



Walter Taron.

ANNUAL REPORT

OF THE

TRUSTEES

OF THE

MUSEUM OF COMPARATIVE ZOÖLOGY,

AT HARVARD COLLEGE, IN CAMBRIDGE:

TOGETHER WITH

THE REPORT OF THE DIRECTOR

FOR

1872.

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Commonwealth of Massachusetts.

BOSTON, MASS., June 4, 1873.

To the Hon. GEORGE B. LORING, *President of the Senate.*

SIR:—The Trustees of the Museum of Comparative Zoölogy have the honor to present to the Legislature the Annual Report of the Director, for the past year, marked [A].

The paper marked [B] contains a list of the Trustees, officers and committees for 1873.

Respectfully submitted, for the Trustees,

MARTIN BRIMMER, *Secretary.*

[A.]

REPORT OF THE DIRECTOR

OF THE

MUSEUM OF COMPARATIVE ZOÖLOGY,

FOR THE YEAR 1872.

It gives me the greatest pleasure to state that my absence, though extended to nearly a year, has not in the slightest degree interfered with the progress of the Museum. Mr. Cary, the Superintendent, has directed the business of our Institution with so much ability, forethought and diligence, anticipating and providing for the needs of each working department, that there have been no unnecessary delays or interruptions. His special Report contains the details of his administration. The scientific officers of the Museum have shown the utmost zeal and fidelity, carrying on the work of the separate laboratories so efficiently that I can truly say the results of the year have far exceeded my most sanguine expectations. There is one inference to be drawn from this statement which is of great importance, though few perhaps can value it as highly as I do myself. I have heard it said repeatedly that the organization of the Museum was too comprehensive, that it covered a wider range than was useful in the present state of science among us, and that since it must collapse whenever I should be taken away, it was unwise to support it on so large a scale. The past year has proved beyond question that the Museum is now so organized (vitalized as it were with the spirit of thought and connected work) that my presence or absence is of little importance. It will keep on its course without any new or repeated stimulus

beyond the necessary appropriations for its maintenance. As to the expense I cannot feel that it is disproportionate, because when I compare it with that of institutions of the same character I see that they spend much more for smaller results. The only question now is whether a Museum of first order is needed in Massachusetts, or not. If the legislature will favor us with a visit I would gladly submit our institution to the most critical examination of its organization. I think I can satisfy any competent visitor, that by her liberal support of the Museum, our State has earned the right to say that among civilized communities there is not a purely scientific establishment of higher character or distinguished by more active, unremitting, original research in various departments of knowledge. If the same pecuniary support it has had in the last two years can be continued in the coming years it will not be long before the scientific world will acknowledge that the Museum of Comparative Zoölogy in Cambridge has no superior, nay, no equal in the world.

Now that the newly erected addition to the building is available it may be interesting to you to learn what disposition is made of the whole, for purposes of work, instruction and exhibition.

True to the aim I have constantly kept in view and in conformity with the spirit of the institution, the space allowed for work is proportionally much larger than in any other Museum; the object of this arrangement being to facilitate the rapid growth of our collections.

The lecture room is, as before, open to all who choose to attend the general instruction given within the walls of the institution. Lectures on different subjects of Natural History are delivered during the whole year and have been attended by students of the University, teachers of the public and private schools of the vicinity, and ladies and gentlemen of every class of the community. This kind of instruction has always been given free of any charge. Next to the lecture room is the student's laboratory; there the practical instruction is given to beginners by Prof. Shaler, as set forth in his special report, while the more advanced students work in the private laboratories of the different departments, according to their particular branches of study.

The private laboratories are eight in number, each devoted to a specialty of the wide range of topics embraced in the organization of the Museum. It would lead me too far were I to describe these laboratories in detail, but I shall in my next report submit a full account of them and the objects for which they were instituted. I would only state now that the books relating to the different specialties are kept in the laboratories, an arrangement which greatly facilitates the work of all.

The exhibition rooms have been more than doubled, owing to the addition of one story to our building; unfortunately they cannot yet be thrown open to the public, our means being insufficient for the present to provide the necessary wall cases and other appliances to protect the specimens from injury by ignorant or careless visitors.

The time has not yet come for a full report on the results of the Hassler Expedition, especially on that part of the work which concerns the Museum of Comparative Zoölogy in Cambridge. Only a portion of the collections forwarded from various ports have arrived, and of these but a small part has been unpacked. I can, however, state that the contributions of this expedition to Natural History have even exceeded my hopes, and that the Museum is enriched by a vast amount of material, covering the whole field of Zoölogy, including the Natural History of Mankind, that of marine mammalia, marine birds, reptiles and fishes. Especially are our collections of fishes, mollusks, crustacea and radiates enlarged, and though I have spoken particularly of marine animals, because our opportunities were better for collecting at sea than on land, yet we have not neglected fresh-water and terrestrial specimens whenever it was possible to obtain them. All these collections, so far as that mode of preservation was suitable for them, have been put up in alcohol, and it may give some idea of their magnitude if I state that more than 3,500 gallons of alcohol have been consumed in packing them. Any enumeration of these objects is impossible at present. The mere examination of the collections and placing them in such a condition as to ensure their permanent safety will be a six months' labor for our whole corps of workers at the Museum, and even the possibility of this initiative work

is dependent upon a special appropriation for the purpose ; but I trust that the means will not be wanting, and that at my next annual report I shall be able to state with precision the scientific value and importance of the collections from the Hassler Expedition. My impression is, and I believe I am rather understating than overstating the truth, that if I am allowed to make these collections available by the proper means of preservation, we have now the greatest working Museum in the world ; the one, that is, which supplies the most extensive and varied material for special and comprehensive zoölogical research. I do not exclude the oldest and largest Museums of Europe from this statement, believing as I do that the time has passed when the value of a Museum is to be measured by the number of its stuffed birds and empty shells.

I should say a few words of the Expedition which has been so beneficial to our Museum, of the circumstances under which it was organized, and of what I have been able personally to do for the institution during the year of my absence. About two years ago Professor Peirce, Superintendent of the United States Coast Survey found it necessary to build a vessel especially for the work of the survey on the Pacific Coast. When she was nearly ready for sea it occurred to the Superintendent that it was a pity to send her empty around the continent, the more so since a great part of her track would be especially interesting for scientific research. He proposed to me to join the vessel with some assistants and to make such explorations as might not interfere with the progress of the voyage and with the regular work of the survey. At the same time he appointed Count de Pourtalès, whose dredgings in the Gulf of Mexico have had such valuable results for science to take charge of the dredging operations for the whole voyage. The opportunity thus offered to me and my younger friends, while it gave us the means of making the voyage from Boston to San Francisco, did not provide in any way for the expenses incident upon the making of collections, their preservation or their transportation to Cambridge. For these objects I made an appeal to the liberality of the citizens of Boston, whose generous good-will toward the Museum I had so often before experienced in the hour of

need. But for their aid I could not have availed myself of the rare chance offered me. With it I may truly say that I have been able to give the Museum such an impetus as even great institutions rarely receive. I add here the list of these contributions, with the total result:—

Subscriptions to Hassler Expedition.

