DONATIONS TO THE CABINET.

Ammonite from the lias of England, fine specimen. From *Nathaniel Brewer*, Esq.

January 7, 1846.

Dr. A. A. Gould in the Chair.

Mr. Francis Alger exhibited certain minerals, and read a paper concerning them, which was referred to the Publishing Committee. The following is an abstract of it.

Mr. Alger announced that he had discovered *Phacolite* among specimens of minerals from New York Island. The crystals are beautifully perfect, double six-sided pyramids, implanted on carbonate of lime. They are of a wax-yellow color, have also a waxy lustre, and are translucent. This mineral, he observed, had been regarded by some as a species distinct from Chabasite, but it is now, principally on the authority of Tamnau, of Berlin, admitted to be only a variety of that mineral, derived from the same primary rhombohedron. Mr. A. remarked that the New York crystals were very interesting, from the fact that they showed the incipient modifications by which the ultimate double six-sided pyramids were produced from the rhombohedron, thereby clearly proving the Phacolite to be a secondary to the primary form of Chabasite. This he had not observed in any of the specimens from Bohemia or Ireland. It should nevertheless be remembered that the analyses of Phacolite, by Anderson and Rammelsberg, make it differ somewhat from common Chabasite, one being a bisilicate of alumina, + bisilicate of lime, potash and soda, + six atoms water; the other, a tersilicate of the first term, and a simple silicate of the second, along with three atoms water.

Yttro-cerite. Mr. A. had found this very rare mineral in the limestone from Orange county, New York. It presents all the characters of the mineral from Finbo, in Sweden, and cannot be

distinguished from it in hand specimens. It is associated with Brucite, but is very scarce. Mr. A. gave his reasons for considering *Dysluite* as identical with *Automalite*. They pass into each other, and the differences in hardness, color, specific gravity and pyrognostic characters, can thus be accounted for by the well-known fact of the isomorphous replacement of the constituents of certain minerals, the crystalline forms of which remain the same. Specimens are seen, in which the bright and perfect crystals of Automalite gradually lose their lustre, and become porous, brittle and soft; thus assuming the characters of Dysluite.

Ottrelite, of MM. Desclozeaux and Damour, identical with *Phyllite*, of Dr. Thomson. This fact was pointed out by Mr. A. on the grounds of similarity in chemical composition, as well as in physical and crystallographical characters, so far as these latter have been determined. They both occur in small disks or plates, very thin, and the most perfect of them having the form of compressed or flattened rhomboidal tables. A specimen of Ottrelite, which he had received from Mr. Markoe, and another of Phyllite, from the hands of Prof. Nuttall, enabled Mr. A. to compare them carefully with each other; and he had no hesitation in declaring them to be the same mineral. Damour's analysis shows the iron to be in the state of protoxide; and it, probably, exists in the same state in Phyllite, though it is put down as peroxide in Dr. Thomson's analysis. The name Ottrelite should give place to that of Phyllite, on the ground of the priority of the latter, and because it expresses so well the ordinary appearance of the mineral. Brooke had supposed Phyllite to be identical with Gigantholite. If we compare the analyses of Gigantholite and Ottrelite, their identity is much more clearly shown, so that it would appear that all three should be classed together.

Polyadelphite. Mr. A. remarked that Dana, in the new edition of his mineralogy, had included this mineral under the species garnet. The correctness of his opinion was now further shown by the circumstances of its occurrence at the locality which Mr. A. had visited the last year. The two minerals occur together, and pass into each other, in the same manner as Dysluite and Automalite. It differs but little in composition, compared with the brown garnet from Franklin, analyzed both by Dr. Thomson and Seybert.

In a former number of these Proceedings, an abstract is given of a paper read before the Society, by Mr. Alger, on the Identity of *Beaumontite* and *Lincolnite* with Heulandite. The identity of the first with Heulandite is not now disputed; but Prof. Hitchcock having maintained that the crystals in Mr. Alger's possession were, possibly, not the mineral which he (Prof. H.) had called Lincolnite, but might be Heulandite, Mr. Alger reaffirmed his first opinion, and gave additional reasons for its correctness.

Dr. S. Cabot, Jr., stated that he had recently received a pair of canvass-back ducks, shot near Newburyport. He had known only one previous instance of these birds being taken in this vicinity, to wit, at Fresh Pond, by Capt. N. J. Wyeth.

DONATIONS TO THE CABINET.

Specimens of Bulimus ovatus, B. planidens, Helix similaris, and others, from the Organ Mountains, near Rio Janeiro. From Mrs. *Alexander H. Everett.*

ADDITIONS TO THE LIBRARY.

Sullivant, W. S. Musci Alleghanienses. 12mo. pamph. Columbus, Ohio, 1845. From *Prof. Asa Gray.*

Gray, Asa. Review of the above work. From the *same.*

Leonhard, Gustav. Handwörterbuch der Topographischen Mineralogie. 8vo. Heidelberg, 1843. From *Francis Alger.*

Phillips, John. Memoirs of William Smith, LL. D. 8vo. London, 1844. From the *same.*

Silliman, B., Jr. Report on the Chemical Examination of several Waters for the City of Boston. 8vo pamph. Boston, 1845. From the *Author.*

Verhandlungen der Kaiserlichen Russischen Mineralogischen Gesellschaft. 8vo. 3 pamphlets. St. Petersburg, 1842, 1843 and 1844. From the *Imperial Mineralogical Society of St. Petersburg.*

January 21, 1846.

The President in the Chair.

Rev. Edward E. Hale gave a short account of the recent Journey of Discovery under the command of Capt. Frémont, and of its scientific results, which he considered to possess extraordinary interest.

Capt. Frémont's party, consisting of thirty-nine men, left Kansas, a frontier village of Missouri, on the 31st of May, 1843. Varying from the route of the year before, and that pursued by the emigrants, they advanced towards the Rocky Mountains by the Republican Fork of the Platte River. Appointing a rendezvous at St. Vrain's, Lieut. Frémont and a light party made a detour of a hundred miles to the southward, hoping to find a more southerly pass through the eastern ridge of the mountains, than that usually followed.

In this expectation he was disappointed. Having collected his whole party again, they continued westward, across the Laramie plains, by a new route; and, by another detour, he, with a light party, visited the Great Salt Lake, a saturated solution of salt, on which he and his crew were probably the first navigators. He rejoined his party at Hall's, on the Snake River, and thence followed very nearly the great emigrant road to the mouth of the Columbia. This road is now marked out with perfect distinctness, and is constantly travelled. From the Columbia, he undertook, in mid winter, to travel south to California: not near the sea coast, as a party under Mr. Eld, of the Exploring Expedition, had done, but eastward of the Cascade chain of mountains, and between one and two hundred miles from the coast. His objects were to visit St. Mary's Lake, to find the great rivers Sacramento and Buenaventura, which are laid down, on the maps, as draining all northern Mexico and southern Oregon.

This bold and dangerous portion of his journey establishes a very important geographical fact. No such rivers exist as the Sacramento and Buenaventura of the maps. They drain only a district lying near the coast, while the greater part of the north of Mexico and the south of Oregon is not drained by waters running into the Pacific. The Columbia is the only river which

breaks the Cascade chain of mountains, for a long distance on the Pacific coast. For twelve degrees south of its mouth, no river flows into the ocean but those which rise on the west side of these mountains, the range of which thus connects, without interruption, with the Sierra Nevada of California.

Capt. Frémont was unable, therefore, to follow a watercourse to the Pacific, as he had hoped, and instead of this, was compelled to cross with his whole party the high range of this Sierra, in mid winter. He effected this between January 19th and March 6th, without losing a man. The lowest point of the pass which he followed, is nearly eight thousand feet above the sea. His Indian guides thought the undertaking madness, and all deserted him successively. As his provisions were failing also, it may be considered as a most daring and triumphant effort.

He refitted at Nueva Helvetia, travelled southwards till he could turn, by Walker's pass, the southern flank of this range of the Sierra, then, by the Spanish caravan trail, worked his way northeasterly again, until near the Salt Lake, whose southern waters he visited, and thence returned home by the waters of the Smoky Hill Fork, making a survey of the head waters of the great rivers of the Mississippi, as he passed. He arrived at Kansas again, July 31st, 1844.

The distance thus travelled on horseback, with a few light wagons for instruments, and a mountain howitzer, was five thousand one hundred and nine miles.

The geographical discovery, the principal feature of which has been noticed, is, undoubtedly, the most valuable scientific result of the expedition. From the time when he left the Salt Lake, till he returned to it, he was travelling around the three sides of a triangle whose area is some two hundred thousand square miles. Of this district little is known, though the hunters and trappers give terrible accounts of its sterility. But Capt. Frémont, in travelling wholly around it, proved that its waters do not discharge from it in any direction into the ocean. For he traced the ranges of mountains which separate it from the Mississippi, the Colorado, the Columbia and the Sacramento.

This basin presents some analogy, therefore, with that of the Caspian Sea in Asia. It may possibly prove that the Salt Lake is the result of its system of rivers.

The older maps have laid down the fact that here were lakes and streams not communicating with the sea. But the full limits of this mediterranean desert have never before been known.

Capt. Frémont is a botanist, and speaks with becoming enthusiasm of the vegetable wonders of western America. Unfortunately, a great part of his collections was lost or injured. The remnant has been carefully arranged by Dr. Gray, who has published, in the Journal of this Society, a Conspectus of the Compositæ, prepared by himself and Prof. Torrey.

Referring in general to the Report for descriptions of botanical novelties, it is worthy of attention that Capt. Frémont describes five esculent roots and plants, used by the natives, and as yet wholly unknown in our gardens. These are: *Psoralea esculenta*, *Valeriana edulis*, *Camassia esculenta*, *Circium Virginianum*, *Erodium cicutarium*; besides the root of *Anethum graveolens*, which, it seems, is the *yampah* of the Indians. The Digging Indians, who seem to be at the lowest limit of civilization, subsist almost wholly on these and on worms; and Capt. Frémont and his men were at times glad to follow their example, adding, in one instance, *red ants*, which, it seems, give a pleasant acid relish.

The work contains, also, important contributions to the zoölogy of the country, especially in enlarging our knowledge of the history and migrations of the buffalo, and its present numerical condition. There are also frequent notices of the mountain sheep, and other animals, as yet but little known.

The volcanic nature of a great part of Oregon, and the numerous and interesting fossils discovered, give an important character to the geological results of the expedition. Hot springs are mentioned in several instances. One, in California, had at the surface a temperature of 209° in mid winter.

The whole book is written with spirit, and it is highly entertaining. Capt. Frémont shows himself, with all modesty, to be a daring and intelligent man.

Prof. Asa Gray stated that there had been recently placed in his hands specimens of earthy matter, filled with finely broken fragments of branches of trees, which were said to have been found occupying the place of the stomach in the skeleton of the *Mastodon* exhumed on Schooley's Mountain,

N. J., and lately exhibited in this city. As similar observations are said to have been made in several instances, Prof. Gray was induced to examine the substances brought to him.

The wood evidently consisted of branchlets of one, two and three years old, broken, quite uniformly, into bits of half an inch or so in length, with only, now and then, traces of the bark remaining on the wood. The wood was not at all fossilized, and was but slightly decayed. From the appearance of the branchlets examined, Prof. Gray inferred that they belonged to some coniferous tree or shrub, and, probably, to a kind of spruce or fir, rather than to a true pine. This inference was borne out by the examination of thin slices of the wood by the microscope. The woody fibre was very beautifully and distinctly marked with the circular discs that are characteristic of all coniferous wood. The structure agreed quite perfectly with that in similar branchlets of the common hemlock spruce.

Dr. S. Cabot remarked upon the internal organization of a male specimen of *Fuligula spectabilis*, lately procured by him in Boston market.

Dr. C. mentioned some external appearances, which have not been described in the accounts heretofore given of this bird. The color of the legs and toes is bright yellow (not orange.) Two of the inner tertiaries are deeply scooped out, as it were, on their extremities, and seem inclined to stand up, on their edges, from a twist in their shafts, somewhat like those of the Mandarin duck.

The superior larynx is $\frac{7}{8}$ of an inch long, by $\frac{4}{8}$ across. The trachea is $7\frac{6}{8}$ inches in length, to the bifurcation of the bronchial tubes. At the lower end of the trachea, is a rounded bony box, $\frac{3}{16}$ of an inch in its transverse diameter, and $\frac{5}{16}$ in its perpendicular diameter on the left or largest side. The left bronchus is $1\frac{7}{8}$ inches long, and considerably dilated in its central parts. The right bronchus is $1\frac{6}{8}$ inches long, calibre equal throughout. The whole length of the alimentary canal is 86 inches. Half way between gizzard and anus, there was found a small appendix, $\frac{3}{8}$ of

an inch in length, and $\frac{2}{8}$ of an inch in width when flattened out, entering the intestine at a right angle, and communicating with it by an orifice somewhat smaller than the calibre of the appendix itself. The cœcal appendices were about $6\frac{1}{2}$ inches in length. The gizzard was very large and strong, being $2\frac{3}{8}$ inches in its longest diameter, and having muscles 1 inch in thickness; it contained fragments of shells broken into small pieces; its lining membrane was very tough and hard, being $\frac{1}{8}$ of an inch in thickness.

DONATIONS TO THE CABINET.

Numerous specimens of minerals and fossils, collected in Col. Kearney's Expedition in the Territory at the eastern base of the Rocky Mountains. From *Lt. J. H. Carlton, U. S. Dragoons*, and *Mr. Henry Loring, Jr.*

ADDITIONS TO THE LIBRARY.

American Journal of Science and Arts. Second Series, No. 1. Jan., 1846. From the *Editors.*

Magazine of Horticulture. For Jan., 1846. From the *Editors.*

February 4, 1846.

The President in the Chair.

The President read a letter from George Lister, M. D., of Washington county, Alabama, concerning the fossil bones collected there by Dr. Koch, and since exhibited in this and other cities, as the remains of an extinct animal, under the name of *Hydrarchos.* The circumstances which elicited this letter, were as follow. It was stated, by Dr. Koch, that the bones had been found together, in a position which proved that they belonged to one individual, and that the vertebræ formed a complete and integral series, arranged in the order in which they were lying when discovered. This

assertion was shown, by Prof. Wyman, in a paper read before this Society, to be a mere fabrication, and the condition and character of the various bones were cited as evidence that they could not have belonged to one individual, and that their arrangement was entirely factitious. Of this, there could be no doubt among persons competent to form a correct opinion, but, as it was desirable to know how far Prof. Wyman's judgment was confirmed by the history of the discovery of the fossils themselves, Dr. Lister, a gentleman living near the locality of Dr. Koch's discoveries, was applied to for information. His reply was put into the hands of the President, and Dr. Lister had authorized such use to be made of it as might be useful.

Dr. Lister's letter is dated Old Court House, Washington county, Alabama, December 7th, 1845. The writer states that there is a tract of fertile woodland prairie, with a black soil, extending from Mississippi, in a southeast direction, through Alabama. Its whole length is about one hundred and fifteen miles. It is covered, here and there, in many places, by sharks' teeth, marine shells, and the bones of aquatic animals, all of which are evidences of a deposit, made at the bottom of an estuary or arm of the sea. Such bones as those of the Hydrarchos, and particularly the vertebræ, can be collected in great numbers by any one who will take the trouble, as Dr. Koch did, to hunt out the various parts; but it is very uncommon, and almost impossible, to discover the bones of one individual, or any considerable part of them, in their natural arrangement.

It was in this prairie, near the Old Court House, in Washington county, that Dr. Koch found a considerable portion of the bones now constituting the Hydrarchos, lying upon, or near, the surface of the earth. They were not lying in their natural position, so as to constitute an unbroken series, but were scattered here and there. Some days after finding some of the bones of the anterior extremities, and some ribs and vertebræ, he went into the State of Mississippi, hoping to discover a cranium. In this he was unsuccessful; but after his return, he found the bone supposed by him to be a cranium, and the lower jaw, in a heap of stones,

where they had been thrown by the negroes when the land was cleared for cultivation. He also procured others of the bones in Clark county, at a place twenty miles distant, and some wagon-loads of them at another place seven miles distant from the spot where he got the most interesting part of them.

Dr. Lister was not present at the actual exhumation of the bones; but, on the invitation of Dr. Koch, he examined them at the Court House, and saw enough to convince him that Dr. Koch could have made his skeleton three hundred feet long, as easily as one hundred and fourteen feet.

Dr. Lister adds that the people of his neighborhood had been very much amused by the accounts of the wonderful animal which had appeared in the New York newspapers, and by the various opinions which had been pronounced upon it by learned gentlemen.

A letter, addressed to the President by Mr. John Bartlett, now engaged in a zoölogical exploration in the south-western States, dated Natchez, January 10, 1846, was read.

Mr. Bartlett said that he had received authentic information that the bones of *Zeuglodon* are found near Natchez, in a blue clay of the tertiary beds. He had seen, in the possession of C. G. Forshey, Esq., of Vidalia, La., vertebræ of the same animal, procured from a stratum of marl, among the older tertiary beds of Ouachita Bluff, eighty feet above the level of Ouachita River. The shells associated with them, at the last-mentioned locality, are, *Ostrea*, *Pecten*, *Isocardia*, *Fissurella*, and *Dentalium*. This observation seems to confirm the original opinion of Dr. Harlan, that the *Zeuglodon* belonged to the tertiary era, an opinion that has been latterly superseded by the belief that its remains were derived from the cretaceous strata. It is probable that its supposed position in the latter, rather than its zoölogical affinities, led Dr. Harlan to consider it to be a saurian, and not a cetacean, as it is now acknowledged to be.

Dr. N. B. Shurtleff informed the Society that the splendid and most valuable skeleton of *Mastodon giganteum*, exhumed in August, 1845, from a marl-pit, six miles west of Newburg, Orange county, New York, had arrived in the

city. He knew that the members, and all friends of science would be gratified to learn that it had been purchased by a scientific gentleman, with a view of giving it a permanent place among us. By the liberality of the proprietor, it would be accessible to naturalists for scientific purposes, and would always constitute an object of great scientific interest. This munificent purchase enabled us to claim for Boston the honor of possessing the two most perfect and the only authentic integral skeletons of the Mastodon. The one, a female, the subject of Dr. J. B. S. Jackson's notice, on pp. 60–62 of this volume, soon to be placed in the halls of Harvard College, and the other, a male, now in preparation for its owner. Dr. Shurtleff announced the proprietor to be Dr. John C. Warren.

