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Note. By the Constitution of the Society any person contributing to its funds a sum not less than fifty dollars, becomes a Patron.

PROCEEDINGS

OF THE

BOSTON SOCIETY OF NATURAL HISTORY.

TAKEN FROM THE SOCIETY'S RECORDS.

January 5, 1848.

The President in the Chair.

The Society met for the first time in their new Hall, in Mason Street. A large number of members was present.

The President congratulated the members on the agreeable circumstances under which the first meeting of the new year was held. He remarked, that the Society had struggled long under the difficulties imposed by narrow means and limited accommodations, yet it had in past years proved itself active and energetic, and had labored well, and contributed its share towards the advancement of Natural History. He hoped it would go on with renewed zeal and vigor for the future, and, under more favorable circumstances and increased means of usefulness, would not permit the achievements of its maturity to contrast unfavorably with those of its youth.

Dr. Storer corrected the record of the last meeting. His statement that the *Carcharias obscurus* was the only Shark of our waters with serrated teeth arose, not from any doubt that the teeth of C. *ceruleus* were serrated, but from a doubt whether that species was an inhabitant of our waters. He has not known of any individual of that species having been

taken in our waters; but he had been told, though not by that gentleman himself, that Prof. Agassiz has a specimen so taken.

Dr. Gould stated that the singing Mouse, caught in Boston, which he had exhibited at the last meeting, whose performance at that time had been rather feeble, had afforded a sufficient excuse by producing the next morning three young ones. Dr. G. had hoped to have preserved them, to ascertain if they possessed their parent's musical powers; but they had all been destroyed by the mother, who has since sung almost incessantly, and with more vigor than before. Dr. G. said he had not yet ascertained by what means the sounds were produced, but thought they might be made by the labial fissure.

Mr. Desor remarked, that the power of a mouse to utter musical sounds was in analogy with a similar faculty possessed by another family of the Rodentia, the Marmots, to which it has long been known to belong.

The President exhibited casts of the Bones of *Dinornis giganteus*, and compared them with those of the Ostrich and Dodo. He also gave a sketch of Mr. Owen's latest observations on the subject of the last-mentioned bird, and the *Apteryx* of New Zealand.

Mr. Stodder exhibited specimens of manufactured *Gutta Percha*, and made some observations upon its properties.

Mr. Desor, lately observing a luminous spot at night in the waters of Boston harbor, took a boat and went to the place, and obtained a bucket full of the water. It was found abundantly stocked with crustacea, drawings of some of which, as displayed by the microscope, were exhibited by Dr. Gould. One of them appeared to be *Calanus arietis*, Templeton.

Mr. Desor remarked, that the light was of a bluish tinge, and is, as he conceives, dependent on the will of the animal.

Dr. Storer exhibited a Fish, of the genus *Motella*, to which he had given the name *caudacuta*. He remarked,

"This genus has been unknown to the waters of North America until I received the specimen which I now exhibit. Two specimens were cast upon the beach at Long Point, Provincetown, in November last. Capt. Atwood brought me one of them, which I determined a new species, and have called *caudacuta*. In some respects it agrees with Parnell's M. *cimbria*, or *four-bearded Rockling*, but differs in several important particulars. The form of the tail furnishes the specific name."

Mr. Ayres presented specimens of two species of Fish *Aphrododerus Sayanus*, which Dr. Dekay says he has never seen, although this specimen was taken within a short distance of Dr. D.'s house; and *Leuciscus nasutus*, from Hampden county, Mass. The individual presented was the one from which Mr. Ayres constituted the species.

Dr. Gould made some remarks upon the importance of depositing in public cabinets, whenever they could be procured, the identical specimens from which species had been described, and also of authentic specimens labelled by describers themselves, and of so designating them that the fact should appear. He hoped the practice would prevail among naturalists.

Mr. J. D. Whitney exhibited and described *Jacksonite*, a new mineral from the Lake Superior region.

The analysis of the ignited mineral gave

		Oxygen.	Ratio.	Calculated.
Silica	46.12	23.96	3	46.17
Alumina and a little $\dddot{F}e$	25.91	12.09	$1\frac{1}{2}$	25.68
Lime	27.03	7.90	1	28.14
Soda	.85			
	99.91			

The oxygen of the silica, alumina and lime being as $3 : 1\frac{1}{2} : 1$, or $6 : 3 : 2$, the formula will be

$$\dot{C}a^2\ \dddot{S}i + \dddot{A}l\ \dddot{S}i$$

This, it will be perceived, is the formula which is given by

Walmstedt for Prehnite, except that it contains no water. The Jacksonite, dried at 100° C., was found to contain less than $\frac{1}{10}$ per cent. of water. The ratio of the oxygen in this mineral is an unusual one, and had led Berzelius to adopt another formula for Prehnite.

Dr. Cabot announced the donation from Mr. James Richards, of a fine specimen of the Wandering Albatross, *Diomedea exulans*, Lin.

Mr. Sharp presented a Seed-vessel of *Nelumbium luteum.*

Messrs. Junius Hall and Horatio Bigelow were elected members of the Society.

Dr. Storer offered the following resolutions, which were unanimously passed.

Resolved, That the heartfelt thanks of this Society be presented to those gentlemen whose munificence has enabled us to call this temple our own.*

Resolved, That we will endeavor to prove our sense of obligation by a renewed devotion to the cause of science.

Resolved, That we deeply feel the kindness and liberality of George M. Dexter and Edward C. Cabot, Esqrs. in advising and aiding in the architectural arrangements of our building; and most especially do we feel indebted to N. B. Shurtleff, M. D., for the skill he has exhibited in adapting, and the zeal and fidelity with which he has for months superintended the advancing work.

Dr. Storer remarked, that there were many individuals whom it would be grateful to his feelings to thank, by name, for the aid they had rendered in money and labor in the accomplishment of the work. But, as he could not name some and omit others, without injustice, he forbore. There was, however, one individual, whose services had been so efficient, that it might truly be said that without him the enterprise could not have been accomplished. He meant the President of the Society. He was sure that every member must feel how deep was our obligation to that gentleman.

The Secretary offered the following resolution, which was adopted.

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* The sum of $28,660 was contributed for this purpose, mostly by the persons whose names have been given on the first page, as Patrons of the Society.

Resolved, That each individual member be requested to consider what books, if any, he can spare from his private collection, and make more extensively useful by adding them to the Library of the Society; and that he be requested so to deposit them, either as a gift or under such conditions as he may see fit.

January 19, 1848.

The President in the Chair.

A large number of members present.

Dr. Kneeland read an account of a dissection by him of the organs of an Alligator, which died recently in this city, from injuries received by falling out of a window. Paper referred to Publishing Committee.

Dr. Gould made some remarks in regard to the phosphorescence of animals, alluded to at the last meeting, and the experiments and conclusions of Prof. Matteucci with reference to it. Prof. M. had placed glow-worms in oxygen gas and in atmospheric air, both the entire bodies and the luminous portions only. After the luminosity was extinguished, he found the air had lost oxygen and gained carbonic acid. Hence he concluded that a real combustion takes place.

Dr. Gould thought the experiments indecisive, inasmuch as the effects observed were precisely those of respiration, for which no allowance had been made. It did not appear that the same results would not follow from placing any other insects under the same conditions. In some of the experiments, parts of bodies only were used; yet the bodies of insects being provided with air-tubes and ganglia throughout their whole length, portions of them for some time after separation would still produce the effect of the entire body, on the surrounding air.

Dr. Cabot remarked, that fire-flies leave a line of light on any surface upon which they may be rubbed. The odor of fire-flies,

he said, resembles that of phosphorus. He regarded their light as analogous to that of phosphorus.

Dr. C. T. Jackson mentioned having heard Prof. Hare, of Philadelphia, speak of experiments he had made on fire-flies. He had placed them in oxygen gas, but did not find that their light was increased thereby. Dr. J. thought the odor to resemble that of ozone, the odor which accompanies the development of electricity, to which, in his opinion, the light of fire-flies was owing.

Prof. Rogers remarked, that the point of combustion varied very much in different bodies. In some it was very low; so that it was difficult to pronounce in all cases that it did not exist.

Mr. Teschemacher exhibited several fine specimens of the fossil vegetation of the anthracite coal, with sections and portions of the leaves of recent palms, part of them artificially carbonized, in order to show the analogy between their structure; particularly as respects the character of the transverse vessels. One of the specimens exhibited the internal part of a portion of a very large leaf (?) lying parallel with, and only one-fourth of an inch distant from a mass of stem of Sigillaria, probably belonging thereto.

He remarked, that the specimens on the table were but a small portion of the new and undescribed forms of vegetation he had discovered in the coal; that in these the impression of form or outline was not the most important evidence, for here was the identical substance of which the plants were composed, carbonized certainly, but nearly as perfect in the form of cell and vessel, and in their relative position to each other, as when the plants were in existence. He made various other observations on the subject, and finally remarked, that although extremely averse to theorizing in the present infancy of science, he could not avoid stating his investigations thus far had inclined him to the opinion of those geologists who considered the anthracite anterior to the bituminous coal formation. Beyond this, he thought the result of these investigations might show the anthracite to have undergone much more intense pressure than the bituminous coal, and to be composed chiefly of large non-resinous acotyledonous and monocotyledonous plants. That the subsequent appear-

ance of the resinous coniferæ, &c. pervading the whole bituminous formation, was a step, perhaps not the first, in the progress of the vegetable creation towards, he would not say those more perfectly developed forms, but towards those dicotyledonous forms of the present day possessing more functions, and qualities more adapted to the use of the animals, terminating with man, which were to appear on the globe; a progress somewhat analogous to that supposed to have taken place in the animal creation.

He much regretted that the want of books, of living and dried specimens of tropical acotyledonous and monocotyledonous plants, particularly of Palms and Gramineæ, and of a proper microscopical apparatus, impeded his further and more minute investigation of this interesting subject.

Prof. Rogers hoped Mr. Teschemacher would persevere in the investigation. Books could and ought to be procured. He offered from his own collections, made in Pennsylvania, an abundant supply of specimens. On the subject of the relative ages of the anthracite and bituminous Coals, he could not agree with Mr. T. He thought his own and his brother's researches in Pennsylvania had demonstrated the parallelism of the two kinds, and the progressive augmentation of bitumen as you advance towards the west.

Dr. Gould exhibited specimens of *Bulla solitaria*, from Plymouth Beach, collected by Rev. Mr. Hincks, who found them in great numbers. Dr. G. was not before aware of the existence of this shell in that locality. It had been found at Newport, R. I., and Roxbury.

He also presented, on behalf of B. A. Gould, Esq., a portion of the Jaw of a Skate, *Raia ocellata*, and a specimen of *Phrynosoma orbiculare*. Also, an *Agama* from Prof. Cleveland, of Bowdoin College.

Dr. Bacon exhibited masses of Gutta Percha, to show the appearances which had been mistaken for wood and bark.

Mr. Teschemacher reported on the Seed-vessel of *Nelumbium luteum*. Mr. Ayres remarked that the plant was found as far north as Connecticut, in a pond in Middle Haddam, in that State.

Messrs. John B. Kettelle and John C. Dalton, Jr. were elected members of the Society.

On motion of Mr. Teschemacher, it was

Voted, That the thanks of the Society be presented to Dr. Storer, Dr. Cabot, and their associates of the Committee who have labored with so much earnestness, perseverance, and success, to raise funds for the purchase and adaptation of the building in which we now meet, for the use of the Society.

A specimen of *Tillandsia usneoides*, taken from a live-oak tree growing at Bona Vista, about three miles from Savannah, was presented by George Griggs, Esq.

February 2, 1848.

The President in the Chair.

Seventeen members present.

Dr. Stone read an extract from the Penny Cyclopedia, on *Lampyris noctiluca*, the Glow-worm, in which detonation of hydrogen gas was said to have followed an immersion of one of them in it.

Dr. Gould considered the phosphorescence of insects as analogous to the luminous appearance sometimes presented by putrefying fish, rotten wood, &c. He stated that Prof. Agassiz was at present engaged in investigating the subject. The President remarked, that Prof. A. had, in a recent lecture, spoken of the coincidence of the luminous portion with the position of the nerves, seeming to indicate a connection between the luminosity and nervous action. Dr. Gould reminded the Society of the fact that the electric power of certain animals also rested in the nervous system.

The President compared the head of an Albatross with

the cast of that of a Dodo, and pointed out a general resemblance between them. Dr. Cabot remarked that the head of the Dodo strongly resembled that of some of the Doves.

Mr. Desor stated that among the various animals that he had procured lately by dredging in Boston harbor at a depth of twenty-five or thirty feet, there were many specimens of a small Star-fish, probably a new species, of the genus *Echinaster*, nearly allied to the European *E. sanguinolentus*.

Several specimens of these star-fishes carried around and before their mouths large bundles of small yellow bodies, of the size of small pins' heads, which were the eggs. An interesting fact is the existence of a strong maternal instinct in these animals. On removing the eggs from the mother's embrace, she was seen to move at once directly towards them, and clasp them again.

On examining the eggs under a microscope, it was ascertained that each egg contained a large, opaque, yellow sphere, which was surrounded by a transparent fluid, similar to that which is found in the eggs of the Mollusks, and being by no means of an albuminous character. On escaping from the eggs the spheres began almost immediately to contract at one extremity, so as to form a sort of peduncle. It was no longer a simple yolk, but an embryo. The peduncle became more and more marked, and after a short time (commonly the first day) the embryo had assumed a form very similar to that of a mushroom. In the mean time there could be seen a distinct separation of the embryo into two layers, an external one, more or less transparent, and an internal one, more opaque. Both were composed of very minute nucleated cells, some having even a nucleolus.

In many cases the division into two zones may be perceived, even when the embryo is still enclosed in its shell; showing that in these lower animals the hatching does not occur at a fixed epoch of development, but that it may be considerably accelera ted or retarded according to circumstances.

Dr. Storer announced the reception, from Capt. Atwood, of a Shark, captured at Provincetown, of a species which he at present considered new. It might perhaps be the same as one described by Dr. Wood, of Portland; but as

his description was from a stuffed specimen, it was difficult to decide whether it related to the same fish as the present one, or not. If it did, it was far from a correct description of the fish in its natural state. The name of Dr. Woods's species is *Lyodon echinata.*

The donation of a copy of the Map of the State from the State government, was announced. The thanks of the Society were voted for the same.

Messrs. Theodore Simmons, B. H. Dixon, and John H. Stevenson, were elected members of the Society.

February 15, 1848.

The President in the Chair.

Twenty members present.

In reference to the remarks, at the last meeting, on the connection between the luminous power in animals and nervous action, the President reminded the Society of the existence of phosphorus in the substance of the brain and nerves.

Dr. Kneeland read a paper on the anatomy of the internal organs of the Shark, lately received from Capt. Atwood.

Mr. J. D. Whitney exhibited a beautiful specimen of a new mineral, *Chlorastrolite*, from Isle Royale, Lake Superior. The analysis showed it to belong to the Zeolite family.

Dr. C. T. Jackson read a paper from Dr. H. C. Perkins, of Newburyport, describing some experiments with Chloroform upon the lower animals, the result of which was to show that Chloroform had the effect to retard the circulation.

Dr. Gould expressed surprise at this result, inasmuch as it seemed different from the effect recorded by other observers;

and he mentioned that Dr. Wyman, who has been engaged in experiments of the same kind as those of Dr. Perkins, has made no mention of such an effect.

Mr. Desor gave an account of some experiments of his own with chloroform on various animals. He found the articulated animals most readily affected. *Cottus* resisted its influence for fifteen minutes. *Gammarus* was paralyzed instantly on coming in contact with a drop of chloroform; they generally recovered after different intervals. *Asterias* was as if dead for three days, and revived on the fourth. *Actinia* was affected. In this animal nerves have not been detected, although Prof. Agassiz has discovered muscular fibres. Their being susceptible to chloroform goes to indicate the presence of nerves. As soon as a drop is put on their tentacles, long white strings come out, the Spermatophora, so called.

Dr. Gould remarked, that in examining ova, the application of chloroform had the effect of stopping the motion of the ovule. The strings mentioned by Mr. Desor, he thinks offensive and defensive organs, which the animal thrusts out when irritated. The stinging power of these animals is well known; it is sufficient to enable them to destroy small animals, and at a considerable distance. It probably resides in these threads.

Dr. Bryant remarked, that the effect of chloroform was by some supposed to prove that the capillaries of the nerves of sensation, being very minute, were affected before those of motion.

The President remarked, that Ether belongs to the class of Excitants. The sedative effect is probably the effect of exhaustion. Ether excites to increased energy, devouring, as it were, the nervous energy.

Dr. W. F. Channing stated, that thinking it desirable to have the effect of the inhalation of the vapor of the Hypo-Nitrous Ether tested, as an opinion had prevailed that it was dangerous to life, he had tried it on himself, and found the effect extremely distressing, and such as would probably be fatal, if carried to a great extent.

Mr. Desor gave a further account of the development of the embryo of the Star-fish, in the study of which he is now

engaged. The only observations we possess upon the Embryology of these animals, are those of the Norwegian naturalist, Rev. M. Sars; but these concern merely the external changes which the embryo undergoes. Mr. Desor has devoted a closer attention to the internal organization. The peduncle plays a most important part in the development of the star-fish, being a receptacle for the yolk intended for the nutrition of the embryo; in consequence of which, its volume diminishes in proportion to the growth of the embryo, until the yolk is completely exhausted, when it is taken up into the body, like a reduced hernia, and becomes part of the intestine.

After having gone through the Mushroom form, mentioned on a former occasion, the embryo assumes gradually the shape of a pentagon, the angles of which are at first very obtuse, but become more and more projecting. After a few days (commonly on the 3d or 4th) a swelling, like a transparent vesicle, may be seen at the lower part of each angle of the pentagon. This is the first indication of the tentacles. Some days after, the number of the vesicles had increased, and there were now for each angle of the pentagon three vesicles, later still five, then seven, &c., being separated by a depression, in which the first trace of the ambulacral furrows was recognized. At the same time there was a small red dot appearing on each of the terminal vesicles, which proved to be the rudimentary eyes. They are mere pigment cells. On compressing an embryo of this age, we see three separate zones; an external one, generally somewhat translucent, a second very transparent, and the internal yolk mass, which is most opaque. The same layers exist also in the peduncle.

On motion of Mr. G. B. Emerson, the thanks of the Society were voted to Dr. Shurtleff, for the great care he has taken, for the time he has given, and for the taste and skill he has exhibited, in providing for the accommodation of the Society and its Collections.

Dr. William Read was elected a member of the Society.

March 1, 1848.

The President in the Chair.

Present eighteen members.

Dr. Bacon, on behalf of Dr. Kneeland, read a paper on the Anatomy of the internal organs of the Thresher Shark, comparing them with those of the Shark from Provincetown, described by him at the last meeting.

Mr. Desor continued his account of his experiments with chloroform on animals.

Two small fishes, a Minnow and a Stickleback, were placed in a jar of water. Twelve drops of chloroform being added, in from four to five minutes they became stupefied. On being removed from the jar, they revived in from twelve to fifteen minutes. On one specimen the experiment was tried five times, with a manifestation of increased susceptibility with each repetition. The circulation under the microscope was seen to be retarded; and in one experiment, where the fish was kept in the jar forty minutes, it was brought to a complete stop. The fish was however not dead. The eye was clear, the color of the body unchanged, and it continued poised as in life, with the back uppermost. The circulation appears to cease first in the minute capillaries of the tail. The hind part of the body is generally bent. Motion in the pectoral fins ceases long after it does in the others.

Dr. Cabot read a paper on the Dodo, which Cuvier arranged with the Gallinaceous birds, and Mr. Owen has since classified with the Raptorial. Dr. Cabot classes it with the Columbidæ. His paper was referred to the Publishing Committee.

Dr. Storer stated that the Shark recently received from Provincetown, proved to be the same species as that taken on the coast of Maine two years since, and which was described and the description communicated to him at the

time by Dr. Wood, of Portland. After our specimen was stuffed and dried, it proved to be the *Somniosus brevipinna*, Lesueur. Lesueur described his fish from a dried and stuffed skin, which he saw in Marblehead, in 1818. Our fish, when recent, did not answer at all to that description or figure ; but when stuffed and dried, it agreed with it perfectly. One characteristic in particular worthy of notice, the *lateral line*, scarcely observable in the recent fish, is exceedingly well marked, exhibiting the vertical bands pointed out by Lesueur. These three specimens, Lesueur's, Dr. Wood's, and the one belonging to the Society, are all the *Somniosus brevipinna*, the Nurse or Sleeper Shark.

Prof. Rogers made some remarks upon the Infusorial deposit at the mouths of rivers in the Southern States. On the Rappahannock, York, and James rivers, these deposits are in great development. They are caused by the influx of vast numbers of marine Infusoria by the flood-tide, which, on meeting the fresh water of the river, are instantly deprived of life, and sink, leaving their silicious or calcareous covering to swell the mass of delta and raise the river bed.

Dr. Gould remarked, that not only do the Marine animalculæ perish on meeting the fresh water, but tribes of fresh water species also are destroyed by the access of the water of the ocean, and add their bodies to swell the general mass.