Nathaniel Thayer, . . .	\$6,000	G. Baty Blake, . . .	\$200
Mrs. G. Howland Shaw, . . .	2,000	W. T. Andrews, . . .	200
Martin Brimmer, . . .	1,000	W. D. Pickman, . . .	200
John A. Lowell, . . .	1,000	W. S. Bullard, . . .	200
Samuel Hooper, . . .	1,000	L. Hollingsworth, . . .	200
Mrs. Samuel Hooper, . . .	500	Amos A. Lawrence, . . .	150
John M. Forbes, . . .	500	Robert M. Mason, . . .	150
Gardner Brewer, . . .	500	George B. Emerson, . . .	100
Theodore Lyman, . . .	500	George B. Upton, . . .	100
George F. Parkman, . . .	500	F. B. Crowninshield, . . .	100
Henry P. Kidder, . . .	500	Miss Alice Hooper, . . .	50
S. Salisbury, . . .	500	Greely S. Curtis, . . .	50
H. H. Hunnewell, . . .	500	G. W. Warren, . . .	50
Abbott Lawrence, . . .	250		
J. L. Little, . . .	250		
James Davis, . . .	200		
			\$17,450

Of this sum there remains a surplus of \$1,200, all I can draw upon for the care and preservation of these magnificent collections. It is not pleasant to ask for new supplies at the very moment of expressing my gratitude for the generosity which made these collections possible. All I can say is that unlooked for success leads to new expenditures, and that I hope the Commonwealth and all those able to help us will do so when it is understood that the proper care and distribution of these new treasures will actually put our Museum in advance of all existing institutions in zoölogical research. Students from other lands must come to us to prosecute their investigations, for we alone have the material in such quantity as to allow of comprehensive and exhaustive comparisons. I should be ungrateful did I not add that but for the assistance given us at every step of our journey by private individuals and private companies, as well as by officers of the governments of the several countries visited by us, we could not, with the means at my command, have accomplished one-half our actual results. The Secretary of State had sent out

instructions to all political and consular agents of the United States Government, as well as to all naval officers, to render any assistance to the expedition not inconsistent with their regular service, and I had constant cause to acknowledge their cordial good-will and coöperation. But we were no less indebted to private mercantile companies, railroad and steamboat corporations and to private individuals. As soon as the special returns are handed in to me by the assistants in charge of the different collections, I shall publish a nominal account of all these favors.

It was, however, to the captain and officers of our own vessel that I was especially indebted. Not only did they put at my disposition every facility for the work of collecting, but they were untiring in fishing, hunting and dredging, and to their individual efforts I owe many of the most valuable specimens we have brought home. I wish every naturalist might have as valiant co-workers as I found in my friend Capt. P. C. Johnson, Lieut. Charles Kennedy, executive officer of the Hassler; Lieut. Day, navigator of the Hassler, Lieut. Mansfield, Lieut. Remy and Dr. Pitkin, U. S. surgeon. To Dr. White and to Dr. Hill, physicists, I was also indebted for most important assistance. Under all the difficulties of photography at sea they succeeded in getting some illustrations of scenery and of specimens which will be valuable in the working up of our results, and Dr. Hill was indefatigable in the collecting of seaweeds and plants, and has brought back to Cambridge a very interesting and rare botanical collection.

I cannot close this Report without an expression of my deep sorrow at the loss of the Rev. J. B. Perry, assistant in the Palæontological Department. Mr. Perry was one of the most devoted and industrious collaborators I ever had; and his attainments were so comprehensive that his place will never be filled in the Museum.

Report of the Superintendent, Mr. T. G. CARY.

[Transmitted to Prof. Agassiz on his return from the Hassler Expedition.]

The matter of most importance which required attention after your departure, was the alteration in the interior of the oldest part of the Museum. The staircase which led from the working-rooms below, through the exhibition-rooms to the attic, was taken out and the apertures closed. The removal of these stairs adds very much to the available space, both in the rooms for exhibition, and in the working-rooms, and enables us to close all the doors which were formerly necessary as a means of communication from one side of the building to the other, all the rooms in the building being now reached by the central staircase. This secures privacy in the working-rooms, and keeps the students' room, and the lecture-room and library free from intrusion.

The library was found to be too small for the increasing number of books, but the floor was so strengthened by an iron brace in the middle of the room, as to allow the addition of three sets of shelves, which gives ample room for the library in its present state. The light in the room has been much improved by painting all the woodwork and the iron supports white.

The unfinished state of the new portion of the Museum has made an economy of room very necessary, and a number of partitions of rough boards have been put up for the reception of such specimens as were ready for exhibition, but could not be displayed for want of proper cases. These enclosures are unsightly, but great care is taken to keep them clean, and for the present they cannot be dispensed with.

The raising of the roof in the older part of the building has given a very large room for storing dry specimens, books, materials for our publications, &c., &c., and it would be very desirable to have this room kept especially for this purpose.

The attic of the new building, with the exception of the two rooms used for fossil plants and for South American palms, is used as a store-room for the collection of skeletons in Dr. Maack's charge. Much valuable room is lost here by the necessity of having the car of the elevator always in the attic, while not actually in use. The same loss of room

occurs on every floor below, and I would suggest that the elevator in its present position is inconvenient on account of loss of room, and would be very dangerous in case of fire.

Much care has been taken in the arrangement of the cellars, which were very much crowded until the new building was erected. All the packages of specimens have been examined, and many of the specimens have been removed from the wooden barrels, or the earthen jars in which they have been kept, and have been transferred to copper cans with screw tops, in which the specimens cannot be injured either by leakage or evaporation. There can be no doubt that the only sure way of preserving alcoholic specimens (especially the fishes), is to put them in vessels of glass or copper, and to use the very best quality of alcohol. These materials are undoubtedly expensive at first, but specimens once properly packed are safe for many years, whereas the use of inferior materials involves the risk of losing the specimens, with the time, labor and money which has been spent upon them. An especial room has been arranged for the proper care of the glass jars and alcohol used in the establishment. By having these expensive articles under the charge of one person, I find the waste and breakage is much less than formerly.

A carpenter has been at work for a year past making models of cases for the exhibition rooms in the new building, but, for the present, there is no possibility of making any additions to the show-cases. The expenses of keeping the Museum on its present footing, without adding to the capacities for exhibition or attempting to furnish any of the rooms in the new part of the building, will require an addition of at least fifty thousand dollars to our regular income of ten thousand five hundred dollars. And in expending this apparently large sum, the strictest economy would be required to enable the Museum to retain the position which it has gained.