Dr. S. said that it was not his intention to give a detailed description of the skeleton, as that would be done in a short time by a distinguished anatomist. He would mention, however, that its height is eleven feet, its length, in a straight line from the most anterior part of the cranium to the most posterior part of the pelvis, is fourteen feet four inches, and the extreme width of the pelvis six feet two inches. The bones are in a remarkable state of preservation, and have very nearly the appearance of recent specimens. With the exception of a few phalangeal and caudal bones, and the posterior portion of the sternum, the skeleton is entire.[1]

Dr. Shurtleff being himself engaged in articulating and mounting the skeleton, thought it might be interesting to mention the manner of doing it. The missing bones are replaced by imitations. In restoring the absent phalangeal bones, the correspondent ones of the opposite side, which fortunately were perfect, offered the means of doing so correctly, by using reversed models of them. The deficient portion of the sternum is copied from that of the Asiatic elephant belonging to the Society. The caudal vertebræ are supplied, in part by models from another

[1] A description of this skeleton is given in the American Quarterly Journal of Agriculture and Science, vol. ii. p. 203. The number of the dorsal vertebræ is there erroneously stated to be nineteen. The actual number is twenty.

skeleton, and in part by others made according to Dr. S.'s judgment. In forming the imitation-cartilages of the ribs, Dr. S. attached *six* of them to the sternum, that being the number of true ribs in the Society's skeleton of the elephant, and the inference being a fair one that, the number of dorsal vertebræ and ribs being the same in the Mastodon and elephant, the number of true ribs would also correspond.

The skeleton is to be placed on a platform in the shape of a double cross, and to be supported by strong iron rods, arranged so as to be nearly out of sight when the skeleton is viewed laterally: viz., the anterior part of the chest by a rod in the shape of an inverted Π between the anterior extremities, to which each of these is attached by a clamp; while its weight is sustained by an iron T secured to the carpus; and the posterior part of the trunk by iron bars crossing each other in the shape of an X, and attached above by bolts to the lower part of the pelvis, and below to the cross. Each posterior extremity is sustained in position by an iron T screwed to the tarsal bones, while the head of the femur is secured in the acetabulum by a strong bolt; the head is made firm by two cross bars (similar to those used for the posterior part of the skeleton,) attached above to the most anterior part of the cranium, and below to the platform and between the fore feet. Two other rods, placed longitudinally, are arranged so as to serve as braces.

In mounting this skeleton, every exaggeration has been studiously avoided, it having been the endeavor of Dr. S. to put the bones as nearly as possible in their natural position as indicated by their articulating surfaces and by analogies.

Dr. S. also mentioned that the skeleton of the largest Asiatic elephant hitherto brought to this country, would soon be mounted, and remain permanently in the city.

Dr. Gould exhibited a collection of shells, sent from Tavoy, in Burmah, by the Rev. Mr. Mason. Among them he distinguished and characterized the following undescribed species:

HELIX SATURNIA. Testa magna, lenticularis, pallidè rubido-cornea, ad peripheriam costato-carinata, latè et profundè umbilicata: anfr. 5 planulatis, spirâ depresso-conicâ, suturâ prof[illegible]ê.

marginatâ: subtus convexa, costulis obsoletis cincta: aperturâ amplâ, rhomboideâ, peristomate revoluto.

Diam. 2; alt. $1\frac{1}{4}$ poll. Hab. Tavoy.

In size and form it is like H. *lampas* from Jamaica; but differs especially in having a broad, deep umbilicus.

HELIX REFUGA. Testa sinistrorsa, discoidea, supra plana, infra concava, viridi-cornea: anfr. 6 arctè volutis, confertim striatis, ultimo propè aperturam deflexo; suturâ impressâ: aperturâ perobliquâ, subcordiformi, peristomate albo, reflexo, callo sinuoso connexo; fauce lamellâ albâ, flexuosâ, ad anfractum penultimum volvente.

Diam. $\frac{3}{5}$; alt. $\frac{1}{3}$ poll. Hab. Tavoy.

This remarkable shell is almost exactly like H. *carabinata*, Fer., except that it is reversed, and has no lamellæ revolving within the outer lip.

HELIX HONESTA. Testa orbicularis, depressa, subcarinata, tenuis, nitida, submargaritacea, straminea vel albida, sub-perforata, subtus lineis subtilibus volventibus striata: anfr. 5 convexis; sutura lineari, marginata: apertura lunata, labro simplici, acutissimo, ad umbilicum reflexo.

Diam. $\frac{9}{20}$; alt. $\frac{1}{4}$ poll. Hab. Tavoy.

A plain, simple shell, resembling H. *fusca* more than any other species I have seen. It is, probably, a NANINA.

BULIMUS MONILIFERUS. Testa conico-oblongata, plerumque sinistrorsa, lævis, luteo-cinerea, flammulis longitudinalibus, fasciâ suturali lineari, et fasciâ subsuturali interruptâ fuscis; regione umbilicali fuscâ, fasciâ luteâ divisâ: anfr. 7, ultimo subcarinato; aperturâ subovatâ, basi angulatâ, sub-effusâ; labro reflexo, rubro-purpureo, ad columellam dilatato; fauce purpureâ.

Long. $1\frac{1}{7}$; lat. $\frac{7}{10}$ poll. Hab. Tavoy.

Differs from B. *contrarius* and B. *lævus*, Mull., by its angular aperture, and the color of its lip and throat. The interrupted line, just in front of the suture, exists in all the specimens I have seen. It does not always occur reversed.

PUPA MELLITA. Testa parva, subfusiformis, pellucida, nitida, straminea, apice obtusa: anfr. 7 convexis; suturâ impressâ, denticulatâ: apertura ampla, subquadrata, plicâ columellari, plicâ basali, plicâ labiali et lamellâ posteriori ringens: peritremate undulatâ, reflexâ, albâ.

Long. $\frac{8}{10}$; lat. $\frac{8}{10}$ poll. Hab. Tavoy, in hortis.

The general aspect of the shell is not unlike that of *Achatina octona*, in company with which it was found.

Succinea semiserica. Testa fragilis, ovalis, a tergo depressa, posticè straminea, anticè albido-sericea, longitudinaliter plicoso-striata: anfr. $2\frac{1}{2}$, ultimo maximo; aperturâ ovatâ, patulâ faciem inferiorem ferè adequante.

Long. $\frac{1}{2}$; lat. $\frac{3}{10}$; alt. $\frac{3}{20}$ poll. Hab. Tavoy, in hortis.

Its shape is like S. *tigrina*, Fer., and it is well characterized by the peculiar silky-white or pearly surface of the anterior half of the shell.

Melania Herculea. Testa ponderosa, elongato-conica, fusco-viridis, decollata: anfr., numero integro ad 15, superstitibus 2–5, planulatis, infra suturam constrictis, plicis profundis 4-nodosis longitudinalibus; ultimo subcarinato, basi striis crassis cincto: apertura subrhomboidali, anticè productâ, callo columellari rotundato, crasso, fauce plus minusve fusco.

Long. 3 poll.; lat. 1 poll. Hab. Tavoy River.

This is the largest Melania with which I am acquainted, and is very massive. It differs from the large Melania found about Calcutta (of which, also, I am unable to find any description,) by its larger size, darker color, more numerous folds, which bear about four tubercles each, instead of having usually only a median carina bearing acute tubercles.

Amnicola cincta. Testa minuta, tenuis, ovato-oblongata, imperforata, pallidè cornea, decollata: anfr. (superstitibus) 3, ventricosis, ultimo magno, subcarinato, lineis volventibus, et interdum fasciâ fuscâ, cincto: apertura ovata, basi admodum producta, labro simplici.

Long. haud $\frac{1}{10}$ poll. Hab. fluv. Tenasserim, Burmah.

Nucula turgida. Testa alba (dealbata,) sub-equilateralis, subrhomboidea, posticè acuta, anticè rotundata, ventricosa, margine ventrali pendente, ubique lamellis concentricis obtusis reflexis confertis ornata: natibus prominentibus; cardine dentibus 21 utroque latere instructâ.

Long. $\frac{1}{2}$; lat. $\frac{1}{4}$; alt. $\frac{7}{20}$ poll. Hab.

This must resemble closely N. *tumida*, Reeve, but is in no wise angular anteriorly.

Dr. Gould also described a species of Bulimus, from the Organ Mountains, Brazil, lately presented to the Society by Mrs. A. H. Everett.

BULIMUS TURNIX. Testa oblongo-ovata, a tergo compressa, nitida, cervina, flammulis albidis quodammodo seriatis marmorata, longitudinaliter striata, lineis granulosis volventibus decussata: anfr. 5 convexis, ultimo magno: apertura ovali, peristomate valdè revoluto, rosaceo: columellâ obliquâ, pliciformi: umbilico obliquo, rimato.

Long. $2\frac{1}{4}$; lat. $\frac{11}{10} \times \frac{8}{10}$; apert. $1\frac{3}{10}$ poll.

Its surface is covered with shining, longitudinally compressed granules, like *B. goniostoma*, and evidently belongs to the same group; but, in other respects, it is more like *B. pudicus* and *B. Bolivarii*. Few exceed it in beauty.

Information having been received that the authorized edition of the scientific portion of the history of the late U. S. Exploring Expedition would consist of only one hundred copies, a number entirely inadequate to supply the wants of the scientific public; it was

Voted, That the interests of science require that an effort should be made to induce the Government to enlarge the edition very considerably, so that the work may be procured by institutions and individuals, other than those to whom copies may be presented by law; and Dr. A. A. Gould and Dr. Samuel Cabot, Jr., were appointed a committee to address the proper authorities in this behalf.

J. H. Carlton, Lt. U. S. Army, was elected a corresponding member, and Mr. Henry Loring, Jr., of Boston, a member of the Society.

ADDITIONS TO THE LIBRARY.

Annual Report of the Kentucky Institution for the Deaf and Dumb. 1846. *Donor unknown.*

Morris, J. E. Contributions towards a History of Entomology in the United States. 8vo pamph. Washington, 1844. From the *Author.*

February 18, 1846.

The President in the Chair.

A letter from J. G. Norwood, M. D., of Madison, Indiana, communicated by Prof. H. D. Rogers, was read.

Dr. Norwood announced the discovery of fossil fishes, at a locality sixteen miles north of Madison. They are, probably, of the genus *Cephalaspis*. He believes them to be the first fossils of the kind found in the west, and hopes that they may aid in determining the western equivalents of eastern and foreign formations. He expressed an intention of publishing a description of the fossils and of their position.

A letter from W. H. Barris, of Ellsworth, Trumbull county, Ohio, was read. It accompanied a crystal (hemitrope) of Selenite, found, imbedded in a stratum of blue clay, in that vicinity.

A paper was read, communicated by Prof. C. B. Adams, containing descriptions of undescribed species of shells, from the island of Jamaica, viz.,

PLANORBIS PALLIDUS. P. t. dextrâ convexâ, apice depressâ, sinistrâ, concavâ; anfractibus vix tribus, ultimo maximo; aperturâ maximâ, transversâ.

Diam. .4; alt. .125 poll. Hab. Jamaica.

CYCLOSTOMA MARITIMUM. C. t. elongatâ, decollatâ, aurantiâ, costulis exilibus plurimis eleganter ornatâ; suturâ exilè crenulatâ; anfractibus duobus perditis, septem reliquis; umbilico minimo; aperturâ ab anfractu penultimo disjunctâ, suprà angulatâ et auriculatâ; labro acuto.

Div. 30°. Alt. .63; lat. .27 poll. Hab. Jamaica.

HELICINA AFFINIS. *H. solitariæ*, nob., affinis, sed t. spirâ conicâ haud convexâ, instructâ; labro reflexo, infrà angulato, haud scisso. Hab. Jamaica.

PUPA ROSEA. *P. cylindro*, Desh., affinis, sed t. rosaceâ, costulis parvulis distantibus ornatâ. Hab. Jamaica.

LIMA PELLUCIDA. L. t. tenuissimâ, hyalinâ, costulis quadraginta tenuissimis instructâ.

Long. .41; alt. .63; lat. .25 poll. *L. Loscombii*, Sowb., affinis. Hab. Jamaica.

Dr. Gould read a letter from Prof. James Hall, announcing that he had in his possession a fossil skull of a large *Rodent*, found in Wayne county, New York, which he proposed to describe and offer the description to this Society.

Dr. D. H. Storer laid upon the table a Synopsis of the Fishes of the State of Ohio, prepared from the papers of Prof. J. P. Kirtland, published in the Journal of this Society.

Dr. S. remarked that, as this series of descriptions is now completed, it had become desirable to know their results, and these he had endeavored to exhibit in the paper now offered. Besides being a synopsis of the families, genera and species of the fishes of that State, so far as they are at present known, he had given to it the character of an index, by appending to it a reference to the volume and page of the Journal where the description of each species may be found. He hoped thus to abridge the labors of the student, who would otherwise be obliged to extend his search through eleven different numbers of the Journal.

PERCIDÆ.	Vol.	Page.	Plate.	Fig.
Perca flavéscens,	V.	335.	XXVII.	2.
Etheóstoma variàta,	III.	274.	"	"
" maculàta.	"	276.	"	3.
" capròdes,	"	346.	V.	3.
" blennioides,	"	348.	VI.	1.
Labrax multilineàtus,	V.	21.	VII.	1.
Lucioperca americàna,	IV.	237.	IX.	2.
Centrárchus hexacánthus,	III.	480.	XXIX.	2.
" æneus,	IV.	239.	XI.	1.
" fasciàtus,	V.	28.	IX.	1.
Pomòtis macrochìra,	III.	469.	XXVII.	3.
" vulgàris,	"	470.	XXVIII.	2.
" nítida.	"	472.	XXVIII.	1.
TRIGLIDÆ.				
Cottus gòbio,	V.	342.		
Gasterósteus incónstans,	III.	273.	II.	1.
SCIENIDÆ.				
Corvina óscula,	III.	350.	VI.	3.

	Vol.	Page.	Plate.	Fig.
SILURIDÆ.				
Pimelòdus nebulòsus,	V.	330.	XXVI.	
" càpreus,	"	339.	XXIX.	2.
" cœruléscens,	"	333.	XXVII.	1.
" limòsus,	"	340.	XXIX.	3.
Notàrus flavus,	"	332.	XXVI.	2.
CYPRINIDÆ.				
Leucíscus elongàtus,	III.	339.	IV.	1.
" dissimilis,	"	341.	IV.	2.
" biguttàtus,	"	344.	V.	1.
" céphalus,	"	345.	"	2.
" erythrogáster,	IV.	23.	II.	2.
" crysolèucas,	"	305.	XV.	1.
" compréssus,	"	306.	"	2.
" plagyrus,	V.	26.	VIII.	2.
" kentuckiénsis,	"	27.	"	3.
" Storerìànus,	"	30.	IX.	2.
" dorsàlis,	"	274.	XXII.	1.
" diplèmia,	"	276.	"	3.
Piméphales pròmelas,	III.	475.	XXVII.	2.
Catòstomus aurèolus,	III.	349.	VI.	2.
" commùnis,	V.	265.	XIX.	1.
" bùbalus,	"	266.	"	2.
" elongàtus,	"	267.	"	3.
" Duquésnii,	"	268.	XX.	1.
" anisùrus,	"	269.	"	2.
" melànops,	"	271.	"	3.
" nìgricans,	"	273.	XXI.	3.
Sclerogràthus cyprinus,	IV.	275.	XXII.	2.
Exoglóssum dùbium,	V.	272.	XXI.	1.
Hydràrgira limi,	III.	277.	II.	4.
ESOCIDÆ.				
Esox reticulàtus,	IV.	233.	X.	2.
" estor,	V.	337.	XXVIII.	3.
SALMONIDÆ.				
Salmo fontinàlis,	IV.	305.	XIV.	2.
" namycush,	"	25.	III.	2.
Corégonus albus,	III.	477.	XXVIII.	3.
" Artedi,	IV.	231.	IX.	1.
CLUPEIDÆ.				
[1] Pomólobus chrysochlòris,	IV.	307.	XV.	3.

[1] In revising the descriptions of the western fishes for the pages of the Journal, I placed this species under the genus *Alosa*. I had, however, never seen a recent specimen, and being therefore not quite satisfied of my correctness, I have preferred to follow Rafinesque's arrangement in my Synopsis. D. H. S.

	Vol.	Page.	Plate.	Fig.
Amia calva,	III.	479.	XXIX.	1.
Chatöessus ellípticus,	IV.	235.	X.	1.
Hyodon tergíssus,	V.	388.	XXVIII.	1, 2.
SAURIDÆ.				
Lepisósteus oxyúrus,	IV.	16.	I.	1.
" ferox,	"	18.	"	2.
" platóstomus,	"	20.	"	3.
GADIDÆ.				
Lota maculòsa,	IV.	24.	III.	1.
ANGUILLIDÆ.				
Anguílla lùtea,	IV.	234.	XI.	2.
PETROMYZONIDÆ.				
Petromyzon argénteus,	III.	342.	IV.	3.
Ammocœtes cóncolor,	"	473.	XXVII.	1.
STURIONIDÆ.				
Acipénser rubicúndus,	IV.	303.	XIV.	1.
" platorynchus,	V.	25.	VIII.	1.
Polyodon fòlium,	IV.	21.	II.	1.
Platiróstra edéntula,	V.	22.	VII.	2.

C. G. Forshey, Esq., of Vidalia, Louisiana, was elected a Corresponding Member.

John H. Dix, M. D., and W. J. Dale, M. D., were elected Members of the Society.

ADDITIONS TO THE LIBRARY.

Proceedings of the Academy of Natural Sciences of Philadelphia. For November and December, 1845. 8vo. pp. 287 to 325. From the *Academy*.

March 4, 1846.

The President in the Chair.

Dr. D. H. Storer made a verbal statement concerning a species of *Esox* received by him, since the last meeting

of the Society, from Mr. William Henry, of Bellows Falls, N. H.