Mr. Desor presented some remarks on some peculiar bodies which are seen moving in the interior of the eggs of different kinds of *Eolis*, and which have been described by M. Nordmann as parasites, under the name of *Cosmella hydrachnoides*.

They are small spheres, with long, transparent threads attached to them, by means of which, with undulations like those of a whip-lash, they move about with great activity. Some observers might be led to consider them as independent existences. One might even suppose them to be the first state of those peculiar parasites which Dr. Gould has found so numerous on the appendages of the full-grown *Eolis*. But, on the other hand, when we

consider that motion is by no means a characteristic peculiar to animals, there would seem to be just as good ground for considering these moving bodies with their cilia as mere cells, similar to the vibratile cells described by Henle. The fact that they are only found when the embryo is already furnished with its long cephalic cilia (cirrhi) might easily lead to the supposition that they are only similar cilia detached from the head of the embryo; which is the opinion of Vogt. At any rate, they must be proved to be animals before they can be quoted as an argument in favor of the theory of spontaneous generation. Mr. Desor exhibited to the Society these bodies under the microscope.

Dr. Cabot announced that he had procured in Boston market a specimen of *Turdus nævius*, the first of the species he had known to be procured east of the Rocky Mountains. It was shot in New Jersey.

Dr. Shurtleff announced from the publishers of the Boston Atlas the donation of their newspaper. The thanks of the Society were voted for this donation.

Dr. Gould announced the donation of a fine Collection of American Insects, from John Bethune, Esq.

Dr. G. H. Lyman was elected a member of the Society.

March 15, 1848.

The President in the Chair.

Present, twenty-four members.

Mr. Desor gave a further account of the development of the Star-fishes.

When the embryo is so far advanced that we can distinguish the ambulacral furrows with the rudiments of the tentacles, we may perceive, on compressing it, in the interior of the body, several spots of a calcareous network between the outer zone

and the internal yolk mass. These calcareous spots are not scattered at random; there are generally eleven principal ones, five corresponding to the radii or ambulacres, five to the spaces between them, and a central one, the rudiment of the madreporic plate. The five interambulacral plates, which answer to the masticating apparatus in other Echinoderms, approach afterwards nearer to each other, so as to form a ring around the attachment of the peduncle; whilst those corresponding to the rays recede, and form as it were a second ring outside of the first. In the mean time new spots appear, but instead of forming outside of those already existing, they come between the two rings; so that the ambulacral spots which were at the beginning near those of the interambulacral ring, are constantly carried further from the centre. The last plate of each ray is therefore the oldest; a fact by no means extraordinary if we consider that it is connected with the eye, and protects it. In a similar way we see, in the higher animals, the hand formed before the arm and forearm. As the ambulacral plates are connected with vision, and the interambulacral plates with the function of nutrition, their early appearance may be considered as an illustration of the general law, that the most important organs are formed first.

Mr. Teschemacher observed, that in the Address, which he had the honor of delivering before the Society in 1841, and on several subsequent occasions, he had regretted the neglect, by Geologists, of the study of Mineralogy. That he had considered this study, as regards the unstratified crystalline rocks, the equivalent of Paleontology, as regards the sedimentary stratified deposits; and that he had no doubt ere long some master-spirit would derive from Mineralogy many of the safest and surest landmarks of Geology. These anticipations have been made good, in some papers read before the Geological Society of France last year.

Mr. T. gave an account of those papers. First, that of Prof. Scheerer, of Christiania, on some of the minerals in the Granite of Norway, showing the existence of primitive, basic water in them; which, in the opinion of the Professor, militated against

the igneous origin of those rocks. Next, a paper by M. Virlet D'Aoust, who contends that Granite and Gneiss are the result of a "normal metamorphism" of stratified Slates and Schists. A third paper, by M. Achille Delesse, on the chemical and mineralogical character of the unstratified crystalline rocks of the Vosges, in which he arrives at the generalization, "that rocks of the same age are of the same chemical and mineralogical constitution; and reciprocally that rocks of the same chemical and mineralogical constitution are of the same age." He enters into a minute examination of the Felspars and other minerals of those rocks, and considers that the water chemically combined in the Felspars is inconsistent with the idea of their igneous origin.

Mr. Teschemacher urged the importance of studying with minuteness the mineralogical character of the boulders of this country, before a proper comparison could be made between them and the rocks *in situ* from which they are supposed to have been separated. This he considered indispensable, before a true judgment could be formed of the means by which, and the course in which they had been moved. Mr. T. exhibited a few specimens in elucidation of his ideas.

Mr. Desor remarked on the metamorphic character of the crystalline rocks of the Alps, and the absence of Granite in those mountains. What had been called such was undoubtedly transformed sedimentary rocks. He had himself collected Belemnites in the so-called Mica-slate of St. Gothard.

Dr. Jackson said he had long been familiar with the altered or metamorphosed rocks, and had minutely described them in his State Geological Reports, particularly in that of Rhode Island, in which he had described the alterations in the shales of the coal measures. There may be seen, on the borders of the Rhode Island coal field, all the changes referred to; and a mica-slate rock, such as is used for scythe-stones, gradually passes into a slate and sandstone rock of the coal measures. He had seen specimens like those described in Mr. Teschemacher's communication.

As to the existence of water in minerals, he would say that it existed in most volcanic minerals, and in many of those from the primary rocks, and must have been present at the time of their formation. He did not regard its presence as any proof

that the minerals were not of igneous origin, for if the water was under pressure it might have been heated to a very high temperature without escaping. Indeed it is well known that water, under artificial pressure, may be heated to redness without formation of steam.

Prof. Rogers expressed the opinion that changes upon the strata resulted not so much from intrusive veins or dykes, as from the gases and steam discharged during paroxysmal action. He illustrated it by the phenomena exhibited all along the south-east side of the Appalachian chain, especially in its extension through Western Massachusetts and Vermont. The crystalline marbles of Berkshire are only the older Appalachian Limestone, (the Matinal series of his nomenclature, the Chazy limestone of the New York survey) in a metamorphic dress; their fossils obscured or effaced by crystallization. This view, long ago advocated by him, has been confirmed by the discovery, by Mr. Hall and others, of organic remains in the less altered portions of the same formations in Rensselaer county, New York. The strata equivalent to the Hudson river Slates are to be seen in the western ranges of Berkshire, altered to the Talcose and Chloritic Schists. Localities were pointed out, where the Argillaceous rocks are to be seen under the aspect of true Gneiss, and the so-called Vitreous Quartz rock appears in the disintegrated condition of a soft Sandstone. Through all this belt of country there is an almost entire absence of veins or dykes.

Prof. Rogers adverted to the progressive diminution of the bitumen in the coals of the Appalachian chain, wherever we cross the chain in the direction of northwest to southeast. This diminution reaches its maximum in Anthracites, to be met with only along the south-east side of the belt; where not only the coal, but all the formations give evidence of igneous action. Yet here are no traces of igneous, mineral injections. These facts have induced him to refer the whole change to the agency of effluent hot steam and gases, discharged during earthquake movements that elevated the whole mountain chain.

With respect to the presence of water in igneous minerals, he remarked that we should view water in its elements as among the essential constituents of the molten interior of the globe; 45 per cent. of the whole fabric visible by man consisting of one of those elements alone, viz. oxygen.

Dr. Gould presented specimens of Land Shells from the Phillippine Islands, selected from some sent to him by Mr. Cuming. They were authentic specimens, being sent by the original collector, and labelled by him. The labels were marked A, to show their authority, and Dr. G. had added some of his own, marked O, to show them to be originals.

Dr. Cabot said he had seen a specimen of the European Widgeon, *Anas penelope*, which had been shot in New Jersey; the first instance he had known of that bird being found in this country.

ADDITIONS TO THE LIBRARY DURING THE QUARTER ENDING MARCH 31.

Proceedings of the Academy of Natural Sciences of Philadelphia. Vol. III. No. 10. July and August, 1847. *From the Academy.*

Annals and Magazine of Natural History. No. 133. October, 1847. 8vo. London. *From the Courtis Fund.*

Proceedings of the American Academy of Arts and Sciences. pp. 49 to 160. 8vo. pamph. Boston, 1847. *From the Academy.*

Gelehrte Anzeigen der Königlichen Bayerischen Akademie der Wissenschaften. 22, 23. 4to. München. 1846. *From the Academy.*

Bulletin de la Societé Geologique de France. Tome 4. Feuilles 26–52. 8vo. Paris, 1846–7. *From Soc. Geol. de France.*

American Journal of Agriculture and Science. Conducted by Dr. E. Emmons and A. Osborne. No. 18. October, 1847. 8vo. New York, 1847. *From the Editors.*

American Journal of Science and Arts. 2d Series, No. 12. November, 1847. 8vo. New Haven. *From the Editors.*

Investigations in relation to Cane Sugar, made in obedience to an act of Congress. 8vo. pamph. Washington, 1847. *From R. C. Winthrop.*

Magazine of Horticulture, &c. No. 155. Edited by C. M. Hovey. New Series, Vol. III. Nov. 1847. *From the Editor.*

Annals and Magazine of Natural History. Vol. XX. No. 134. November, 1847. 8vo. London. *From the Courtis Fund.*

Verhandlungen der Kaiserlich-Russischen Mineralogischen

Gesellschaft, zu St. Petersburg. Jahre, 1845–6. 8vo. pamph. *From the Imperial Mineralogical Society of St. Petersburg.*

Magazine of Horticulture, &c. No. 156. December, 1847. *From the Editor.*

Enumeration of North American Lichenes; to which is prefixed an Essay on the Natural Systems of Oken, Fries, and Endlicher. By Edward Tuckerman. 12mo. Cambridge, 1845. *From the Author.*

American Journal of Agriculture and Science, June and September, 1847. 8vo. New York. *From the Editors.*

Gray's Genera of Birds. Part 42, for October, 1847. *From the Audubon Fund.*

Annals and Magazine of Natural History. Nos. 135 and 136. Supplementary No. December, 1847. London. *From the Courtis Fund.*

Silliman's American Journal of Science and Arts. 2d Series. No. 13. For January, 1848. *From the Editors.*

Thomas Brown. Book of Butterflies, Sphinxes, and Moths. Vol. II. 12mo. London, 1832. *From H. H. Tuttle.*

Philosophical Transactions. Vol. I. From 1665 to 1666. *From. B. P. Haines.*

Darwin's Zoönomia. 4 vols. 8vo. London, 1801. *Presented by Dr. S. Kneeland, Jr.*

J. E. Smith. Compendium Floræ Britanicæ. 12mo. London, 1828. *From the Same.*

Darlington, W. Reliquiæ Baldwinianæ. Selections from the Correspondence of the late William Baldwin. 12mo. Philadelphia, 1843. *From the Same.*

Rousseau, J. J. Letters on the Elements of Botany. With Notes by T. Martyn. 8vo. London, 1785. *From the Same.*

Farrar, John. Elements of Electricity, Magnetism, and Electro-Dynamics. 8vo. Boston, 1839. *From the Same.*

Experimental Treatise on Optics. 8vo. Cambridge, 1826. *From the Same.*

J. Jonstoni. Thaumatographia Naturalis. 18mo. Amsterdam, 1732. *From the Same.*

Bichat. Traité des Membranes en général et de diverses Membranes en particulièr. Nouvelle edition, revue et augmentee des Notes par M. Magendie. 8vo. Paris. *From the Same.*

Annals of Botany. No. 5. 8vo. London, 1845. *The Same.*

Latreille. Memoires sur divers sujets de l'Histoire Naturelle des Insectes, de Geographie Ancienne et de Chronologie. 8vo. Paris, 1819. *From the Same.*

G. Breschet. Recherches Anatomiques et Physiologiques sur l'organe de l'Audition chez les Oiseaux. 8vo. pamph. Paris, 1836. Atlas to ditto, 4to. Paris, 1836. *From the Same.*

Manual of Magnetism, with 180 Illustrations. 2d edition. 12mo. Boston, 1847. *Presented by Daniel Davis.*

J. D. Dana. On certain Laws of Cohesive Attraction. 8vo. pamph. Boston, 1847. *Presented by the Author.*

Bulletin de la Société Imperiale de Naturalistes de Moscou. Nos. 1 and 2. Moscow, 1847. *From the Soc. Imp. Nat.*

Rapport sur la Séance Extraordinaire de la Société Imperiale de Naturalistes de Moscou. 8vo. 1847. *Presented by Charles Cramer.*

Researches into the Comparative Structure of the Liver. By Joseph Leidy, M. D. 8vo. pamph. 1848. *From the Author.*

Twenty-seventh Annual Report of the Mercantile Library Association. 8vo. pamph. New York, 1848. *From the Association.*

Outline of a Course of Geological Lectures. 8vo. New Haven, 1829. *From Dr. N. B. Shurtleff.*

J. G. Spurzheim. Observations on the Deranged Manifestations of the Mind, or Insanity. With Appendix, by A. Brigham. 8vo. Boston, 1833. *From the Same.*

Letters on Entomology for Young Persons. 12mo. London, 1825. *From the Same.*

F. J. Grund. Elements of Chemistry. 12mo. Boston, 1833. *From the Same.*

F. Accum. Practical Essay on the Analysis of Minerals. 12mo. Philadelphia, 1809. *From the Same.*

R. B. Thornton. Grammar of Botany. 18mo. New York. 1818. *From the Same.*

Domesticated Animals. 18mo. Boston, 1835. *From the Same.*

N. Boubée. Géologie Elementaire. 18mo. Paris, 1833. *From the Same.*

J. Joyce. Dialogues on Chemistry. 2 vols. 18mo. New York, 1818. *From the Same.*

J. Rennie. Alphabet of Botany. 18mo. New York, 1833. *From the Same.*

J. F. Dana. Epitome of Chymical Philosophy. 8vo. Concord, N. H. 1825.

Lavoisier. Elements of Chemistry. 8vo. 2 vols. in 1. New York, 1806. *From the Same.*

Bordeau. Dissertation sur les Eaux Minérales du Bearn. 18mo. Paris, 1750. *From Mr. S. G. Drake.*

Phillips, W. Outline of Mineralogy and Geology. 18mo. New York, 1816. *From the Same.*

Dobson, M. Medical Commentary on Fixed Air. 8vo. London, 1807. *From the Same.*

Poncelet. Histoire Naturelle du Froment. 8vo. Paris, 1779. *From the Same.*

Annals of Philosophy, Natural History, &c. Vol. 3d. 8vo. London, 1804. *From the Same.*

Pouillet. Elemens de Phisique Expérimentale et de Meteorologie. 4 vols. 8vo. Paris, 1832. *From Dr. John Bacon, Jr.*

Pursh, F. Flora Americæ Septentrionalis. 2 vols. 8vo. London, 1814. *From the Same.*

Barton, B. S. Elements of Botany. 3d. ed. 8vo. 2 vols. Philadelphia, 1827. *From the Same.*

De Candolle. Vegetable Organography. Translated by B. Kingdom. 2 vols. 8vo. 2d ed. London, 1841. *From the Same.*

Davy, H. Elements of Agricultural Chemistry. 6th ed. 8vo. London, 1839. *From the Same.*

Lindley, J. Theory of Agriculture, with Notes, &c. by A. J. Downing and A. Gray. 12mo. New York, 1841. *From the Same.*

Arnott N. Elements of Physics, with Additions, by Isaac Hays. 8vo. Philadelphia, 1834. *From the Same.*

Mrs. Somerville. Connection of the Physical Sciences. 12mo. Philadelphia, 1834. *From the Same.*

Combe, Andrew. Physiology of Digestion. 12mo. New York, 1836. *From the Same.*

Audubon and Bachman. Plates 121–125, to their Quadrupeds of America. *From the Subscribers.*

Transactions of the Entomological Society of London. Parts 2–5, vol. iv. and Part 1, vol. v. 8vo. London, 1846, 1847.

Proceedings of the Same, pp. 97–144. 8vo. London, 1847.

Address of the Rev. F. W. Hope before the Same. 8vo. pamph. 1846.

Address of Mr. George Newport before the Same. 8vo. pamph. 1845. *All presented by the Society.*

Journal of the Indian Archipelago and Eastern Asia. Nos. 1, 2, and 3. July, August, and September, 1847.

Transactions of the American Philosophical Society of Philadelphia. Part 1, vol. x. 4to. *From the Society.*

Seventy-five plates of rare, unfigured Plants, from the Linnæan Herbarium. Long 4to. *From C. J. Sprague.*

Journal of the Indian Archipelago, Nos. 4 and 5, for October and November, 1847. 8vo. pamph. Singapore. *From the Editors.*

Transactions of the Linnæan Society. Vol. XX. Part 2. 4to. London, 1847. *From the Society.*

Proceedings of the Linnæan Society, pp. 305–340. 8vo. London, 1846, 1847. *From the Society.*

American Journal of Science and Arts. Conducted by B. Silliman, &c. 2d series. No. 14. March, 1848. *From the Editors.*

J. A. Smith. Mutations of the Earth. 8vo. pamph. N. York. 1846. *From Francis Alger, Esq.*

J. Chickering. Statistical View of the Population of Massachusetts, from 1765 to 1840. 8vo. pamphlet. Boston, 1846. *From F. Alger, Esq.*

Synopsis of the Lichenes of New England, the other Northern States, and British America. By Edward Tuckerman. 8vo. Cambridge, 1848. *From the Author.*

Leidy, Joseph. On a new genus and species of Fossil Ruminantia, Poëbrotherium Wilsonii. 8vo. pamp. Philadelphia, 1847. *From the Author.*

Gray's Genera of Birds. Part 43. Long 4to. London, 1848. *Audubon Fund.*

Edinburgh Review. Vols. 80, 82, 84. 8vo. New York, 1844–7. *From T. Bulfinch, Esq.*

Travels in North America. By Charles Lyell. 12mo. New York, 1845. *From the Same.*

How to Observe. Geology. By H. T. De la Beche. 2d ed. 8vo. London, 1836. *From the Same.*

Molluscous Animals, including Shell-fish. By John Fleming. 8vo. Edinburgh, 1837. *From the Same.*

Remarks on the Geology and Mineralogy of Nova Scotia. By Abraham Gesner. 8vo. Halifax, 1836. *From the Same.*

Phrenology, in connection with the Study of Physiognomy. By G. Spurzheim. 8vo. London, 1826. *From the Same.*

Memoirs of James Jackson, Jr. By James Jackson. 8vo. Boston, 1835. *From the Same.*

Botanical Text-Book. By Asa Gray. 12mo. New York, 1842. *From the Same.*

Political Economy. By A. Potter. 12mo. New York, 1842. *From the Same.*

Discourse on the Study of Natural Philosophy. By J. F. W. Herschel. New edition, 12mo. New York. 1840. *From the Same.*

April 5, 1848.

The President in the Chair.

Twenty members present.

The President read a written report on the first volume of the Transactions of the Royal Society, which had been committed to him.

Prof. Agassiz commenced an account of the Annelida of Boston harbor, noticing particularly on this occasion the Tubulibranchiate Annelids. These animals have been classified by their branchial and locomotive appendages; but Mr. A. showed that these organs were not well adapted to form a basis for classification, inasmuch as they are transitory, are modified, or disappear, in the course of the life of the animal. He described the growth and appearance of these animals in the several genera of which he had

found specimens; viz. thirteen genera, comprising seventeen species; many of which are different from the known genera of Europe.

Dr. Gould read a letter, from Dr. Perkins in West Africa, giving an amusing account of his own experience of the difficulties with which Naturalists and collectors have to struggle, in their intercourse with the natives of barbarous countries, in endeavoring by their aid to procure specimens or elicit information.

Dr. James W. Stone and Mr. John E. Williams were elected members of the Society.

April 19, 1848.

The President in the Chair.

Twenty members present.

Prof. Agassiz made some remarks on the existence of numerous minute tubes in Fishes, opening externally, which have hitherto been considered mucous tubes, but which he is convinced are tubes for the introduction of water into the body. These openings in some fishes are extremely numerous, existing over the whole external surface. In fresh water fishes, and in those living in shallow waters, they are comparatively few. They are most numerous in fishes which swim at great depths.

In reply to a question of Dr. Wyman, he said that he had not as yet found them in the sharks and rays. These openings are sometimes visible to the naked eye, and sometimes require a magnifying power for their detection. They are very large and numerous, and easily seen, in the head of the common shad. These minute tubes unite into larger ones, in a manner which seems to be the same in each class. He thought this circum-

stance might be of some value in the classification of fishes. The tubes grow larger and larger as they approach the heart. They open into the circulating system near the heart. Prof. A. had injected the heart through these tubes, and had drawn blood from them by a syringe. He had injected the external surface through a *single* tube, and that whether opening near the head or the tail, or in other parts of the body. He believes these tubes an apparatus for the safety of fishes living at great depths, to enable them to resist the great pressure to which they must there be subjected. He did not deny the existence of mucous tubes in fishes, for there are such, about the heads of sharks for instance, from which mucus may be obtained by pressure; but he is sure, that what have been considered hitherto as mucous tubes are in reality water tubes.

Dr. C. T. Jackson made some remarks upon the drift scratches and cleavage planes of the Roxbury Greywacke. He gave the particulars of the directions of the scratches, and measurements of the angles of the cleavage planes. The former run S. 20° E. S. 24° E. S. 40° E. The line of fracture of the pebbles is N. 30° E.