Much pains has been taken to give an appearance of neatness and order to the grounds adjoining the Museum. These improvements have been made at a very trifling cost. I found it necessary to have two men to assist the janitor in moving boxes of specimens, receiving collections, and in doing all the drudgery of the establishment; and as the

services of these men were not always required in the Museum, I set them to work on the improvement of the grounds, when they were not otherwise engaged. I mention this because a casual observer might think that money had been spent on flower-beds and gravel-walks, which could have been used to greater advantage in the interior of the Museum. The actual money expended on the grounds during your absence has, not been more than one hundred dollars.

Report on the Mammals, by J. A. ALLEN.

To the collection of mammals few additions have been made since the last report. A considerable number of the skins and skeletons of the large ruminants, obtained last year by the Rocky Mountain Expedition, have been mounted and will be placed on exhibition as soon as the cases in the large hall are ready for their reception. All the unmounted skins are now catalogued and safely and conveniently stored in the tightly closing cans mentioned in preceding reports. The alcoholic collection has been carefully revised, and no loss of specimens has as yet occurred. It is to be hoped, however, that all now stored in barrels may be soon removed to copper cans. As the necessary cans have already been ordered, and some are just coming to hand; it seems probable that during the ensuing year the whole collection will be placed in copper or glass receptacles, so that in future their liability to injury by the decay of kegs and the consequent escape of the spirits will be wholly obviated.

The greater part of the large number of skeletons sent to Prof. Ward last year for preparation has been returned to the Museum, and generally in a highly satisfactory condition. Much material of this character still needs a similar treatment, in order to render it available to its fullest extent for scientific examination. It is to be hoped that this work may be continued for the entire osteological collection.

A few alcoholic specimens have been sent out in exchange, and a skeleton of *Bison Americanus* has been forwarded to Dr. H. Dohrn, of Stettin, Prussia.

The subjoined schedule indicates the sources from which additions have been received during the past year:—

By Donation.

BICKNELL, EDWIN. Several lots of embryos and gravid females of white mice.

CARLTON, Rev. M. M. One bat in alcohol and several skulls, from Northern India.

CHAPELL, R. H., New London, Ct. A fine large walrus skull from Alaska.

GARMAN, W. S. One skin of a bat and several mice in alcohol, chiefly from the vicinity of the Great Salt Lake, Utah Territory.

LOCKWOOD, SAMUEL, Jr. Several mice, in alcohol, from Hamilton Co., New York.

MANN, B. P. 4 skulls, 2 species, from Massachusetts, from the collection of the late Horace Mann, Jr.

MULLER, BARON VON, Melbourne, Australia. One specimen of Echidna, in alcohol.

SCAMMON, Capt. C. M. Baleen plates from several species of Cetacea of the Pacific Coast of North America.

By Exchange.

JEITTELES, L. H. Several jars of small mammals, chiefly *Vespertilionidæ*, from the vicinity of Salzburg, Austria.

SCOTT, W. D. 25 skins of *Sciuridæ*, 3 species, from Massachusetts.

By Purchase.

A fine old male Rocky Mountain sheep, from Bozeman City, Montana Territory, mounted by Prof. Ward.

Report on the Birds, by J. A. ALLEN.

The chief additions to the ornithological department during the past year, has been the collection of over 1,500 specimens received in exchange from the Brown University, this being a portion of the collection of the late Mr. John Cassin, and containing many of his types. Another considerable invoice has also recently come to hand; namely, a collection of 116 species from Chili, through Professor Philippi. This is

especially important as being from a locality from which we had few specimens.

In addition to the labor of cataloguing and incorporating with the general collection, the 5,000 specimens received during last year and the early part of the present, the labelling of the collection of skins has been commenced, and some 10,000 specimens have already been supplied with labels, indicating their localities and the sources whence they were received, and generally also their systematic names. In this work I have been greatly aided by Masters Wing and Howe, who have both worked with great care and assiduity.

The alcoholic collection has been carefully watched, and the loss of specimens thus far prevented. The large earthen crocks, with screw-tops, introduced to some extent in this department as storage jars, as mentioned in previous reports, have proved, from their porosity, even more untrustworthy than the kegs they were intended to replace. Accordingly, as a final resort, copper cans have been adopted for the specimens too large to be stored in glass, and the transfer of the specimens to them has already been commenced. As we shall soon have enough of the copper cans for the whole collection of alcoholic birds, as well as mammals, it is expected that during the coming year all will be permanently arranged in them and thus secured from loss by the leakage or evaporation of the alcohol.

The only invoices sent out in exchange have been a lot of 67 specimens to Brown University, and 35 to Mr. W. D. Scott, and a smaller number to a few other parties. The whole collection of *Tyrannidæ* has been loaned to Dr. Elliott Cowes, U. S. A., for use in his revision of this group, a part of which have already been returned, with his identifications. A few alcoholic specimens have also been loaned to Professor O. C. Marsh, of New Haven.

The following schedule indicates the sources from which additions have been received during the past year:—

By Donation.

ALLEN, J. A. A skin and part of a skeleton of *Podiceps cornutus*, and several skins of native species.

GARMAN, W. S. One embryo, in alcohol, from Great Salt Lake Valley, Utah.

MANN, B. P. 46 skulls, 20 species, chiefly from the collection of the late H. Mann, Jr., and several embryos.

PIKE, NICOLAS, U. S. Consul at Mauritius. 10 skins, 8 species, and a large lot of eggs; chiefly from the Mauritius.

WEBBER, MRS. M. One skin of *Colaptes auratus*, from St. Simons Island, Ga., and a box of eggs from Florida.

By Exchange.

FROM BROWN UNIVERSITY, Providence, R. I. 1,550 skins, chiefly from the collection of the late Mr. John Cassin.

FROM L. H. JEITTELES. Embryo of *Falco tinnunculus*.

FROM PROF. PHILIPPI, Santiago, Chili. 201 skins, 116 species; from Chili.

FROM W. D. SCOTT. 45 skins, 15 species; chiefly from West Virginia.

Report on the Fishes, by RICHARD BLISS, Jr.

Early in the year it became evident that our large collection of fishes stored in barrels and kegs in the cellar, would suffer great damage were there not found some fitter means of preserving them. The dampness of the cellar rapidly corroding the hoops of the kegs allows the staves to spread and the alcohol to escape, thus quickly spoiling the specimens. To obviate this, in consultation with the superintendent, Mr. Cary, it was decided to substitute copper cans with screw tops, in which the specimens could be preserved without the possibility of the loss of alcohol by leakage or evaporation. As fast as the cans were furnished the specimens in the barrels were transferred to them and supplied with fresh alcohol. At present nearly all the specimens in barrels have been changed to cans, and in two or three weeks it is expected that the work will be completed and the collection in a state of perfect safety.

The whole collection in the cellar has been arranged according to families, the cans numbered and the contents of each duly registered in the record book, so that ready access can be had to any specimen.

The specimens identified and labelled by Dr. Steindachner

prior to his departure on the Hassler Expedition, together with some others, have been placed in the temporary enclosure in the large exhibition room, in order to avoid the defacement of the labels which would occur if stored in the cellar. Here the specimens have been arranged according to their localities; certain shelves containing the fishes of Europe, others those of Asia, Africa, North and South America.