Dr. S. observed that the species is a beautiful one, and differs from the only two species of this genus he had previously seen, viz., *E. estor*, and *E. reticulatus*, but agrees *perfectly* with Richardson's description of *E. lucius*, in his Fauna Boreali-Americana, Vol. IV. p. 124. According to Mr. Henry, this species was originally introduced, from Lake Champlain, into ponds connected with Black River, Windsor Co., Vermont, and thence carried into the Connecticut River. He had known, in some seasons, one hundred or more to be taken at Bellows Falls, weighing each from one to fourteen pounds. Dr. S. remarked that, although Richardson had stated that his "specimen, taken in Lake Huron, was submitted to Cuvier's inspection, and had also been carefully compared with the English pike, without any specific differences having been detected," American ichthyologists had been slow in acknowledging the two to be identical, believing the same fluviatile species not to exist on both continents. Dr. Dekay had admitted *E. lucius*, with a query, into his "Report," and he (Dr. S.) had done the same in his "Synopsis."

Dr. S. hoped to be able soon to have another specimen, when he should exhibit it to the Society and have it figured.

Dr. S. further remarked that, with all due deference to the authority of distinguished naturalists abroad, he was, each succeeding year, less willing to rely upon their opinions in matters of doubt, touching the fishes of this country, unless good reasons were given for those opinions. To illustrate his remark, he spoke of the *common smelt*. In the year 1818, Lesueur described this species, as new, in the 1st vol. of the Jour. Ac. Nat. Sc. of Philadelphia, under the name of *Osmerus viridescens*. Cuvier, in his Règne Animal, made no mention of this species; and hence Richardson observed, in his Fauna Boreali-Americana, "As Cuvier, though well acquainted with Mr. Lesueur's ichthyological papers, has not noticed this smelt in his *Règne Animal*, we may infer that he did not consider its title to rank as a species sufficiently established." Dr. S., in his Report on the Fishes of Massachusetts, had, accordingly, considered Artedi's specific name, *eperlanus*, as having the priority, there probably being but one smelt. To settle this point, he transmitted to Mr. Yarrell, the

well-known British ichthyologist, specimens of our species, and wished him carefully to compare them with the English fish. The remarks of that gentleman upon this species, which will appear in Dr. S.'s "Synopsis," show the species to be distinct from each other, and that our fish is Lesueur's *O. viridescens.*

Dr. A. A. Gould remarked upon the occurrence of *Esox lucius* in Connecticut River, as stated by Dr. Storer.

He said that he hoped that Dr. S. would give the subject a very thorough examination, before he admitted this as a fact. He had himself, after much consideration, and with favorable opportunities for observation, adopted the opinion that no fluviatile species exists both in Europe and North America. He considered the North American species to be quite distinct, and that the fish which had latterly been thought to be *Cottus gobio*, of Europe, would prove ultimately to be specifically distinct from it. Great caution should be exercised in admitting the identity of any foreign species with our own.

Mr. John E. Teschemacher read mineralogical notices of *Damourite* and *Pyrrhite*, minerals that had recently been examined by him.

Mr. T. stated that, in the Annales de Chimie for Oct., 1845, there is a paper, from M. Achille Delesse, on a new mineral found among the Kyanite of Pontivy, which he had named Damourite. It is a combination of silicate of alumina and hydrate of potash. His analysis gives:

Silica,	45.22
Alumina,	37.85
Potash,	11.20
Water,	5.25
	99.52

In the closed tube, before the blowpipe, it gives off water. This mineral appears, either during its formation or afterwards, to have undergone intense pressure.

Among the minerals from Chesterfield, Mass., which, in a paper read before this Society, and published in their Journal, Vol. IV. No. 1, Mr. T. had considered as new and requiring

investigation, was a yellow amorphous substance, found in very small quantity, which gave off water in the closed tube, became milk-white before the blowpipe, and, with the strongest heat, melted at the edges into a white enamel; with microcosmic salt, gave a colorless bead, and became blue with nitrate of cobalt. As these characters agreed with those of the Damourite above, he made several trials with reägents, and found it to be a pure silicate of alumina, with a small percentage hydrate of potash. He sent a portion of it to Mr. A. A. Hayes, of Roxbury, who was kind enough to repeat the examination, with the same result. It is found in recesses of the albite, at the tourmaline locality, and appears to have undergone severe pressure.

In the Kyanite from Leiperville, Pennsylvania, there is also a yellow substance which attracted the attention of Mr. T., two or three years ago. Like the Damourite, it is pressed so hard against the Kyanite that it is scarcely possible to separate them from each other. This has also been subjected to the same trials as the other, both by Mr. Hayes and Mr. T., and with the same results. These two minerals are therefore, unquestionably, the Damourite of M. Delesse. The latter, from Leiperville, is found plentifully, although Mr. T. is not fortunate enough to possess sufficient for further analysis. The closing remarks of M. Delesse, on the early conditions of the rock in which it is found, as indicated by its analysis, are of great interest, both in themselves as well as in exhibiting the importance to geology of considerations on the absolute conditions requisite for the formation of the different minerals that are interspersed among the various formations. Knowledge on this subject, when more facts are collected and generalized, will, probably, cause considerable change in many of the theories current in the present state of science.

Mr. T. stated that, by the kindness of Dr. J. W. Webster, a further supply of Pyrrhite, an interesting mineral found in volcanic ejections at the Azores, has been placed in his hands. He had measured the orange-red octohedrons, which give 109.28′, and are therefore, as he had previously supposed, the regular octohedron. There are, however, other crystals, accompanying them, of which the forms are widely different, although, before the blowpipe, they give the same reaction with oxide of titanium as the others. The color of these crystals is also rather of a reddish

clove-brown, and they are more transparent than the orange-red octohedrons. One of these is an oblique rhombic prism, the solid lateral angles replaced. Another is probably a right rhombic prism. All these crystals, however, are very minute, and have, on this account, hitherto baffled his attempts at measurement of the angles. But under a powerful microscope all the planes are distinctly and clearly visible. Rose, in his admirable papers on titanic acid, observes that Rutile, Anatase and Brookite, all oxides of titanium, but of incompatible crystalline forms, make the first clear instance of trimorphism, so that the variety of forms observed are not extraordinary; nay, further investigation will probably prove that the oxide of titanium may, in its crystalline form, be polymorphous.

Mr. T. thought it proper to notice that Monticelli and Covelli, in their Prodromus of the Mineralogy of Vesuvius, describe a siliceo-calcareous titanite or sphene, in the form of the octohedron with a rhombic base, measuring 103.20 to 131.16. This he had not seen; nor did they analyze it.

Prof. H. D. Rogers submitted some verbal remarks on the occurrence of crystals of fluate of lime in Cannel coal.

Prof. Rogers stated that his attention had been recently drawn to the frequent violent snapping of the English Cannel coal, which he had been using in his grate, and to the almost explosive dispersion of small fragments of fluor spar, about the apartment, which accompanied the louder crepitations. He had satisfied himself, by watching the phenomenon, that the fluor spar was derived from the body of the coal, since it was thus projected from the grate when nothing had been placed upon the fire but large and clear lumps of the coal, and afterwards he had detected a small isolated crystal of the mineral upon breaking a piece of the coal. Some of the fragments of the fluor scattered into the room were more than half an inch in diameter, and retained portions of the original crystalline faces, indicating that it is probably lodged, within the coal, in insulated crystals. He mentioned this as the first instance, within his knowledge, of the discovery of any of the compounds of fluorine in a substance appertaining to the vegetable kingdom; and he intimated that since this element exists, as is now admitted, in the bodies of

animals, we are almost authorized to infer that they derive it from their ultimately vegetable food. He suggested that this fluor of the Cannel coal may, nevertheless, have been derived by volcanic agency, from subterranean sources, possibly by hydrofluoric acid, in the form of vapor, transmitted through the fissures of the coal, reacting upon the calcareous matter which occurs among the earthy substances of many coal seams. The fluoride of calcium, thus generated, may have been formed either within the substance of the coal, or, more probably, in the passage of the hydrofluoric acid vapor through underlying beds of limestone, and have been afterwards sublimed into the crevices of the coal bed.

Dr. Charles T. Jackson read a paper on the Importance of the Science and Art of Mining, which, he stated, held a rank second in importance to that of agriculture only. He said that it was his wish to call the attention of the public to the real metallurgic resources of the country, but, at the same time, to condemn absurd or unprincipled speculation, which had very much interfered with and retarded a healthy and profitable development of American mining operations.

Dr. Jackson described some of the most important mines in the country, and gave a particular account of the newly-discovered copper and silver mines of Lake Superior, especially of those belonging to the Lake Superior, Pittsburg and Isle Royal, and Boston companies, which he had been employed to survey. Through his researches, the importance of the silver veins had first become known to the public; and he doubted not that they would, ultimately, become profitable to the companies owning them, and valuable sources of revenue to the government and to the people.

The Lake Superior mining district is very remarkable, especially the deposits of the native metals in the trap rocks, and in the adjacent calcareous spar veins, which traverse the conglomerate rocks. The trap rocks form very long and broad dykes in the conglomerate and red sandstone, and pursue a north-east and south-west course, nearly parallel to the coast of Kewenaw Point, and are supposed to extend to the St. Croix, a tributary of

the Mississippi River. The range of trap dykes is nearly parallel with the great trappean ranges, forming the north mountains of Nova Scotia, and skirting the coast of the Bay of Fundy with their mural escarpments, and, like them, include, in the amygdaloidal portions especially, masses and disseminated globules of native copper which fill the cavities. In Nova Scotia, however, the metallic copper is, more frequently, found in the trap tuff or breccia, and regular veins of the metal are not found; while, on Kewenaw Point, on the south shore of Lake Superior, the copper veins are more regular, and follow, very frequently, the Prehnite veins, which run N. 32° W. and S. 33° E., the crevice filled with Prehnite being, probably, the line of fracture through which the metallic copper was sublimed or injected. That this was sometimes the case, is obvious from the fact that the metallic copper takes the imprint of the crystals of Prehnite which line the sides of one of the leading veins on Eagle River. The disseminated copper in the amygdaloid appears to be coëval in origin with the trap rocks. He had formerly supposed it might have been reduced from copper ores preëxistent in the sandstone, the amygdaloid being regarded by him as a product of the interfusion of the sandstone and trap. This idea he does not think can be sustained by the facts noticed in the Lake Superior rocks; for the copper should be found only along the line of junction of the trap and sandstone, if such was its origin, and the copper ores ought to be found more frequently in the adjacent sandstone. The north-western course of the veins, being nearly at right angles with the direction or strike of the dykes, militates against that theory.

Among the interesting discoveries, which he made while exploring the Lake Superior mines, in 1844, was the occurrence of perfectly pure native silver, attached, by a firm metallic union, to native copper, without any blending or alloying beyond the line of contact, and patches and veins of native silver in masses of pure copper. The silver, being pure and quite soft, had been previously mistaken for metallic tin, an idea obviously arising from the known associations of tin and copper ores in Cornwall. While at Lake Superior, he proved to those who had any doubts that the metal referred to was pure silver, by subjecting it to chemical experiments.

The proportion of silver mixed with the copper, at the Lake Superior, and Pittsburg and Isle Royal Company's mines, on Eagle River, is of much greater value than the copper in the same rock, and will be advantageously separated.

He would refer to his Reports to those companies for details concerning the value of their ores. A new vein has recently been discovered by the Pittsburg and Isle Royal Company, at their mines, on the south-west branch of Eagle River, which has furnished specimens of native silver of extraordinary richness, some of which have been analyzed by Mr. A. A. Hayes. The Lake Superior Company's mines are wide, and sufficiently rich for profitable mining. [See his Reports to that company.]

The Copper Falls Company have a remarkable vein of metallic copper, which is from six to eighteen inches wide, and is charged so fully with copper as to resist the drill. Its extent is not yet known, but it was traced, for the distance of eighty feet, in a course parallel with that already noticed as the general direction of the veins in the trap rocks. He had recently learned that very large sheets of metallic copper had been discovered in working this vein, and that the amygdaloidal wall rock was quite rich in copper. A little metallic silver has also been found associated with the copper in the vein. The Boston Copper Company has opened a very remarkable vein of copper at Agate Harbor. It is a regular vein of crystalline calcareous spar, traversing the conglomerate in a north and south direction, and is five inches wide on the top of the cliff, on the lake shore, and one foot wide near its base, twenty feet lower down. In this vein, he found crystals of metallic copper quite abundantly, and some very large lumps and crystalline masses. He obtained one mass weighing forty pounds, which was covered with crystals of pure copper and particles of silver. Another mass had been sent him by the miners, which weighed more than one hundred pounds, and another had been sent to the trustees of the company which weighs five hundred and sixty-four pounds. The prevalent forms of the crystals are the regular octahedron and the rhombic dodecahedron with the edges replaced by single planes; but other and more complicated forms also occur.

It is obvious, both from the crystalline forms and the mode of occurrence of this copper, that it was deposited from a state of

igneous fluidity; and, from the circumstance that the walls of the vein are encrusted with Laumonite, it would appear that the spar vein itself is of igneous origin. Many other instances of a similar kind indicate that the calcareous spar veins, which traverse the conglomerate and sandstone rocks, are true veins of igneous origin.

At Copper Harbor, the green rock, formerly mistaken for carbonate of copper, but which Dr. J. ascertained to be a hydrous silicate of the oxide of copper, or chrysocolla, has been explored, and it has led to the discovery of a very remarkable vein of the black oxide, and black and brown silicates of copper, from which a considerable quantity of ore has been taken, and has been wrought into sulphate of copper, at the Roxbury Laboratory.

This vein is, however, quite uncertain; for the ore widens into flattened ellipsoidal masses, and then thins out and disappears, while the dead rock or calcareous spar takes its place. It is said that black sulphuret of copper has been found, at some depth, in this vein; but he had seen no specimens of it. The miners had penetrated, to the depth of forty or fifty feet, in dead vein, but had extracted much rich ore within twenty feet of the surface, where a drift had been excavated for its removal. This vein is from eight inches to one foot wide where the black oxide is obtained, but is quite irregular.

Dr. J. would suggest that the chrysocolla was, originally, a gelatinous mass, like silica, separated from minerals by acids, and that, when the rock cooled this jelly, the hydrous silicate was deposited, while, in its more heated interior, the brown and black silicates were deposited. He would suggest, also, that the black oxide might have been precipitated, from the hot siliceous solution, by the action of hot limewater, which might have been abundantly produced in the vein during its formation. It is easy to imitate this operation in the laboratory of the chemist; and there is no reason why it may not have been one of nature's great chemical operations.

Trap rocks occur very near this vein, and, perhaps, underlie the conglomerate for some distance around. To them is attributed the heat which permeated this vein; and the alkalies, which produced analcime instead of laumonite, in the lower portions of the lode, may have originated from the subjacent igneous rock.

Laumonite, also, occurs in this and in an adjacent calcareous spar vein, and is, doubtless, derived from the chemical combination of the lime of the spar with the siliceous and aluminous ingredients of the conglomerate and sandstone. Datholite is found in many of the spar veins, in the trap rocks, at Eagle Harbor, Copper Falls and Eagle River, and the crystals of that mineral often include bright scales of metallic copper. The crystals of calcareous spar, and those of Prehnite, also, include bright particles and scales of that metal. This fact must modify our notions as to a slow aqueous infiltration of those minerals into veins and geodes; for, were it a slow operation, the copper would have become oxidated, which is never the case in any of the instances he had examined.

Dr. J. took this occasion to state that he had never owned, or been interested in any stock, in any of the Lake Superior or other mines; and that he had no other object in view, in these statements, than to advance the interests of science, and to aid in the promotion of the legitimate mining operations of this country. He deemed it necessary to make this avowal, because, on some occasions, more unworthy motives had been attributed to him.

A valuable and extensive donation of skins of mammalia and birds, the skeleton of the lesser ant-eater, and various reptiles, from Dr. Francis W. Cragin, of Surinam, was announced.

James Lloyd was elected a member of the Society.

DONATIONS TO THE CABINET.

Five skeletons of birds, and one of a species of Rana, and twenty-one crania of reptiles, birds and small quadrupeds. From *E. W. Coale, M. D.*

ADDITIONS TO THE LIBRARY.

Dana, James D. The Structure and Classification of Zoöphytes; being the Introduction to the Volume on Zoöphytes, one of the Series of the Voyage of the American Exploring Expedi-

tion, in the Years 1839 to 1842. 4to. pp. 132. Philadelphia, 1846. From the *Author.*

American Journal of Science and Arts. For March, 1846. From the *Editors.*

March 18, 1846.

The President in the Chair.

Prof. Asa Gray communicated a notice of a new genus of plants of the order of *Santalaceæ*, of which the following are the technical characters.

DARBYA. Flores dioici. *Masc.* Perigonium simplex, turbinatum, ad medium 4–5-dum; lobis ovatis, patentibus. Discus crassiusculus, perigonii penitus tubo adnatus, margine 4–5-crenatus. Stamina 4–5, e sinubus disci, lobis perigonii opposita: filamenta brevia, subulata: antheræ biloculares; loculis fasciculo filarum araneosarum ad basin lobi perigonii annexis. *Fœm.* Ignota. Fructus * * * stylo unico superatus, unilocularis, monospermus. Frutex, in Georgia et Carolina superiore vigens, glaber, cortice griseo. Folia opposita, uncialia, membranacea, ovalia, margine integerrima, subundulata, breviter petiolata, venosa, subtus pallidiora. Pedunculi axillares, solitarii, folio breviores, ebracteolati, umbellam 3–8-florem gerentes; floribus parvis virescentibus, intus flavidis.

Species. *Darbya umbellulata.* Hab. near Milledgeville, Geo., *Dr. Boykin*, and at Macon, *Prof. Darby;* also at Lincolnton, N. C., *Mr. M. A. Curtis.*

Dr. Gray stated that, as he had no doubt that this shrub adds another to our few genera of this interesting order, he desired that it should bear the name, and commemorate the botanical services, of Prof. Darby, one of its discoverers, to whom a large part of our still incomplete knowledge of the plant is owing. Dr. G. hoped that some botanist of upper Carolina or Georgia would preserve the pistillate flowers and young fruit in spirits, in order

that the structure of the ovula, and the fecundation so peculiar in this natural family, may be duly studied.