Mr. E. C. Cabot mentioned a ledge of Puddingstone, in Brookline, at the cutting for the Water-works, conspicuously marked with scratches in a direction N. and S. 17° E.

Mr. Desor remarked of the same rock, that the scratches were found not only on the prominent parts of the surface, but also on the depressed portions, between the projecting pebbles; while on other parts they were wholly wanting. This fact is not easily explained except by supposing that the presence of the scratching body was not great enough to affect the pebbles, which are of a harder nature than the cement between them.

Mr. J. E. Teschemacher recurred to an observation made by him at a previous meeting, respecting the process of the metamorphism of rocks, for the purpose of doing justice to the earliest efforts of this Society, as well as to the labors of one of its distinguished members. In a very long paper, read before the Geological Society of France, in 1846, entitled "Studies on the Metamorphism of Rocks," by M. Durocher, the author states,

that from his own experiments he finds the mineral "Macle" to be "Andalusite," and also that the dark clay slate in which it is imbedded, and which often forms the centre of a group of crystals, exists in these centres in a pyramidal form. Mr. T. then exhibited the first number of the Journal of this Society, published in 1834, containing a paper by Dr. Charles T. Jackson, in which the latter fact is distinctly stated, and analyses given proving clearly that the "Macle" is Andalusite. The results of this paper have been copied into almost every work on Mineralogy since published in the English language; and Mr. T. expressed his surprise that a mineralogist, of so little knowledge as to claim these facts as his own discoveries, should attempt to write on a subject requiring the most extensive and acute mineralogical science.

The last investigations respecting this Andalusite were, he believed, by Svanberg and by Erdmann; their analyses agreed with those of Dr. Jackson as nearly as could be expected from analyses of a mineral from different localities and so closely imbedded as the Macle.

Mr. T. thought that the expression of the opinion of M. Durocher, that the Macle was the clay slate metamorphosed, ought to have been accompanied by accurate analyses of the slate, particularly of that part immediately in contact with the mineral, in order to afford comparison of its ingredients with those of the Andalusite.

He made several other observations on metamorphism, and urged the necessity of accurate analyses of the various rocks. He did not think the idea of Mr. Durocher, of the resemblance of the process of metamorphism to that of the cementation of iron, well founded.

Mr. Teschemacher observed that he had collected and measured many specimens of the cleavages of sedimentary rocks, both clay slates and sand stones. Amongst them were forms varying very considerably in their angles. In all these the cleavage was clear. Each piece, however small, could only be cleaved into similar forms, and one set of faces could be more readily produced than another, precisely like many regular crystalline bodies. He thought therefore that the particles of these rocks, like

the atoms of crystals, had taken their places during their deposition, according to exact laws, and that this idea derived much support from the recent discoveries of Faraday, that all bodies possessed inherent magnetism of a certain intensity. There was no reason to suppose that a grain of silex, forming a portion of a sedimentary rock, should not still be possessed of the original qualities by which it took a crystalline form.

Prof. Rogers presented a specimen of altered Rock, from New Hope, on the Delaware. At this place a dyke of Greenstone passes through the Argillaceous Red Shale, within an hundred feet of which specks or centres of imperfect crystallization are perceptible, and nuclei of Epidote and Tourmaline. The sedimentary rock assumes the appearance of Greenstone. He also spoke of the rocks at Newton Tunnel. An Agillaceous Sandstone is there seen altered to Porphyry. The original bedding is uneffaced. Prof. R. made some remarks on slaty cleavage; and promised to go more fully into the subject at a future meeting.

Dr. C. T. Jackson read from his note-book notices of experiments on solutions of Gun-cotton, which had been read at the meeting in January, 1848, but had not been particularly recorded.

The date of the entry is Dec. 20, 1847, and it is as follows: "Tried the solubility of my Gun-cotton. That of one hour's immersion will not dissolve in ether, and does not lose its explosive quality when dried. That of twelve hours' immersion dissolves quickly and entirely in sulphuric ether, and numerous bubbles of oxygen disengage from the dissolving mass. The ether solution is an excellent cement and varnish. It dries into a pellucid substance, like horn; and when dried more, turns white. It is not explosive; but an immersion in the mixed acids renders it so again readily. Its ethereal solution is precipitated by water, white and flocculent. Acids will not dissolve it, nor will boiling water; but the latter renders it hard, or rather excessively tough. Paper immersed in the ethereal solution, became glazed, and is good for writing."

Mr. Ayres, on behalf of Dr. Storer, exhibited a figure, with a description, of a new genus of Fish, *Blennius ser-*

pentinus; so named by Dr. Storer, who had received it from Capt. Atwood, who took it from the stomach of a cod.

A cast of *Isotelus gigas*, and tail of *Asaphus*, with eye and mouth pieces, was laid on the table, and committed to Dr. Wyman.

Dr. Kneeland placed on the table several Skeletons, presented by Mr. Ogden. They were as follows: Numidian Crane, Civet Cat, South American Monkey, Humming Bird, King Charles's Spaniel, and the Skull of a Chinese Dog. He also presented, from Mr. Ogden, a Bird of Paradise, mounted by him. On motion of Dr. Cabot, the thanks of the Society were voted to Mr. Ogden for this donation.

Dr. William Keller, of the Cambridge Scientific School, and J. Wingate Thornton, Esq., were elected members of the Society. Dr. Siedhoff, of Newton, was elected a Corresponding member.

May 3, 1848.

ANNUAL MEETING.

Dr. D. H. Storer, Vice-President, in the Chair.

Present, twenty-one members.

A portion of the record of the last Annual Meeting was read by the Secretary.

The Curators presented and read their Annual Reports, of which the following is an abstract.

The Curator of *Herpetology* reported, that the additions to his department during the past year, had been few. The more liberal accommodations of the new hall, however, afforded him an opportunity of placing many specimens on the shelves, which

have hitherto been kept out of sight for want of room. The Collection is particularly deficient in specimens from the Southern and Western parts of North America.

The Curator of *Comparative Anatomy* reported the addition, during the past year, of several very valuable specimens in his department.

The Curator of *Mineralogy* reported, that of the specimens in his department belonging to the Society, eight hundred only were thought worthy of a place on the shelves in the new building, where they have been deposited and classified. By permission of Mr. Alger, he had selected from his cabinet eighty duplicate specimens, which he now presented in his name. He had also made choice of $50 worth of minerals, from a quantity deposited with Mr. Alger on sale, to be paid for from the money subscribed in aid of the Society at Mr. Alger's solicitation.

The Curator of *Ornithology* reported, that there have been presented, by various individuals during the past year, eighty Birds. He proposes to present, from his own Collection, over one hundred specimens as soon as funds can be procured to defray the expense of mounting them.

A valuable collection of Birds' Eggs has been received from G. A. Bethune, Esq. All the Bird Skins belonging to the Society have been mounted and put in the cases. The whole number is about six hundred and eighty. The Curator had, by his own effort, raised a subscription of $120, to aid in defraying the expense of mounting the specimens under his charge. Donations to this department during the past year have been received from Major Townsend, Messrs. G. M. Dexter, E. C. Cabot, W. Sohier, Robbins and Ogden, and Drs. Cabot, Shurtleff, Read, and Abbot.

The Curator of *Ichthyology* reported, that the Cabinet under his charge is not in so perfect a condition as it was several years since, owing to the losses produced by the ravages of insects and the means used to eradicate them. Several fine specimens have however been received from Capt. N. E. Atwood, of Provincetown; among them *Somniosus brevipinna*, and a new species of *Blenny* and *Motella;* the latter two genera being new to the waters of Massachusetts.

The *Librarian* reported, that during the past year there had been received 120 volumes, and 102 pamphlets and parts of volumes, most of them donations from friends of the Society; among whom he mentioned the names of the late Hon. Judge Davis, (who by his will authorized us to select twelve volumes from his valuable library), Alcide D'Orbigny, Akademie der Wissenschaften zu München, Drs. Kneeland, Shurtleff, and Bacon, Thomas Bulfinch, Esq., and the subscribers to Audubon's Quadrupeds of America. The whole number of volumes in the Library is 1260, pamphlets and parts of volumes 120. Abundant space is afforded in the new Library room for at least 10,000 volumes.

The Treasurer reported, that during the past year,

The amount received from general sources was		$1,288 96
Amount expended for general purposes		1,300 35
Balance due him		11 39
Amount received from trustees of Courtis Fund		1,103 56
" paid from Courtis Fund		450 73
Balance due to Courtis Fund		652 83
Amount received from subscribers to building		26,999 75
" paid towards building	20,000 00	
" paid on account of repairs	7,257 63	
		27,257 63
Leaving a balance due the Treasurer		257 88
Total receipts		29,392 27
" expenditures		29,008 71
Balance due from Treasurer		383 56
Owing for building	3,000 00	
Interest	425 00	
		3,425 00
Owing to Messrs. Dexter & Cabot, about		1,100 00
" for iron shutters, say		195 00
		4,720 00
To pay which, are still due from subscribers to building		1,720 00
Balance to be provided for		$3,000 00

The Treasurer and the Committee of Finance were authorized to adopt such measures towards liquidating the debt as they might see proper.

The Society next proceeded to the choice of Officers for the ensuing year, and elected the gentlemen presented as candidates by the nominating committee, as follows:

President,
Dr. John C. Warren.

Vice-Presidents,
Dr. C. T. Jackson. Dr. D. H. Storer.

Corresponding Secretary,
Dr. A. A. Gould.

Recording Secretary,
Dr. S. L. Abbot.

Treasurer,
P. T. Jackson, Esq.

Librarian,
C. K. Dillaway, Esq.

Cabinet Keeper,
Dr. Samuel Kneeland, Jr.

Curators,

J. E. Teschemacher, Esq.	*Of Botany.*
Dr. John Bacon, Jr.	*Mineralogy.*
Dr. N. B. Shurtleff,	*Comparative Anatomy.*
W. J. Burnett, Esq.	*Entomology.*
W. O. Ayres, Esq.	*Ichthyology.*
Prof. Jeffries Wyman,	*Herpetology.*
T. T. Bouvé, Esq.	*Geology.*
Dr. Samuel Cabot,	*Ornithology.*
Dr. William Read,	*Conchology.*

Dr. Cabot, of the nominating committee, read a communication from Thomas Bulfinch, Esq., declining to stand as a candidate for the office of Recording Secretary another

year, which he had filled for some years past. On motion of Dr. Storer, it was

Voted, unanimously, That the thanks of the Society be presented to our late Secretary, for the fidelity and zeal with which he has ever performed the duties of his office, and that his communication be placed on file.

On motion of Dr. N. B. Shurtleff, it was unanimously

Resolved, That the thanks of the Society be presented to Drs. Harris and Gay, for their valuable services as Curators for many years past.

Mr. J. E. Teschemacher asked the attention of the Society for a few minutes, to the following statement:

It was well known, that he had been, for two or three years, studying the vestiges of the fossil vegetation existing in the Anthracite Coal; he had, on several occasions, and particularly before this Society, expressed his opinion, that the vegetation of which the Anthracite Coal was formed, differed essentially from that forming the Bituminous Coal; this latter containing resinous woods, which were absent from the former.

He understood that Dr. Carpenter was delivering a Course of Lectures in London, on Paleontology, in which he touched on the Anthracite deposites in Wales, (Eng.) and stated his view, that the vegetation forming this deposit was non-resinous, differing from that forming the Bituminous Coal, which was resinous.

Mr. T. observed, that although this had been his opinion for several years, yet he thought it highly probable the idea was new with Dr. Carpenter, and hoped it had arisen from his study of the Welsh Anthracite; it would then be a strong presumption in favor of this view. Mr. T. thought that the fact of the alternation of Anthracite and Bituminous Coal in Wales, mentioned by Prof. Rogers at a previous meeting, was incompatible with the theory of the metamorphism of Bituminous into Anthracite Coal by igneous agency.

May 17, 1848.

Vice-President, C. T. Jackson, in the Chair.

After the Record of the last meeting had been read by the Secretary, the Annual Address was delivered by Dr. D. H. Storer. It was an interesting historical sketch of the origin and progressive growth of the Society up to the present time. Dr. Storer availed himself of the opportunity to acknowledge the indebtedness of the Society to its numerous friends and benefactors, who at all times have been ready with a liberal hand to supply its wants and promote its interests, until, by a crowning act of their munificence, it has been furnished with a building in every respect suited to its wants. He urged with great earnestness upon the members the duty of making redoubled efforts in the cause of science. The Address was listened to with great attention by a crowded audience.

At the conclusion of the Address, on motion of B. D. Greene, Esq. it was voted, that the thanks of the Society be presented to Dr. Storer, for his eloquent and interesting Address, and that a copy be requested of him for publication.

Prof. Agassiz asked permission to make a few remarks of a general character, which he thought would not be ill-timed on the present occasion, although it was a meeting for a special purpose. He then made a most earnest and stirring appeal to the students of science in America, to seize the present opportunity to make a greater effort than they had ever made before, to promote the cause of science. Hitherto, he said, we had been obliged to look up to Europe as our leader and guide in this pursuit. American Naturalists had done much, considering the circumstances under which they had labored, but little in comparison with what

they could do. The present disturbed condition of political affairs in Europe must, for a time, suspend the progress of science there. It was for us now to make a strenuous, self-sacrificing effort to carry it forward here. A short period of persevering labor on the part of a number of individuals would place America in the position hitherto occupied by the Old World.

June 7, 1848.

The President in the Chair.

Present, fourteen members.

Dr. Gould had recently examined the Shells collected by Mr. J. Bartlett, in the south-western States, for the late Dr. Binney, in reference to his proposed work on the Land Mollusks of the United States, and which Dr. B. had been unable to examine previous to his decease. Dr. G. was pleased to find several new species of much interest, as they tended to illustrate the gradual modification of species in their geographical succession. He gave descriptions of the following:

SUCCINEA LUTEOLA. Testâ variabili, ovato-turritâ, solidiusculâ, laxè striatâ, extus albâ vel corneâ, sed plerumque lutescente, intus luteâ; anfr. 4, supernis rotundatis, ultimo conico-ovato; aperturâ modicâ, ovatâ, partem dimidiam longitudinis vix superante; columellâ normaliter arcuatâ, haud plicatâ, ad regionem umbilicalem reflexiusculâ. Long. $\frac{1}{2}$, lat. $\frac{1}{4}$ poll. *Hab.* Texas.

Very variable in its proportions as well as in coloring. Short specimens resemble S. *campestris* of the South, but want its columellar fold. The elongated specimens are like S. *amphibia*; and in the diminutive size of the aperture it is like S. *vermeta*. Fresh specimens are well characterized by their golden yellow color. It may possibly be Say's S. *undulata*.

SUCCINEA CONCORDIALIS. Testâ tenui, lucidâ, obliquè ovatâ, acuminatâ, reflexâ, cereâ et ad apicem rubicundâ, leviter striatâ et lineis obscuris volventibus insculptâ; anfr. 3 perobliquis, supernis parvulis, tumidis, suturâ profundâ; aperturâ ovatâ, trientes duæ longitudinis testæ æquante, basi rotundatâ; columellâ arcuatâ, absque plicâ, leviter arrectâ; intus micante. Long ½, lat. ¼ poll. *Hab.* near Lake Concordia.

At first view, this might be mistaken for *Limnea columella*. Its color and texture are like S. *amphibia*, from which it differs chiefly in the slight upturning of the edge of the columellar lip, the presence of the obscure revolving lines and the ruddy apex.

HELIX SELENINA. Testâ parvâ, discoideâ, pallidâ, tenuissimâ, exiliter striatâ, diaphanâ; anfr. 5 convexis, ultimo subangulato, suturâ impressâ; basi convexo, umbilico infundibuliformi perforato; aperturâ angustâ, lunari, labro simplici. Diam. ⅛ poll. *Hab.* Georgia and Florida.

About the size of H. *arborea*, distinguished by its delicacy, its pale, opaline color, its small well-defined and deep umbilicus, its discoidal spire and its narrow aperture. Its color and superior aspect may be compared with H. *lineata*.

HELIX ROTULA. Testâ parvâ, discoideâ, pellucidâ, nitidâ, electrinâ, H. *suppressæ* simili, umbilico infundibuliformi profundo perforatâ; anfr. 6½, vix convexis, striis distantibus supernè impressis, suturâ marginatâ; aperturâ semilunari, labro simplici, haud incrassato. Diam. ⅛ poll. *Hab.* Tennessee.

This delicate little species has the size and color of H. *indentata*, and is similarly striated above; the whorls are numerous and closely convoluted like H. *suppressa*, but it has a larger umbilicus, like H. *lasmodon*, and has no thickening or plate within the aperture.

HELIX MAXILLATA. Testâ parvâ, globoso-lenticulari, pallidè castaneâ, solidulâ, H. *hirsutæ* simili: aperturâ lineari, labro reflexo, præter emarginationem inconspicuam dente obsoleto divisam integro, fauce lamellam sicut maxillam pone labrum gerente; lamellâ columellari rectâ, supernè bifurcatâ. Diam. ¼ poll. *Hab.* Tennessee.

This shell, which is smaller and somewhat more globose than

H. *hirsuta*, is well characterized by its partially bifurcated pillar tooth, and by the peculiar jaw-like plate, almost concealed behind the inflexed lip, within the fauces.

Helix leporina. Testâ parvâ, lenticulari, lucidâ, rufo-corneâ, pilosiusculâ, leviter striatâ, vix perforatâ; spirâ depressâ, anfr. 5 convexiusculis, ultimo supernè subangulato; regione umbilicali excavato; aperturâ lunatâ, labro incumbente, reflexo, roseo, dentes duos albos sinum amplectentes gerente; lamellâ columellari obliquâ, albâ, erectâ, acutâ, rectangulari, callo lineari supernè ad angulum aperturæ junctâ. Diam. $\frac{1}{5}$, alt. $\frac{1}{8}$ poll. *Hab.* Mississippi and Arkansas.

Intermediate between H. *hirsuta* and H. *inflecta*, though smaller than either. It is less globose than *hirsuta*, while the aperture is much the same, except that the sinus of the lip is formed by the projection of two teeth instead of by an emargination, in this respect resembling H. *inflecta*. From the latter it differs in the columellar tooth. It resembles H. *pustula* still more, but the umbilical region wants the peculiar channel of that species.

Helix vultuosa. Testâ depressâ, utrinque convexiusculâ, tridentatâ, rufo-corneâ, latè umbilicatâ, H. *fallaci* et H. *texasiana* intermediâ; anfr. $5\frac{1}{2}$ arctè volutatis, convexis, ultimo ad peripheriam sub-angulato; aperturâ arctè lunari, labro albo, crasso, tortuoso, dentibus duobus instructo, quorum altero mediano profundè posito, retrocedente, altero basali, marginali, falcato; lamellâ columellari obliquâ, arcuatâ, erectâ, faucem ferè occludente. Diam. $\frac{2}{5}$, alt. $\frac{1}{4}$ poll. *Hab.* Arkansas and Texas.

Differs from H. *fallax* in being generally smaller and more convex, with a narrower aperture more nearly closed by the teeth, and in having the basal tooth much more developed and the median one deeper seated and directed more inward; from H. *texasiana* it is distinguished by having an open umbilicus, and by having no line of callus connecting the pillar tooth with the upper angle of the aperture, forming a re-entering angle.

Many other Shells are contained in the Collection, which are either new species, or very strongly marked varieties of the northern types. Among them is one, which seems to be quite

common from Georgia to Texas, and which Dr. Binney regarded as the southern form of H. *thyroidus*, though some of his specimens were labelled "*clausa?*" They have the globular form of H. *clausa*, sometimes approaching even to H. *elevata* in height; the aperture is large and rounded, the umbilicus generally quite closed, and the columella sometimes possesses and as often is destitute of a tooth like H. *thyroidus*. I think further observation will establish its claim as a distinct species, and in such case I would propose for it the name of H. BUCCULENTA.

Another form, found in the south-western States, is allied to H. *appressa* and H. *palliata*. It is a little more globular than the former, has its peculiar imperforate base, but its aperture is more open and rounded, and destitute of a tooth. H. *Columbiana* is still more globular, smoother, with an open umbilicus and a peculiar sinuosity of the lip. I would indicate this form by the name of H. ABJECTA.

PUPA VARIOLOSA. Testâ minimâ, ovato-conicâ, rufâ, sub-perforatâ, confertim indentatâ; anfr. 4-5 turgidis; suturâ profundâ; aperturâ obliquè semiovali, dente columellari, altero labiali, altero postico lamellari armatâ: labro vix reflexo. Long. $\frac{1}{12}$ poll. Inhabits Florida.

Smaller than any of our species except P. *milium*, and is distinguished by its short, conical form. The five specimens examined, all presented the crowded thimble-like impressions under a magnifying power of 20 diameters. I think no other American species has the revolving tooth on the penult whorl.

PUPA MODICA. Testâ minutâ, fragili, ovato-conicâ, elongatâ, albâ vel corneâ, edentatâ, anfr. 5 convexis, P. *fallaci* simillima, sed minore dimidio, anfractibus duobus carente; aperturâ campanulatâ, labro expanso, haud planulato. Long. $\frac{1}{10}$, lat. $\frac{1}{15}$ poll. *Hab.* Florida.

