldt Fund (about \$300.) can be applied for the benefit of one or more students of Natural History, either at the Museum, the United States Fish Commission Station at Woods Hole, the Stations at Bermuda, or the Tortugas.

The income of the 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 Virginia Barret Gibbs Scholarship Fund, of the value of \$250., 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.



•
PLATE 1.

Lanthanotus borneensis Steindachner. Sarawak.
Gift of Prof. H. W. Smith.





PLATE 2.

Group of North American Squirrels, Chipmunks, and Spermophiles.
Mounted by Mr. George Nelson.





The following Publications of the Museum of Comparative Zoölogy
are in preparation :—

LOUIS CABOT. Immature State of the Odonata, Part IV.

E. L. MARK. Studies on Lepidosteus, continued.

“ On Arachnactis.

A. AGASSIZ and C. O. WHITMAN. Pelagic Fishes. Part II., with 14 Plates

H. L. CLARK. The “Albatross” Hawaiian Echini.

Reports on the Results of Dredging Operations in 1877, 1878, 1879, and 1880, in charge
of ALEXANDER AGASSIZ, by the U. S. Coast Survey Steamer “Blake,” as follows:—

A. MILNE EDWARDS and E. L. BOUVIER. The Crustacea of the “Blake.”

A. E. VERRILL. The Alcyonaria of the “Blake.”

Reports on the Results of the Expedition of 1891 of the U. S. Fish Commission Steamer
“Albatross,” Lieutenant Commander Z. L. TANNER, U. S. N., Commanding, in
charge of ALEXANDER AGASSIZ, as follows:—

K. BRANDT. The Sagittae.

“ The Thalassicolae.

O CARLGREN. The Actinarians.

W. R. COE. The Nemertean.

REINHARD DOHRN. The Eyes of
Deep-Sea Crustacea.

H. J. HANSEN. The Cirripeds.

“ The Schizopods.

HAROLD HEATH. Solenogaster.

W. A. HERDMAN. The Ascidians.

S. J. HICKSON. The Antipathids.

E. L. MARK. Branchiocerianthus.

JOHN MURRAY. The Bottom Specimens.

P. SCHIEMENZ. The Pteropods and
Heteropods.

THEO. STUDER. The Alcyonarians.
— The Salpidae and Doliolidae.

H. B. WARD. The Sipunculids.

R. V. CHAMBERLIN. The Annelids.

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., Com-
manding, as follows:—

H. L. CLARK. The Holothurians.

— The Volcanic Rocks.

— The Coralliferous Limestones.

S. HENSHAW. The Insects.

R. VON LENDENFELD. The Silice-
ous Sponges.

H. LUDWIG. The Starfishes and Ophi-
urans.

G. W. MÜLLER. The Ostracods.

MARY J. RATHBUN. The Crustacea
Decapoda.

G. O. SARS. The Copepods.

L. STEJNEGER. The Reptiles.

C. H. TOWNSEND. The Mammals,
Birds, and Fishes.

T. W. VAUGHAN. The Corals, Recent
and Fossil.

R. V. CHAMBERLIN. The Annelids.

PUBLICATIONS
OF THE
MUSEUM OF COMPARATIVE ZOÖLOGY
AT HARVARD COLLEGE.

There have been published of the BULLETIN Vols. I. to LIV.; of the MEMOIRS, Vols. I. to XXIV., and also Vols. XXVI. to XXIX., XXXI. to XXXIV., XXXVI. to XXXVIII., and XLI.

Vols. LV. to LVIII. of the BULLETIN, and Vols. XXV., XXX., XXXV., XXXIX., XL., XLII. to XLVIII. 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.

Contributions from the Zoölogical Laboratory, Professor E. L. Mark, Director.
Contributions from the Geological Laboratory, Professor R. A. Daly, in charge.

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.