A printed description of the fossil fish, mentioned in a communication received from Dr. Joseph G. Norwood, on the 18th February last, (see Proceedings of that date,) drawn up by himself and Prof. David D. Owen, was communicated to the Society by the former.

After giving its characters in detail, the authors remark upon its geological position. It was split out of a layer of light gray subcrystalline limestone, containing numerous *Atrypa prisca* and *Spirifer euruteines*, associated with *Strophomena euglypha*, *Pterinea cardiiformis*, *Favosites spongites*, *Calymene bufo*, *Tentaculites scalaris*, and other fossils characteristic of the shell-beds which form a part of the chain of rocks, in the bed of the Ohio River, at the Falls, immediately under the water-limestone found in digging the Louisville canal. On Lewis's Creek, however, the water-lime is absent, or is represented only by a thin layer of chert, and the black slate is found in the bank of the creek, not four feet above the layer containing the fossil fish. This black slate is most likely the equivalent of the Genesee slate, and not of the Marcellus shale of the New York survey, since the underlying layers, though they contain Onondaga and Corniferous fossils, yield also many organic remains of the Hamilton group.

The writers consider it to be evidently a ganoid fish, analogous to those described from the Devonian system of Europe. On the supposition that it belongs to a new genus, as would seem to be indicated by the great size of the scutcheon plates and their peculiar form, they propose for it the name of *Macropetalichthys rapheidolabis*. They believe this to be not only the first instance of finding scutcheoned fishes in this country, but that it establishes the lowest geological position in which the remains of vertebrate animals have been found, excepting defensive fin-bones in the Corniferous group in New York, and the scales of fishes, traced throughout the Clinton group of Pennsylvania and Virginia, by the Professors Rogers.

Dr. N. B. Shurtleff remarked upon some peculiarities of the skeleton of the Asiatic elephant (*Elephas indicus*) belonging to the Society.

The bones are those of the largest elephant ever brought to the United States, the animal having been about nine feet in height during life. It was frozen to death on its passage, and died when within a few miles of this city, at Nantasket roads. At the time of the dissection, measurements were accurately taken by Dr. S., and the flesh was removed from the feet and tail, under his direction, so carefully that no bone was lost or displaced in either. The bones of the sternum and cartilages were prepared and preserved in a manner to retain their natural relations to the bones of the thorax. The thickness of the intervertebral substance was noted, and the form of the spinal column draughted, so that the bones, when put together, should exhibit, in the dry skeleton, the same form they had when covered with flesh.

Dr. S. stated that the reason of his mentioning this careful mode of procedure was not for the purpose of showing that this is his usual way of securing a knowledge of the proper form of skeletons; but because, having found that the Society's specimen does not agree in all respects with the description by Cuvier, he wished to have it seen that the differences were not caused by the loss or misplacement of the bones.

Cuvier, in his *Ossemens Fossiles*, states that "the spine of the elephant is composed of seven cervical, twenty dorsal, three lumbar, four sacral, and twenty-four or twenty-five coccygeal vertebræ, and that this animal has five true ribs only, and fifteen false." This, certainly, is not always the case, for our specimen has *five* sacral, like the *Mastodon giganteum*, and *twenty-six* coccygeal vertebræ, including the terminal bone. Our skeleton has likewise *six* true ribs. A point worthy of especial notice, as observed in our skeleton, is the fact that there are only nineteen pairs of ribs, while there are twenty dorsal vertebræ, the last dorsal vertebra possessing all the characteristics of a vertebra of that class, but showing no appearance that it ever had ribs articulated with it, which appearance is very distinct in all the other dorsal vertebræ. The number of sacral vertebræ agreeing with that of the North American Mastodon, brings that extinct animal nearer to the existing races of Pachydermata.

The remarks made upon our skeleton of the elephant are equally true in regard to another specimen of the Asiatic elephant, a young animal whose bones are in the collection of

Dr. J. C. Warren, that, also, having only *nineteen* ribs, *six* of which are true, and *twenty* dorsal vertebræ. (Another individual, since examined, has the twenty pairs of ribs, and five sacral bones.)

These facts prove, at least, that the number of ribs in a perfect skeleton do not always indicate the number of dorsal vertebræ, and the reverse.

The number of cubic inches contained in the cranial cavity of the Society's skeleton is three hundred and fifty-four.

Dr. Shurtleff also exhibited an instrument, constructed by himself, for measuring the capacity of the crania of animals, and presented it to the Society, as a standard measure for future use.

It consists of a hollow metallic cylinder, three inches in diameter, and about fourteen inches in length, of the capacity of exactly one hundred cubic inches. Into this hollow cylinder slides a wooden cylinder nicely adapted with a graduation to hundredths, or cubic inches, marked upon one side. In using the above, the cavity of the skull is first accurately filled with a proper material, such as flax-seed, beans, or shot, and then the material is measured, each cylinder full being one hundred cubic inches. The quantity remaining above the hundreds is ascertained by putting it into the measure and introducing the wooden cylinder, the graduation on the side indicating the number of cubic inches less than one hundred.

Dr. Samuel Cabot, Jr., made some observations concerning the supposed identity of *Anas penelope* and *Anas americana*, the European and American widgeons.

Having had a recent opportunity of dissecting two American widgeons, Dr. C. had observed some peculiarities of structure which seemed to him to forbid the opinion that these birds are identical with the European species. Although, very generally, resembling each other, there are some remarkable differences. The difference in the length of the intestines is greater than ever occurs in birds of the same species. Dr. C. had compared the American species with a specimen of the European bird, also dissected by him; and he gave the comparative measurement of the different parts.

Anas americana, American Widgeon.	Inches.	*Anas penelope*, European Widgeon.	Inches.	
Measures in length,	20 1/2		20 3/8	
" " extent,	34 1/2		33	
Tip of bill to nostril,	1 2/8		1 1/8	
Opening of nostril in length,	1/8		3/16	
Œsophagus to proventriculus,	8		7 2/8	
Proventriculus,	1 1/2		1 6/8	1/8 thick covered on inside with openings of follicles.
Gizzard, length,	2 1/2		2 3/8	
" width across tendons,	1 1/2		1 4/8	
" perpendicular to tendons,	1 3/8			
Muscular walls of two sides through,	1 1/16		1 3/8	of right side,
			1	of left side.
Contained eel grass, gravel, &c., a considerable quantity,				A small quantity of sand, gravel and eggs of fish or insects.
Intestines, from gizzard to anus,	68		52	
Liver, right lobe, long,	3 3/8			Much injured, does not appear large, gall bladder full, 1 1/8 in. long, 4/8 wide.
" " " across,	1 1/8			
" left " long,	2			
" " " across,	1			
Heart, length,	1 1/2		1 1/2	
" width,	1		1 1/8	
Trachea, to bifurcation of bronchi,	7			
Bronchi,	6/8			
Bony box, at lower larynx, length,	5/8		1	nearly round, and
Diameter, (much largest on right side,)	3/8		6/8	equal nearly on both sides.
Testicles, length,	5/16		6/16	
" width,	3/16		2/16	
Kidneys, length,	2 1/2			Not measured.
Left cœcum, length,	8			" "
Right " "	7 1/8			" "
Cœca enter intestine at from vent.	4			" "

On the inside of the gizzard, in the *Anas americana*, opposite to the centre of each muscle, is a smooth, hard, and almost bony plate, one of which has its thickest edge uppermost, and the other the reverse, so that they present their surfaces diagonally, as regards the plane of motion, though applying their opposite surfaces very exactly to each other. These plates are of an oblong shape, $\frac{7}{8}$ of an inch in length, and $\frac{5}{8}$ across.

Dr. Cabot also stated that he had dissected a male of *Tetrao cupido;* and gave the measurement of some of the internal organs, viz.:[1]

Tongue. Length, to tip of os hyoides, $2\frac{1}{2}$; to opening of larynx, $\frac{7}{8}$; to base, $\frac{5}{8}$.

Œsophagus. Length, to crop, 5; diameter of upper part, which is very dilatable, $1\frac{1}{2}$; length to proventriculus, $8\frac{1}{2}$.

Proventriculus. Length, $1\frac{1}{8}$; thickness, $\frac{3}{16}$.

Gizzard. Longest diameter, $2\frac{3}{8}$; shortest diameter, 1; at right angles with the longest diameter, $1\frac{5}{8}$; lining membrane of gizzard very tough and horny, and marked by longitudinal rugæ, its muscular parietes about $\frac{1}{2}$ inch thick; filled with half-digested corn, rye and other seeds, mixed with fragments of stone and sand.

Intestinal canal. From gizzard to anus, length, 70.

Cœca. Length, 23; opening into intestine, 5 from anus; diameter of upper part, flattened out, $\frac{5}{8}$; its diameter larger than that of the intestine in its whole length, except in the cloaca and the upper part of œsophagus.

Crop. Diameter, when flattened out, 3.

Liver. Length of right lobe, $2\frac{7}{8}$; in diameter, $1\frac{1}{2}$; length of left lobe, 2; in diameter, $1\frac{1}{8}$.

Kidneys. Length, nearly 2.

Testicles. In length, $\frac{3}{16}$.

Heart. In length, $1\frac{7}{8}$; diameter, $1\frac{3}{8}$.

Trachea. To bifurcation, not stretched, 6; do., stretched, $6\frac{7}{8}$.

Bronchi. In length, $\frac{3}{8}$.

Dr. C. T. Jackson read the results of a chemical analysis

[1] The measurements are in inches and parts of an inch.

of lava from the great crater of Kilauea, in Hawaii, one of the Sandwich Islands.

He remarked that this lava is distinguished for its ready fusibility, and is a true glass, with ferruginous, calcareous and alkaline bases. It is well known, from the descriptions of travellers who have visited this volcano, that the crust of indurated scoriæ becomes suddenly melted by the imprisoned heat of the volcano, and that, when thus liquified, it is tossed about by the escaping gases, so as to represent an immense caldron of boiling igneous fluid. Each explosion of gas or steam throws off masses of semi-indurated lava, which draw after them delicate filaments resembling finely-drawn green glass, and these glassy fibres are driven by the wind into heaps, at the sides of the crater, where considerable quantities may be collected. The natives of Hawaii call it the hair of Pele, the demigod of the mountain, who is supposed by them to tear her hair with rage when the volcano is in eruption, and they formerly endeavored to appease her wrath by throwing a hog into the crater. This curious superstition is now becoming obsolete through the influence of the missionaries.

This analysis was made, under Dr. J.'s directions, by his friend and pupil, Mr. Joseph Peabody, of Salem. The alkalies were separated from the filamentous lava, or Pele's Hair, by himself. A slight overrun in the analysis may be imputed to the greater purity of the volcanic glass in its filamentous state.

Several lots, of 25 grs. each, were analyzed with the following results per cent.:

Silicic acid,	50.00,	contain'g oxygen	25.975	
Protox. of iron,	28.72		6.538	Oxyg. of bases,
Lime,	7.40		2.078	
Alumina,	6.16		2.923	13.067
Potash,	6.00		1.017	
Soda,	2.00		0.511	
	100.28			

It will appear, from this analysis, that the ratio of the oxygen of the acid is to that of the bases as 2 to 1. Hence the lava is a bisilicate of those bases, or (Fe Ca Al K N) Si^2, or Fe Si + (Al Ca K N) Si.

It is probable that this lava will make good bottle-glass.

Dr. C. T. Jackson exhibited a series of fossil shells and corals from the lead mines of Gratiot's Grove, Wisconsin, which were collected by Mr. Joshua Childs, formerly captain of mines in that district.

The fossils were all internal moulds, not a trace of any of the substance of the shells remaining. They all belong to the Silurian limestone group. A perfect dodecahedral crystal of Galena was also exhibited, which came from the Wisconsin lead region.

Joseph G. Norwood, M. D., of Madison, and John T. Plummer, of Richmond, Wayne county, Indiana, were elected Corresponding Members.

J. M. Whiton and Henry Warren, Esq's., were elected members of the Society.

DONATIONS TO THE CABINET.

A box of specimens, illustrating the rock formations and fossils of the southern part of Lee county, near the junction of the Kinchafoona and Flint Rivers, Georgia. From *L. B. Mercer, M. D., Palmyra, Georgia.*

A graduated cylinder for measuring the capacity of crania. Presented by *Dr. Nathaniel B. Shurtleff.*

ADDITIONS TO THE LIBRARY.

Reports of the First, Second and Third Meetings of the Association of American Geologists and Naturalists at Philadelphia, in 1840 and 1841, and, at Boston, in 1842; embracing its Proceedings and Transactions. 8vo. pp. 544, pl. 16. Boston, 1843. From *A. Binney.*

Musci Alleghanienses, sive Enumeratio Muscorum atque Hepaticorum quos in itinere à Marylandia usque ad Georgiam, per tractus montium, A. D. 1844, decerpserunt Asa Gray et W. S. Sullivant. Concinnavit et exposuit W. S. Sullivant. 8vo. pp. 87. Columbus, Ohio, 1846. From the *Author.*

Report on Scientific Nomenclature, made to the Association of American Geologists and Naturalists at New Haven, May, 1845. 8vo. pp. 7. New Haven, 1846. From the *Association.*

April 1, 1846.

J. E. Teschemacher, Esq., in the Chair.

Mr. J. E. Teschemacher exhibited specimens of vegetable remains from the anthracite coal-beds of Mansfield, Mass.

He remarked that the subject of fossil vegetables was exciting increased attention among naturalists, and that the study of them was very much facilitated by the new system of classification introduced by Presl, founded upon the venation of the leaves, in place of that based upon the fructification. The leaves were often well preserved, while the fructification was rarely shown so perfectly as to be of service. Mr. T. announced his intention of devoting some time to the study of the American coal-plants. He had already been able to detect several mistakes, into which Brongniart and others had been led, to which he would refer at some future time.

Prof. H. D. Rogers expressed the opinion that different species of vegetation would be found to characterize different beds of coal, according to the age of the deposit.

Dr. A. A. Gould read a letter from J. Hamilton Couper, Esq., dated at Bainbridge on the Chatahoochie River, Georgia, March 15, 1845.

Mr. Couper had found the silicified limestone of that neighborhood, commonly called the *burr mill-stone* by reason of the use to which it was sometimes applied, to be very abundant. It is filled with fossil shells, none of which appear to be identical with the Claiborn fossils as described by Conrad and Lea. Few of them are identical with the cretaceous shells represented by Dr. Morton, though Mr. C. considered them to belong obviously to that formation. The most striking and abundant shell is an *Ostrea*, six inches by four or five, somewhat resembling *O. panda*. *Pectens* of several species are very abundant; as is also a species of *Nummulites*, probably *N. Mantelli*. Mr. C. also found several *Turritellæ*, *Spatangi*, *Echini* and their spines, a small *Ammonite*, a *Scutella*, a *Sigaretus*, and a *Conus* two and

a half inches long, somewhat resembling *C. gyratus*, but with a flat spire. Mr. Lyell had placed this formation in the Eocene series; but Mr. C., judging from the fossils, could not agree with him. Above, and upon this formation, imbedded in clay-marl, he had found fragments of fossil bones. From the rounded form, compactness of texture, and the eccentric and concentric circles of the cross sections of the ribs, he considered them to belong to the *Zeuglodon*.

Prof. H. D. Rogers asked the attention of the Society to some phenomena noticed by him in the mineralogy and geology of the southern shore of Lake Superior. He also exhibited specimens of sandstones and trap rocks, and their concretionary geodes, from the same region.

The first feature alluded to by Prof. Rogers was the mode in which the metallic copper of Kewenaw Peninsula is often surrounded by certain minerals, its frequent associates. At the Eagle River mine, and elsewhere, the metalliferous rock is not, as sometimes supposed, a real trap rock, but a mixture of trappean matter, and that of the red sandstone formation, more or less baked and modified by intense igneous action. These semi-fused materials, in crystallizing, have very frequently resulted in the following curious arrangement: the crystalline metallic copper occupies the centre of globular and variously formed concretions; calcareous spar usually, but not always, invests the copper; and very generally the exterior of the kernel is pure crystalline chlorite. Specimens were shown proving this to be the common order. These nodular lumps are dispersed through a base which exhibits a sort of pasty mixture of softened red shale and true trappean matter; and many of them are so surrounded as to indicate them to be true segregations from this semi-igneous, semi-aqueous compound. Upon this view, we may derive the magnesia of the *chlorite*, which could not originate from the red shale, either from the hornblende of the trappean matter, or from a sublimation of magnesium, in the form of vapor, penetrating to the outer crust at a moment of volcanic outburst, as potassium and sodium are conjectured to do, according to Forchhammer, in the generation of some granitic rocks.

Evidence was then presented of the production of a portion, at

least, of the agates, which so abound in the altered rocks, adjoining the dykes of trap, from amygdals of chlorite; and various specimens were exhibited, showing the stages of transition from the one to the other.

Prof. R. next referred to the interesting question of the age of the red sandstone and conglomerate of Lake Superior, about which geologists have been much divided in opinion. The absence of any clear sections showing the place of this formation, in relation to the other strata of Michigan, and the non-existence of fossils in it, had hitherto made its date merely conjectural. He had to announce, however, that he succeeded, in September last, in detecting the contact of this conglomeritic mass with rocks of a determinate place in the Appalachian series. The peninsula of Kewenaw offers no such contact; but, going to the neighborhood of Chocolate and Carp Rivers, he there discovered the following condition of things: First, a group of rocks, the equivalents, undoubtedly, of the Primal sandstone and Primal slate, of Professors W. B. Rogers and H. D. Rogers, denominated, in the nomenclature of the New York Survey, the Potsdam sandstone, and these rocks, highly inclined, and traversed by parallel east-and-west axes. Secondly, upon the uptilted edges of this earliest palæozoic formation, rests, in an unconformable position, and with a very gentle northern dip, the conglomerates and shales of the red sandstone series. Specimens of the conglomerate were displayed, in which the pebbles were all from the older rocks. Mr. Rogers thought this fact of unconformable superposition an almost conclusive proof of a post-palæozoic date; and he proceeded to argue, from various points of analogy between the red sandstone itself, its trappean dykes, and their mineral associations, with the similar components of the mesozoic or new red sandstone of the Atlantic States, that the formation in question is of equivalent age and origin with this last-named interesting group of rocks.