Differs from P. *fallax* only in being one half its size, in having two whorls less, and in having a bell-shaped aperture with a thin revolute lip instead of a thick flattened one.

CYLINDRELLA PONTIFICA. Testâ parvâ, ovato-fusiformi, supernè attenuatâ, griseo et fusco marmoratâ; anfr. ad 12 rotundatis, costulis crebris obliquis, alternis suturam præterentibus,

ornatis, ultimo carinato: apertura laterali, circulari, campanulatâ; columellâ rectâ, umbilicum linearem tegente; peristomate reflexo, ferè continuo.

Allied to *Pupa unicarinata*, Lk., and P. *turrita*, Pfeif., but is smaller, more coarsely ribbed, has a more complete aperture, projecting to the left side, and is readily distinguished from either of them by the projection of the alternate ribs across the suture, giving the whorls a dentate or coronated appearance. Its coloring is like that of *Pupa cinerea*.

CYLINDRELLA JEJUNA. Testâ fusiformi, solidiusculâ, truncatâ, pallidè corneâ, filis tenuibus albis longitudinaliter liratâ: anfr. superstitibus ad 9 (totis ad 18) convexis, ultimo exiliter carinato; suturâ benè impressâ; collo brevissimo; aperturâ expansâ, peritremate albo, continuo, anfractui penultimo haud annexo. Long. $\frac{2}{5}$, lat. $\frac{1}{10}$ poll. *Hab.* Florida.

This may be a form of C. *lactaria*, so common in Florida, and which presents so many varieties, especially in the length of the neck and the development of the lip. But it seems to be constantly smaller, darker colored, more solid, and with more convex whorls. The peritreme also seems never to rest on the penult whorl, as is usually the case in C. *lactaria*.

The President expressed his regret at his necessary absence from the city at the time of the Annual Meeting. He gave an interesting account of his visits to the Collections of objects of Natural History, brought home by the United States Exploring Expedition at Washington, the Collection of the Academy of Natural Sciences at Philadelphia, and the Baltimore Museum. Having made an especial study of the fossil remains of the *Mastodon giganteus*, he was particularly interested in finding at Washington a tooth of an individual of this species, brought from Oregon, the first known to have been received from that locality. In Philadelphia he saw a tooth of *M. angustidens*, probably the identical specimen formerly exhibited in Baltimore as having been found in the Miocene formation of the State of Maryland, not many miles from that city. As it was a

solitary remnant of the individual, and as no other trace has been found of the existence of this species in North America, much doubt is thrown upon the fact of its discovery in the alleged locality.

The President's remarks led to a general conversation on the importance of using great caution in fixing the true locality of specimens in scientific collections. Prof. Agassiz laid great stress upon it. He said, the name of the locality should be indelibly inscribed upon every specimen as soon as it is received, even if its scientific name be as yet unknown. By this simple act great confusion and doubt might be sometimes avoided. He said, that he had had for several years in his possession a very interesting fossil fish, *Mallotus villosus*, which he had received without any mention of the locality from which it had been obtained. This fish was of great geological importance, as it was the only instance of a Fossil being identical with a living species. On visiting Dublin several years after it came into his possession, he was shown other specimens of the same fish, and learnt their singular history. They were brought from Iceland, on the shores of which large numbers of them are annually destroyed and converted into this state by volcanic disturbances, by which they are killed and buried in the mud, and become petrifactions. Prof. Agassiz, and Drs. Gould and Cabot, all mentioned instances of specimens of Natural History having been brought from localities where they were said to have been found, but which must have been previously carried there from other localities.

Prof. Agassiz had recently made some observations on the structure of the Foot in the embryo of birds, which he thought would throw new light on the classification of birds, and perhaps call for radical changes in the system now in use. He had examined the feet of the embryo of *Turdus migratorius*, *Hirundo riparia*, *Sylvia æstiva*, and *Fringilla melodia*, and found the following appearances in all.

The four toes, which in the mature bird are separate, three being directed forwards and one backwards, are in this state all directed forwards, and webbed. There is as yet no trace of bone in them, there are only rows of cartilaginous cells in the

position to be occupied by bone, which are more closely grouped together at the points where the joints are destined to appear. The lower extremity is, in fact, at this time a fin. The upper extremity is in a similar condition, presenting, however, only three rows of cartilaginous cells, united by a membrane. As this condition of the extremities exists in different families, Prof. A. thinks that the present grouping of all web-footed birds together, may be incorrect; particularly since they differ as much among themselves in other respects as they do from Land birds. He found that the bill of the immature Robin resembled that of a Vulturine bird, being straight near the base, and curved at the extremity, the upper mandible being longer than the lower. This would seem to indicate that the Vulturine form is a lower type than it has usually been considered. This appeared to derive confirmation from the great resemblance of the bill of some of the Water birds to that of some of the Vulturine family, that of the genus *Lestris*, for example. Some of the birds of prey also have another point of resemblance to Water birds in a rudiment of a web between two of the toes. Hereafter, birds having all their toes directed forwards, must be regarded as of a lower type than those which have one directed backwards; as, for instance, the Pelicans and Cormorants among Water birds, and the genus *Cypselus* among Swallows. From the result of his examinations of the embryos of birds, Prof. A. had recently, before a scientific society, ventured to predict that hereafter, among the higher Mammalia, the foot of the embryo would in the same way be found to be webbed, like that of the Seals and Cetacea. Prof. Jeffries Wyman immediately afterward confirmed the truth of the prediction in the case of the fœtus of a Cat. A similar appearance had been figured as existing in the human embryo, but its philosophical bearing had not been before noticed.

Dr. Cabot read a statement of the comparative measurements of the American and European Oyster-catcher. His observations tend to confirm the opinion of the distinctness of the two species, which have sometimes been confounded with each other.

	Hæmatopus palliatus. Female. inches.	*Hæmatopus ostralegus.* Female. inches.
Length from tip of bill to tip of tail	21	18¼
Extent " " " "	36	32⅜
Length of tongue . . .	⅝	⅞
Œsophagus to proventriculus .	7⅞	7
Proventriculus in length . .	1	1⅛
Intestines to vent* . . .	40	59
Cœca enter intestine at . .	2½ from vent.	3
Length of cœca . . .	2¾	4½
Trachea to bronchi . . .	4⅛	4 1/16
Keel of sternum in depth, not quite	1	1
" " in length . .	2½	2¼

Prof. Rogers had recently revisited the Anthracite Coal deposites in Rhode Island, and confirmed his previous opinion, that they are of the same geological epoch as the Anthracite Coal-fields in other parts of the United States. In fact, he was satisfied, from the identity of the Fossils in this formation and the adjacent Slate, both in Europe and America, that the age of these deposites must be the same everywhere; and any theory to account for their existence must be "world-wide."

Dr. Gould presented several specimens of rocks from Burmah; also, six or eight Shells, among them *Auricula vulpina*, from St. Helena, interesting from the fact that this species has become extinct within a few years.

Dr. Gould read a note from Mrs. Binney, offering as a donation to the Society's Collection a large number of Shells and Fossils from the Southern region of the United States, and of native Fishes beautifully preserved in large jars, which had been collected for her husband, the lamented Dr. Amos Binney, the late President of the Society. On motion of the President, it was voted that the thanks of the Society be presented to Mrs. Binney, for this manifestation of her interest in our welfare; with the assurance that the Society will endeavor to dispose of them for the best interests of science, according to Dr. B.'s well-known desire.

* A very minute remnant of vitelline duct found at 18½ inches from vent.

Dr. Cabot announced the addition to our Collection of the following Ornithological specimens: *Larus Bonapartii* two specimens, adult male, spring plumage, and adult female, changing from winter to spring plumage; *Hirundo rufa*, male; *Hirundo purpurea*, male; *Tetrao Canadensis*, male and female; *Strepsilus interpres*, adult male, spring plumage; all purchased for the Society. *Calidris arenaria*, male, spring plumage, presented by Mr. Robbins, of Boston market. *Tringa alpina*, male, spring plumage; *Erythrospiza purpurea*, male; *Carduelis pinus*, male, presented by Mr. E. C. Cabot. *Corvus frugilegus*, presented by Mr. E. Cabot. *Hirundo rufa*, female; *Lagopus mutus*, male, winter plumage; *Bonasia sylvestris*, male; *Pica caudata*, male; *Perdix cinerea*, male; all presented by Dr. Cabot. *Ardea exilis*; *Loxia leucoptera*, male and female adult, and adult male changing plumage; received in exchange.

Dr. Cabot also presented to the Society, in the name of R. B. Forbes, Esq., a complete suite of specimens of the Nutmeg, *Myristica moschata*, in different stages of development. The thanks of the Society were voted to the donor.

A donation was announced from Mr. Horatio R. Storer, of a number of small Fishes, taken by him in the vicinity of the Orkneys and in the Baltic; also several Crustacea, taken from the stomachs of fishes caught on the same voyage. The thanks of the Society were voted to Mr. Storer for his donation.

Dr. John Bacon presented, in the name of Dr. Coale, specimens of *Leucite* and *Olivine* from Mount Vesuvius. The thanks of the Society were voted to Dr. Coale.

A singular specimen was deposited in the Cabinet of the Society by Mr. J. L. Clarke, of a pair of Horns of *Cervus virginianus* deeply imbedded in the trunk of a small oak tree. The block was cut from the trunk at the height of twelve feet. The thanks of the Society were voted to him.

June 21, 1848.

The President in the Chair.

Present, fifteen members.

Mr. Ayres gave an interesting account of some researches he had been making in reference to an obscure point in the anatomy of the genus *Leuciscus*. In the fish of this genus the pharyngeal bones are armed with strong teeth, and by the action of powerful muscles they are brought together, crushing the food before it enters the stomach. For a long time Mr. A. had failed to discover any point of origin for the small muscles, whose function it is to separate these bones after they have been brought in contact. He at last discovered this to be a pair of extremely small, needle-like bones, articulated perpendicularly upon the small bones connecting the branchial arches. The tension upon these delicate bones is sustained by two little ligaments extending from their extremities, on the side opposite to the muscles, to the roof of the mouth, like the backstays of a mast. Mr. Ayres displayed this apparatus in *L. pulchellus*. He presented to the Society specimens of *L. cornutus*, *L. atrinasus*, and *Fundulus fuscus*.

A portion of a letter from Dr. Mantell to the President of the Society was read, in which he mentioned that he had recently obtained exquisite specimens of the soft parts of *Foraminifera*, preserved in chalk and flint. He had also recently obtained a portion of the lower jaw of the adult *Iguanodon*, with the teeth in place. Referring to the sketch accompanying the letter, he says,

"You will see, at a glance, that it is wholly unlike the jaw of any reptile, and in truth is not similar to that of any creature, recent or fossil. This relic is the right dentary bone (lower jaw) with the symphysis perfect, two successional teeth in place, and sockets for eighteen mature teeth, not one of which remains.

The extraordinary character is the prolonged and edentulate symphysis, and the great number of vascular foramina on the anterior and external part; of course indicative of a large, fleshy under lip, and a large, prehensile tongue, both adapted for a large vegetable feeder. You will remember the extraordinary form and structure of the teeth of the *Iguanodon*. The only analogy I can find is in the symphysical portion of the jaw of the Sloth, and particularly in the colossal extinct *Edentata*, the *Mylodons*; with which other osteological peculiarities of my gigantic reptile correspond; for example, the vascular dentine of the teeth, and the sacrum formed of five anchylosed vertebræ."

Dr. J. M. Warren presented to the Society a beautiful stuffed specimen of Boa; also, an admirably mounted skin of a Baboon of doubtful species. Dr. W. stated that this individual had possessed immense strength, having been able to lift a common man from the ground, and cast him from him several feet. Dr. Warren also presented a fine stuffed specimen of an adult male Chimpanzee, four years of age.

Dr. Cabot announced the donation from Russell Sturgis, Esq., of seventy-two valuable East India Bird skins. The thanks of the Society were voted to the donor.

Dr. Gould announced the gift of a number of specimens of Rocks from Malta, from an unknown donor; also, a donation of several jars containing Reptiles, Fishes, and Birds from Dr. F. W. Cragin, of Surinam. The thanks of the Society were voted to Dr. C. for this renewed evidence of his interest in our welfare.

A valve of *Chama*, weighing over two hundred pounds, was presented by Mr. Benjamin Kent, of Roxbury. The thanks of the Society were voted to him.

A donation of Shells was received from J. J. Dixwell, Esq. a member of the Society; also, a present of Cocoons of an unknown insect, from Mr. Batchelder, of Saco, through Dr. Storer.

Drs. George Derby and W. W. Morland were elected members of the Society.

ADDITIONS TO THE LIBRARY DURING THE QUARTER ENDING JUNE 30.

Audubon and Bachman. Plates 116–120. Also, 124–130, to their "Quadrupeds of America." *From Subscribers.*

Gelehrte Anzeiger, herausgegeben von Mitgliedern der Akademie der Wissenschaften. Vols. 6–20. 4to. München, 1838–45. *From the Academy at Munich.*

Leidy, Joseph. On a new Fossil Genus and Species of Ruminatoid Pachydermata, Merycoidodon Culbertsonii. 8vo. pam. Philadelphia, 1848. *From the Author.*

George Berkeley. Treatise concerning the Principles of Human Knowledge. Part I. 12mo. Dublin, 1710. *From S. Kneeland, Jr.*

Journal of the Indian Archipelago and Eastern Asia. No. 6, and Supplement to No. 5, for December, 1847. 8vo. Singapore. *From the Editor.*

Annals and Magazine of Natural History. Nos. 1, 2, 3, 4, of Vol. I. 2d Series, June to April. 8vo. London. *Courtis Fund.*

Rennie, James. Ornithological Dictionary of British Birds. By Col. G. Montague. 2d ed. With a plan of Study, and New Articles and Original Observations. By J. Rennie. 8vo. London, 1831. *From Dr. W. Read.*

Elements of Physiophilosophy. By Alonzo Oken. M.D. From the German, by Alfred Tulk. 8vo. London, 1847. *Courtis Fund.*

Memorials of John Ray. Edited by Edwin Lankester, M. D. &c. 8vo. London, 1846. *Courtis Fund.*

Alternations of Generations. By J. J. Sm. Steenstrup. Translated from the German, by George Bush. 8vo. London, 1848. *Courtis Fund.*

Outlines of the Geography of Plants. By F. J. F. Meyen. Translated by Margaret Johnston. 8vo. London, 1846. *Courtis Fund.*

Ray Society. Reports on the Progress of Zoölogy and Botany. 1841–1844. 2 vols. 8vo. Edinburgh, 1845. *Courtis Fund.*

Organization of Trilobites. By Herman Burmeister, M. D. Translated from the German, by Prof. Bell and Prof. E. Forbes. 4to. London, 1846. *Courtis Fund.*

Illustrations of the genus Cinchona. Baron Von Humboldt's Accounts of the Cinchona Forests of South America, and Lambert's Memoir of the different Species of Quinquina. Dissertations of Don Hip. Ruiz on Medicinal Plants of South America. Account of the Spikenard of the Ancients. by A. B. Lambert. 4to. London, 1821. *From Dr. S. Cabot, Jr.*

Alder and Hancock. Nudibranchiate Mollusca of Great Britain. 3 Parts. 4to. 1844–1846. London. *Courtis Fund.*

Proceedings of the Academy of Natural Sciences of Philadelphia. Vol. III. Title page and Index. 8vo. 1848. Also Vol. IV. No. 1. *From the Academy.*

Proceedings of the American Philosophical Society. Vol. IV. No. 39. July to December, 1847. *From the Society.*

Joseph Leidy, M. D. On some bodies in the Boa Constrictor resembling the Pacinian Corpuscles. 8vo. Pamph. *From the Author.*

Silliman's American Journal of Science and Arts. 2d Series. No. 15, for May, 1848. New Haven. *Exchange.*

Reports and Abstracts of the Proceedings of a Committee for the Investigation of the Coal and Mineral Resources of India, to May, 1841. Long 4to. Pamph. Calcutta, 1841. *From J. McLelland.*

Audubon and Bachman. Plates 131–135, of their Viviparous Quadrupeds of North America. *From the Subscribers.*

Recherches Geologiques sur le Jura Salinois. Par M. Jules Marcou. Premièrə partie. 4to. Pamph. Paris, 1846. *From the Author.*

American Almanac for 1831 and 1833. 2 vols. 12mo. Boston. *From Dr. S. Kneeland, Jr.*

Recherches Cliniques et Medicales sur la Créosote. Par E. Miguet. 12mo. Pamph. Paris, 1834. *From the Same.*

Edinburgh New Philosophical Journal, conducted by Prof. Jameson. No. 51, for January, 1838. *From the Same.*

Catalogue des Coléoptères de la Collection de M. le Compte Dejean. 2 vols. 12mo. Pamph. Paris, 1833. *Deposited by Dr. T. W. Harris.*

Report of Lieut. Neil M. Howisen, on the Territory of Oregon. Congressional Documents. 8vo. Pamph. Washington, 1847. *From Hon. R. C. Winthrop.*

Andry's Manual of Diseases of the Heart. Translated by Samuel Kneeland, Jr. 12mo. Boston, 1846. *From the Translator.*

Class Book of Botany. By Alphonso Wood. 8vo. Boston, 1845. *From Dr. A. A. Gould.*

Botanic Essays. By Patrick Blair. 8vo. London, 1720. *From the Same.*

American Annual Register. 1829, 1830. 8vo. Boston. *From F. T. Gray.*

Rordansz, C. W. Europe, Commerce, or Mercantile Guide to the Continent of Europe. 8vo. London, 1818. *From the Same.*

Congressional Documents, &c. 3 vols. 8vo. *From the Same.*

Robertson, William. History of America. 2 vols. 8vo. Philadelphia, 1822. *From the Same.*

Humboldt, Alexander Von. Political Essays on the Kingdom of New Spain. 2 vols. 8vo. New York, 1811. *From the Same.*

Brydone's Tour through Sicily and Malta. 1 vol. 8vo. Dublin, 1774. *From the Same.*

Gerard's Essay on Taste. 8vo. London, 1759. *From the Same.*

McLellan, J. Journal of a Residence in Scotland. 12mo. Boston, 1834. *From the Same.*

Linné, C. General System of Nature. 8vo. London, 1806. *From J. C. Hayden, M. D.*

Manual of Botany for the Northern States. By Members of Botanical Class in Williams College, (Mass.) 12mo. Pamph. Albany, 1814. *From Dr. A. A. Gould.*

Eaton, Amos. Index to the Geology of the Northern States. 12mo. Leicester, (Mass.) 1818. *From the Same.*

Descriptive Catalogue of the Anatomical Museum of the Boston Society for Medical Improvement. By J. B. S. Jackson, M. D. 8vo. Boston, 1847. *From the Society.*

Gray's Genera of Birds. Part XLIV. for June, 1848. London. *Audubon Fund.*

Annals and Magazine of Natural History. No. 6, for June, 1848. *Courtis Fund.*

Genera of the Plants of the United States, illustrated by Figures

and Analyses from Nature. By J. Sprague. Superintended, and with Descriptions, by Asa Gray, M. D. Vol. I. 8vo. Boston, 1848. *From Rev. Francis Parkman.*

Dr. Theodore Cantor. Spicilegium Serpentium Indicorum. 8vo. pamph. London, 1839. *From the Author.*

Catalogue of Reptiles inhabiting the Malayan Peninsula and Islands. 8vo. Pamph. Calcutta, 1847. *From the Author.*

Sheet from Proceedings of Entomological Society of London. 1842. (Coleopterous Insects from Chusan and Canton, by Rev. T. Hope.) 8vo. London. *From the Author.*

General Features of Chusan, with Remarks on the Flora and Fauna of that Island. 8vo. Pamph. London, 1842. *From the Same.*

Catalogue of Mammalia inhabiting the Malayan Peninsula and Islands. 8vo. Pamph. *From the Same.*

Proceedings of the American Philosophical Society. Vol. V. No. 40. January to April, 1848. *From the Society.*

Memoires de la Société Phisique et de Histoire Naturelle. Tome XI. 2d Partie. 4to. Genévè, 1848. *From the Society.*

Bulletin de la Société des Sciences Naturelles de Neuchatel. 1844–1846. 8vo. Neuchatel, 1847.

July 5, 1848.

Dr. D. H. Storer, Vice-President, in the Chair.

Present, twelve members.