The specimens in the glass cases in the exhibition rooms as well as those in the cellar, have been thoroughly examined and fresh alcohol added whenever needed. In this work I have been assisted by Mr. Lockwood.

Many specimens have been added to the exhibition collection since last year; hence still more room is needed to properly exhibit them. Among these additions is a series of mounted skeletons received in exchange for certain specimens sent to the Vienna Museum.

Among the more important donations received at the Museum during the past year may be mentioned a very fine collection of fishes from Nicolas Pike, Esq., U. S. Consul at the Mauritius. The collection embraces many rare and several hitherto undescribed species, and is of great value as illustrating the ichthyological fauna of those islands.

A large collection of fishes from the rivers of North India, by the Rev. M. M. Carleton, is also very valuable, as the number of species sent furnishes valuable data regarding the geographical distribution of the fishes of the immense river basins of Northern India. Heretofore much difficulty has been experienced in obtaining specimens from this locality in good condition. Owing to the swollen condition of the rivers in that country during the cool season, it is impossible to collect fishes at a time when they would keep best, and in the dry season, when the rivers are low, the temperature of the air is so high that the specimens become softened, and the subsequent shaking they undergo during the passage is apt to destroy them. Since Mr. Carleton has become aware of this fact he has taken great care to avoid the difficulty, and the specimens received this year have arrived generally in a perfect state of preservation. Mr. Carleton informs me that the Rev. David Herron is, at my request, making a

complete collection of the fishes of Dehra Doon; a valley in the Sub-Himalayas, situated between the water basins of the Jumna and Ganges Rivers. A former collection sent by Mr. Herron having suffered complete destruction during the passage to America, he has kindly undertaken to gather another more complete one.

From Dr. Francis Day, Inspector-General of the Fisheries of India, we have received a valuable collection of fishes from the Ganges, being types of some of the species described by him in the Proceedings of the London Zoölogical Society for 1868 and 1869. Dr. Day offers to exchange with us types of his Fishes of India, as well as those of the Malabar Coast, for specimens of our North and South American fishes. This opportunity to add to the value of our collection is one which should not be lost.

The Museum, during the past year, has obtained by exchange and purchase valuable collections from Baron von Müller of the Botanic Gardens, Melbourne, Australia. From Dr. L. H. Jeitteles from Salzburg and from Dr. Tausch, through Dr. Jeitteles, a jar of fishes from the Pruth in Bukovina, Austria. A collection from C. L. Salmin of Hamburg. A collection containing many rare specimens from Dr. Steindachner of the Vienna Museum, and a large collection both of alcoholic and dry specimen from the Red Sea, purchased of Dr. Klunzinger.

A collection of American fishes has been sent to Mr. C. L. Salmin in exchange; and representatives of the North American Sparoids have been lent to Prof. S. F. Baird, of Washington.

In addition to the care of the collection I have identified and catalogued all the specimens sent by the Rev. Mr. Carleton, with the exception of the last invoice; besides pushing forward my work on the family Pomotis and allied genera, which is now approaching completion.

In doing this a series of specimens for the Systematic Collection has been set aside, and another series illustrative of the North American faunæ has been begun.

I subjoin a schedule of the specimens received during the year:—

By Donation.

From the Hon. NICOLAS PIKE, a valuable collection from the Mauritius; many species.

From the Rev. M. M. CARLETON, a large collection from Northern India; many species.

From BARON VON MULLER, of the Botanic Garden, a collection from Melbourne, Australia, 27 species.

From Mr. H. G. HUBBARD, one jar of young *Amiurus*, from Lake Erie.

From the collection of H. MANN, Jr., by Mr. B. P. MANN, two jars of young *Pomotis* and *Bryttus*.

From the Rev. D. W. STEVENS, one jar of *Clupea harengus*, and one jar of *Anguilla bostoniensis* from Martha's Vineyard.

From Mr. D. W. ATWOOD, one specimen of *Petromyzon marinus* from Barnstable, Mass.

From Mr. SAMUEL LOCKWOOD, Jr., several jars of fishes from Tupper's Lake, Hamilton, Co., N. Y.

By Exchange.

From Prof. L. H. JEITTELES, one jar from the Salzach at Salzburg, two species, and two jars from Ostende, Belgium, four species.

From Dr. TAUSCH, one jar from the Pruth near Czernowitz in Buckovina, four species.

From Dr. FRANCIS DAY, a collection from the Ganges River, India, 114 specimens, 40 species.

From C. L. SALMIN, a collection from Hamburg, Prussia.

From Dr. FRANZ STEINDACHNER, collections from Europe, Asia and Africa.

From the VIENNA MUSEUM, a series of skeletons.

By Purchase.

From Dr. KLUNZINGER, a large collection of alcoholic specimens and skins from the Red Sea.

From the Alleghany Expedition.

By Mr. A. R. CRANDALL, a collection from Eastern Tennessee and Western Virginia.

Nothing has been done during the past year for the improvement of the collection of reptiles, besides taking care of the new additions.

Report on the Mollusca, by JOHN G. ANTHONY.

My last report, made on the 31st December last, brought the transactions, in my department, up to that date, leaving therefore but a period of ten months to report on at this time.

During the early portion of the present year my health was so far impaired as to interfere very materially with my labors at the Museum, the severe cold weather rendering my attendance there very uncertain. I was able, however, to continue my work for the Museum at such times at home, and in the identification of species, as well as in mounting specimens, considerable progress was made. The correspondence, too, so necessary in keeping up our regular exchanges, was duly attended to, and several packages were at that time prepared at home ready for sending abroad.

Among other labors performed at that season, was the examination and identification of all the unlabelled shells belonging to Colby University at Waterville, Maine, which were brought to my house for that purpose. These specimens consisted mainly of that portion of the collections made by Mr. A. S. Bickmore, in the South Seas, which came to the University through the liberality of one of its most generous patrons, and in consideration of those services and the further promise of such of our duplicates as we can readily spare, we received all the duplicate shells belonging to that institution.

Soon after resuming regular labor at the Museum, I completed the final arrangement of all our land shells, adding to the several genera such species as had been accumulating for three years past, and the whole is now in complete order.

Having concluded this laborious task, so far as land shells were concerned, I have since followed the same plan with the marine genera, and am now busily engaged, when other duties do not prevent, in completing that desirable object, making at the same time a full catalogue in all the genera. As this work properly performed necessitates more or less identification of species, it is of course a slow process, but one which I hope to bring to a satisfactory conclusion within the coming year. When that desirable end is accomplished, the collection of shells will be in better condition than ever before.

During this period our exchanges have by no means been

neglected, and the proper preparation of the specimens, together with the correspondence growing out of these exchanges, have occupied much time.

Among the packages received by exchange, have been several contributions of more than usual importance and deserving of special mention. No one of our various benefactors in this way has been more assiduous and untiring in his efforts to enlarge and improve our collection than the U. S. Consul at Mauritius, Hon. Nicolas Pike. In this department he has sent us, from time to time, some of the most valuable contributions we have ever received.