Some discussion of these subjects was then had by Dr. C. T. Jackson, Prof. William W. Mather, of Ohio, and Prof. Rogers. Prof. Mather then stated some facts observed by him, in relation to the geology of the northern shore of Lake Superior.

Dr. John Bacon, Jr., informed the Society that he had recently made a microscopic examination of sand from the desert of Zahara, taken from specimens in the Society's cabinet.

He had found it to consist, in a great part, of siliceous grains, with a few *Polythalamia* intermixed. These are mostly fragments. He had been able to identify only one species, viz., *Textularia globulosa*. He intended to give the subject further attention.

Dr. A. Binney exhibited a collection of fossils, and other geological specimens, from the strata of the bluffs at Natchez, on the Mississippi River.

Dr. B. remarked that the flat alluvial borders of the lower Mississippi are interrupted, in several places, by elevated cliffs, generally on one side of the river only, at the foot of which the channel flows, undermining and breaking them down from time to time, and thus exposing a natural section of their strata. These elevations are known as *bluffs*. The bluff on the eastern side of the Mississippi, at Natchez, is about two hundred and fifty feet above the low-water level of the river. It is made up of nearly parallel strata of calcareous loams, clays, sands and gravel, which contain in the different layers, besides inorganic substances, great numbers of terrestrial, and some fluviatile, shells, remains of mammalia, and numerous water-worn, agatized pebbles, imbedding corals, madrepores, encrinites, and marine shells. Agatized wood and lignites are also found. No detailed description of the bluff formation has yet been published; but in the limited notices which have been given it appears to have been taken for granted to be wholly the result of diluvial action, and to form a part of the extensive and as yet not fully understood deposits, known as *diluvium* or *drift*.

An incomplete series of specimens from the different strata, collected at Natchez, by Mr. John Bartlett, had afforded Dr. B. an opportunity of examining the fossil land shells, and of comparing them with existing species; and the result of this examination he proceeded to lay before the Society. He ventured at the same time, but with much hesitation, owing to his want of famili-

arity with geological subjects, to offer some suggestions respecting the upper series of the bluff formation itself.

The most remarkable portion of this formation is the upper bed, or that next below the soil of the surface. It consists of a yellowish calcareous loam, thickly filled in many places with terrestrial shells, and in others, with a few fluviatile species. The depth or thickness of this bed is described to be from twenty to fifty feet. The material of which it is composed is minutely comminuted, and, when dried, falls into an impalpable powder. The shells are generally unbroken, the most delicate edges of the aperture remaining entire, and, except in the loss of color, and the want of cohesion caused by the destruction of their animal matter, they are precisely similar to existing species. The calcareous concretions and bones, found in this bed, are also mostly unbroken, and exhibit no marks of friction, or wear, in a current of water. The condition of the bed, and of its contents, seems, therefore, to forbid the opinion that they ever formed a part of a great diluvial current, but point rather to a slow subsidence of the materials in still water. Under any other circumstances, the minute particles would have been mixed with other matter, and the shells, some of them of a thin and delicate texture, would have been mostly fractured and crushed.

Below the loam, is a bed of light ash-colored marl, containing fluviatile shells, and having a thickness of from five to ten feet; this, with only an intervening stratum of fine gravel, is succeeded by a bed of sandy loam, from twenty to thirty feet in thickness, containing bones of the mastodon. The other deposits are mostly clays and sands, with calcareous and arenaceous concretions, and limonites, of too soft a consistence, and too loose a structure, ever to have withstood the grinding and wearing effects of a rapid motion in a stream of sand and water. At the depth of one hundred feet, or thereabouts, (for it has not been accurately measured,) there occurs a stratum of two and a half to three feet in thickness, of rolled and water-worn fragments of agate, calcedony, cornelian and hornstone, with agatized corals, madrepores and encrinites, having precisely the appearance they might be supposed to have if brought down, by the current, from the upper districts of the river. Below these, clays and sands, with concretionary minerals, fossilized wood, and lignites, imbedded

in some of them, are noticed to low-water mark. The last bed, in the series visible above water, is an indurated clay, of unknown thickness, which is said to contain bones of the *Zeuglodon*, and apparently belongs to the tertiary formations.

Dr. Binney said that, in the course of the examination, he had been struck with the near resemblance of the upper beds of the *bluff* to the deposit in the valley of the Rhine, called locally *loess*, as described by Mr. Lyell. Like that, they consist of a yellowish pulverulent loam filled with land-shells, and calcareous concretions; and he supposed them to be due to similar causes. The physical characters of the deposit, and its contents, go far to account for its origin. The Mississippi, draining, through ten thousand channels, a vast geographical area, bears upon its surface the light objects washed down the streams of a large part of the central portion of North America, and holds suspended, in its waters, comminuted particles, derived from the various soils and calcareous strata through which its tributaries pass. During the rainy seasons, its accumulated waters rise above its banks, and, spreading over the low country, form shallow lakes, where they remain until the river again subsides within its banks. The deposit, left by the retiring waters, is a calcareous loam, and often resembles precisely the loamy deposits of the bluff. Like these, too, it contains land and fluviatile shells left on the surface of the deposit, and sometimes the carcasses of animals which have been turned aside from the main current of the river. We have only to suppose then the region, in which the bluff deposit prevails, to have been formerly but a little raised above the ordinary level of the Mississippi, and, consequently, to have been subject to frequent inundation by the rising of its waters, or that, from the damming up of its waters below, the river spread out into an extensive lake, to have at once a cause adequate to such a deposit as that presented by the strata in question. The present position of these beds is easily accounted for by their gradual uplifting through earthquake action, a theory by no means a violent one, as the valley of the Mississippi is one of the theatres of modern earthquakes, and has been disturbed by them at a period yet very recent.

Dr. B. stated it to be his opinion, derived from facts that had come to his knowledge, and from a few published remarks that

had met his eye, from time to time, that the *loess*, so to call it, is an extensive formation in the region bordering on the Mississippi, and that it will be found largely developed there and in the valleys of its tributary rivers. He had, in several instances, had brought to him fossil land-shells, in the same condition as those found in the Natchez bluff, with no other indication of their origin than that they were obtained in Mississippi. This fact seemed to him to indicate the existence of other localities in that vicinity. Prof. David D. Owen, of New Harmony, Indiana, has discovered an extensive deposit of this kind in Pusey County, on the Wabash River, in that State. It is a fine sandy loam, of a yellowish-white color. It occurs on the upland, from twenty-five to fifty feet above the bottom land, and is generally reached in digging wells at the distance of from six to ten feet from the surface, and has been penetrated to the depth of twenty-five feet, without passing through it. It appears also on the opposite side of the Wabash, in Illinois, at about the same level, and near Shawneetown, on the Ohio River, forty miles distant. Prof. Owen, from whom this information was obtained, had heard that a similar deposit had been noticed in an analogous situation on the Mississippi River, above the American bottom, opposite St. Louis. The Wabash deposit contains great numbers of terrestrial, and some fluviatile, shells, in a condition similar to those of the Natchez bluffs.[1]

On the whole, Dr. Binney had adopted the conclusion that the upper beds of the Natchez bluffs are analogous to the *loess* of the Rhine, and that the strata are the result of fluviatile action, and not attributable to the drift. A long period of gradual sinking of the land, producing stratum upon stratum of sands, clays, gravel, marl and loam, brought down by the waters, succeeded by another lengthened period of gradual rising, during which the river cut its way through the strata it had before deposited, would account for all the existing appearances. In this view, the concretionary minerals, contained in the beds, must be held to be the result of chemical action among their materials, after they were deposited.

[1] Hon. B. Tappan stated to Dr. B., verbally, that a similar deposit, with land-shells, occurs in the valley of the Scioto, near Columbus, Ohio.

The species of land-shells detected in the *loess*, in the specimens sent, are: *Helix albolabris, alternata, concava, elevata, exoleta, gularis, hirsuta, inornata, inflecta, ligera, monodon, palliata, perspectiva, profunda, thyroidus; Helicina orbiculata; Succinea obliqua.* These are all existing species. Several of them do not now inhabit the neighborhood of Natchez, though they are very numerous on the banks of the more northern tributaries of the Mississippi.

In a small parcel of *loess* from the Wabash deposit, Dr. B. found *Helix clausa, hirsuta, inflecta, labyrinthica, lineata, thyroidus; Pupa armifera* and *contracta; Helicina occulta;* together with several species of *Limnea, Planorbis, Amnicola* and *Valvata;* — all at present existing in that region, except *Helicina occulta*, a rare shell when recent, but very plentiful in its fossil state, though it has been found alive in south-western Pennsylvania.

A careful examination of both deposits would no doubt bring to view other species.

Joseph Peabody, of Salem, and Frederick W. Davis and Thomas Bailey, of Boston, were elected Members of the Society.

DONATIONS TO THE CABINET.

A collection (50 skins) of Australian birds. From *Russell Sturgis, Esq.*

Three cases of insects. From *M. S. Perry, M. D.*

A slab of flexible sandstone, 18 inches long, 3 inches wide, and 1 inch thick, from a deposit at Spartacus, S. C. From *Robert W. Gibbs, M. D.*, of Columbia, S. C.

ADDITIONS TO THE LIBRARY.

Annals and Magazine of Natural History. For March, 1846. From the *Courtis Fund.*

Gray, G. R. Genera of Birds. 4to. No. 23. From the *Audubon Fund.*

Transactions of the American Philosophical Society. Vol. IX. part 2. From the *Society.*

Proceedings of the American Philosophical Society. September to December, 1845. From the *same.*

Johannes Rœper. De Organis Plantarum. 4to. Basiliæ, 1828. From *Prof. Asa Gray.*

Dana, James D. On the Drawing of Crystals. 8vo pamph. New Haven. From the *same.*

Oakes, William. Catalogue of Vermont Plants. 8vo pamph. Ipswich, Mass. From the *same.*

Croom, H. B. Catalogue of Plants in the vicinity of Newbern, N. C. 8vo pamph. New York, 1837. From the *same.*

Supplement to the Appendix to Capt. Parry's Voyage. 4to pamph. London. From the *same.*

Lichenes. Auctoribus Julio Meyer et Julio de Floter. 4to pamph. From the *same.*

Sprengel Antonio. Tentamen Supplementi ad Systematis Vegetabilium Linneani editionem decimam-sextam. 8vo pamph. Gottingæ, 1828. From the *same.*

April 15, 1846.

The President in the Chair.

Letters were read from B. L. C. Wailes, Esq., of Washington, Mississippi, and John T. Plummer, M. D., of Madison, Indiana, severally acknowledging the receipt of notice of their election as corresponding members; and from Mr. George Ditson, of Cuba, and M. Tuomey, Esq., accompanying donations.

Mr. Charles Stodder gave a verbal description of some appearances in the strata of *drift*, in a ridge, on the north flank of the hill at South Boston, called Mount Washington, unlike any which had been described, so far as he knew, and which, he thought, could not be accounted for by any of the theories proposed to explain the phenomena of drift.

Mr. Stodder stated that the general form of the ridge is narrow

and elongated, its length being about thirty rods, its width at base ten rods, and its height above tide water, which washes its side, about fifty feet. It runs in nearly an east-and-west direction. Excavations, for the purpose of removing the materials, have been made, which expose sections in all directions. It is composed of regular strata of gravel, clay, and sands, of varying fineness and color. The general appearance of the strata is that they conform to the shape of the hill, dipping outwards in all directions, as far as they are exposed; some of them terminate abruptly upwards, as if denuded, and their edges are overlaid by unstratified materials. The north-west is covered by pebbles, large and small, with coarse gravel; the south-west by finer gravel; the south-east is fine sand, unstratified, so far as can now be seen; and the north-east and north is fine sand stratified. But the most interesting fact presented is, that the strata of sands, clay and gravel are fractured in various directions; many of the fractures causing shifts or faults of the strata. In one section three horizontal fractures are to be seen, one over the other; in another, a fracture, dipping a few degrees from vertical, has caused a fault of about three feet; in another, two fractures, nearly vertical, and about three feet from each other, have caused faults of about two feet each, so that the section presents the strata arranged in echelon. One fracture, in a direction about fifteen or twenty degrees from horizontal, can be traced distinctly twenty-five or thirty feet, cutting all the strata in its course, and making a fault of a few inches in all. The fractures are almost innumerable, and in almost every direction. There are certainly two, if not three, strata of clay; and, in one section, there is exposed, and cut through, nearly in the centre of the mass of the hill, a mass of clay, about eight feet high, and ten feet wide. It is unstratified, and disturbs the stratified sands, with which it comes in contact, as if it had been forced in amongst them.

Mr. S. considered that the indications of all the phenomena presented at this place, justify the inference that the ridge has been produced by a crowding up of the stratified materials, from their original horizontal position, by some powerful force applied laterally.

Prof. C. B. Adams communicated a Memoir on the Mol-

lusca of the Island of Jamaica, with remarks on their geographical distribution and habits, extended descriptions of newly-observed species, and remarks on those already known.

The materials, from which Mr. Adams prepared this paper, were collected by him, personally, during a visit to Jamaica, in the winter and spring of 1843 and 1844. The portion of the island explored was but small, comprising the Bay of Port Royal only on the south shore, and the coast from Annatto Bay, inclusive, to Rio Bueno, a distance of sixty miles, on the north; and, in the interior, the region between Kingston and Spanish Town, on the south, and Annatto Bay and Galina Point, on the north.

The author states that the differences in the terrestrial species occupying the sandstone, and limestone, districts respectively, is very striking, and the transition instantaneous. *Cyclostoma*, *Helicina* and *Cylindrella* are restricted to the limestone district, as also the larger species of *Bulimus*, *Achatina*, *Pupa* and *Helix*; while the minuter species of the latter genera, and *Succinea*, are, for the most part, common to both. The bases of perpendicular limestone cliffs, and cavernous limestone rocks, were invariably found to afford immense numbers of land-shells. Such places are the favorite retreat of the Colimacea, during seasons of drought; and here great numbers of their shells were collected. The marine species, inhabiting a rocky station, are also most abundant on limestone rocks. These rocks are worn by the waves into irregular cavities of various dimensions, which afford shelter to multitudes of them.

The profusion in which these animals are distributed, in favorable localities, is shown by the fact that, near a place called Goshen, Prof. Adams obtained forty terrestrial species, within a circuit of two miles in diameter, and on the inner side of the peninsula, one hundred marine species, within a space of two miles from Port Royal.

One of the causes affecting the increase of the terrestrial species, and, at the same time, affording a curious instance of the indirect influence of human agency in disturbing the equilibrium of species, is stated to be their frequent destruction by rats. The cultivation of the coffee plant tends to the excessive multiplication

of rats, which feed upon the pulp of the berry. Their numbers were formerly restrained by the employment of rat-catchers on the coffee estates. Since the emancipation of the slaves, this occupation has been neglected, and the vermin have multiplied to an astonishing degree. Not content with their usual domestic ravages, and the destruction of ripening coffee, they destroy vast numbers of land-mollusks. The shells are found in a fresh state, but with a hole nibbled in one of the whorls for the extraction of the animal. Of a majority of species of *Cyclostoma* and *Helicina*, and of several of *Helix*, which occurred abundantly at Rio Bueno, four fifths of the fresh specimens had been destroyed in this way. As the older shells, which had begun to decompose, were entire, it may be inferred that this agency is of recent date.

Among the notices of the habits of the terrestrial species, Prof. A. mentions the activity with which they move, and the rapidity with which they climb the trees during wet weather, as something that astonishes persons accustomed to the sluggish motions of the species of northern latitudes. The semi-maritime habits of some of the species are noticed. *Cyclostoma maritimum* and *Helicina costata* are examples. Both occur at the water-side, within reach of the spray, and the latter under stones thrown up by the sea. The first is rarely, and the latter apparently never, found in the interior. The species most nearly associated with the latter, in habit, is *Littorina muricata.*

Prof. Adams enumerates the following species, natives of New England, as existing also in Jamaica, viz., *Buccinum vibex, Say, Cerithium terebrale, Limnea umbilicata, Helix chersina, Pupa contracta, Pupa rupicola, Modiola barbata, Lucina divaricata.*

The following is an abstract of the genera, and of the number of species of each, described in this paper. A remarkable feature in it is the total absence of the *Naiades.* The arrangement, here given, is alphabetical.

Acasta, 1. Achatina, 8. Amphidesma, 2. Ampullaria, 1. Anatifa, 2. Ancylus, 1. Anomia, 1. Arca, 9. Auricula, 4. Avicula, 2. Balanus, 3. Buccinum, 8. Bulimus, 8. Bulla, 4. Calyptrea, 1. Cardita, 1. Cardium, 1. Cassis, 1. Cassidaria, 1. Cerithium, 14. Chama, 1. Chemnitzia, 2. Chiton, 11. Conia, 1. Conus, 3. Crepidula, 2. Cyclostoma, 21. Cylindrella, 9. Cypræa, 6. Cytherea, 4. Dolium, 2. Donax, 2. Emarginula, 1.

Erato, 1. Eulima, 1. Fasciolaria, 1. Fissurella, 10. Fusus, 2. Helicina, 13. Helix, 21. Janthina, 2. Lima, 4. Limnea, 1. Litiopa, 1. Littorina, 10. Lucina, 9. Mactra, 1. Marginella, 1. Melanopsis, 1. Mitra, 5. Modiola, 3. Mytilus, 2. Murex, 5. Natica, 2. Nerita, 4. Neritina, 7. Oliva, 5. Ostrea, 3. Ovula, 1. Paludina, 1. Patella, 5. Pecten, 3. Pectunculus, 1. Pedipes, 1. Perna, 3. Phasianella, 1. Pholas, 2. Physa, 1. Pileopsis, 1. Pinna, 2. Planaxis, 1. Planorbis, 2. Pleurotoma, 15. Plicatula, 1. Psammobia, 3. Pupa, 5. Purpura, 6. Pyrgoma, 1. Pyrula, 1. Ranella, 1. Rissoa, 7. Scalaria, 2. Sigaretus, 1. Solarium, 1. Spirula, 1. Spondylus, 1.. Strombus, 3. Succinea, 2. Tellina, 10. Teredo, 1. Thetis, 2. Triton, 6. Truncatella, 3. Turbinella, 3. Turbo, 5. Vaginulus, 1. Venus, 5.