Mr. Desor announced that he had recently been studying with the microscope the development of the ovum of a marine worm of the genus *Nemertes.*

The eggs of this animal, which are of a bottle shape, are laid in long strings, which are nearly of the size of the parent animal. They are attached to the strings by the small extremity, and are generally arranged in pairs. Two or three yolks are usually found in each, and sometimes as many as nine, ten, or eleven, rarely, only one. They are of very soft consistence, and are

usually compressed from lying one upon the other. Soon after the eggs are deposited, the division of the yolk commences, but does not proceed so regularly as in some ova. Each division contains a transparent dot. On the twelfth day, each yolk, being provided with cilia, has a revolving motion. This movement has been noticed in so many ova of different classes of animals, that it may be considered as the rule for all embryos. Mr. Desor supposes it to commence as soon as the division of the yolk ceases. It varies in its rapidity, is without any special direction, and never stops. At the fifteenth day, when examined with a high power, the yolk presented the appearance of two zones, the outer of which was furnished with cilia, and was of a lighter color than the inner. On the sixteenth day, with a power of two hundred and fifty diameters, the inner body was seen to be moving within, by means of proper cilia, similar to those of the outer. Some days afterwards this inner body assumed the appearance of an embryo worm. On pressing the envelope it tried to escape from it, and succeeded, moving freely about, and dragging after it the remains of the outer coat. This appendage had no analogy to the placenta or the membranes of other embryos, but was exclusively composed of cells of the original yolk. Mr. Desor remarked upon the extreme singularity of this double and independent motion of the two parts of the ovum. The motion of the inner, he said, seemed to be voluntary, while that of the outer clearly could not be, and resembled greatly that of the spores of Confervæ. The discovery of the existence of these two movements is something new in Embryology. Mr. D. made some remarks, which he said he intended to present hereafter in a more extended form, on the nature of the fluid in which the yolk of the *Nemertes* floats. It exists probably in all ova, but its true nature has hitherto been mistaken by embryologists. He proposes for it the name of the "*Biogen liquid.*" In the course of his remarks Mr. D. said that embryologists had laid too great stress on particular days as the epochs of certain stages in the development of ova. These are never precisely uniform in the date of their occurrence, but depend somewhat upon outward circumstances, such as the temperature, for instance.

Prof. Wyman exhibited specimens of various orders of the Ants which inhabit the gigantic Ant-hills of Africa, the

Termites bellicosus. Naturalists have described five orders as belonging to each colony. Of these Prof. W. exhibited four, viz. workers, soldiers, males, and the queen. The body of the last, the parent female, was enormously developed, to accommodate the ova with which it was distended. This great enlargement takes place by an increase of the substance between the scales of the abdominal segments. The royal cell, which was also displayed by Prof. W., is of compact clay, with openings for the free ingress and egress of all the orders except the queen, who is immovably incarcerated in it. There is also a sort of gallery or passage-way surrounding her, with which the external openings communicate. The specimens were brought from Africa by Dr. T. S. Savage.

Prof. Wyman mentioned that he had recently obtained specimens of *Clepsina,* with the young attached to the abdomen of the parent. The mother was observed to sit upon the eggs soon after they were laid. At first these were spherical, but in a few days became elongated. After four or five days they became attached to the mother, and the yolk began to divide in the usual way, and the development of the alimentary canal commenced.

Prof. Wyman also communicated some results obtained by dissections of the nervous system of frogs. He had found attached to the trunk of each of the Spinal Nerves, just before their division into motor and sensitive roots, a vesicle containing a white chalky substance, which under the microscope was shown to be composed of vast numbers of minute crystals, (probably Carbonate of Lime,) each having a hexagonal form, and terminated at either extremity by a six-sided pyramid. The sac containing them was well defined, about half a line in diameter, and subdivided internally by numerous septa into small cavities in which the crystals were lodged. Nervous filaments were traced into the interior of the sac. A deposit of similar crystals was also noticed around the veins in the Spinal Canal, and on the base of the Cranium.

The chalky matter found in the vestibule of the ear he proved by the microscope to be composed of crystals similar in size and appearance to those found attached to the Spinal Nerves. He had sought for them in great numbers of Frogs of different species, and in no instance had he failed to detect them. He had not found them in Menobranchus or in Tortoises, except in the vestibules of the latter. From their constant presence in frogs he was disposed to regard them as essential parts of their Nervous system.

The vesicles have been noticed by Swan in his "Illustrations of the Comparative Anatomy of the Nervous system," but have not been described. Prof. Wyman had been informed by Prof. Owen that he had called attention to them in his lectures at the Royal College of Surgeons, but no detailed description had been given of them.

Mr. Ayres presented specimens of the young of *Leuciscus pulchellus*, exhibiting a characteristic black, lateral stripe. As the fish grows older this mark becomes nearly obliterated. It remains distinct, however, until the end of the first year. It is found in *L. pulchellus*, *L. cornutus*, and *L. atrinasus*, in which last it is permanent.

Mr. A. also presented a specimen of *Pytuophis melanoleucus*, Hoop Snake or Bull Snake, six feet in length, which had been captured on Long Island. This is a very common species in the southern parts of the United States, but has not hitherto been noticed so far north by naturalists. There is a popular notion that this snake takes its tail in its mouth and thus, in the form of a hoop, rolls itself over the surface of the ground. Hence its common name. Mr. A. also presented to the Society a specimen of *Hydrargira multifasciata*.

Dr. Storer presented from Mr. J. T. Plummer, of Richmond, Indiana, the following list of Fishes found in his vicinity, viz., *Ammocetes bicolor*, *Petromyzon argenteus*, *Bodianus flavescens*, *Cichla ænea*, *Gasterosteus inconstans*,

Etheostoma variata, E. caprodes, Catostomus Duquesnii, C. erythurus, C. nigrans, Minnilus dinemus, Luxilus chrysocephalus, L. elongatus, Semotilus cephalis, S. dorsalis, S. diplema, S. biguttatus, Hydrargira limi, Esox reticulatus, Pimelodus cærulescens, P. cupreus, Hypentelium macropterum. Dr. Storer also presented a specimen of *Corydalus cornutus*, in the name of E. P. Clark Esq., and a South American insect on behalf of Dr. F. W. Cragin.

Mr. Thomas Bulfinch presented to the Society, a small lobster undergoing the process of changing its shell.

Dr. Francis Minot was elected a member of the Society.

July 19, 1848.

Dr. D. H. Storer, Vice-President, in the Chair.

Present, ten members.

Dr. Cabot announced that among the specimens for which the Society is indebted to Dr. Cragin, of Surinam, he had found the male and female of a species of *Chordeiles*, which he was at first disposed to consider as undescribed, but which he finally concluded must be *C. labeculatus*, which has been described from the female, by Jardine. There are, however, some marked differences between our female specimen and his description. The female of our bird measures eight inches, instead of seven and a half, the measurement of Jardine's. On the left wing, at a point opposite the tips of the sixth and seventh primaries, a white band occurs, extending quite across the first three primaries, and becoming rufous on the fourth, and not quite crossing the web on either side of its shaft. On the first primary this band is divided by a black mark along the shaft. On the right wing the band extends across both barbs on the third primary

only, there being no white on the outer web of the second, and only a mere trace on the outer web of the first. In all other respects the bird agrees exactly with Jardine's description. Therefore, considering that his specimen had lost the first and second primaries, and that he mentions another specimen which he considered as belonging to the same species, in which he observed some white upon the wings; and considering also the marked difference between the two wings in our specimen, it is fair to conclude that these are merely different stages of plumage in the female of the same bird.

The male is eight and one half inches long; its wing six and five-eighths inches from the flexure. It strongly resembles the female, but has not the rufous markings to the same extent, either on the head or wings. The white band on the wing is purer, and extends entirely across each of the first four primaries. The tail is dark brown, crossed by six or seven greyish bands, and has also a white band, which extends across all but the two middle feathers, at about one half an inch from their tips.

Mr. Forbes, of Windsor, Vt., present by invitation, gave an account of a curious formation, apparently Stalactitic, discovered buried in the sand in a cut for the Central Railroad, at Sharon, Vt. Large masses of a calcareous substance have been found beneath the surface, of a tabular form, a few inches thick. From their under surface depend groups of conical projections, some of them of grotesque shape, others hollow, like some stalactites, and terminating in a point. Occasionally a mass has been found in an inverted position, with the plane surface down, and the points upward. No satisfactory solution of this phenomenon has as yet been given.

Dr. Gould deposited in the Cabinet of the Society, a very fine specimen of *Cerithium giganteum*, from the Paris basin.

A specimen of *Fringilla sanguinolenta* was presented by Dr. J. B. S. Jackson.

Two beautiful specimens of Coral were presented in the name of Miss Champney, of Roxbury. The thanks of the Society were voted for the donation.

Messrs. John A. Henshaw, of Cambridge, John H. Thompson, of New Bedford, and Frederick A. Whitwell, of Boston, were elected members of the Society.

Sept. 6, 1848.

Dr. D. H. Storer, Vice-President, in the Chair.

Present, eleven members.

A skeleton of a marine bird was presented in the name of Dr. T. M. Brewer. It was said to have been prepared in the short space of two hours, by exposure to the attacks of a kind of vermin found on the Banks of Newfoundland, which is said to be very destructive to the cod-fish there found. The bird was lowered to the bottom by means of a weighted line, and drawn up in two hours a perfect, ligamentary skeleton.

Mr. Ayres announced that during a recent visit to Long Island, he had obtained a specimen of *Myliobatis acuta*, a rare fish in a locality so far north. It was taken off the south side of the Island. He presented to the Society specimens of *Hydrargira fasciata*, *Lebias ellipsoides*, and a young *Mustelus canis*.

Dr. Cabot announced that the following birds, belonging to the Society, had been recently mounted and put in the cases; viz., *Pardalotus percussus*, male; *Fringilla* ——, adult and young male; *Regulus calendula*, male; *Coturnix cambaiensis*, female; *Carduelis tristis*, female; *Pitta cyanoptera*, male; *Spermestes* ——, male; *Charadrius melodus*, male; *Lestris Richardsoni*, young; *Cryptonyx coronata*, adult and young male; *Bucco Henricii*, *Treron olax*, *Irene puella*, *Cimbyrhincus macrorhincus*, *Chara-*

drius pluvialis, Sterna argentea, Rallus virginianus, all males; *Hemipalima multistriata,* young male. Dr. Cabot remarked that the *H. multistriata* is extremely rare in Massachusetts, the specimen which he now presented, with two others purchased at the same time in Boston Market, being the first of the species he had ever seen here. *Porphyrio* ——, male. This bird flew on board of a vessel six hundred miles from land, in the latitude of the Cape de Verd Islands. It lived for several days. It was among the specimens recently given by Mr. Gassett.

Mr. Burnett announced the donation from Dr. T. W. Harris, of between six hundred and seven hundred valuable insects of the order *Coleoptera,* from the interior of Europe.

BOOKS RECEIVED DURING THE QUARTER ENDING SEPTEMBER 30.

Amer. Journal of Science and Arts. 2d series. No. 16. July 1848. *Exchange.*

Report to the Stockholders of the Dauphin and Susquehanna Coal Company. 8vo. Pamph. Phil. 1848. *From T. Bulfinch.*

History of Framingham, 1640 to 1847. By W. Barry. 8vo. Boston, 1847. *From Francis Parkman.*

Annual Report of the Commissioners of Patents, for 1847. 8vo. Washington, 1848. *From R. C. Winthrop.*

Proceedings of the Zoölogical Society of London. No. 161 to 177. July, 1846, to June, 1847. 8vo. Lond. *From the Zoöl. Society.*

Reports of the Council and Auditors of the Zoölogical Society of London. April 1847. 8vo. Pamph. Lond. *From the Zoöl. Society.*

List of the Fellows, &c. of the Zoölogical Society of London. June 1847. 8vo. Pamph. Lond. *From the Society.*

Annals and Magazine of Natural History. No. VII. for July, 1848. *Courtis Fund.*

Ancient Sea-margins, as Memorials of Changes in the Relative Level of the Sea and Land. By Robert Chambers. 8vo. Edinburgh, 1848. *From Gould, Kendall & Lincoln.*

Principles of Zoölogy. By Louis Agassiz and Augustus A. Gould. 12mo. Boston, 1848. *From the Authors.*

Proceedings of the Academy of Nat. Sciences. Vol. III. Nos. 5, 9, 11. 8vo. Pamph. Phil. 1846 – 7. *From the Academy of Nat. Sciences.*

Amer. Journal of Agriculture and Science. For Nov. 1847. 8vo. New York. *From the Editors.*

Audubon and Bachman. Plates 136 to 140, inclusive, of Viviparous Quadrupeds of America. *From Subscribers.*

Descriptions of Plants collected by William Gambel, M. D., in the Rocky Mountains and Upper California. By Thomas Nuttall. 4to. Pamph. Phil. 1848. *From W. Gambel.*

Proceedings of Zoölogical Society. 8vo. Pamph. pp. 123 to 233. Lond. 1847 – 8. *From. J. E. Gray.*

Geographical Memoir upon Upper California, in illustration of his Map of Oregon and California. By John Charles Fremont. Addressed to the Senate of the United States. 8vo. Pamph. Washington, 1848. *From R. C. Winthrop.*

Manual of Mineralogy. By James D. Dana. 12mo. New Haven, 1848. *From the Author.*

Annual Report of the Regents of the University of the State of New York. 8vo. Pamph. Albany, 1848. *From R. C. Beck.*

Proceedings of the American Academy of Arts and Sciences. Vol. I., pp. 297 – 346. 8vo. Boston. 1848. *From the Am. Academy.*

Annals and Magazine of Natural History. 2d series. No. 8, for Aug. 1848. *Courtis Fund.*

Gray's Genera of Birds. Part 45. Lond. 1848. *Audubon Fund.*

Third Annual Report on the Geology of Vermont. By. C. B. Adams. 8vo. Pamph. Burlington Vt., 1847. *From C. B. Adams.*

American Journal of Science and Arts. 2d series. No. 17, for Sept. 1848. *Exchange.*

Addresses on the Dedication of the New Cabinet and Observatory of Amherst College. 8vo. Pamph. Amherst, 1848. *From C. B. Adams.*

Popular Description of the New Cabinet and Astronomical Observatory of Amherst College. 8vo. Amherst, 1848. *From C. B. Adams.*

Geographical Memoir upon Upper California. By J. C. Fremont. 8vo. Pamph. Washington, 1848. *From R. C. Winthrop.*

Traité Elémentaire de Minéralogie. Par T. S. Beudant. 2ème edit. 2 vols. 8vo. Paris, 1830. *From G. B. Emerson.*

System of Theoretical and Practical Chemistry. By. Fred. Accum. 2 vols. 8vo. Phil. 1814. *From G. B. Emerson.*

Lectures on Geology. By Jer. Van Rensselaer. 8vo. New York, 1825. *From G. B. Emerson.*

Treatise on Mineralogy. 2d Part. By C. U. Shepard. 12mo. 2 vols. New Haven, 1835. *From G. B. Emerson.*

Report of the Fifth Meeting of the British Association for the Advancement of Science. 8vo. Lond. 1836. *From G. B. Emerson.*

System of Chemistry. By Thomas Thomson. 8vo. Vols. 2, 3, 4. With Notes by T. Cooper. 8vo. Phil. 1818. *From G. B. Emerson.*

Catalogue of American Minerals, with their Localities. By Samuel Robinson. 8vo. Boston, 1825. *From G. B. Emerson.*

Account of a Geographical and Astronomical Expedition to the Northern Parts of Russia. 4to. Lond. 1802. By Martin Sauer. *From G. B. Emerson.*

Illustrations of the genus Cinchona, &c. By A. B. Lambert. 4to. Lond. 1821. *From G. B. Emerson.*

Bulletin de la Société Geologique de France. Deuxième serie. Tome 5ème, Feuilles 1 – 3. (8 – 22 Novembre 1847.) *From the Société Geol.*

Annals and Mag. of Nat. History. No. IX. 2d series. For Sept. 1848. *Courtis Fund.*

History of the Fossil Fruits and Seeds of the London Clay. By J. I. Bowerbank. 8vo. Pamph. Lond. 1840. *From Joseph Leidy.*

Address at the Anniversary Meeting of the Entomological Society of London. Jan. 1848. 8vo. Pamph. London. *From Joseph Leidy.*

Notice sur la Valeur du Caractère Paléontologique en Geologie. Par L. de Koninck, D. M. 8vo. Pamph. Bruxelles, 1847. *From Joseph Leidy.*

Notice sur quelques Fossiles du Spitzberg. 8vo. Pamph. Par L. de Koninck, M. D. *From Joseph Leidy.*

October 4, 1848.

The President in the Chair.

Present nineteen members.

The business of the meeting was opened by Prof. Agassiz, who announced that during a recent visit to Lake Superior, he had made a special study of its fishes. Among them he had found several new species, and even new genera; and one fish, with a head like a perch, and a second dorsal fin, adipose, concerning which he was in doubt in what family to place it. He proposed, on the present occasion, to confine his remarks to the *Salmonidæ*. Prof. A. then gave a general sketch of the classification of the *Salmonidæ* now in use, and passed on to some observations on some of the Lake Superior species. One of them he believed to be identical with *Salmo fontinalis*, the common Brook Trout of the streams of other parts of the United States.

SALMO AMETHYSTUS, *Namacush.* Of this species Prof. A. remarked, that the color to which it owes its name does not show itself distinctly while the fish is swimming, or when first caught; but only after being taken from the water, when the mucus on the surface begins to dry. The general color of this species varies with the ground on which it is caught. Those found on a muddy bottom are generally greyish, while those from a gravelly bottom are of a reddish color, with much brighter fins. The sexes differ in shape, the male having a more pointed head than the female, although the jaws are of equal length. The *ventral* fins are placed *very far back;* a valuable specific mark in the *Salmonidæ*, a family in which it is very difficult to fix on characteristic differences. The *S. amethystus* is the most valuable fish for food found in Lake Superior. In answer to a question from Dr. Storer, Prof. A. replied that he did not notice the amethystine color in the mouth of this species.

SALMO SISKIWIT, AG. This also is a fish of high flavor, but

so fat as to be unfit for food; the greater part of it melting down as it were, in the process of cooking. It is stout, broad and thick; more so than any species of Salmon except the *S. trutta* of Central Europe. The nostrils are nearer the eye than in *S. amethystus*, and the *dorsal* fin is larger. *Tail* much less forked, and of a crescent shape. The color varies according to the feeding ground on which it is caught, and is brighter during the breeding season. The latter fact Prof. A. remarked is true of fishes in general. The young of the *S. siskiwit* have transverse bars which disappear with their growth, like those of other species of salmon.

Prof. A.'s remarks on the color of fishes during the breeding season led to a general conversation on the subject. Mr. Ayres said he considered color a very uncertain mark on which to base specific differences. He had frequently noticed the brighter hue during the breeding season, but so far as his observations extended it existed only in the males. Prof. Agassiz remarked that in the genus *Phoxinus*, the reverse is the case. He agreed with Mr. Ayres, that color cannot be relied on as a specific character. Dr. Bryant remarked that he had noticed at Newport a difference of color in the Tautog, *Tautoga americana*, of different sexes; the females being mottled, and the males of a darker, more uniform hue, with white chins. Mr. Ayres said that he had hardly seen two specimens of this fish alike in color, and the white chin he considered due to the locality. Dr. Storer spoke of the remarkable varieties of color noticeable in the brook trout from different localities; those from waters with sandy bottoms being very bright, while those from waters over muddy bottoms are extremely dark. This difference is even more striking in specimens of pickerel from different places. Mr. Ayres had noticed similar distinctions in trout caught in different parts of the same stream. Prof. Agassiz had observed them in trout frequenting opposite sides of the same brook, according as they were habitually in the sun or shade.

Mr. Burnett read a paper on the Peeping Frog of New England, from which the following are extracts.

"The Peeping Frog has been hitherto considered by Herpetologists as the *Hyla squirella*, and a description and account of it to this effect have been given in the last Report on Massachusetts Reptiles. My friend Dr. D. S. C. H. Smith, of Providence, R. I., lately showed me the true Peeping Frog, which has been vocal until a week since, so that there can be no doubt of the character of the animal. It differs widely from the *H. squirella*." It proves to be the *Hylodes Pickeringii*. Mr Burnett doubted the existence of the *H. squirella* among us. His paper continued: "There is something quite curious in the coloration of this animal, which it possesses in common with others of the same order, consisting in a constant, apparently volitional change of hue. It immediately assumes that of the object on which it rests, be it stone, wood or leaf; and I have noticed it pass in a few minutes, from fright, through all the tints, from a pea-green to the lightest wood color. The habits of this little animal do not differ materially from those of the genus *Hyla*. The peeping sound is produced by both sexes. In summer they cease to be vocal, and retreat from the pools, where the eggs are deposited, to the woods, where they live, hopping about on the boughs of the trees, feeding upon insects, and occasionally making a shrill whistling noise. Having by autumn become quite fat, they leave the woods and pass the winter at the bottom of pools, or in the mud in their vicinity." Mr. Burnett exhibited colored drawings of the animal taken at different seasons.

Dr. Cabot announced that the following ornithological specimens had been recently received by the Society, viz., *Cypselus pelasgius*, Chimney Swallow, presented by Mr. F. Gassett; *Ardea nycticorax*, Night Heron, young, presented by Mr. W. Minot Jr.; *Tringa rufescens*, Buff-breasted Sandpiper, presented by himself. He also presented specimens of gold ore from the Cabarras mine, in the name of Mr. T. G. Cary, Jr.

Specimens of Coal containing vegetable Fossils; Fossil shells from the Catskill mountains, and a *Turritella* were presented in the name of Daniel P. Curtis, Esq. The thanks of the Society were voted for the donation.

Prof. Wyman presented specimens of Fossil fish from Beyroot.

Dr. A. A. Gould presented specimens of *Mallotus villosus* in a fossil state, contained in clay concretions from the coast of Maine. This fish is interesting as being the only species known to naturalists, in both a living and fossil condition.