Our constant friend Dr. Dohrn, has also continued his kindness by sending us two parcels of choice specimens of shells, which being rare species and of unquestioned correctness as to labels, possess unusual value.

From Colby University we have received two large packages containing not only species for our collection, but many valuable duplicates for other exchanges.

Governor Rawson, of Barbadoes, has favored us with a well selected series of marine forms of the West Indies, which materially improves our West Indian faunal collection. This is the more satisfactory as we had been previously quite deficient in marine forms from that quarter. The species sent by him are particularly rich in graduated series of the young and old individuals, which gives them an additional interest to our collection.

The disastrous fire at Chicago in October, last year, which destroyed the Museum of the Academy of Sciences, with all its contents, consumed nearly all our specimens dredged in the Gulf Stream, and was to us a serious loss which seemed at the time almost irreparable. Prof. Stimpson, however, who by that fire was temporarily deprived of his position as director of the Museum, was at once employed to resume those dredgings, and the result of his labors has mainly supplied the species lost by that conflagration.

We are also largely indebted to J. G. Jeffreys, Esq., who had been allowed to select from those dredgings shortly before the fire for the purpose of comparison with similar dredgings made for the British Government, and who has not only promptly returned the specimens loaned him for that purpose,

but has also, in consideration of our great loss, sent back all those which were given to him unconditionally. Such conduct deserves the highest praise.

Other contributions may be briefly mentioned and we desire to express our great obligations for them to the several donors.

Dr. W. Newcomb sends us four species and nine specimens of select Santo Domingo shells, which were much desired and add greatly to our collection.

R. E. C. Stearns, contributes forty-one species, one hundred and twenty-three specimens of California marine shells, some of which species proved new to our collection.

W. G. Binney has sent us 15 species and 70 specimens, which are of more value than the number would seem to indicate, being mostly types of new species.

T. Bland has also kept us constantly in mind, and sent us 51 species, 809 specimens of West India shells, desirable for exchanges.

From A. Sallé, of Paris, we derive 28 species, 44 specimens of rare and choice shells, from Mexico and Santo Domingo.

Through our constant benefactor, Col. Pike, we have received a box containing 131 species and 360 specimens of marine shells from Mrs. Lacroch; this contribution is particularly rich in *Mitra* and *Pleurotoma*.

Mr. H. Hemphill, of Oakland, California, has laid us under obligations by sending us an unusually satisfactory collection of 259 species and 1,300 specimens of California shells, which makes our representation of that faunal region almost a complete one.

In European species we have been favored with large contributions from Dr. Kobold, Dr. Boll and Mr. Sandberger.

Rev. Mr. Carpenter, missionary to Burmah, has brought us 30 species of land and fresh-water shells collected by him in that region.

J. G. Jeffreys has again favored us with a small but exceedingly satisfactory collection of Chitons, being all the species found in Great Britain.

The foregoing, with some minor contributions from various sources, make up a total of 41 packages, containing 1,763 species, 19,342 specimens received during the ten months to

which this report refers. This may seem but a small addition as compared with former years, but I hope to be able to chronicle a much larger increase next year, when the many packages brought or sent home by the Hassler Expedition shall have been opened and distributed.

The number of packages sent away during the same time from my department has been 17, and they contained 1,555 species and 7,104 specimens. Small as these figures may seem they leave us very nearly free from obligations on account of our exchanges.

My young lady assistants were engaged at the commencement of the year in cleaning and mounting specimens for exhibition, but more recently I have directed them to select and separate the duplicate shells of every description, belonging to the Museum, so as to render them more available in our exchanges, and for the preparation of special collections for our high and normal schools.

This work when accomplished will afford great facilities and economize much time.

Report on the Articulates, by Dr. H. A. HAGEN.

The additions to the department in the year 1872 are:—

1. From Prof. FR. SANBORN, two species of North American Borens.

2. From Rev. M. M. CARLETON, a very large collection of butterflies and other insects, dry and in alcohol, from the Himalaya Mountains, about 10,000 specimens.

3. From Mr. J. A. ALLEN, insects and fresh-water crustacea from Nebraska.

4. From Prof. L. Agassiz, butterflies, from St. Thomas, West Indies.

5. From Prof. GERSTAEKER, in Berlin, a collection of 500 species of Hymenoptera and Diptera, representing types of his published monographs.—To be paid for.

6. From Mr. PIKE, U. S. Consul at Mauritius, a very rich lot of Crustacea, dry, from Mauritius; and valuable insects dry and in alcohol, from the same locality.

7. From W. H. EDWARDS, in Coalburgh, W. Va., 30 species of Lepidoptera from Colorado, types of his publications.

8. From Mr. HUBBARD, Cambridge, a lot of biological specimens of different insects.
9. From Mr. W. BASSETT, Conn., a complete set of his photographs of North American galls.
10. From (?)* a determined collection of European Coleoptera.
11. From Mr. W. H. EDWARDS, Coalburgh, W. Va., a complete series of *Papilio Marcellus* and new varieties.
12. From Mr. FOWLER, some insects and worms in alcohol from Florida.
13. From Mr. COMSTOCK, Ithaca, N. Y., biological specimens of insects.
14. From Mr. C. E. WEBSTER, of Binghamton, N. Y., a lot of biological specimens belonging to Bom. Yama-Mai.
15. American diptera and galls, also manuscript materials on the metamorphosis of diptera, and his scientific correspondence, deposited by the Baron OSTEN-SACKEN.
16. From S. W. GARMAN, of Chicago, insects in alcohol and some fossils from Utah and Wyoming.
17. From Mr. NIC. PIKE, U. S. Consul in Mauritius, insects, spiders, centipedes and worms in alcohol, from Mauritius.
18. From Mr. SCOTT, Va., a rich lot of Lepidoptera, from Virginia, in papers, named.
19. From Prof. F. SANBORN, biological specimens and rare insects from New England.
20. From Prof. G. MAYR, in Vienna, Austria, 61 species of galls, types of his monograph; 30 species of gall producers; 36 species of ants.—By exchange.
21. From Mr. W. BRISCHKE, of Danzig, Prussia, a beautiful lot of 100 species insects (biological collections).—Bought.
22. From J. BOLL, of Bremgarten, Switzerland, a valuable lot of Coleoptera and Lepidoptera, and biological objects.
23. From J. BOLL, a collection of Neuroptera.—Bought.
24. From Mr. B. P. MANN, several interesting insects from Rio de Janeiro.
25. From Mr. TROUVELOT, of Cambridge, eggs of *Corydalis cornuta*.
26. From Mr. J. SHUTE, insects for the biological collection.
27. From Mr. HUBBARD, an interesting lot for the biological collection; insects and some Astacides.
28. From J. BOLL, a valuable lot of New England insects of all orders, and biological specimens.

* The collection arrived at the Museum without any indication by which it could be identified, or the donor ascertained.