Total of genera, 97.

" of species, 365.

DONATIONS TO THE CABINET.

Specimens of *Paludina piscium, D'Orbigny.* From Uruguay, by *J. S. Phillips*, of Philadelphia.

A box of copper ores, from Cuba. By *George Ditson*, of Cuba.

A collection of fossils, from the bluff formation at Natchez, Miss. By *A. Binney.*

ADDITIONS TO THE LIBRARY.

Annals of the Lyceum of Natural History of New York. 8vo. Vol. IV. No. 5. 1846. From the *Lyceum.*

Redfield, John H. Descriptions of New Species of Shells. 8vo pamph. New York, 1846. From the *Author.*

Calcutta Journal of Natural History, conducted by John McClelland. 8vo. Nos. 9 and 12. Calcutta, 1843. From the *Editor.*

May 6, 1846.

ANNUAL MEETING.

T. T. Bouvé, Esq., in the Chair.

Reports from the several Curators, concerning the condition of the respective departments of the Museum, were read. From these it appeared that a gratifying increase had taken place in nearly all of them, and that all the objects were in a good state of preservation. The want of sufficient room for the useful exhibition of the collections was enlarged upon, and the necessity of procuring further accommodations at no distant day was made manifest.

The Librarian made a report on the state of the Library, showing its condition and increase during the past year. The number of volumes, and parts of volumes, added during that time, is one hundred and forty-three. The most valuable of these were procured by purchase, and the year was not distinguished by any considerable donation.

The Treasurer reported upon the financial condition of the Society.

The amount of the permanent fund, well invested, is,	$12,000 00
The ordinary income during the year, derived from fees of admission and annual assessments on the members, were,	530 37
The ordinary expenses for rent, fuel, care of the collections, printing, &c., were,	509 65
Balance in hands of the Treasurer,	20 72
The income of the permanent fund was,	582 50
The balance on hand at the commencement of the year was,	421 88
	1004 38

The expenditure on account of the Journal, Proceedings, Library, &c.	$856 37
Balance on hand	$148 01

The Society then ballotted for officers for the ensuing year, and the following gentlemen were chosen:

President,
Amos Binney.

Vice Presidents,
Charles T. Jackson, D. Humphreys Storer.

Corresponding Secretary,
Augustus A. Gould.

Recording Secretary,
Thomas Bulfinch.

Treasurer,
Patrick T. Jackson, Jr.

Curators,

J. E. Teschemacher,	*Botany*,
Martin Gay,	*Mineralogy*,
Thomas T. Bouvé,	*Geology*,
N. B. Shurtleff,	*Comparative Anatomy*,
Samuel Cabot, Jr.,	*Ornithology*,
Jeffries Wyman,	*Ichthyology and Herpetology*,
T. William Harris,	*Entomology*,
John Bacon, Jr.,	*Conchology*.

Librarian,
Charles K. Dillaway.

Cabinet Keeper,
Henry J. Bigelow.

May 20, 1846.

A. A. Gould, M. D., in the chair.

Professor Jeffries Wyman read a report on the fossil cranium and lower jaw of an extinct Rodent, which had been referred to him for examination; the same which is mentioned on page 103 of this volume.

Professor Wyman considers it to have belonged to the same animal, of which a lower jaw, and an incisor tooth of the upper jaw, were described by Mr. J. W. Foster, one of the assistants in the Geological Survey of Ohio, and to which the name of *Castoroides Ohioensis* has been given. The subject of Professor Wyman's remarks, and those described by Mr. Foster, are the only remains of the animal which have been observed hitherto. The cranium surpasses in size that of any fossil or existing animal, referable to the same order.

On comparing it with other skulls of *Rodents*, it presents some analogies to the genera *Castor*, *Fiber*, and *Hydrochærus*. Osteologically considered, it has stronger affinities with the *Castors*, than with either of the other genera; but, in the dentition, the *type* is totally different from that of the Castors, and not unlike that of the *Hydrochærus*; to the conformation of the pterygoid processes and fossæ, some resemblance exists in the *Fibers*.

It also differs from the *Castors* in the much smaller relative capacity of the cerebral cavity, in the greater depression of the occiput, in the form of the condyles and of the foramen magnum; the former admitting of a free motion vertically, but of a very limited one in a lateral direction, and the latter having an oval form and destitute of an emargination on its upper border; it differs from the Castors, also, in the size of the pterygoid processes and fossæ, especially in the incurvation of the internal ones, and the consequent subdivision of the posterior nares; in the compound nature of the molares, and in the fluting of the anterior face of the incisive teeth; the diminutive size of the incisive foramina, and in the conformation of the lower jaw, with

reference to the insertion of the muscles of mastication. The molares consist of laminæ, the first lower and the last upper tooth each having four, the rest only three; which, as in the elephant and Hydrochærus, consist of dentine enveloped with enamel, and are united together by cæmentum; the number of laminæ, however, in the posterior molares of the Hydrochærus amounts to thirteen, and the interspaces are imperfectly filled with cæmentum, so that the edges are serrated, and in the interior teeth the enamel is more or less involuted; in the Castoroides the number of laminæ does not exceed four, and the cæmentum fills the whole of the interspaces, so that the tooth is destitute of serrated edges.

The internal pterygoid processes, differ from those of all existing genera, having a remarkable curvature inwards towards the median line, the most prominent points coming in contact on the median line, so as to divide the entrance to the posterior nares into two. The internal pterygoid fossæ are deep excavations, as is the case in the Fiber, where the external as well as the internal process is well developed.

The jaw described by Mr. Foster somewhat exceeded in size that described in the present article.

The generic characters, which have been deduced from this cranium, are as follow:

Teeth: Incisors $\frac{1}{1}$ $\frac{1}{1}$, Canines $\frac{0}{0}$ $\frac{0}{0}$, Molars $\frac{4}{4}$ $\frac{4}{4}$, total 20; incisors longitudinally striated in front. Molars consist of thin laminæ of dentine, surrounded by enamel, and the different laminæ united together by crusta petrosa; the first tooth in the upper, and the last in the lower jaw have each four laminæ, and the remaining teeth have only three each. The grinding surfaces of the crowns are nearly flat, but slightly excavated between the ridges of enamel. The internal pterygoid fossæ are largely developed, and the internal processes so far deflected inwards as to meet on the median line, and divide the entrance to the posterior nares transversely, thus forming a superior and an inferior orifice.

DONATIONS TO THE MUSEUM.

Tertiary Fossils from Acquia Creek, Virginia. From *Professor Jeffries Wyman.*

ADDITIONS TO THE LIBRARY.

Gray, G. H. Genera of Birds. 4to. Part 25. *Courtis Fund.*

American Journal of Science, for May, 1846. From the *Editors.*

American Quarterly Journal of Agriculture and Science. Vol. III. No. 2. Albany: 1846. From the *Editors.*

Proceedings of the American Philosophical Society, from January to April, 1846. From the *Society.*

June 3, 1846.

D. H. Storer, M. D., Vice President, in the Chair.

Dr. J. B. S. Jackson directed the attention of the Society to a statement made by Professor Owen, in regard to the dentition of the Mastodon. (*Odontography*, p. 615.)

One of the distinctive characters, he says, is a displacement of the first and second molars, in the vertical direction, by a tooth which is developed above them in the upper, and below them in the under jaw, and this has been recognized in the *M. giganteum* and *M. angustidens.* In a note, however, at the bottom of the page, he says: "The presence of the small premolar in the lower jaw has not yet been determined; neither has its absence. An excavation in the jaw of the young mastodon, described by Dr. Godman, at the place where the germ of the premolar is hypothetically stated in Pl. 144, fig. 7, b. 1, would determine this point in regard to the *M. giganteum.*" Dr. Jackson then showed the lower jaw of a young animal, from the Mastodon Collection which is now at Cambridge, and in which, as he formerly observed, (Proceedings of the Society, October, 1845,) the first three molars are developed and above the socket. Below the second of these teeth, and in the outside

of the jaw, corresponding to the situation of Professor Owen's sketch of the premolar, Dr. Jackson had made a large and deep excavation, exposing the fangs of the second tooth, removing some of the bone from between them, and opening freely into the dental canal, but without finding any appearance of the tooth which Professor Owen considers as characteristic of the Mastodon. Dr. Hays, also, in his paper upon the "Inferior Maxillary Bones of Mastodons," &c., (Transactions of the American Philosophical Society, Vol. IV. p. 319,) speaks of having examined about forty lower jaws, but says nothing of such a tooth.

Dr. Jackson then alluded, for explanation, to that part of his former Report upon the Cambridge Collection, (Proceedings of the Society, October, 1845,) in which he speaks of six as the true number of the molar teeth in *M. giganteum*, at least in the lower jaw, and in which he inferred, from a statement of Professor Owen, (Annals of Natural History, Vol. XI. p. 330,) that he considered five as the number; the inference was certainly a fair one. He now finds that in the Odontography, which he had not seen when his Report was made, Professor Owen describes seven molars, generally so called, on each side and in each jaw, but with the saving clause above quoted in regard to the lower. Dr. Jackson's observation, then, as to the number of the molar teeth in the lower jaw, corresponds with that of Professor Owen, except for the "small premolar," of the existence of which no proof has yet been given.

Dr. Gould announced that, being employed in the examination of the Shells collected by the United States Exploring Expedition, commanded by Charles Wilkes, U. S. N., he proposed to read before the Society, from time to time, as they might be prepared, descriptions of the new species, in anticipation of their future publication, in a more extended form, and fully illustrated by figures, as one of the volumes of the great work on the Expedition, issued by Congress.

He commenced with the following species of the genus Chiton.

CHITON LIGNOSUS. Testa solidula, ovata, tectiformis, cæsia, lineolis fuscis inequalibus subradiantibus marmorata, systemate duplici punctorum majorum et punctorum minorum impressa; valvis planulatis, angulatis, sine rostris; areis lateralibus haud elevatis, vix distinctis; valvâ anteriori parvâ; valvâ posteriori vix umbonatâ: intus æruginosa. Long. $1\frac{1}{2}$, lat. $\frac{7}{8}$ poll. *Hab.* Puget Sound.

. Has the form of C. *setiger*, and somewhat the coloring of C. *fulvus*, Wood. It is also allied to C. *tulipa*, Quoy.

CHITON QUERCINUS. Testa depressa, ovalis, vix carinata, quercina, maculis olivaceis nubeculata; valvis subrostratis; areis lateralibus vix elevatis, longitudinaliter sulcatis, sulcis incumbentibus et sulco radiante bisectis; areis centralibus ad latera lineis rugosis longitudinaliter sculptis, ad dorsum punctatis; valvâ anteriori sulcis concentricis et sulcis radiantibus remotioribus decussatâ; valvâ posteriori prope marginem umbonatâ; margine lato, pruinoso, flavescente. Long. $\frac{7}{8}$, lat. $\frac{3}{8}$ poll. *Hab.* New South Wales.

Allied to C. *foveolatus*, Sowerby.

CHITON JUGOSUS. Testa ovalis, carinata, tectiformis, nitida, coloribus pallidè et saturatè herbeis variegata; valvis planulatis, ad apices adunco-acuminatis; areis lateralibus prominentibus, et lineolis confertis parallelis viridibus longitudinaliter notatis; areis centralibus sulcis acutis parallelis longitudinaliter aratis, sed ad verticem simplicibus et minutissimè punctatis; valvâ anteriori concentricè lineolatâ; valvâ posteriori umbonatâ, prope marginem concentricè lineolatâ, præter aream terminalem triangularem luteolam; margine granulato, fasciis cæruleis et viridibus limbato: intus pallidè virescens. Long. 1, lat. $\frac{3}{8}$ poll. *Hab.* New South Wales.

Resembles C. *Siculus*, which, however, has radiating lines on the lateral areas.

CHITON FRUTICOSUS. Testa ovalis, valdè elongata, transversim arcuata, omnino textiliter punctata, olivacea, maculis minutis saturatioribus fulgurantibus variegata; valvis haud rostratis; areis lateralibus prominentibus, et lineis elevatis interruptis ramosis radiatis; areis centralibus lineis longitudinalibus rugosis, ad latera profundis, ad dorsum evanidis et arcuatis sculptis; areâ posteriori magnâ, umbonatâ, lineis inconspicuis, interdum divaricatis, radi-

atâ: intus flavo-olivacea: ligamentum latum, pallidum, minutissimè granulatum. Long. $1\frac{1}{2}$, lat. $\frac{5}{8}$ poll. *Hab.* New South Wales.

Resembles fig. 61 of Sowerby's Conch. Illustr., which is said to be a variety of C. *Indicus*, but which has no ramose sculpture on the lateral areas.

Chiton platessa. Testa parva, tenuis, elongato-ovalis, transversim arcuata, citrino-olivacea, ubique minutissimè punctata; areis lateralibus parvis, vix elevatis, lineis 2–3 inconspicuis striatis; areis centralibus lineis confertis acutis granulatis arcuatim decussatis; valvâ posticâ magnâ, obscurè radiatâ; margine virente, fusco tessellato, minutissimè granulato: intus cæruleo-virescens. Long. $\frac{7}{8}$, lat. $\frac{9}{20}$ poll. *Hab.* New South Wales.

Similar in its general aspect to C. *fruticosus*, but smaller, smoother, and the sculpture of the lateral areas and terminal valves entirely different. It is almost exactly like fig. 67 of the "Conchological Illustrations."

Chiton jaspideus. Testa ovata, tenuis, carinata, ubique minutissimè punctata, coloribus rosaceis plus minusve saturatis picta; areis centralibus lineis minutis granosis confertissimè striatis; areis lateralibus indistinctis, et lineis 3 ad 4 sparsè granuosis radiatim notatis; valvis terminalibus granoso-striatis, posticâ excavatâ; margine coriaceo, pruinoso. Long. 1, lat. $\frac{7}{10}$ poll. *Hab.* Callao.

Resembles, in size, shape, and sculpture, C. *apiculatus*, Say; but the sculpture is more delicate, and the color, resembling some varieties of jasper, is quite distinctive.

Chiton puniceus, (Couthouy MS.) Testa parva, oblongo-elliptica, elevata, ad dorsum carinata, punctatissima, punicea, gradibus ætatis conspicuis obtusis signata: areis lateralibus præruptè elevatis, et sparsim granulatis; areis centralibus costulis longitudinalibus parallelis ad 6, plerumque ad medium dislocatis, clathratis; valvâ posteriori rostro parvulo acuto et septo transversali notato: ligamentum minutissimè imbricatum, adversum suturas albido fasciatum. Long. $\frac{1}{2}$, lat. $\frac{3}{10}$ poll. *Hab.* Orange Harbor.

Very much resembles C. *ruber*, Lowe.

Chiton confossus. Testa parva, ovata, fastigiata, pallida,

roseo et incarnato concinnè variegata; valvis rostratis; areis lateralibus elevatis, serie posticâ squamârum et serie obliquâ squamârum majorum ad apicem spectantium finitis; intervallo lævigato, et granulis paucis annulatis sparso; areis centralibus plerumque lævibus sed punctis sparsis triangularibus retrospectantibus confossis; valvâ posteriori valdè gibbosâ, umbone ferè terminali, dentibus insertionis 9, et ad valvam anteriorem 25, pectinatis: margine fusco, carnoso. Long. $\frac{5}{8}$, lat. $\frac{3}{8}$ poll. *Hab.* Feejee Islands.

Allied to C. *sculptus*, Sowb., which has three lateral rays and the central areas smooth.

Chiton pruinosus. Testa parva, oblongo-elliptica, convexo-elevata, subcarinata, coloribus variis olivaceis, cinereis, et fusco-rubris irrorata et maculata; areis centralibus sub lente omnino quincuncialiter punctatis; areis lateralibus longitudinaliter imbricato-striatis: intus virescens: margo minutissimè granulatus, coloribus fuscis et cinereis tessellatus. Long. $\frac{7}{10}$, lat. $\frac{7}{20}$ poll. *Hab.* Rio Janeiro.

The sculpture of this very variably-colored species is sufficiently characteristic. Between the striæ are usually found minute pores, probably produced by some parasite.

Chiton viridulus, (Couthouy MS.) Testa tenuis, oblongo-ovata, dilutissimè olivacea, ad dorsum sub-carinata, utrinque subcanaliculata, ubique sub lente quincuncialiter insculpta; areis centralibus et lateralibus parum distinctis; lineis incrementi prope marginem conspicuis; valvis terminalibus leviter radiatis: margo minutissimè squamatus. Long. $\frac{3}{5}$, lat. $\frac{7}{20}$ poll. *Hab.* Orange Harbor.

Chiton petaloides. Testa parva, tenuis, ovalis, arcuatim elevata, subcarinata, dilutè citrina; areis lateralibus elevatis, rugosè granulatis, et striis radiantibus ad 4 insculptis; areis centralibus longitudinaliter rugosè granulato-punctatis, et lineolis tenuissimis angulatis dilutè violaceis pictis; valvâ posteriori acutè umbonatâ et costâ transversali divisâ: margo stramineus, minutissimè granulato-imbricatus. Long. $\frac{1}{2}$, lat. $\frac{2}{5}$ poll. *Hab.* Sandwich Islands.

A very beautiful and peculiar shell, its markings resembling the venated petals of some flowers.

CHITON DENTIENS. Testa minima, ovata, carinata, olivacea, ad dorsum albido fulminata, omninò minutissimè granulata; areis vix distinctis; valvis rostratis postice subdenticulatis, dentibus albidis: margo pruinosus. Long. $\frac{1}{5}$, lat. $\frac{3}{20}$ poll. *Hab.* Puget Sound.

Resembles C. *alternatus*, Sowb., which, however, has radiating ribs upon its lateral areas and terminal valves.