October 18, 1848.

Mr. E. C. Cabot in the Chair.

Present, ten members.

Dr. Gould presented several specimens of new shells, and read descriptions of them.

GLANDINA BULLATA. Testâ papyraceâ, bullatâ, diaphanâ, ellipsoideâ, lacteâ, ferrugineo tinctâ, longitudinaliter crebrò striatâ; spirâ octantem longitudinis æquante, anfr. 5 convexiusculis; suturâ modicâ; aperturâ $\frac{2}{3}$ longitud. testæ, latè lunatâ; columellâ modicè arcuatâ, laminâ callosâ indutâ. Long. $1\frac{1}{2}$, lat. $\frac{1}{2}$ poll. *Hab.* Louisiana.

This shell was received in considerable numbers from Rev. E. R. Beadle, of New Orleans. It differs from *G. truncata* in its extreme tenuity, inflated form, and short spire, in the smaller number of its whorls, its paler color, finer striation, and nearly straight pillar.

LIMNEA LANCEATA. Testâ mediocri, fragili, diaphanâ, corneâ, attenuatâ, striis incrementalibus et striis volventibus argutè reticulatâ; spirâ anfr. 6 planiusculis, perobliquis, ultimo $\frac{3}{4}$ testæ æquante; aperturâ angustâ, dimidiam longitudinis ferè adequante, posticè acutâ; plicâ columellari conspicuâ, acutâ, vix spirali; labro fasciâ castaneâ submarginali picto. Long. $\frac{1}{3}$, lat. $\frac{1}{4}$ poll. *Hab.* North shore of Lake Superior, " Pic Lake," where it was collected by Prof. Agassiz.

Next to *L. gracilis* this is the most delicate species we have. It may be compared with *L. attenuata* and *L. reflexa*, from both

of which it differs in the flatness of its whorls, in its aperture, which is proportionally much longer and narrower, and in being only about half their size. It is much like large specimens of *Physa hypnorum* reversed.

Prof. Agassiz read a paper on the necessity of a thorough revision of the system of classification in Zoölogy now in use. He gave a sketch of Cuvier's system, and showed its many deficiencies in the present advanced stage of science. He thought that a more perfect system was called for, based upon the embryonic development of animals, and the order of their appearance at the various geological epochs. His views were illustrated by many interesting facts. Dr. Gould followed with some interesting observations in confirmation of Prof. A's. views, drawn from his study of the Mollusca. He had noticed among them a structural agreement, according to their position in the scale, with the order of geological succession. Points to which he alluded in illustration were the degree of development of parts, as that of the head, for instance; the development of distinct organs, as of the eyes; and the shape of the shell.

Mr. Desor gave an account of his recent zoölogical investigations among the shoals of Nantucket, whilst on board the surveying steamer Bibb; Capt. Davis having afforded him every opportunity for dredging in depths varying from three to twenty-five fathoms.

Among the radiated animals which thus came under his examination were the following:

HYDROIDIAN POLYPS.

1. PLUMARIA ARBOREA, Desor. Polypidom arbuscular, irregularly branched; branches long and pinnate, the pinnæ leaning to one side. Cells pyriform, with a plain margin, very close together, on the internal side of the branches. From 4 to 6 inches high. Dredged on the Shoals of Nantucket, ten miles east of Sancati Head, from a depth of fourteen fathoms.

2. SERTULARIA PILICULA, Ellis. From 2 to 3 inches high.

Found in great quantity on Nantucket Shoals, adhering to stones and shells, at depths varying from six to twenty-four fathoms.

3. SERTULARIA ARGENTEA, Ellis. Varies in size from 3 and 4 inches to 1 foot and a half. Common at depths of from three to five fathoms; also found frequently on the beaches around Cape Cod, where it is thrown by the waves.

4. SERTULARIA PLUMEA, Desor. Polypidom very fine, like down; stem very little branched. Cells opposite, very close. Differs from S. *rosacea*, Johnst., in being much less branched. Height 1 inch. Dredged from twenty-two fathoms near South Shoal.

5. LAOMEDEA DICHOTOMA, Lin. From half an inch to an inch high. Attached to stones and shells. Found at a depth varying from ten to fifteen fathoms, near South Shoal.

ASCIDOIDIAN POLYPS OR BRYOZOA.

6. FLUSTRA TRUNCATA, Lin. Very abundant near South Shoal, at depths varying from fifteen to twenty-two fathoms.

7. CELLULARIA TURRITA, Desor. Polypidom dense, like a bush; stem orange colored, divided into a great number of branches, so that each stem looks like a small tower or pyramid. Found in depths varying from three to fifteen fathoms. Thrown in great quantity on the beaches of the islands of Nantucket and Martha's Vineyard.

8. CELLULARIA DENSA, Desor. Polypidom very dense, bushy: divided into a great many branches, which are brittle when dry. Somewhat allied to C. *avicularia*, Pallas, but differs in the form of the cells, which are more simple. Dredged from a depth of twenty-two fathoms near the South Shoal.

9. LEPRALIA VARIOLOSA, Johnst. Very abundant on the Shoals of Nantucket, at depths of from ten to twenty-five fathoms, where it covers almost every stone and shell. Its color is of a bright red, but it fades very soon after being brought to the surface.

10. MEMBRANIPORA TENUIS, Desor. Cells lobate, more elongated than in M. *pilosa*, Pallas, with a plain margin of a pale pink

color. Abundant in Muskeget Channel at a depth of from three to five fathoms.

ECHINODERMS.

11. ASTERACANTHION FORBESI, Desor. Rays about two and a half times as long as the disk is broad. Differs from A. *rubens* in its more cylindrical rays, and in its spines, which are not pointed, but obtuse and canaliculate along the avenues. Color reddish brown. Dredged from a depth of eight fathoms in the Vineyard Sound.

12. ASTERACANTHION RUBENS, Müll. Found at all depths, from low water mark to twenty-five fathoms.

13. ASTERIAS SPONGIOSA, Fabr. Frequent among barnacles, at depths of from five to fifteen fathoms.

14. OPHIOCOMA ACULEATA, Müll. Frequent among barnacles, at the same depth as the preceding species, and commonly associated with it.

15. ECHINARACHNIUS PARMA, Rumph. Found in great quantity among the Shoals of Nantucket, at an average depth of from six to twenty fathoms. Of a bright red color, but turns green after death. E. *atlanticus*, Gray, is nothing but a young individual of this species.

16. ECHINUS GRANULATUS, Say. Found scattered at all depths from low water mark to twenty-five fathoms. Of a beautiful green color at the greatest depths.

17. SIPUNCULUS BERNHARDUS, Forbes. Frequent in the Vineyard Sound, at the depth of from six to twelve fathoms. Found generally in the shells of *Buccinum trivittatum*, Say, which are very common in this locality, at that depth.

18. CUCUMARIA FUSIFORMIS, Forbes. But one specimen was found, white, tinted with pink on the back. It was dredged near South Shoal, from a depth of twenty-two fathoms.

Mr. Desor described also two new species of Sponges.

19. SPONGIA URCEOLATA, Desor. Cup-shaped, with a lobated margin; perforations very minute. Diameter 1 inch. It is of a

bright red color, but turns black after death. Dredged in the harbor of Edgartown, from a depth of four fathoms.

20. SPONGIA SULPHUREA, Desor. A large species, massive, variously crooked and bent, often annular. Surface covered with many scar-like impressions, at the bottom of which are seen small perforations. It is of a bright yellow color when alive, like sulphur, but turns black after death. Found in great abundance in the Vineyard Sound at a depth of from six to ten fathoms, attached to stones or old shells.

Among the twenty species here enumerated, nine only are mentioned in Gould's Report on the Invertebrata of Massachusetts, seven are entirely new, and four have not been found before on this side of the ocean. Most of the species seem to be exclusive inhabitants of the deep waters, with the exception of the two very common species of Echinoderms, (*Echinus granulatus* and *Asterias rubens*,) which are found at all depths.

Mr. Desor offered for the acceptance of the Society, the original specimens of the above-described species.

Mr. Burnett read a long and interesting paper on the "Hibernation of Insects, and its relation to their Metamorphoses." After some preliminary remarks on the relations of the functions of animal organisms to the season of the year, and the laws regulating the phenomena of hibernation, he came to the consideration of these laws as particularly manifested in the economy of insects. In the course of his observations this autumn upon the *Noctuidæ*, he had noticed that the ova of one species, *Clisiocampa americana*, the common Tent Caterpillar, instead of remaining all winter, as has been supposed, exposed to the cold and storms in an undeveloped state, begin at once to undergo the embryonic changes. He found in every egg which he opened, a young caterpillar with the vitelline sac attached to it, the vitelline duct entering upon the back. He had observed the same thing in several other species of *Noctuidæ*, and therefore infers its probable existence in all. He

exhibited to the Society specimens under the microscope, displaying these appearances.

Mr. Burnett remarked of those species which hibernate under ground, that he had found that they undergo at once the transition from the Pupa state to that of perfect insects, as occurs in the diurnal *Lepidoptera*. He said he thought that a kind of alternation of generation, as it is explained by Sars and Steenstrup, was noticeable in insects. He illustrated his point by a very interesting account of *Bombus americanus*, the American Humble-Bee. His paper concluded with some observations on the distinction between the hibernation of animals, and the Pupa condition of insects. (For the paper in full, see Journal of the Boston Society of Nat. History, Vol. VI. No. 1.)

Mr. Ayres read a paper on a very curious fish which he exhibited to the Society. It was taken at sea, south of the Grand Banks of Newfoundland, in 42° N. lat. and 50° W. long., by Capt. Porter, of St. Stephens, New Brunswick, and is now in the possession of Miss L. Felt, of Boston. When taken it was in a vertical position, with the snout a little above the surface of the water. It was living, but made no attempt to escape. It somewhat resembles the genus *Scopelus*, but differs from it in so many particulars as to make a new genus necessary to receive it. From a striking peculiarity, the softness of its bones, Mr. Ayres proposes for the genus the name of *Malacosteus*, and for the species, from its color, *Malacosteus niger*.

Some of its most striking features are the large size of the eye, the great development of the facial and branchial apparatus, making the head appear to be one quarter of the length of the whole body, while the cranium in reality is remarkably small; the immense gape of the mouth and gills, which is greater than in any other known species; the long sharp teeth in the lower jaw; the small fins, indicating slowness of progression; the absence of scales or any traces of their development; the existence of a singular spot on the cheek, a short distance below

the eye, resembling very much the lens of that organ; the extreme softness of the bones, which can be pierced even in their hardest parts by a needle, with the greatest ease; the absence of branchial rays; and the existence of only a trace of humeral bones. Length 8¼ inches.

From an imperfect dissection, all that he was permitted to make, Mr. Ayres had ascertained a few particulars with regard to its anatomy.

The ovaries present a striking peculiarity in their want of symmetry. They are dissimilar in form, size and situation; a character unknown in any other genus.

The apparently single bone proceeding from the cranium to the articulation of the lower jaw, is found to consist of the temporal, tympanal, and jugal bones united. Of the other bones of the cheek no ossification can be found. The organ on the cheek resembling the lens of the eye, is found under the microscope to be composed of muscular fibres, and is probably part of the *masseter*. (For the paper in full see Journal of the Boston Society of Natural History, Vol. VI. No. 1.)

Dr. Storer had recently received from Capt. Atwood, of Provincetown, a beautiful specimen of *Zygœna*, Hammerhead Shark. The *Zygœna* of our waters has been hitherto considered by naturalists the *Z. malleus*. Dr. Storer had never before seen a perfect specimen. From an examination of the specimen from Provincetown he was now enabled to say that the species is not the *malleus*, but a new one, to which he proposes to give the name *Z. subarcuata*. Dr. Storer exhibited a fine drawing of the fish, and read the following account of it.

"When my 'Report on the Fishes of Massachusetts' was published, in 1837, I had not seen a specimen of a *Zygœna* belonging to our waters. Two years afterwards, I received a dried one, which was taken at Chatham, on the south side of Cape Cod. Imperfect as it was, I described it in a *supplement* to my report, which appeared in the fourth volume of our Society's

Journal; and agreeing as it did, in some important particulars, with the *malleus*, as described by Valenciennes in the 'Memoires du Museum d' Histoire Naturelle,' which latter species is said by this writer to be found upon the coast of Brazil, I concluded it must be that species.

DeKay in his Report on the Fishes of New York, after having seen several specimens, arranges it also as the *malleus*.

A recent specimen, brought me by my old friend Capt. Atwood, from Provincetown, where it was taken a few weeks since, enables me to determine the species — to settle the question that it is not the *malleus*, but an undescribed species, which I would thus characterize.

ZYGŒNA SUBARCUATA. — Head, broad again as long; anterior portion of head convex; posterior margin of head concave. Distance from snout to first dorsal fin equal to one fourth the length of the fish.

The *malleus* is described as having the head three times as broad as long; the distance between the snout and the first dorsal fin equal to one third the entire length of the fish; the anterior portion of the head slightly scalloped, and its posterior margin nearly straight.

The specimen above described is two feet long, and is the third of this species I have known to be taken north of Cape Cod, — all of which have been caught in the harbor of Provincetown, in nets set for mackerel.

DeKay speaks of a specimen having been taken *eleven feet* in length. He says the species is 'much dreaded for its boldness and ferocity;' and Mitchill tells us of a specimen in whose stomach was found 'many detached parts of a man, together with his clothing.'"

Dr. Storer also read a paper on a new species of *Carcharias*, as follows:

"Two or three months since, I read a description and presented a figure of a species of shark, measuring nearly thirteen feet in length, and supposed to weigh about 1500 pounds, which was captured at Provincetown in June last. Thinking this enormous species must have been described by some previous Ichthyologist, I was unwilling to hazard a description until I had further investi-

gated the subject. Now, not having been able to find a description which answers to it, I feel compelled to consider it as a new species, and would offer the following characters.

CARCHARIAS ATWOODII. Above, of a leaden gray color, white beneath. Body very short anterior to the ventral fins. Pectorals large. Anal back of second dorsal. Teeth in both jaws, large, triangular, serrated; those of the lower jaw, the smaller. About twenty-four teeth in each row.

I know of no species which can be thought of, while examining this species, unless it be the *C. vulgaris*, the great White Shark. In that species however, the *anal fin is opposite the second dorsal*, and the *upper lobe of the caudal fin has no triangular termination.*

The absurd notion of indiscriminately annexing the names of individuals to objects of Natural History has been almost discarded, unless in cases where the persons so specified have in some way advanced the boundaries of science. In the instance before us, I feel you will all agree with me in acknowledging that the compliment here offered, is deserved; when I remind you that the hardy fisherman referred to, while constantly engaged in the fatigues of his exceedingly laborious profession, has transmitted me within the last two seasons, besides the species here described, a species of *Blennius*, and *Motella*, both of which *genera* were new to our waters; besides a specimen of the *Semniosus brevipinna*, previously only known by a description of a stuffed specimen met with by Lesueur, at Marblehead, thirty years ago; and a specimen of *Aspidophorus monopterygius*, never but once previously met with south of Greenland; without referring to numerous specimens of our most common species. I would at the same time reiterate, what you have repeatedly heard me state, that he is more conversant with the history and habits of the Fishes north of Cape Cod, than any individual with whom I am acquainted; or in other words, that he is our best practical Ichthyologist."

Dr. Gould presented, in behalf of Mr. B. S. Porter, the skin of an African bird which is frequently transported to South America, where it is kept for a cage bird. In South America it is called La Viuda or Widow Bird. The dona-

tion was accompanied by a letter giving an account of some of its habits and changes of plumage.

Mr. Henry W. Abbot was elected a member of the Society.

November 1, 1848.

The President in the Chair.

Present, nineteen members.

Dr. Gould now gave descriptions of the following shells from the Collection of the Exploring Expedition.

NATICA ALGIDA. Testa parva, tenuis, globosa, glabra, albido-livescens: spira anfr. 4 ventricosis juxta suturam linearem tabulatis, ultimo magno ampullaceo: apertura semilunaris; columellâ arcuatâ: basis umbilico modico spirali funiculato, ad aditum angulato, perforata. Long. $\frac{6}{8}$; lat. $\frac{5}{8}$ poll. *Hab.* Rio Negro.

Differs from N. *saluta* principally in its sutural region, and in its umbilical region, in which latter respect it differs from several allied species such as N. *globosa*, N. *borealis*, &c.

NATICA DILECTA. Testa parva, globulosa, solida, sub epidermide sordidâ eburnea, lineolis rubiginosis araneosis scutulata et propè suturam lituris castaneis maculata; spira rotundata, anfr. 5 ventricosis: apertura semilunaris; labro crasso; columellâ valdè calliferâ, callo anticè et ad funiculum castaneo, et canali transverso ferè diviso; umbilico amplo, funiculo ferè impleto. Long. $\frac{6}{8}$; lat. $\frac{5}{8}$ poll. *Hab.* ——?

Has a general resemblance in size and form to N. *maroccana*, and must also be allied to N. *lupinus*, Desh. The whorls are closely appressed at the suture, and the network coloring is much like that on the bands of *Conus ammiralis*.

STOMATELLA DECOLORATA. Testa auriformis, depressa, subperforata, albida maculis lacteis et labeculis sanguineis marmor-

ata, costulis numerosis confertis cincta, striis minutis ad paginam superiorem interpositis : spira prominula, anfr. 4 planulatis, suturâ profundâ discretis : apertura obliqua, sub-circularis ; columellâ acutâ, supernè reflexiusculâ, areolâ latâ inornatâ adjacente. Long. $\frac{7}{8}$; lat. $\frac{5}{8}$; alt. $\frac{3}{8}$ poll. *Hab.* Mangsi Island.

Allied to S. *maculata*, Quoy., but the spire is less elevated, the aperture is more rounded, and above all it is characterized by the plain white lunate area adjacent to the columella.

Stomatella tumida. Testa subglobosa, ampullacea, tenuis, nitida, cinereo-olivacea, propè suturam albido et rufo seriatim maculata et lineolis sagittatis vittata, subtus flavescens, sulcis remotis cincta, sulcis basalibus fusco-articulatis ; spira anfr. 4 tumidis : apertura circularis ; labro acuto, albo ; columellâ revolutâ, callo copioso, erecto, albo-striato marginatâ ; intus margaritacea. Long. $1\frac{1}{8}$; lat. $\frac{3}{4}$; alt. $\frac{7}{8}$ poll. *Hab.* China Seas, Moluccas.

Distinguished by its globular form, shining surface, peculiar coffee-colored ground with delicately painted feathery ridges and the large white erect columellar callus. It accords with the figure in Chemnitz, named *Turbo papyracea*, but that shell is described as perfectly smooth.

Ampullaria columellaris. Testa ponderosa, imperforata, rhomboidali-ovalis, nitida, sed sub lente argutè reticulata, flavo-viridis, fasciis rubidis cincta : spira elevata, anfr. 7 ventricosis : apertura semilunaris $\frac{2}{3}$ longitud. testæ adæquans ; columellâ axillari, prælongâ, cylindricâ, contortâ ; labro flavido, evaso ; fauce castaneo. Long. $2\frac{1}{2}$; lat. 2 poll. *Hab.* Province of Maynas, Peru.

Remarkable for its solidity, its elongated form, its want of umbilicus, and the presence of a columella like that of the bulimoid helices.

Amnicola badia. Testa minuta, elongata, ovato-turrita, bádia : spira acuta, apice erosâ, anfr. 5 convexiusculis, ultimo vix angulato ; suturâ impressâ : apertura ovata, peristomate continuo, obtuso, fusco. Long. $\frac{1}{5}$; lat. $\frac{1}{12}$ poll. *Hab.* Banks' Peninsula, N. Zealand.

A small elongated species like A. *preissii* of New Holland.

Its color and its dark obtuse peristome give rather marked characters to a shell so small and simple.

AMNICOLA EGENA. Testa minuta, tenuis, sub-perforata, elongato-turrita, epidermide virescente induta: spira acuta, anfr. 5 convexis; suturâ profundâ: apertura ovata; peristomate continuo, labro acuto, patente. Long. $\frac{1}{8}$; lat. $\frac{1}{10}$ poll. *Hab.* Banks' Peninsula, N. Zealand.

More slender and less solid than A. *badia*, and of an entirely different color. It is very much like *Paludina acuta* of Europe.

LACUNA CARINATA. Testa parva, tenuis, ovato-globosa, epidermide corneâ tenui undulatim striatâ induta: spira anfr. 5 ventricosis, ultimo carinâ filosâ cincto: apertura semicircularis dimidiam testæ adæquans; columellâ rotundatâ. Long. $\frac{3}{10}$; lat. $\frac{1}{8}$ poll. *Hab.* Puget Sound.

In color and marking much like L. *vincta* of our shores. Our shell sometimes has the last whorl perceptibly angular, but it never has the filiform carina.

LITIOPA DECUSSATA. Testa parvula, perfragilis, acuto-conica, badia; spira anfr. 8 convexis, transversim striatis, apicalibus plicatis: apertura ovata anticè subtruncata; labro simplici; columellâ arcuatâ, antice unidentatâ. Long. $\frac{3}{40}$; lat. $\frac{1}{10}$ poll. Found on floating wood, lat. 37° 40′ N., long. 54° 30′ W.