29. Insects from New England, and biological specimens by the curator.

The most important fact for the department was the transfer to a new room, considerably more spacious and more convenient for work, giving convenient working places to more students and assistants. Indeed, most of the tables were occupied during the past year. The spacious glass-cases along two walls of the room allowed a convenient arrangement for the library of the curator, increased in a valuable manner by the entomological works deposited by Prof. L. Agassiz and Mr. A. Agassiz, and those of the library of the Museum. The arrangement is made alphabetically, and all the works relating to the North American fauna are separated for the use of the students. A complete catalogue on labels made by the curator renders it easy to find every pamphlet. The library contains about 3,000 volumes, and represents more than 6,000 numbers of the entomological papers, enumerated in the curator's *Bibliotheca Entomologica*. Special attention was given to complete the series of North American authors and of papers scattered in the different economical and horticultural periodicals. A fine copy of Curtis' *British Entomology* (old illumination), a complete copy of the *New England Farmer*, *Lacordaire's Coleoptera* and *Harold's Catalogue* are the most important additions. So far as possible the curator takes care to supply the library with European monographs and periodicals, but chiefly with those not bought by other libraries in Cambridge and Boston.

An addition of new boxes and cabinets was necessary and has partly been provided for.

Mr. J. Boll, from Bremgarten, Switzerland, appointed by Prof. L. Agassiz, as assistant for the entomological department, was obliged to return to Europe on account of serious sickness in his family. Though he could only work here for a few months, the unsurpassed beauty of the insects collected and arranged by him furnishes a standard of the manner in which insects should be handled and set up for a public collection. He arrived toward the end of October and was obliged to leave in March, and yet he was nevertheless able to collect several thousands of insects around Cambridge and

Boston, to form a biological set, an entomological herbarium, to spread one-sixth of the butterflies in the collections of the Museum, and to arrange a nursery for raising insects. Besides a lot especially selected and raised in his room in glass jars and boxes, he established in the Museum four closets filled with dry leaves and branches of wood to raise insects contained as larvæ in these plants. The greater part of these were taken with him to Europe, and he sent a short time ago a written communication on the result. There are raised Micro-Lepidoptera, 60 species in 300 specimens; Macro-Lepi, 120 specimens; Hymenoptera, 170 species. The Tineina are scientifically described by Prof. H. Frey, in Zurich, and now in the course of publication. Of course the long transfer from Cambridge to Zurich of so delicate, living animals has been injurious to a part of them, and if Mr. Boll had been able to stay here the result would have been surely several times greater for the number of species as well as specimens.

I am glad to be able to state the very good condition of the collection in the better closed boxes. For the first time, upon a revision in the spring, in none of the boxes were Museum pests to be seen. Newly arrived additions strongly infested with *Tribolium ferrugineum*, a pest never before observed in the Museum, have since given us hard work, and even now are not entirely overcome.

The curator's time was taken up for several months by the rearrangement of a considerable part of the biological collection and the collection representing the transformation of the insects. Especially the Lepidoptera, Neuroptera, Pseudoneuroptera, and the collection of North American galls, necessitated an entirely new arrangement.

The biological collections of the department have increased rapidly in number and species in the last year, in consequence of the plan adopted of representing the whole history of a species in full (*a plan not yet carried out in any other Museum upon such a comprehensive scale*). The collection now begins to form a very valuable part of the whole department. Even the non-entomological visitors of the Museum, formerly attracted in a special manner by the beauty of the butterflies, begin to show a decided preference for those parts of the collection; and, in fact, frequently additions more or

less important are sent by visitors who have been so interested to fill the blanks of the collection. The most advanced part of the biological collection are the Lepidoptera ; the beautifully prepared specimens of European species by Mr. Brischke, are especially attractive. The North American silk-moths have been more or less completely worked out by the curator. The Lepidoptera fill more than two cabinets, and considering that many of the very common species are still wanting or to be more fully arranged, it may be presumed that in a short time twice as many cabinets will be necessary for this order alone.

The Pseudoneuroptera and Neuroptera, belonging mostly to the collection deposited by the curator, are exceedingly rich, and even without rival for some parts, as, for instance, the white ants, the Phryganids, the Odonata. The collection of white ants was considerably enlarged by Dr. Fr. Müller, of Itajahy, in the province of St. Catarina, in Brazil, who is now occupied with the study of this family.

The other parts of the biological collection are also in great need of a new arrangement, only prevented by lack of time. The appointment of two young ladies to help in the department will allow the curator to accelerate certain mechanical parts of the work, formerly done by himself.

The collection of galls is exceedingly rich for North American species, mostly in published types. By exchange of duplicates a similar collection for European species has been obtained from the newest monographer, Prof. G. Mayr, in Vienna, Austria. The biological collections of Brischke contain 400 species. The collection of galls, 400 numbers ; galls' insects, 200 species, mostly types. The mines of Lepidoptera more than 100 species.

The publication of these parts of the collection is to be considered as the most important and most pressing work. Mr. L. Cabot, having published the immature state of the family of the Gomphina, has ready for publication, figures and descriptions of the Aeschnina. Both papers contains for the greater part entirely new forms, and are a very valuable addition to our knowledge of those insects. Such monographs advance scientific classification in the surest way, and the monograph of the Gomphina proves that the Gomphina and

Cordulegaster, formerly united, can no longer be included in the same family.

The immature states of *Ascalaphus* and *Myrmeleon* have been described by the curator, and contain 37 species in about 20 genera, two-thirds of them new to science. Mr. Konopicky, from Vienna, attached as artist to the entomological department by order of Prof. L. Agassiz during his absence from Cambridge, has figured the larvæ, nymphæ, cocoons and eggs, so far present in the collection, with superior finish, and the volume containing these drawings is really a valuable addition to the illustrations in the Museum library. It is intended shortly to publish the whole family of the Hemerobina in the Illustrated Catalogues. For the remarkable monographs of North American Lepidoptera by Mr. W. H. Edwards, in Coalburgh, W. Va., Mr. Konopicky has figured a number of eggs, caterpillars and chrysalids from the living specimens, to be published in the forthcoming parts of this work. Some scientific work was completed by the curator either for the benefit of correspondents of the Museum or in consequence of new publications. The Cordulinæ of the Museum were sent to Baron De Sélys Longchamps in Liège, Belgium, and are published in his synopsis, forming an addition of about one-third of the species. The *Ascalaphina* were compared and studied after Mr. McLachlan's monograph, the *Ephemerina* after Mr. Eaton's monograph, and both families arranged upon the basis of this new knowledge. A monograph of the interesting genus *Pteronarcys* was given, and a scientific review of the Pseudoneuroptera and Neuroptera of T. W. Harris's collection made ready for publication. The Lepidoptera of Texas were sent to Prof. Zeller, in Stettin for publication. The Noctuidæ, Geometridæ, and a part of the Micros are just published by him, and the Texan Tineina by Prof. H. Frey, in Zurich. The Texan Hemiptera are in the hands of Mr. Ph. R. Uhler, in Baltimore, for publication. The Hymenoptera from Texas are finished for publication by Mr. E. T. Cresson, in Philadelphia, and returned to the collection. The Coleoptera from Zanzibar are published by Dr. Gerstaecker, in Berlin, and returned to the Museum.