CHITON INCANUS. Testa solida, oblongo-ovalis, valdè convexa, cinereo et nigro variegata, concentricè undulato-striata, granulis sparsis nigris aspersa, ad dorsum subcarinata et longitudinaliter nigro bifasciata; areis lateralibus vix distinctis: margo aculeis inequalibus curtis curvatis nigris et canescentibus indutus. Long. $1\frac{3}{10}$, lat. $\frac{3}{4}$ poll. *Hab.* New South Wales.

Like C. *piceus*, Gray, in general appearance, and still more like C. *petholatus*, which has a hairy margin.

CHITON MUSCOSUS. Testa ovalis, depressa, scabra, ad dorsum obtusa, cinereo bifasciata et plumosè striata; valvis magnis, lateraliter disjunctis; areis lateralibus parvis, granulis subquadratis radiantibus arcuatim tessellatis; areis centralibus sulcis acutis confertis flexuosis subparallelis longitudinaliter aratis; valvâ anticâ magnâ, semicirculari, decemcostatâ et granulis subquadratis insculptâ; valvâ posteriori parvâ, costâ transversali inconspicuâ subterminali: margo latus, filis corneis inequalibus muscosis indutus. Long. 2, lat. $1\frac{1}{8}$ poll. *Hab.* Puget Sound.

Allied to C. *brevispinosus*, but its sculpture and margin are quite distinct.

Extracts from a letter from Zadock Thompson were read, announcing the discovery, in the State of Vermont, of *Tryonyx ferox* and *Cottus gobio*.

Dr. D. H. Storer exhibited a drawing of *Gasterosteus biaculeatus*, made from a specimen taken at Nahant.

DONATIONS TO THE MUSEUM.

A jaw of Carcharias obscurus. From *Dr. D. H. Storer*.

ADDITIONS TO THE LIBRARY.

Thesaurus Conchyliorum. By G. B. Sowerby. Nos. 3 to 6. 8vo. London: 1843 to 1846. *Courtis Fund.*

Lettre à M. Ph. Fr. de Siebold, sur les Collections Ethnographiques, &c. 8vo pamph. Paris, 1845. From *M. Jomard.*

Seconde Note sur une Pierre Gravée trouvée dans un ancien tumulus Americain. 8vo pamph. Paris, 1845. From *same.*

Annual Report of the Regents of the University of New York, for 1846. Albany, 1846. From the *Regents.*

Storer, D. H., M. D. Synopsis of the Fishes of North America. 4to. Boston, 1846. From the *Author.*

June 17, 1846.

C. T. Jackson, M. D., in the Chair.

Mr. John E. Teschemacher read a paper on Fossil vegetation, and particularly on that of the coal formations of North America.

He applied to this subject the discoveries of Liebig, of Dumas, and Boussingault, in which the atmosphere is considered as the connecting link between vegetables and animals, the former being the reducing, the latter the consuming force, and argued that the existence of the vegetable as coal, proved the non-existence of the consuming force or animals, and also showed the probability of a different atmosphere at that period.

He stated the importance of collecting the fossil vegetation of this continent, and comparing it with that of the other continents, in order to establish a uniformity of vegetation, and with it a uniformity of climate for its growth; connecting with this the fourth law of Professor Pictet, on the distribution of animal fossil remains, tending to exhibit a gradual decrease of the area of this uniformity of climate from the earliest organic existence, the vegetable, through the various succeeding epochs of animal life.

He touched on the value of the labors of Presl and J. Smith, of Kew, on recent ferns, to the student of fossil filices, and on the necessity which the result of further discoveries and investigations, would produce for the amelioration of the present method of arrangement of fossil vegetation. He also exhibited drawings

of Odontopteris Brardii, and some probably new Odontopterides, from the black schist, Portsmouth, R. I., and of various other fossil vegetation, from Mansfield, Mass., and from Nova Scotia, with a list of fossil vegetables from various American localities.

Dr. C. T. Jackson exhibited specimens of Copper and Zinc Ores, from Warren, N. H., considered by him to be remarkable in their structure and appearance.

The copper Pyrites occurs intermixed with crystallized Tremolite, and brown mica, and takes the form of those minerals, being fibrous in the Tremolite, and flattened into plates in the mica. The black blende exhibits the same structure, and the iron Pyrites is also impressed with the form of the fibrous Tremolite, also crystals of an octahedral form, composed of yellow copper pyrites and black blende. He remarked that this impressibility of one mineral by another, seemed something like the influence of example as exhibited in another department of science, and the power of numbers was evidently perceptible in the compression of the more sparse ores, amid these congeries of Tremolite crystals and micaceous plates.

Specimens of rich argentiferous galena, from Warren and Shelburne were exhibited, those from the latter town being associated with cuperiferous black blende, and beautiful crystals of iron Pyrites. The lead from these ores contains from 4 to $5\frac{1}{2}$ pounds of silver per ton, a sufficient proportion to warrant its extraction by cupellation. The mines are about to be wrought for lead and silver. He exhibited also specimens of twisted crystals of rutile or red oxide of Titanium, and bright green crystals of Apatite or Phosphate of Lime, from the Warren copper mine, the latter being a new mineral for that locality.

Dr. Jackson also remarked upon a paper on the geology of a portion of the White Mountains, by Professors W. B. and H. D. Rogers, published in the American Journal of Science, for May, 1846.

He said that it was his intention, during his late visit to New Hampshire, to have examined the spot, where, as stated by those

gentlemen in the paper referred to, they had discovered fossils in the masses of slate included in the primary rocks of the White Mountain range, but for want of time was obliged to defer it to some future occasion. He would merely remark, at present, that he could not agree with the Messrs. Rogers in the latitude they gave to the metamorphic theory, and thought he could satisfy any geologist that the White Mountains were not formed of melted sandstones and slates, for he could point out localities there where numerous fragments of slate are included in the granite, and are not altered by heat beyond mere induration. He was so impressed with this fact that he had in his Report endeavored to account for it, by the imperfect conduction of heat in the fused granitic rocks.

The Messrs. Rogers seem to have overlooked the statement, in his Final Report on the Mineralogy and Geology of New Hampshire, that *numerous masses of the older silurian strata occur intercalated in the primary rocks.* If they have discovered fossils in them, the fact would go to confirm his original views on that subject, and it would be quite interesting to observe fossils, which, like the fabled salamanders had gone through so fiery an ordeal. Nevertheless, to use an expression of M. De Blainville, *il faut que le fait soit bien constaté.*

Dr. Gould continued his descriptions of new Shells, collected by the United States Exploring Expedition, and belong to the genus Patella.

PATELLA TALCOSA. Testa magna, solida, ponderosa, ovato-rotundata, depressa, costulis radiantibus numerosis sub-equalibus rotundatis flexuosis instructa, vertice sub-centrali, colore saturatè cinnamomeâ; facies interna talcoso-argentata, purpureo tincta; callo centrali crasso, albo, spatuliformi, ad marginem radiato; impressione musculari lato, profundo: margo crenulatus. Long. 4, lat. $3\frac{1}{2}$, alt. $1\frac{3}{4}$ poll. *Hab.* Hawaii, Sandwich Islands.

The colors of the interior, in small specimens, are very rich, and the shell is of a rounded shield-like form, like P. *testudinaria*, attaining sometimes a very large size, larger than any other species except P. *pyramidata.*

PATELLA SAGITTATA. Testa tenuis, translucida, ovato-rotundata,

depressa, fusco-viridis, nigro obscurè radiata, subtilissimè granuloso-striata, apice antico, acuto, incumbente ; margine integro : facies interna argentea, cum reflexionibus succineis, et interdum fusco radiata ; fundo (luce transmisso) elegantissimè reticulato, et maculis sagittatis radiato. Long. $1\frac{1}{3}$, lat. $1\frac{1}{10}$, alt. $\frac{3}{5}$. *Hab.* Feejee Islands.

This delicate and beautiful species is allied to P. *testudinaria*, but is more depressed and more delicate in all its characters, and its peculiar marking, as seen by transmitted light, like some of the Navicellæ, distinguishes it. It was the only species collected at the Feejee Islands.

PATELLA ILLUMINATA. Testa inequilateralis, ovato-conica, fuliginosa, maculis sparsis flavidis translucidis illuminata, creberrimè radiatim costellata : apertura ovata ; facies interna nigro-picea, sericeo splendens ; fundo flavido. Long. $1\frac{1}{2}$, lat. $1\frac{1}{4}$, alt. $\frac{3}{5}$ poll. *Hab.* Auckland Islands.

In shape like P. *argentea*, with the interior of P. *tramoserica*. It may be the young of what is figured by Quoy as P. *granularis*.

PATELLA FIMBRIATA. Testa elevata, obliquè conica, fusco-purpurea, cinereo tincta, costulis distantibus rotundatis radiata, costulis tuberculos fornicatos in seriebus concentricis instructos gerentibus ; apice acuto subcentrali : apertura ovata, limbo lato, nigro pectinato : facies interna nitida, cæruleo-alba, secundum costulos radiata, fundo saturatiori. Long. $1\frac{1}{2}$, lat. $\frac{19}{20}$, alt. $\frac{9}{20}$. *Hab.* Straits of De Fuca.

Much like a small P. *granularis* in shape. The undulations within, corresponding to the ribs, are marked with unusual distinctness. Its ribbed surface and destitution of striæ distinguish it from all the varieties of L. *pintadina*.

PATELLA CITRULLUS. Testa depresso-conica, sub-equilateralis, translucida, extus rugoso-undulata, prope apicem lineis granuliferis radiata, pallidè olivacea, intus nitida, plumbea, fundo albido : apertura rotundato-ovata ; margine expanso, acuto. Long. $1\frac{3}{4}$, lat. $1\frac{1}{4}$, alt. $\frac{1}{4}$ poll. *Hab.* Funchal, Madeira.

This shell resembles somewhat the skin of a cucumber, externally. The radiating striæ occupy the upper half of the shell, and the lower half is somewhat imbricated by the stages of growth. It is somewhat like P. *Candei*, D'Orb.

PATELLA PAUMOTENSIS. Testa solida, albido-cinerea, ovalis, depresso-conica, apice sub-centrali, costis acutis radiantibus irregularibus ad 40 instructa: facies interna alba vel dilutè incarnata; impressione musculari callosâ, albâ vel citrinâ; areâ centrali ferrugineâ vel incarnescente: margo costis dentatus, spatiis intercostalibus fusco tinctis. Long. $1\frac{3}{8}$, lat. $1\frac{1}{2}$, alt. $\frac{1}{2}$ poll. Feejee's. Long. $1\frac{1}{8}$, lat. $1\frac{1}{4}$, alt. $\frac{3}{8}$ poll. Wilson's I. Long. $1\frac{1}{5}$, lat. 1, alt. $\frac{2}{5}$ poll. Rose I.

Allied to P. *tramoserica*, but its colors are generally dull and dead, instead of silky. Generally, eight or ten of the ribs are more prominent than the rest The prevailing color of the interior is that of ripe muskmelon. Sometimes there are dusky spots between the ribs. It seems to be found at all the islands of the Paumotu group, and as far as Taheiti.

PATELLA LUCTUOSA. Testa obliquè conica, crassa, vertice eccentricâ, obscurè olivacea, interdum sanguineo tincta, costis majoribus ad 12 rotundatis, scabrosis, pallidis, minoribus quibusdam interjectis: apertura ovalis; margine crenulato: facies interna livida, reflexionibus succineis micans; limbo fasciis fuscis et albidis inequalibus alternantibus radiato. Long. $1\frac{1}{4}$, lat. 1, alt. $\frac{1}{2}$ poll. *Hab.* New Zealand.

Unusually rough and irregular of surface, not unlike coarse specimens of P. *vulgata*, but the interior sometimes rivals P. *tramoserica*.

PATELLA PIPERATA. Testa scabrida, obliquè conico-depressa, olivacea, costato-striata, costis majoribus pallidioribus cum lineis saturatioribus interruptis aspersis, apice eccentricâ, acutâ: apertura ovata; margine crenulato; facies interna livida, fundo ferrugineo, radiis albidis insigni. Long. $1\frac{1}{5}$, lat. $\frac{8}{10}$, alt. $\frac{1}{2}$ poll. *Hab.* Cape de Verds and Madeira.

Somewhat like what I suppose to be P. *scutellaris*, from the Mediterranean, especially its interior, but more elevated and less elongated.

PATELLA INSTABILIS. Testa olivaceo-cervina, elongata, elevata, ad latera compressa, creberrimè radiatim striata, apice subcentrali, obtusâ, castaneâ: apertura oblongo-elliptica; margine integro: facies interna lactea. Long. $1\frac{1}{2}$, lat. $\frac{17}{20}$, alt. $\frac{8}{10}$ poll. *Hab.* Puget Sound.

Resembles P. *compressa*, but is more smooth and solid, and the apex more nearly central. It may have derived its form from being attached to some arched body.

PATELLA CINNAMOMEA. Testa parva, ovalis, convexa, tenuis, cinnamomea, cum striis radiantibus, tenuibus, confertissimis, imbricato-asperis, apice acuto, antico, ad marginem valdè declinato; aperturæ margine anteriori excurvato, intus costâ albâ marginali munito. Long. $\frac{1}{2}$, lat. $\frac{3}{8}$, alt. $\frac{9}{40}$ poll. *Hab.* New South Wales.

Closely allied to P. *Galathea*, Lam. which, however, is snow-white, more circular, the apex more central, and the striæ much coarser.

PATELLA CONICA. Testa parva, conoidea, elevata, valdè regularis, inornata, vel lineolis obsoletis radiantibus et concentricis striata; colore luteo-cinereo: apertura rotundata, margine simplici, limbo marginali planato. Long. $\frac{4}{5}\frac{5}{8}$, lat. $\frac{1}{2}$, alt. $\frac{3}{8}$ poll. *Hab.* Puget Sound.

Similar to P. *scurra*, Lesson, but is more elevated, less symmetrical, and more delicate in structure and markings, especially in the radiating striæ.

LOTTIA PINTADINA. Testa diversissimè figurata et picta, tenuis, ovato-rotundata, radiatim et confertim striata, smaragdina, interdum fuscescens vel cinerascens, maculis crebris albidis tessellata aut radiata; apice plerumque sub-centrali, plus minusve elevatâ: facies interna cœruleo-albida, nitens; fundo piceo; limbo lato, piceo et albido tessellato. Long. 2, lat. $1\frac{3}{4}$, alt. $\frac{3}{5}$ poll. *Hab.* Straits of De Fuca, Puget Sound, and Mouth of Columbia River.

This very variable species is the analogue of L. *testudinalis* of the North Atlantic waters, though larger. Two well-marked varieties may be noted. One tessellated with about equal proportions of green and whitish, the interior marginal limb broad and tessellated, the dark color predominating. In the other the colors are arranged rather in stripes, the internal limb is narrower, and the light color predominates. Very probably L. *scutum*, Esch. is only another variety.

LOTTIA CYMBIOLA. Testa solida, depresso-conica, arcuata (apice eccentricâ) glauco et fusco-olivaceo radiata, radiatim creberrimè puncto-striata: apertura elliptica, margine minutissimè

crenulato: facies interna, albida, spadiceo sordidata; limbo lato, fusco et albo tessellato. Long. $\frac{9}{10}$, lat. $\frac{7}{10}$, alt. $\frac{3}{10}$ poll. *Hab.* Bay of Valparaiso.

A small, rather smooth shell, arched in every direction, in consequence of attaching itself to other shells. When fresh it is very prettily radiated.

PATELLA (LOTTIA?) TEXTILIS. Testa depressa, obliquè conica; apice anteriori, acuto; costis latis, elevatis, subplanulatis, nodosis ad 15 radiantibus; epidermide viridi, punctis albidis quadratis reticulato: basi ovato-rotundato, limbo marginali albido et fusco-viridi fimbriato: facies interior albida; fundo piceo. Long. 1, lat. $\frac{3}{4}$, alt. $\frac{3}{10}$ poll. *Hab.* Straits of De Fuca and Killimook.

Like some varieties of P. *viridula;* but its base is less orbicular, its color is darker green, and the reticulations are finer and less in zigzag; the ribs are less numerous, nodular, and not paler. Its remote locality favors the idea of its being distinct.

PATELLA (LOTTIA?) SCABRA. Testa parva, scabra, per-inequilateralis, obliquè arcuato-conica, pallidè virens, nigro diversemodè virgata, costis radiantibus scabrosis ad 15 ornata; basi ovatâ: facies interna albida; fundo piceo, limbo marginali viridulo et piceo fimbriato. Long. $\frac{7}{8}$, lat. $\frac{6}{8}$, alt. $\frac{3}{8}$ poll. *Hab.* San Francisco.

About the same size, and may be only a variety, of P. *textilis.* Its arched form, rough surface, coarse black stripes, and different locality, seem to warrant its separation.

PATELLA (LOTTIA?) ARANEOSA. Testa parva, tenuis, depresso-conica, sub-equilateralis, lævis, pallidè virescens, ramulis rubiginosis araneosis reticulata: facies interna albida; margine simplici, acuto; limbo marginali planulato, rubiginoso, radicoso. Long. $\frac{5}{8}$, lat. $\frac{1}{2}$, alt. $\frac{1}{4}$ poll. *Hab.* Sooloo Sea.

A pretty little shell, most probably a Lottia, resembling some of the species figured by Quoy, especially his *orbicularis.* Indeed it is so like the reticulated variety figured in Pl. LXXI. fig. 33, that the examination of a more extensive series might show them to be identical.

Rev. Joseph Banvard was elected a member of the Society.

ADDITIONS TO THE LIBRARY.

Proceedings of the Providence Franklin Society, Vol. I. Part I., for April, 1846. From the *Society*.

July 1, 1846.

A. A. Gould in the Chair.

A letter from George Ditson, Esq. of Neuvitas, Cuba, accompanying a donation, was read.

Dr. Gould described the following new species of Siphonaria, Emarginula, and Fissurella, from the Shells of the Exploring Expedition.

SIPHONARIA CORNUTA. Testa rudis, fuliginosa, valdè depressa, per-inequilateralis, radiatim striata, apice submediano, costis ad 15 inequalibus, ultra marginem prolongatis, præcipuè costâ suprasiphonali: cavitas parva, minimè profunda, dextrorsum effusa; limbo marginali expanso, albo, vel fusco inter costas radiato. Long. 1, lat. $\frac{17}{20}$, alt. $\frac{1}{2}$ poll. *Hab.* Mangsi Islands.