Agrees well with L. *striata*, Pfeiff., except that it is less than half the size.

Mr. Desor exhibited specimens and gave an account of a new species of *Salpa* obtained by him off the coast of Nantucket.

This genus is interesting as furnishing an instance of alternation of generation; one generation consisting of many individuals united together in a common chain, the next of separate individuals, and so on in alternate succession, each kind producing the other. Mr. Desor gives to his new species the name *Salpa Caboti*. The genus Salpa had been doubtfully classed, he stated, among the Mollusks. It differs from them in the following particulars. The intestine is reflected, and opens at the common orifice of the

body. The circulation (which is not a true circulation, but a simple oscillation of the fluids from one side to the other, first in one direction and then back again,) is regulated by a valve which is not found in the Mollusks, and acts in either direction, according to the motion of the current. Locomotion is produced by the contraction of strong muscular bands, whereas in the Mollusks it is generally produced by the alternate contraction of many small muscles. In the Salpa it is difficult to say which is the anterior and which the posterior extremity. On the other hand it resembles the Medusæ, especially the Beröe, in its transparency; in the character of its tissue, which is furnished with similar projecting points; in its stinging power when held in large quantities in the hand; and in the position of the embryos around the stomach. The Salpa propels itself by taking in water and expelling it again with force by openings, which in the separate individuals are two in number, in the complex chain one for each member. In reply to a question from Dr. Gould, Mr. Desor said that so far as he had been able to examine it the nervous system is ganglionic, like that of the Mollusks.

Mr. Desor also exhibited some drawings of a new species of *Pelagia* obtained by him in Nantucket Bay. This genus has not before been found on this side of the Atlantic; and the species, characterized by having eight eyes, and five long slender threads, he proposes to call P. *quinquecirrha.*

Dr. C. T. Jackson exhibited specimens of a new mineral found in the copper deposit of the Pittsburg and Boston Company's mine at Lake Superior. He had not yet completed its analysis, but it belonged, he said, to the family of the Zeolites. He also exhibited rings ingeniously made of native copper and silver, the two minerals remaining in contact just as they occur in the mine. He gave an interesting account of the mining processes carried on at Lake Supe-

rior. He stated that the sandstone of that region agrees in its characters with those of the oldest of the sandstone formations. He concluded with an account of the immense quantities of Specular Iron ore found in the region south of L'Anse, Lake Superior, on or near the Machigamig river.

Dr. Storer presented a specimen of *Cottus*, taken in eighteen fathoms of water on Nantucket Shoals. It was only one inch in length, and proved to be the *C. variabilis* of Ayres, which is improperly described by DeKay as the *C. æneus* of Mitchill. The true *C. æneus* is another species. The *C. variabilis* is usually found in shoal water along the shores; and it is a curious fact that the specimen presented should have been taken in such deep water. Three were caught by Mr. Desor, of which the specimen presented was one, in water of twelve, fifteen and eighteen fathoms depth.

Dr. Storer also presented, in the name of Dr. Forsyth of Chelsea, Mass., a specimen of *Chimæra Colliei*, from California, described and figured in the Zoölogy of Beechey's Voyage. This genus of fishes is remarkable for having on the top of the head a large projecting mass, covered with spines, which shuts down over it like a hood, and serves as a protection.

Dr. Bacon presented, in Mr. Alger's and his own name, a number of mineralogical specimens, most of which had been recently collected during a mineralogical excursion to the western part of New Jersey.

Dr. David S. C. H. Smith of Providence R. I., was elected a Corresponding Member.

November 18, 1848.

Dr. D. H. Storer, Vice-President, in the Chair.

Present, twenty-four members.

Mr. J. D. Whitney exhibited and described a large reflecting goniometer, made by August Oertling, in Berlin. This instrument is in its general form and arrangement similar to that described by Mitscherlich, in the Transactions of the Berlin Academy; it has, however, several improvements over any other instrument which has been as yet constructed. The execution of the work is highly creditable to the maker, who is well known as one of the most skilful and ingenious workmen in Germany.

By a slight change in the arrangement of some of the parts, this instrument may be used for the determination of indices of refraction, and for other purposes in physical research, when nice angular measurements are required. The graduation is on silver, and reads by two verniers to 10″.

Mr. Whitney read a paper containing the results of the chemical examination of certain American minerals. The mineral named by Nuttall, Nemalite, and since analyzed by Thomson and Connell, with very discordant results, is simply a fibrous hydrate of magnesia, as was supposed by Nuttall himself without analysis. The name Nemalite ought not to be continued, since the substance differs only from Brucite, or hydrate of magnesia, by being in a fibrous state. Mr. Whitney read a description and analysis of a mineral from the north shore of Lake Superior, which had been hastily and incorrectly examined by Mr. Le Conte, and named by him, Coracite. This mineral contains the oxide of uranium, $\ddot{U}$, combined with oxide of lead and lime, also,

carbonic acid, water, silica, alumina and oxide of iron. It differs from pitchblende in its ready solubility in acids; the uranium existing in pitchblende as $\dot{U}\ddot{U}$, the proto-peroxide, and of course in an insoluble state. He also read analyses of Pectolite from Isle Royale and Bergen Hill, and showed that the Stellite of Beck from Bergen Hill, as well as the Stellite and Wollastonite of Thomson, ought to be united with Pectolite, since they agreed with it entirely in chemical and physical characters.

Mr. Desor exhibited a number of Drift fossils from Nantucket, which he had collected in company with Mr. E. C. Cabot. They were taken from the cliff at the east end of the island. The outlines of the strata on the surface of this cliff are somewhat obscured by the sand which has been blown over it. About half way up it is an oyster bed, from which the specimens were taken. It contains many fossils in a remarkably perfect condition; even crab's claws being found here unbroken. Its position indicates that it has not been disturbed since it was formed. It contains most of the species found on the neighboring beaches. Specimens of Venus are sometimes found with the valves open, as if from the relaxation of the muscles at the moment of death.

Until within two years it has been supposed that there were no fossils in the drift south of Lake Champlain. Last year Mr. Desor discovered a similar fossil deposit on Long Island in Brooklyn, which was then carefully examined by himself and Mr. Redfield. Its origin was very doubtful however, as the shells were very much broken and worn. But at Nantucket, a point between these localities, the formation is now found to exist without the least trace of disturbance. The strata at the east end of this island dip towards the west, the angle of dip gradually increasing from the highest to the lowest. The fossils are of the same species as those now living on the neighboring shore; an interesting fact indicating a similarity of climate at the time they were de-

posited with that of the present. In Europe the opinion has prevailed among geologists that at the epoch of the drift the climate was colder than it is now.

Beneath the oyster bank of Nantucket is a stratum of coarse, sandy clay, very much like that at the base of the cliff of Gay Head, which was regarded by Prof. Hitchcock as a tertiary deposit. It is probable, therefore, that these two formations are the outcrops of a Tertiary basin which passes underneath these two islands of Nantucket and Martha's Vineyard and the intervening sea.

Boulders are found on the surface of both of these islands. It is an interesting inquiry how those on Nantucket could have been deposited above the bed of fossils without disturbing it. The regularity of the stratum of sand under them, and the character of the climate as indicated by the shells, are incompatible with an explanation based on the glacial theory. They could hardly have been brought by Icebergs, for among them are masses of Pudding-stone, such as exists at Hingham and Roxbury, which rest here at a higher level than their source.

Prof. Agassiz gave an account of two new fishes obtained by him at Lake Superior, which he regarded as the types of two new genera. The first is an entirely new type in the class of fishes. Prof. A. incidentally alluded to his former researches, by which he had demonstrated the constant relation existing between the character of the scales and the general character of the fish, and mentioned some instances in illustration.

The first of these two new species is a small fish, five or six inches long, in its general shape resembling a *Leuciscus*. It has the adipose fin of the *Salmonidæ*, but not the jaws of that family; these strongly resembling those of the *Percoids*. In its scales, which are serrated on their margins, it also resembles the *Percoids*. Its characters are sufficiently peculiar to justify the establishment of a new family from

this single species. Fossil species with similar characters are found in the cretaceous formations. This is the second, Prof. A. remarked, of the "old-fashioned" fishes, so to speak, corresponding in their structure to fossil species, which has been observed in this country. The other, the *Lepisosteus*, is the only living representative of a large family of fossil species. The existence of these two species has undoubtedly reference to the fact, that America is the oldest extensive continent which has been upheaved above the level of the sea. In New Holland, two genera exist, bearing similar relations to older families; a fish, the *Cestracion*, or Port Jackson Shark, and a shell, the *Trigonia*, which have their analogues among the oölitic deposits. Prof. A. exhibited a colored drawing of the new fish of which he was speaking, by Mr. J. E. Cabot; and presented specimens for the cabinet of the Society. He has given it the name "*Percopsis*," on account of its resemblance to the Percoids.

The second species, to which Prof. A. gives the name *Rhinichthys*, is characterized by its long snout, the position of the mouth beneath it, and the arrangement of the teeth. The male is brighter than the female.

This genus belongs to the family of *Cyprinidæ*, and should be placed in the vicinity of *Barbus*, though it has no barbels. *Leuciscus nasutus* of Ayres, and L. *atronasus* of Mitchill, belong to this genus.

Prof. Agassiz also exhibited a colored drawing of *Sphargis coriacea*, Leather Tortoise, which was recently cast on shore at South Wellfleet, Cape Cod. It is the second only of this species which has been obtained from our waters.

Dr. Cabot stated that during a recent visit to the east end of Long Island, he had made some interesting observations on the formation of fresh water ponds by the closing up of the entrances to inlets from the sea. About three miles from the end of Montauk Point is such a pond, from four to six miles in circumference, separated from the sea by a sand beach about twenty rods wide. Within the memory

of persons now living it was an open strait, by which small vessels passed through the island. Its waters are now entirely fresh, and contain fresh water animals, such as *Emys picta*, E. *punctata*, and *Emysaurus serpentina*; and fresh water plants, among which is the *Valisneria*. It is the resort of myriads of water fowl, such as are usually found on fresh water. To a great distance from the shore this pond is very shallow, but becomes deeper towards the centre in the probable situation of the old channel. Within twenty years, oysters could be obtained here, and their shells are still abundant. In the vicinity of this pond are smaller ones of a similar character. In other places the process of transformation may be seen now going on. The sea washes up a sand bar across a bay, and in time stops up its entrance. Sometimes this obstruction is broken through by storms, and the sea again enters until the passage is once more closed. Sometimes the barrier is removed by the neighboring inhabitants, to permit the entrance of the herrings. It is an interesting question how the water in these ponds becomes changed from salt to fresh.

Mr. Desor mentioned several similar facts in confirmation of Dr. Cabot's statements.

Mr. Ayres said that he was very familiar with the region which was the subject of Dr. Cabot's observations. He stated, that in the pond to which he had particularly referred, there are still to be found specimens of the Striped Bass, *Labrax lineatus*, which had been shut in when it was cut off from the sea.

Mr. Whitney suggested as an explanation of the change from salt to fresh water in these ponds, that, as the bottom is sandy, all the water originally enclosed had escaped by percolation, and its place has been gradually supplied by rains and neighboring springs.

Mr. Ayres stated that in the neighborhood of these ponds there exist, on the sea-shore, the remains of a pine forest, which has been submerged. At low tide, a strip of this

forest, consisting of numerous stumps with their roots, from which a large part of the soil has been washed away, is left dry upon the beach; down which it extends below low water mark to an unknown distance.

Dr. Gould read descriptions of the following new species of shells, brought home by the U. S. Exploring Expedition:

LITTORINA PATULA. Testa magna, solida, rudis, rotundato-ovata, cinereo-olivacea albido maculata: spira anfr. 5, ultimo magno, ventricoso; suturâ vix impressâ: apertura ampla, rotunda; columellâ latâ, excavatâ, albâ; facie ventrali testæ quasi attritâ, et maculâ fuscâ notatâ; fauce castaneâ, anticè albo-vittatâ. Long. $\frac{3}{4}$, lat. $\frac{1}{2}$ poll. *Hab.* San Francisco.

Remarkable for the amplitude of the aperture, the broad excavated columella, apparently ground away by the protrusion of the operculum.

LITTORINA LEPIDA. Testa parva, solida, elongata, biconica, nitida, livida vel sanguinea albido tessellata vel zonata præsertim propè suturam et ad peripheriam, spiraliter crebrè et tenuiter puncto-striata: spira acuto-conica, anfr. 5, ultimo angulato: apertura ovata; labro acuto, pallido; fauce rubrâ, albo-zonatâ; columellâ planulatâ, sanguineâ. Long. $\frac{3}{5}$, lat. $\frac{2}{5}$ poll. *Hab.* Puget Sound.

A small, biconical species like L. *lineata*, characterized by its finely puncto-striate sculpture, its range of articulate spots, and by the blood-red color of the columella.

LITTORINA SCUTULATA. Testa parva, ovato-conica, plerumque erosa, castanea vel livida albido inordinatim maculata, striis obsoletis cincta: spira anfr. 5, ultimo ventricoso: apertura latè ovata; labro acuto, pallido; columellâ planatâ, antrorsum expansâ; fauce livido. Long. $\frac{3}{5}$, lat. $\frac{2}{5}$ poll. *Hab.* Puget Sound.

Allied to L. *tenebrosa*, but has a more elongate and acute spire; also to L. *lepida*, but is more inelegant, and without the coloring of the base and aperture of that shell.

LITTORINA CALIGINOSA. Testa parva, ovata, tenuis, lævis vel lineis incrementalibus striata, epidermide fusco-virente luteo maculato induta: spira, apice erosâ, anfr. 4–5, ventricosis; suturâ profundâ: apertura vix $\frac{1}{2}$ longitud. testæ adequans, rotundato-

ovata; labro continuo, acuto, pallido, vix everso; fauce livido. Long. $\frac{1}{5}$, lat. $\frac{1}{8}$ poll. *Hab.* Terra del Fuego.

Has the general characters of small specimens of L. *tenebrosa*, and its structure and color give it somewhat the aspect of a fresh water shell.

LITTORINA ACUMINATA. Testa parva, solida, nitida, elongata, conico-turrita, livida obscurè flammulata interdum maculis albidis articulatis cincta: spira acuta, anfr. 6, planulatis, ultimo subangulato; suturâ profundâ; apertura ovata; columellâ nitidâ, moritinctâ. Long. $\frac{3}{10}$, lat. $\frac{1}{5}$ poll. *Hab.* Mangsi Island.

A small, much elongated species in the style of L. *lineata*, known by its regular grooving, and its mulberry-tinted columella.

LITTORINA PLENA. Testa parva, solida, ovata, cinereo-olivacea, interdum albido reticulata, striis spiralibus insculpta: spira parva, acuta, anfr. 5, ultimo globoso, subangulato; suturâ profundâ: apertura parva, dilatata et angulata; columellâ planulatâ, rufâ, albido marginatâ; fauce castaneâ, albo-zonato. Long. $\frac{1}{4}$, lat. $\frac{1}{5}$ poll. *Hab.* San Francisco.

The globoseness of the last whorl is remarkable. It is less elongated than L. *acuminata*, and smaller, more polished, and with a smaller aperture than L. *scutulata*.

STILIFER ACICULA. Testa minuta, imperforata, elongato-subulata, acutissima, ad apicem integerrima et lentè distorta, nitidissima, livido-lactea interdum flavescente: spira anfr. ad 12 planulatis; suturâ lucidâ: apertura angusta, ovalis; labro simplici, antrorsum arcuato, anticè evoluto; columellâ vix arcuatâ. Long. $\frac{3}{8}$, lat. $\frac{1}{10}$, *Hab.* Fejee Islands, in Holothuria.

A much more delicate species than any one of *Stilifer* or *Eulima* described. The little *Phasianella stilifera*, Turt. (*Stilifer turtoni*, Brod.) is somewhat like it. S. *subulatus*, from the West Indies, is much less slender.

SOLARIUM EGENUM. Testa parva, ovato-conica, exalbida, submargaritacea: spira anfr. 6 convexis, liris acutis 4 cinctis, posterioribus granulatis: basis convexiuscula, perforata; umbilico scalariformi, ad ambitum acuto, crenulato: apertura circularis; labiis ferè continuis. Diam. $\frac{3}{10}$, alt. $\frac{1}{4}$ poll.

The characters of this shell do not bring it strictly within the typical form of *Solarium*, but its facies is rather that of *Solarium*

than of *Trochus*. It is to be grouped with S. *dealbatum*, Hinds, which it closely resembles. It is also similar in form, color, and size to *Margarita obscura*, Couthouy. Perhaps it would come under the genus TORINIA, Gray.

Dr. Gould presented to the Society an imperfect specimen of *Anodon gigantea*, Middendorff, from the river Onon, northern Siberia, received from the describer. It was 11 inches long, and 6½ high.

Dr. Cabot exhibited to the Society the following birds, new to the collection, which had been recently mounted for the Cabinet; viz., *Picus auratus*, male, presented by Wm. Minot, jr.; *Aix sponsa*, male, presented by Mr. Robert Holl; *Mergus serrator*, female, presented by Mr. F. H. Jackson; *Ortygometra carolinensis*, presented by Mr. Nathan Robbins; *Fuligula marila*, male, presented by himself; *Mergus cucullatus*, young male, purchased in Boston Market; *Picus pileatus*, male; *Anöus* ——, *Tetrao rupestris*, male, from Newfoundland; and *Astur cooperi*, female, received in exchange.

December 6, 1848.

Dr. C. T. Jackson, Vice President in the Chair.

Present, nineteen members.

Mr. Desor gave an account of his investigations to ascertain the true character of the ovarian egg. He stated that up to the present time the yolk had been regarded by embryologists as a homogeneous, granular mass. This has been considered its fundamental character. Mr. Vogt, in studying the embryonic development of the *Salmonidæ*, had noticed that in the ovarian egg the granules of the yolk showed a disposition to accumulate around the germinative

vesicle, and in course of time became condensed about it. Mr. Desor had, he said, noticed similar appearances in the ovarian egg of *Nemertes* and *Ascidia*. The egg of the latter is at first merely a transparent cell, containing the germinative vesicle, about which, at an early stage of development, a cloud of small granules seems to be forming. These granules are probably cells. As the process goes on, the surrounding area becomes crowded with them, but they are the most numerous near the germinative vesicle. At a later stage the granules recede from the circumference of the sphere, to become compact about the germinative vesicle, forming the perfect yolk, and leaving the surrounding space filled with a transparent fluid. This liquid has been hitherto regarded by embryologists as albumen. As Mollusks, however, have no oviduct in which albumen could be formed, this cannot be its true character. Mr. Desor had therefore been led to the conclusion that it is a true "mother liquid," from which the yolk has been precipitated, crystallized, as it were. It must for this reason be the most important part of the ovum, and accordingly he proposes for it the name "*Biogen liquid*." The facts observed in the development of Mammalia strongly inclined him to the opinion that this process of precipitation from the Biogen liquid would be found to be universal. Bischoff has figured the Rabbit's ovum surrounded by the chorion, with the whole of the enclosed space filled up by the yolk. As development goes on, the yolk is found not to occupy the whole interior, but it is occupied in part by a clear fluid, which surrounds the yolk, the nature of which Bischoff acknowledges he is at a loss to understand. This, Mr. Desor suggested, is probably the Biogen liquid. Thus it would appear that all yolks are formed by condensation: a fact of great interest, indicating as it does, that the great law of attraction is at the bottom of the formation of organic, as well as inorganic bodies; and that the same force which has condensed the heavenly bodies, acts with

equal power in uniting the particles which make up a living animal.

As soon as the egg enters upon its organic life it begins to revolve, and in this movement we have another coincidence with the order of things in the formation of the planetary system, according to the nebular hypothesis.

With regard to Fishes, Mr. Desor remarked that it is not yet certain that in their embryonic development they follow exactly the process which has been observed in the ova of other animals. In the ovum of this class while yet in the ovary, the yolk substance, containing a number of oil drops, fills the whole space. When more developed it is separated from the circumference of the ovum by a transparent interval. It is a question yet undecided whether there exists a true shell-membrane in these eggs, through which water may have penetrated by *endosmose*, following the condensing yolk.

Here Mr. D. read a letter addressed to him by Prof. Gilman, of New York, confirming his observations, and coinciding in his views with regard to the Biogen liquid, but going even further than Mr. D. himself; and showing that, by his own researches, he had ascertained that even the germinative vesicle is formed from it. He also expressed his belief that a shell-membrane exists in the ovarian egg of most Fishes, and that the liquid between it and the yolk-membrane must have entered by *endosmose*. So that for the present, the embryonic development of this class of animals would seem to be an exception to the general rule.

Mr. Ayres stated that he had recently been engaged in a careful dissection of *Catostomus*, to ascertain whether there exists in this fish the curious arrangement of the muscular apparatus of the pharyngeal bones, which he had demonstrated in the genus *Leuciscus*. (See Proceedings, June 21st, 1848.) He had found that although the same muscles exist in the throat of *Catostomus* as in *Leuciscus*, their

insertion is different. They are inserted directly into the second branchial bone. The little needle-like bones, which in *Leuciscus* show such an ingenious contrivance, do not exist in *Catostomus*. Mr. Ayres said he had found them in all the species of *Leuciscus* which he had examined.