Mr. Hubbard finished the scientific determination and

arrangement of the Prionidæ of the collection. Mr. Comstock, of Ithaca, N. Y., spent his vacation time in studying the collection, and Mr. Garman, of Chicago, and Mr. Minot, of Cambridge, are now occupied some days of the week in a similar study. So far as possible the curator has tried to give to these gentlemen private instruction concerning general entomology.

In the arrangement of other parts of the collection progress has been limited to the work already referred to. However, the whole Pseudoneuroptera and nearly all the Neuroptera are in perfect order. Both of these collections are only rivalled by two similar collections in Europe.

The scientific correspondence to be done by the curator was, as usual, very extensive.

The collection of the Crustacea was the whole year stored in the upper galleries of the older part of the building, as the new rooms are not yet fitted. Shortly before the disaster in Chicago, the late Prof. W. Simpson did go through the collection and divided them in two parts. One, nearly one-third of the collection, was to be sent to him to Chicago for scientific publication just the day when the horrid news of the disaster reached the Museum. The collection is now far more important than it ever was before, as it contains a part of the published types of W. Stimpson, the remainder of which was destroyed in Chicago. A valuable lot of them is still in the hands of Mr. Alph. Milne-Edwards, in Paris.

The additions to the collection of the Crustacea are very numerous and valuable for the fauna of Mauritius by Mr. N. Pike, and for the East Indies by Rev. M. M. Carleton. The additions to the Astacides of the United States would allow an important supplement to the curator's monograph of new species or better and more numerous specimens of some described species.

Report of Professor N. S. SHALER, Assistant in charge of Instruction.

During the academic year 1871-2, one hundred and three persons have attended the instruction given in the Museum.

Ninety-five of this number have received practical teaching in the laboratory, as well as lecture-room instruction. The first year's course consisted of twenty-four lectures and ninety hours of practical exercise, under the supervision of the instructor. This was attended by the members of the junior class, scientific students and some teachers. The second year's course consisted of one hundred and twelve hours of lectures and discussions, and an equal amount of supervised laboratory work. This course was attended by members of the senior class, the divinity school, about half a dozen teachers and several university students. The first year's course is designed to furnish a course of practical instruction in accordance with the system pursued since the foundation of the department of Zoölogy in the Lawrence Scientific School. The student is compelled to come at once into the position of an investigator, receiving only such assistance as may be required to help him to help himself. The first year's lectures are designed only as an adjunct to the other work. When the students have been carried, in a practical way, through one group of animals, becoming acquainted with its outlines by the use of typical forms, the group is taken up in the course of lectures and reviewed. In the second year's course the same system of practical work is continued, but each student is now required to take up some limited subject and devote time enough to his work to attain a thorough knowledge of it. Besides this practical work, a course of lectures, readings and discussions has been used, to acquaint the students with the outlines of the history of Zoölogy, from Aristotle to the present day. In this course the original monographs and treatises of the great masters have been taken up wherever it was practicable. Every student has been required to keep a notebook with extended notes and drawings concerning the practical work he has done. This remains in the possession of the instructor, except when in use in the laboratory, and serves as a continuous test of the status of the student. Besides the above described instruction, which was given by the assistant in charge, Mr. Tuttle was employed by the university authorities, to give a course of instruction on the use of the microscope. This course, which was completed in one term, was sufficiently extended to enable the students to acquire a

practical working knowledge of the microscope. Mr. Edward Burgess was also employed by the college to give a course of instruction in Entomology during half a term. The care of this system of instruction has required about five hours per diem during the eight months of the university year; this has left little time for any other work. The first part of a monograph, on the Brachiopoda of North America, has been prepared for the press and will be issued during the current year, as a part of the Catalogue of the Museum, with eight plates and two maps to illustrate geographical distribution.

The second part is about half ready for the press. The condition of the collection of Brachiopoda has been materially improved. A lathe has been arranged in such fashion as to cut sections of the specimens; several hundred have been prepared, showing the internal structure, and about one hundred microscopic sections have been made and mounted by Mr. Crandall. These preparations have already given some important additions to our knowledge of the remains of this group of animals. With the hope of making important additions to our collections of fossils, a subscription was obtained to send Mr. Crandall on a collecting journey through the mountain region of eastern Tennessee, western North Carolina, northern Georgia and Alabama. At the present time this expedition is still in the field. Large collections have been made, however; those from near Chattanooga, Ga., and Huntsville, Alabama, having an especial value. Mr. Crandall will spend some time in Illinois, working upon the most important localities in that State.

The department is indebted to the following gentlemen for subscriptions to this exploration fund: A. E. R. Agassiz, Louis Cabot, John Cummings, C. W. Eliot, E. W. Gurney, Theodore Lyman, John E. Lowell, and N. S. Shaler.

During the summer months of 1872, arrangements have been making for the foundation of a Zoölogical station and summer school of Natural History on our coast. With a view to determine the best place on our shore for such a work, a careful inspection was made of the coast between New London, Conn., and Eastport, Maine. With the advice and consent of the director of the Museum, Nantucket has been selected for the site of the station and school. It is intended

that the school shall furnish an opportunity for students of Natural History, especially the teachers of our public schools, who may be engaged in giving instruction in that branch, to acquaint themselves with the methods of study which are used in the Museum. The summer term of three months will enable those who are earnest in such work, to acquire a knowledge of facts and methods which cannot fail to have a very important influence upon the ways of teaching in our public schools. Some liberal citizens of Nantucket have agreed to furnish a suitable building on the edge of the water, which will give a larger amount of room for the work of investigation and instruction than is afforded by any other existing school.

There are six rooms, each thirty by forty feet, and one of twice this size, which can be used for the purposes of the school. A number of the working naturalists have promised to aid in the work of instruction. It now seems reasonable to expect that there will be at least twenty-five investigators of ability, and a considerable number of students in attendance next summer. The U. S. Coast Survey and the commissioner of fisheries, have promised their coöperation in this work. Although like the existing department of instruction in the Museum, in connection with Harvard University, this school will be in fact the summer session in the educational department of the Museum. Under its general direction, it may prove a powerful means of extending the system of instruction which has always been followed in the Museum. It is to be hoped that the necessary arrangements may be made to enable the teachers of the State Normal Schools to attend this school during the summer vacation.

Report on the Palæontological Collections generally, by JOHN B. PERRY.

The following account of the present condition of the palæontological collections, and of the progress made in the department during the past year, is respectfully submitted.