Dr. C. T. Jackson, in reference to Mr. Desor's remarks at the last meeting, stated, that on the coast of Maine, near Newcastle, there exists an oyster bank, sixty feet thick, similar to that on Nantucket, containing various species of Mollusks, of which living specimens may be obtained in the vicinity, but in deep water. Ignorant of this fact, and knowing that they do not now exist on the shores of Maine, Mr. Lyell had been led to the erroneous conclusion that they now belong only to more northern latitudes.

In reply to a question from Mr. Desor, as to his opinion of the age of the American Continent in comparison with that of the other continents, Dr. C. T. Jackson said, that it was his belief that the American Continent was upheaved the first, as the granite bears obvious marks of greater age. Mr. Desor replied that he did not consider this evidence conclusive as to the continent's having been upheaved above the *water level.*

Dr. Bacon presented, in the name of Mr. William Stimpson, specimens of dendritic oxyde of Manganese on slate, from Charlestown, Mass., and Shark's teeth from the green sand of New Jersey. He also presented minerals from Mexico, consisting of silver ore, crystallized calcareous spar, and calcareous sinter, from Rio del Munte and its vicinity; and opal from Guanaxuato, received in exchange, from Lieut. J. McNab, U. S. A. He also announced that there had recently been purchased by Mr. Alger, for the Society, mineralogical specimens to the value of $175; this being the balance of a sum of $300, which Mr. A. had been authorized to expend for this purpose, from the funds raised by him in 1847 in aid of the Society. Dr. Bacon

also presented from Mr. Alger, specimens of Hematite, from Amenia, N. Y., Fluor-spar, from Cumberland, Eng., and variegated Copper Ore from the Bruce mine, on the north shore of Lake Huron.

Dr. Cabot exhibited a number of birds, which had been recently mounted for the Society's collection. Among them were the *Roseate Tern*, *Sterna paradisea*, obtained by him at Beverly, Mass., the most northern locality in which it had as yet been found; and *Saltator raptor*, a Yucatan species, described and figured by him in the Journal of the Society, Vol. V., p. 90, as *Pyrrhula raptor*.

Mr. Ayres presented to the Society a number of specimens of the *Cyamus ceti*, Whale louse, attached to a piece of skin of the Right Whale.

December 20, 1848.

The President, in the Chair.

Present, twenty-two members.

Dr. Gould presented descriptions of the following shells brought home by the U. S. Exploring Expedition:

Turbo confragosus. Testa solida, albida, pyramidata, rudis, rugosa; rugis parvis, obtusis, ad peripheriam et ad angulum anfractuum interdum in spinis compressis prominulis productis: spira anfr. ad 6, angulatis superné declivibus, ultimo ad peripheriam acuto; suturâ callosâ: basis planulata, liris squamosis concentricis inequalibus ad 8 cincta: apertura circularis; labro acuto, perobliquo; columellâ curtâ anticè dentatâ; fauce margaritaceâ. Lat. $1\frac{1}{2}$, alt. $\frac{7}{8}$ poll. *Hab.* Dean's Island, Paumotu group.

This species has the low conical form, and bony aspect of the stellate species found in the West Indies. I know of no other

similar one from the Pacific. Its wrinkled surface, polygonal whorls, and the squamous basal ridges mark it.

TURBO SIRIUS. Testa parva, imperforata, pyramidata, dilutè beryllina, leviter corrugata; spira anfr. 4 conicis, infra obliquè plicatis, ad peripheriam acutis et spinis compressis ad 18 armatis: basis planulata, stellaris, liris concentricis muricatis ad 5 insculptis; regione columellari arcuatâ, lævigatâ; labro perobliquo. Diam. $\frac{1}{2}$, axis $\frac{3}{10}$ poll. *Hab.* New Holland.

The multitude and regularity of the triangular projections of the periphery, when viewed from below, give the base a beautiful star-like form, much like T. *stellaris*.

TURBO LACINIATUS. Testa rudis, depresso-conica, cinerea roseo-tincta: spira anfr. 4, irregulariter plicatis, plicis ad peripheriam acutissimis, dilatatis et in spinis elongatis compressis excurrentibus: basis convexiuscula, liris muricatis concentricis 10 – 12 insculpta: apertura circularis; columellâ lævi, arcuatâ, roseâ; labio perobliquo: faux margaritacea. Lat. $\frac{3}{4}$, alt. $\frac{3}{5}$ poll. *Hab.* Manilla.

Closely allied to T. *rhodostomus*, Lk., but wants the double series of spines at the periphery.

TROCHUS PRUNINUS. Testa solidula, elevata, ovato-conica, lævis, nitida, prunina, lineis capillaceis numerosis cincta: spira anfr. 7 convexiusculis, ultimo subangulato; suturâ profundâ: apertura subcircularis; columellâ rotundatâ, albâ, anticè roseo-tinctâ, subsinuosâ: interior margaritacea, vividè iridescens. Alt. $\frac{7}{8}$, lat. $\frac{7}{10}$ poll. *Hab.* Auckland Island.

This peculiarly colored species has the form, thickness, and appearance of the delicately lineated specimens of *Littorina angulifera*.

TROCHUS TEXTURATUS. Testa conica, imperforata, solida, cinerea viridi vel roseo-tincta, liris volventibus roseo-maculatis et laminis incrementi tenuibus clathrata: spira anfr. 7, vix convexis, ultimo sub-angulato: apertura rotundata, anticè evoluta; columellâ rotundatâ, labro declivi, acuto: interior margaritacea, iridescens. Alt. 1, lat. $\frac{7}{10}$ poll. *Hab.* New Zealand.

This may be well compared with the coarse, solid, sulcated variety of *Littorina angulifera*.

TROCHUS LIGATUS. Testa solida, ovato-conica, imperforata, costulis rotundatis flavescentibus ubique cincta, intervallis incarnatis concinnè clathratis, ad apicem violacea: spira anfr. 6 convexis: apertura circularis; columellâ rectâ rotundatâ; labro crenulato: regio umbilicalis vix indentata. Alt. $\frac{3}{4}$, lat. $\frac{4}{5}$ poll. *Hab.* Puget Sound.

This shell resembles, in most respects, T. *doliarius;* small specimens are like *Margarita cinerea*, Couth.

TROCHUS PUPILLUS. Testa parva, elevato-conica, margaritacea extrinsecus incana, filis virido-fuscis ubique cincta, ad intervallos minutissimè clathrata: spira anfr. 6 convexis: basis planiuscula, fissurâ umbilicali perforata: apertura circularis; columellâ arcuatâ: faux fulgida, minutissimè punctata. Lat. $\frac{1}{4}$, alt. $\frac{3}{10}$ poll. *Hab.* New Zealand.

Somewhat similar to T. *ligatus*, but much smaller, more delicate, more nacreous within, and partially umbilicated. It is still more like *Margarita cinerea*, but is more solid, and more delicately marked.

TROCHUS JUCUNDUS. Testa parva, solida, conica, flammulis radiantibus invicem coccineis incarnatis et albis picta: spira anfr. 6 sub-angulatis, filis granulosis alternis minoribus cinctis: basis convexiuscula, imperforata, liris concentricis linearibus articulatim pictis insculpta; regione umbilicali indentatâ: apertura rhomboidea; columellâ arcuatâ, lævi; labro simplici. Long. $\frac{3}{7}$, alt. $\frac{3}{8}$ poll. *Hab.* New Zealand.

A very beautiful shell, both in color and sculpture, quite distinct from any described species.

TROCHUS GRADATUS. Testa parva, solida, perforata, ovato-conica, turrita, cinerea ferrugineo-flammulata: spira anfr. 5, declivibus, ultimo carinis duabus biangulato quorum suprema secundum spiram volvat; interspatio trilineato et concinnè clathrato: basis convexiuscula, liris granulatis concentricis ad 8 insculpta; umbilico amplo, infundibuliformi: apertura circularis; columellâ tenui, rectâ, anticè dentiferâ. Alt. $\frac{3}{8}$, diam. $\frac{2}{5}$ poll. *Hab.* Pacific Islands.

In most respects it is like T. *eximius*, Reeve, which, however, is imperforate. It is also somewhat like T. *sulcatus*, Wood's Sup.

TROCHUS ACINOSUS. Testa solida, convexo-conica, æruginosa, seriebus 4 papillarum insignis et lineolis capillaceis volventibus ubique insculpta; serie anticâ majori: spira anfr. 6 planiusculis, ultimo acutangulato: basis excavata, cinerea, filis concentricis fuscis cincta; interspatiis indentatis; regione umbilicali infundibuliformi et costis duabus tri-partitâ: apertura rhombea; columellâ lævi, contortâ; labro simplici, perobliquo. Diam. $\frac{1}{5}$, alt. $\frac{1}{8}$ poll. *Hab.* New Zealand.

The peculiarities of this species are, the series of tubercles on the delicately lineated ground, the excavated base with its thread-like unbeaded lines, and the two white ribs in the umbilical pit. May be compared with T. *vernus*, Chem.

TROCHUS ELISUS. Testa parva, elevato-conica, imperforata, cinerea: spira anfr. 6 declivibus, suturâ fossali valdè profundâ discretis, costulis transversis granosis tribus (quorum intermediani minore) cincta, interspatiis clathratis: basis convexa, costulis clathratis insculpta: apertura subcircularis; columellâ granulatâ; labro intus sulcato. Diam. $\frac{3}{8}$, alt. $\frac{1}{2}$ poll. Dredged at Singapore.

Distinct from any described species. Its markings are deeply sculptured, and its peculiar sutural region is a character which cannot fail to be noticed at first glance. It is quite probable that it may be colored differently when quite fresh.

Mr. E. C. Cabot read a paper giving an account of some researches he had made during the last autumn, in company with Mr. Desor, to determine the fact of the constant presence of fresh water in Dune sand and sand spits. These researches were conducted at Cape Cod, which they visited for that purpose in the U. S. Surveying Steamer Bibb, under the command of Lieut. Davis, with whose assistance they were made.

In every instance where there was a body of sand above the tide level, with salt water on opposite sides, or entirely surrounding it, *fresh* water was discovered on digging to a moderate depth. Thus at Monomoy, a long, low island of sand, south of Cape Cod, fresh water was found at its highest part, at a depth of *two* feet. On the beach, at the line of high water, it was

obtained almost on the surface. The same fact was observed on Sandy Neck, a long sand peninsula, which separates Barnstable Bay from Barnstable Harbor, and at Provincetown. At the former place, it is particularly striking, as good water is very scarce in the town of Barnstable, on the main land directly opposite. In this town is a well, about one hundred and fifty feet from the shore, in which the water rises and falls with the tide, although only through a space of one foot and a half.

As yet, Mr. Cabot had not been able to satisfy himself whether the amount of rise and fall in wells showing this sympathy with tidal fluctuations, depends upon their distance from the salt water or not. Since making these observations he had noticed that such a rise and fall is not limited to wells in a natural formation. He had observed that in loose deposits of an artificial character, in the vicinity of salt water, they also occur. Thus, in Suffolk street, which is laid out on newly-made land, this fluctuation takes place in the wells; and in some trenches which he had caused to be dug recently in Charles street, for the foundation of a building, at high tide fresh water makes its appearance, while at low tide they are empty. An interesting inquiry suggests itself as to the origin of these deposits of fresh water in such loose soil. They cannot be derived from springs, for these occur distinct from them, in the same formations, and present peculiar characters of their own; often bubbling out from the surface of the sand, even below the line of high water on beaches. It might be supposed that they are the result in part of a filtration of the salt water through the sand. To test this, Mr. Cabot poured a quantity of salt water through sand, and found that it lost two per cent. of its specific gravity; a curious and unexpected result, but not sufficient fully to explain the case. On the whole, he was inclined to accept the opinion of Mr. Mather, that these supplies of fresh water are derived from rains, and are prevented from oozing out laterally, by the pressure of the neighboring salt water. As this advances, it recedes, and its level rises; as the tide goes out, it follows, and its level is depressed. The practical result from these investigations is, that it will undoubtedly be found that in all deposits of sand like those examined by Mr. Cabot, an abundant supply of fresh water may be obtained at all times; a fact of great importance to mariners.

Mr. Ayres stated that he had made similar observations to those of Mr. Cabot.

He knew of an instance of a sand bank, eight feet high, formed within his recollection, in which fresh water might be obtained at the depth of eighteen inches. At Sag-Harbor, where he had resided for some years, there is a well, about forty rods from the tide, in which the water rises and falls four feet, a little after the tide. A little further from the shore is another, which rises and falls two feet; a well still further off, rises and falls one foot; at a short distance above this is one which is not sensibly affected.

Mr. J. E. Cabot mentioned a statement of Darwin's, that on the Coral Islands of the Pacific, fresh water may be easily procured by digging a short distance below the surface.

Dr. Pickering stated that he had himself seen the natives of these islands obtain a supply whenever it was wanted, by making a slight excavation. In reply to a question from Mr. Ayres, whether the water in the lagoons of these islands is always salt, he stated that so far as he had examined them it is so. They either communicate directly with the sea, or else are separated from it by a barrier over which it easily passes in storms. In reference to the point that fresh water in sand deposits does not necessarily correspond in level with the neighboring salt water, he called the attention of the Society to the fact, that imbibition or capillary attraction affords a ready means of accounting for it. In Lower Peru, where it never rains, and the country is fertilized by irrigation, he remarked that the soil is found to be moist several feet above the surface of the water in the canals.

A gentleman present, not a member of the Society, suggested that the difference of specific gravity of salt and fresh water might be a satisfactory reason for their not intermingling in the sand formations examined by Mr. Cabot.

The subject under consideration suggested to the Presi-

dent some interesting facts and questions as to the nature of springs and wells.

It was impossible, he said, to account for the water in the wells of Boston, by the supply afforded by rains alone. Water is found abundantly in places at so great an elevation that mere drainage could not have furnished it. It would seem, therefore, that it must have been brought by underground currents, perhaps from a great distance, following the course of an impervious underlaying stratum. Such an underground current he stated to exist at the south part of the city. The President also stated that in the vicinity of the state-house, there is a very deep well which rises and falls with the tide.

Dr. Cabot called the attention of the Society to a communication which had appeared in several newspapers of this city, over the signature of Prof. Horsford, of Harvard University, in which he attributes the form in which the gold is found in California, to the grinding action of glaciers. Dr. Cabot wished to know whether those gentlemen of the Society most conversant with such subjects, coincided with Prof. Horsford in his views.

Mr. J. D. Whitney said he saw no sufficient reason for calling in the glacial theory to explain the phenomena in question, since gold is very commonly found in vein rock, either in the form of rounded grains or scales. Simple decomposition of the rock would liberate it in the shape in which it is found in California.

Mr. Desor said that the movement of glaciers is so slow, he doubted if they could by any possibility produce such a violent disruption and grinding to powder of the rock formation, as Prof. Horsford supposes to have taken place. Neither does it appear that there are any striæ on the surface of the rocks in place, such as are invariably found in the track of a glacier. Nor was Mr. Desor aware that any evidence had been heretofore adduced, of the existence of glaciers at a point so far to the south, on the North American continent.

Mr. J. D. Whitney gave the results of the chemical examination of three minerals, described as new species, by Prof. C. U. Shepard, (Am. Jour. of Science, New Series, Vol. 2, p. 249,) namely, Arkansite, Ozarkite, and Schorlomite. These minerals are all from the same locality, in Arkansas.

The first, Arkansite, which Prof. Shepard supposed to be a niobate of yttria and thorina, is titanic acid, with a little iron, crystallized in the form of Brookite, and having the specific gravity of that variety of titanic acid, while it has, at the same time, the opacity and color of nigrine, a variety of rutile. Ozarkite is a zeolitic mineral, a silicate of alumina and lime, with a little soda. It is probably scolezite. Among the specimens of the third mineral, schorlomite, there appear to be at least two distinct substances. One is colophonite, or lime-iron garnet, which occurs both massive and crystallized; the other is a substance considerably resembling black garnet in external characters, but which proved, on chemical examination, to be a new titaniferous silicate. As this new mineral, however, differed so widely in chemical composition, and in certain important chemical characters, from Prof. Shepard's schorlomite, Mr. Whitney had given it a new and more appropriate name, and the name of schorlomite can be dropped till the real "hydrous silicate of yttria, thorina, and oxide of iron" shall be found. The name given to this new mineral is *Ferrotitanite*, in allusion to its analogy with titanite or sphene, and to its containing iron in addition to the elements of sphene.

Its chemical composition may be represented by the formula

$$(\dot{C}a^3\,\ddot{\ddot{S}}i + \ddot{\ddot{F}}e\,\ddot{\ddot{S}}i) + \dot{C}a\ddot{T}i^2,$$

which agrees very nearly with the results of the analyses of this mineral. For particulars of the examination of these minerals, see the Society's Journal, Vol. VI., No. 1.

Dr. Bacon exhibited eighty mineralogical specimens presented to the society by Mr. Alger. About a year since, Mr. A. offered the society the selection of four hundred specimens from his private collection. At that time eighty

were taken, and the specimens now exhibited were a second instalment.

Dr. Cabot exhibited twenty-eight birds, which had been recently mounted for the Society. Among them was a remarkably fine pair of Argus pheasants, — *Argus gigas*.

Dr. Cabot announced, on behalf of Dr. Storer, that a specimen of the Nurse or Sleeper Shark, *Somniosus brevipinna*, ten feet in length, had been recently caught at Nahant. This is the second of that species, which has been captured in Massachusetts Bay within a year.

Dr. Henry Wheatland of Salem, was elected corresponding member, and Mr. James West, of East Boston, an immediate member of the Society.

BOOKS RECEIVED DURING THE QUARTER ENDING DECEMBER 31.

Transactions of the Entomological Society of London. Vol. V. Part 2. Lond. 1847. *From the Entomological Society.*

Journal of the Indian Archipelago, and Eastern Asia. Nos. 1 to 5 of Vol. II., and Supplement to No. 6 of Vol. I. 8vo. Singapore, 1847 – 8. *From the Editors.*

Bulletin de la Société Geologique de France. Deuxième Serie. Tome quatrième. Feuilles 53 – 62. (17me Mai, 1847.) Tome cinquième, Feuilles 4 – 8. (22me Nov. 1847 — 10me Janvier, 1848.) *From the Société Geologique.*

Annales de la Société Linnéenne de Lyons. Années 1845 – 6. 8vo. Lyons, 1847. *From the Société Linnéenne.*

Annales des Sciences Physiques et Naturelles, d'Agriculture et d'Industrie. Tome IX. Année 1846. 8vo. Lyons. *From the Société Royale d'Agriculture.*

Annals and Magazine of Natural History. No. X., for Oct. 1848. 2d series, Vol. II. *Courtis Fund.*

Mollusques Vivantes et Fossiles. Par Alcide d'Orbigny. Livraisons 1 – 7. 8vo. Paris, 1845. *From the Author.*

Audubon and Bachman. Plates 141 – 145, of Viviparous Quadrupeds of America. *From Subscribers.*

Silliman's American Journal of Science and Arts. 2d series. No. 18, for Nov. 1848. *Exchange.*

Recherches sur les Poissons Fossiles. Par Louis Agassiz. 6 vols. 4to. Planches, 3 vols. Folio. Neuchatel, (Suisse,) 1833–47. *From Hon. Nathan Appleton.*

Annals of the Lyceum of Natural History of New York. Vol. IV. No. 12. Sept. 1848. *From the Lyceum.*

Descriptions of new species of Bullia and Marginella. By J. H. Redfield. 8vo. Pamph. New York, 1848. *From the Author.*

Distinctive characters of Cypræa reticulata of Martyn, and Cypræa Histrio of Meuschen. By J. H. Redfield. 8vo. Pamph. New York, 1847. *From the Author.*

Annual Report of the Regents of the University on the condition of the State Cabinet of Natural History. 8vo. Pamph. Albany, 1848. *From the Regents of the University.*

Natural History of Fossils. By E. Mendes da Costa. Vol. I. Part I. London, 1757. *From S. G. Drake.*

Annals and Magazine of Natural History. 2d series, Vol. II. No. 11, for Nov. 1848. *Courtis Fund.*

Manual of Chemistry. By Wm. T. Brande. 8vo. London, 1819. *From G. B. Emerson.*

Book of Nature. By John Hill. Folio. London, 1758. *From G. B. Emerson.*

Smithsonian Contributions to Knowledge. Vol. I. 4to. Washington, 1848. *From the Smithsonian Institute.*

Journal of the Indian Archipelago. Nos. 6, 7, 8. Vol. II. Singapore, 1848. *From the Editors.*

Beschreibung der, in der Grossen Knochen Hohle, Tennessee, (Nord America,) gefundenen fossilen Knochen des Megalonyx laqueatus, von R. Harlan, M. D.; verdeutscht durch Charles Cramer. 8vo. Pamph. Moscau, 1847. *From C. Cramer.*

Memoirs of the American Academy of Arts and Sciences. New series. Vol. III. 4to. Cambridge and Boston, 1848. *From the American Academy.*

Gray's Genera of Birds. Part 46. Long 4to. London, Dec. 1848. *Courtis Fund.*

Annals and Magazine of Natural History. 2d series. Vol. II. No. 12, for Dec. 1848. *Courtis Fund.*