As to the condition of the collections a few words will

suffice. The plan adopted in the distribution of the vast store of material was fully set forth in the report of last year. The arrangement is such as to render the finding of any given portion of material a comparatively easy task. So far as I am aware, this task was never of so easy accomplishment as now. This is true notwithstanding the large additions made to the collection within the last few years, and the increase which is constantly going on. As the present plan is carried out in greater detail, the consultation of the collection, though the future increase of material should be great, will come to be more and more a matter of pleasure. One of the most serious difficulties now experienced in the way of consulting the entire collection is found in the fact, that many groups simply lie one above another in piles of drawers, instead of being arranged upon racks.

Of the work done this year in the palæontological department, the plan was exhibited at large in my last annual report. That report also gives the several sections of the work as it is now laid out, and in progress of gradual execution, with sufficient minuteness. In indicating the progress actually achieved, I have, therefore, merely to refer to that report, both as to plans and details, simply adding that the main labor during the past year has been expended in the carrying out in greater fulness what is therein indicated in outline.

The Taconic and Silurian fossils have received their share of attention. To the Devonian, Carboniferous and Dyassic, Mr. St. John has devoted himself with assiduity, and will report upon this portion of the work in detail. Considerable additional labor has been expended in efforts to bring together in completeness all the secondary material belonging to the Museum. Professor Hyatt has carried forward his special work on the Ammonites of the Mesozoic rocks. A large number of this group of Cephalopods is in readiness for mounting, and would have been mounted before this, had there not been uncertainty as to the exact colors to be adopted for the tablets of the Triassic and Jurassic fossils. The Tertiary organic remains have been constant objects of care. Full particulars in regard to them having been given in the last report, I may simply add that the work upon them has

been pushed with as great rapidity as circumstances have allowed.

In the work upon the Tertiary shells, in which is included a large amount of previously unfinished details of a preliminary kind, I have been assiduously and greatly assisted by the Misses Cutler and Atkinson, who by their long experience have become efficient helpers in this portion of my labor.

A few words respecting the several different collections of Tertiary fossils, which are now in process of formation, may not be out of place in this report, especially as it is the intention to make like collections illustrative of all the other geologic formations, and as a brief statement of their character in this place should preclude the necessity for a frequent repetition of the same explanation. It is the aim, and work towards its realization is in constant progress, to make at least five Museum collections. These are called respectively the synoptical, the systematical, the faunal, the chronological, and finally the students' collection. To each of them may be devoted a word of explanation.

1. The Synoptic Collection. This is to consist of a few characteristic forms—choice being made of a single specimen of each of a few of the more marked species—of every considerable organic group, and is to stand as an epitome or synopsis of what will be exhibited in greater detail under other relations. It will thus serve to give at a glance the grand characters of the whole kingdom of nature.

2. The Systematic Collection. In this collection each species is to be represented usually by a single choice specimen, the individual selected being one of the best to be found, that all the characters of the species may be, to as large an extent as possible, exhibited in a unique example. Of course this collection is to be arranged according to systematic affinities, irrespective of geologic age, or of any other considerations.

3. The Faunal Collection. It is the aim to make this collection as complete as the material will allow—to give distinct prominence to every feature at all worthy of exhibition. Every locality should be represented, so far as may be, in order to the fullest indications of the natural limitation and distribution of species in each of the many successive live-periods. All the peculiarities of the individual and of the

species need to be brought to light, thus furnishing the most abundant means for the study at once of the permanency, and of the variability of organic characters. With the same end in view, it is the purpose to select specimens of both sexes, and of various stages of growth, that the whole truth may be known according to the facts of nature.

4. The Chronologic Collection. This is intended to comprise a single example of every distinct species found on each geologic horizon without regard to locality. It is thus suited to indicate as well the life-period of each species, genus and family, as the orderly succession of these groups in time.

5. The Students' Collection. This collection, equally with each of the other collections, has its distinctive aim. The end kept prominently in view in its formation is twofold, viz., to meet the wants of the teacher in furnishing suitable means for illustration, and the necessities of the pupil in supplying appropriate material for study.

It is scarcely necessary to add that, in the formation of these collections, specimens for sections illustrative of the internal structure of given organic forms, are in constant process of selection, while all the material which remains unused is set aside, after being duly labelled, for exchange.

In closing this report, reference might be fitly made to the additions to this department of the Museum during the year. The palæontological collections have, however, been so greatly enlarged by the reception of specimens from other institutions, that a mere enumeration of them would unduly swell this report, and is therefore omitted.

Report by DR. G. A. MAACK.

The progress I have made since the writing of my last report concerns the osteological collection of the Museum. The examination and arrangement of this collection have at present advanced so far that I am able to report it as very complete in many points, while its general character stands in proper proportion to all the other collections of the Museum. As this collection had never been arranged when I took charge of it, but was packed up in a large number of boxes, which

had been handled over many times, I had to do a great deal of mechanical work in order to bring together the right parts and specimens and clean them in such a manner that they could be used for scientific studies. I have to mention this, that the employment of my time may be understood. There are altogether 448 skeletons and skulls of mammalia; 225 of birds and 120 of reptiles. The fishes are not yet in order.

Casts have been made: first, of a series of Mastodon skulls belonging to the anatomical museum of Prof. Wyman; secondly, of a large series of specimens lent to us by the Smithsonian Institution at Washington for that purpose; thirdly, of several unique specimens lent to us by Prof. Leidy, of Philadelphia; fourthly, of fish specimens for Mr. St. John. Collections have been sent to the Smithsonian Institution at Washington, to Prof. Leidy, to the Museum at Munich, and to Mr. Jeitteles at Salzburg, Austria.

[B.]

TRUSTEES OF THE MUSEUM OF COMPARATIVE ZOOLOGY,
1873.

THE GOVERNOR OF THE COMMONWEALTH,	WILLIAM B. WASHBURN.
THE LIEUTENANT-GOVERNOR,	THOMAS TALBOT.
THE PRESIDENT OF THE SENATE,	GEORGE B. LORING.
THE SPEAKER OF THE HOUSE,	JOHN E. SANFORD.
THE SECRETARY OF THE BOARD OF EDUCATION,	JOSEPH WHITE.
THE CHIEF JUSTICE OF THE SUPREME JUDICIAL COURT,	REUBEN A. CHAPMAN.

 LOUIS AGASSIZ.

 THEODORE LYMAN.

 NATHANIEL THAYER.
 SAMUEL HOOPER.
 JAMES LAWRENCE.

 CHARLES W. FREELAND.
 SAMUEL ELIOT.
 MARTIN BRIMMER.

OFFICERS OF THE MUSEUM OF COMPARATIVE ZOOLOGY FOR
1873.

His Excellency WILLIAM B. WASHBURN, Governor of the Commonwealth, *President.*

CHARLES W. FREELAND, *Treasurer.*

MARTIN BRIMMER, *Secretary.*

LOUIS AGASSIZ, *Director.*

SAMUEL HOOPER, JOSEPH WHITE, NATHANIEL THAYER, JAMES LAWRENCE,
Committee on Finance.

LOUIS AGASSIZ, SAMUEL ELIOT, CHARLES W. FREELAND, *Committee on the
Museum.*