Allied to S. *atra*, to which it may possibly be traced by its varieties; but it is more elongated, less symmetrical, and the ribs, which are much more numerous on the left than on the right side, surpass the margin to a much greater extent.

SIPHONARIA INCULTA. Testa parva, crassa, irregularis, depresso-conica, costulis 20–24 radiata; apice sub-centrali: cavitas profunda, latere sinistro præcipiti, latere dextro declivi; fundo fusco nubeculato; cicatrice musculari profundâ; limbo marginali expanso, sericeo, hepatico; margine costulis dentato. Long. $\frac{7}{10}$, lat. $\frac{11}{20}$, alt. $\frac{1}{4}$ poll. *Hab.* New Zealand.

A small, rugged-looking species, easily distinguished by its irregular, one-sided form, and its liver-brown interior.

SIPHONARIA LATERALIS, (COUTHOUY MS.) Testa parva, fragilis, inequilateralis, perobliqua, oblongo-ovalis, olivacea, sursum

fuscescens, costulis radiantibus ad 25 obtusis, nodosis, subequalibus: intus hepatica; cicatrice musculari inconspicuâ. Long. $\frac{3}{5}$, lat. $\frac{2}{5}$, alt. $\frac{1}{5}$ poll. *Hab.* Burnt Island, Orange Harbor.

This might be regarded as the young of S. *Lessoni.* But besides essential differences in the animal, the great inequality of the two sides, the peculiar position of the apex and the more coarse and nodular ribs, give it a peculiar character.

SIPHONARIA LEPIDA. Testa parva, tenuis, ovato-rotundata, depresso-conica, cinereo-olivacea interdum violaceo tincta; apice submediano, obtuso; costis radiantibus numerosis depressis, quorum ad 12 majoribus, albicantibus; striis incrementi confertis, laxis: intus livida, albido radiatim lineata; margine vix crenulato, pallescente. Long. $\frac{9}{20}$, lat. $\frac{7}{20}$, alt. $\frac{3}{20}$ poll. *Hab.* Rio Janeiro.

Allied to S. *plicata*, Quoy, which, however, is described as solid, its summit recurved, its ribs equal, its interior pale horn color, radiated with pairs of reddish lines, and is found at Tongataboo.

SIPHONARIA NORMALIS. Testa parva, tenuis, symmetrica, basi rotundata, elevato-conica, fusco-cinerea, creberrimè costato-striata, striis subequalibus: subtus fundo castaneo, limbo marginali mustelino, cicatrice benè impresso; margine acuto, ad canalem siphonalem angulato, albido lineolato. Long. $\frac{4}{10}$, lat. $\frac{7}{20}$, alt. $\frac{3}{20}$ poll. *Hab.* Sandwich Islands.

A small, delicate species, very different from any I have seen. Its circular base, regular conical form, very numerous rib-striæ, and peculiar pale chocolate color distinguish it.

EMARGINULA ASPERA. Testa parva, tenuis, depresso-conica, fuliginosa; costis elevatis quadratis plerumque duplicibus ad 10 albidis, ad intervallos striis crebris decussantibus exasperatis; vertice subcentrali, acuto, recurvo: intus glauca, albido radiata; margine denticulato: incisura angusta, profunda, intus in canalem versus apicem producta. Long. $\frac{4}{10}$, lat. $\frac{3}{10}$, alt. $\frac{3}{20}$ poll. *Hab.* Sydney, New South Wales.

Much like E. *rugosa*, Quoy, in size and form, but differs in color, sculpture, and the larger size of the notch.

EMARGINULA FUNGINA. Testa parva, solidula, elliptica, cinereo-virens; costis radiantibus, parvulis, quarta quaque majori, rotundatis; apice mediani, erecto: intus viridula, cicatrice mus-

cular intrinsecus atri-limbatâ; margine smaragdino, elegantèr crenulato: incisura lata, modicè profunda, intus in canalem ad verticem producta. Long. $\frac{1}{2}$, lat. $\frac{3}{8}$, alt. $\frac{1}{5}$ poll. *Hab.* Upolu.

A very pretty species, somewhat resembling E. ***parmophoidea***, Quoy, but differs in the dark coloring along the inner margin of the muscular impression, forming the figure of a toadstool, and in the greater development of the notch.

EMARGINULA OSSEA. Testa crassa, rudis, albida, quadrangulari-elliptica, costis radiantibus numerosis inequalibus acutis, et striis incrementi decussata; basi arcuato, margine crenulato; cicatrice musculari benè impressâ: incisura haud profunda, intus vix in canalem producta. Long. $\frac{6}{10}$, lat. $\frac{9}{20}$, alt. $\frac{3}{10}$ poll. *Hab.* Feejee Islands.

Allied to E. ***australis***, Quoy, but is much smaller and less deeply checkered.

EMARGINULA CINEREA. Testa cinerea, E. ***ossea*** similis, sed tenuior, altior, magis dispositè et delicatè clathrata: cicatrice musculari inconspicuâ: incisura minimè profunda, in canalem interiorem valdè insignem producta. Long. $\frac{5}{8}$, lat. $\frac{1}{2}$, alt. $\frac{3}{8}$ poll. *Hab.* ——— ?

Similar to the preceding, but far less solid, and much more regularly and delicately cross-barred; and if the size of the notch, the development of its canal, and the depth of the muscular impression, are important characters, they are certainly distinct species.

FISSURELLA CRATITIA. Testa solida, elevata, ovalis, albida, radiis fuscis ad 16 picta, lineis elevatis radiantibus et concentricis sub-equalibus profundè imbricato-cancellata: apice sub-centrali, intus alba; margine inequaliter crenulato: foramen apicalis sub-rotunda. Long. 2, lat. $1\frac{2}{5}$, alt. $\frac{1}{2}$ poll. *Hab.* Puget Sound.

It has the general aspect of F. ***maxima***, but is sculptured like F. *Græca*.

FISSURELLA VERNA. Testa solida, striata, ovalis, symmetrica, depresso-conica, cinereo-viridescens, atro-purpureo radiata, costis ad 20-30 sub-elevatis, planis, interstitiis adequantibus; vertice subcentrali, purpureo: fissura parva, ovalis; margine crenato: intus alliacea, fissuræ limbo radiatim striato, purpureo marginato. Long. $1\frac{2}{5}$, lat. $1\frac{1}{5}$, alt. $\frac{1}{2}$ poll. *Hab.* Port Praya, St. Jago Island, Cape de Verds.

Much like F. *obtusa*, Sowb., but more elongated, and with its ribs, more numerous rays and faintly scolloped margin, as well as its distant locality, it may be regarded as a different species. Some specimens are not rayed, and others are entirely dark purple.

FISSURELLA OCCIDENS. Testa ovata, conica, valdè elevata, radiatim multistriata, fasciis atro-purpureis ad 15 et fasciis rosaceis alternantibus radiata, apice subcentrali: apertura ovata: facies interna nivea, margine latiusculo viridulo fusco tessellato: fissura ovali-rotundata. Long. $1\frac{3}{10}$, lat. $1\frac{1}{10}$, alt. $\frac{11}{20}$ poll. *Hab.* Callao.

In shape and color it agrees with F. *caffra*, Chem., from the Cape of Good Hope, and also with F. *Praya*, Quoy. It is remarkable for its elevated, conical form, and dark, radiate exterior.

FISSURELLA CRUCIATA. Testa parvula, tenuis, nitida, elongato-ovata, arcuatim elevata, costulis radiantibus prominentibus ad 30, cum filis confertis, ordinatis, concentricis decussata; apice anteriori, fissurâ elongatâ; coloribus nigris et albis cruciatim signata: intus nitida, livido et albo similiter picta; margine crenulato. Long. $\frac{2}{5}$, lat. $\frac{1}{4}$, alt. $\frac{1}{8}$ poll. *Hab.* Sooloo Sea.

Similar to F. *minuta*, Sowb., but nearly twice as large, proportionally broader and more elevated, and with the sculpture more in relief; the blue circles about the fissural callus are also wanting.

DONATIONS TO THE CABINET.

Copper and Tin ores from Cuba, and Cinnamon stone from Ceylon. From *George Ditson, Esq.*, of Cuba.

Cranium of a Rodent. From *same.*

Skins of *Pyrrhula raptor*, *Psaris erythrogenys*, *Lanius rubiginosus*, and *Psittacus menstruus*. From *Dr. S. Cabot, Jr.*

ADDITIONS TO THE LIBRARY.

Milne-Edward M. Histoire Naturelle des Crustacées. 3 vols. 8vo, plates. Paris, 1834. From the *Courtis Fund.*

Straus-Durckheim, Hercule. Traité d'Anatomie Comparée. 2 vols. 8vo. Paris, 1843. *Same.*

Sander Rang. Manuel des Mollusques et de leurs Coquilles. 18mo. Paris, 1829. *Same.*

Gould, John. Monograph of the Odontophorinæ, or Partridges of America. Part II., folio. London, 1846. *Same.*

Gray, George R. Genera of Birds. No. 26, folio. London, 1846. *Same.*

Annals and Magazine of Natural History, for June, 1846. 8vo. London. *Same.*

American Journal of Science and Art. New Series. 8vo. No. 4. New Haven, July, 1846. From the *Editors.*

July 15, 1846.

The President in the Chair.

Letters were read from Caleb G. Forshey, Esq., of Vidalia, La., and John G. Norwood, M. D., of Madison, Ind., severally acknowledging the notice of their election as corresponding members; and from B. B. Brown, M. D., of St. Louis, accompanying a donation.

A letter from Professor Oliver P. Hubbard, of Dartmouth College, relating to a singular diseased affection of the perch, *Perca flavescens*, was read.

It appeared from information received by Prof. Hubbard, that about sixteen years since, this fish was transferred by Mr. M. C. McClure, of Ackworth, N. H., from Warren's Pond, in Alstead, to Cold Pond, ten miles further north, in Ackworth and Unity, the last named pond being at that time destitute of this species. Both ponds are at this time well stocked with it, but the perch of Cold Pond are not edible by reason of numerous cartilaginous concretions which are diffused throughout the body of the fish, while those in Warren's Pond, from which they are derived, have never exhibited this peculiarity. These concretions are

indicated by a blue spot, when they are near the surface. There is an accumulation of them near the base of the tail, and they are scattered more or less through the fin and tail.

Prof. Hubbard also remarked upon two instances of extraordinary elongation and distortion of the incisor teeth of the woodchuck, which had lately come under his observation.

In one case the incisors are deflected to the right, and pass downwards, backwards and upwards, so that the vertex of that of the right side is in a line with the zygoma, and rises above it, while that of the left side has entered the maxillary bone of the right side a little in advance of the molar teeth, and under the infra-orbital foramen which it has displaced upwards, and penetrated to the lower part of the alveolus of the right incisor, overlapping its base about one fourth of an inch. The vertex of each is somewhat chisel-shaped, but with the cutting edge on the inside. The left incisor only is considerably worn upon its left side near the insertion into the jaw, as if by friction against the incisor of the lower jaw. The right incisor measures about 4 inches in length on its curve; diameter of the spiral, $\frac{13}{16}$ inch; extent, 1 circle and half an inch; length of alveolar portion, $1\frac{3}{16}$ inch; vertex, $\frac{3}{4}$ inch, to the right of the median line of the roof of the mouth. The left incisor is only $\frac{3}{8}$ inch distant from the same line. The resemblance of the two teeth is very great in every respect, though the left one, having a long insertion at each end, is immovable.

In the second case, the lower jaw was wanting, but the teeth were said by the owner to "curve back by the sides of the head, like the tusks of an elephant." The left upper incisor was broken off near the jaw. That of the right side curves to the left in a circular spiral of $\frac{3}{4}$ inch diameter, backwards and upwards, and penetrates the roof of the mouth, on the inside of the first left molar tooth, into the left nasal passage; then passes forward, downward and outward, crossing under and just behind the left incisor, into the mouth again. The same spiral is continued, though in a smaller curve, and reaches almost to the first left molar again, making in the whole extent almost two complete circles. The tooth tapers regularly from the base upwards, and

terminates in a sharp point, and the upper part is so worn on the inside as to be triangular. When the animal to which this cranium belonged was taken, he was very much emaciated, and moved with much difficulty.

In neither of these cases was there any appearance of disease except that caused by the distortion itself.

The President remarked that instances of distortion of the incisors among the rodent animals is by no means uncommon. Many of these, affecting different species, may be found recorded in the books. The incisors of the two jaws are placed in opposition to each other, and by their mutual pressure, seem to restrain each other's growth. When, by accident, either of the teeth is turned aside from its natural direction, the antagonistic power is removed, the growth of the tooth proceeds without restraint, and the animal is soon unable to bring their points into opposition. As these teeth are its main instruments of procuring food, it becomes unable to procure a full supply, and sooner or later dies of hunger, often it may be supposed in the midst of plenty.

Dr. Gould gave descriptions of the following new species of Rimula, Crepidula, Calyptræa, Hipponix, and Pileopsis, from the collection of the United States Exploring Expedition.

Rimula cucullata. Testa solida, cinerea, per-inequilateralis, costis ad 40 acutis, compressis, majoribus et minoribus alternantibus radiata, et striis concentricis confertis muricata; apice elevato, acuto, adunco, prorsum spectante: fissura lanceolata: apertura ovata; margine sulcis inequalibus alternantibus crenulato: facies interna porcellana; fornice tenui, simplici, arcuato. Long. $\frac{5}{8}$, lat. $\frac{7}{16}$, alt. $\frac{3}{8}$ poll. *Hab.* Puget Sound.

A large and curious species, its very inequilateral form giving it the aspect of a Hipponix. It is less elevated in proportion to its base than any other known species. The ribs are very regular, and sometimes still finer rays are found in the interstices.

Rimula galeata. Testa solida, cinerea, elevata, globoso-conica, apice centrali, acutô, prorsum porrecto, striis filiformibus confertis radiata, et striis minoribus concentricis decussata: fissura brevis, fusiformis: apertura rotundato-ovalis; margine expanso,

acuto, minutissimè crenulato; fornice costâ transversali anticè suffulto, fossam trigonalem utroque latere formante. Long. $\frac{9}{20}$, lat. $\frac{8}{20}$, alt. $\frac{8}{20}$ poll. *Hab.* Puget Sound.

Differs from the preceding in shape, sculpture, and in the interior rib, which props the fornix, and forms two pits, which, with the fissure, remind one of the openings for the eyes and nose in the human skull.

Two small species of Rimula were found at Orange Harbor, one of which is probably R. *conica*, D'Orb., and the other I name R. COGNATA, which is similar to the preceding and to R. *Noachina*, but more depressed. These were found living, and will be again noticed when describing the animal.

CREPIDULA ROSTRIFORMIS. Testa solida, lævis, castanea, elevata, recurva, ad basim rotundato-ovalis; apice postico, adunco: lamina interna parva, alba, profundè sita, versus apicem penetrans; margine arcuatim sinuato. Long. $\frac{3}{4}$, lat. $\frac{1}{2}$, alt. $\frac{3}{8}$ poll. *Hab.* Straits of De Fuca.

I am acquainted with no other species where the apex is so elevated and so remote from the margin of the shell. It looks like a very obtuse-angled bird's-beak. The specimen examined had numerous rib-like folds on the surface, which were probably caused by its adhesion to some ribbed shell.

CREPIDULA LINGULATA. Testa parva, depressa, obliqua, rotundata, alba, lineis numerosis crebrè divaricantibus radiata, epidermide pallido induta; apice acuto, libero, propè marginem sito: intus lutescens; septo linguiformi, excavato, ad medium carinâ diviso et obliquè protruso, ad latus sinistrum profundè sinuato. Diam. $\frac{1}{2}$, alt. $\frac{3}{8}$ poll. *Hab.* Puget Sound.

Like C. *capensis*, Quoy. The only specimen examined seems to have been convex and solid in its early growth, afterwards becoming flat.

CREPIDULA NUMMARIA. Testa tenuis, plana, circularis, alba, striis incrementalibus laxis insculpta, epidermide flavo-corneâ induta; apice vix conspicuo, marginali: septum internum latius quàm longum, deorsum fornicatum; margine flexuoso: cavitas ferè nulla. Diam. $\frac{3}{4}$ poll. *Hab.* Classet.

This very peculiar shell is well characterized by its perfectly flat, circular form. It probably grew within some other shell, and other specimens may be found moulded into a different form. It is separated from C. *lingulata* by the form of its septum.

CALYPTRÆA FASTIGIATA. Testa parva, tenuis, lævis, rotundata, elevato-conica, concentricè et tenuissimè striata, epidermide fusescente induta; spirâ anfract. 3 planulatis, apice submediano, acuto: lamella interna spiralis, striata margine libero ad centrum duplicato, haud appresso, umbilicum parvum efformante. Diam. $\frac{1}{2}$, alt. $\frac{5}{8}$ poll. *Hab.* Puget Sound.

In shape, size and interior, it scarcely differs from C. *pileolus*, D'Orb., but that shell is white, has a rough surface, and is radiately ribbed about the summit. It also resembles C. *squama*, Brod.

CALYPTRÆA RADIOSA. Testa irregularis, tenuis, alba, lucida, ad basim rotundata, obliquè globoso-conica, lineis acutis numerosis elevatis cum striis tenuissimis intercalariis radiata; apice postico, obtuso: lamella interna elongata, semi-volutata, perobliquè truncata; cornubus lanceolatis; basi attenuato. Diam. $\frac{1}{3}$, alt. $\frac{4}{10}$ poll. *Hab.* Mangsi Islands.

Differs from C. *equestris*, *lithedaphus*, and other similar species, in having rather distant, regularly-disposed raised lines, with intervening smaller ones, instead of their being all of uniform size.

CALYPTRÆA CHLORINA. Testa irregularis, tenuis, concentricè undosa, lineis elevatis acutis confertis radiata, ad basim subcircularis, obliquè pyramidata, epidermide tenui chlorico induta; apice elevata, posteriori, spirali, cernuo: intus nitida, porcellana; margine evoluto, acuto; laminâ interiori semi-cyathiformi, brevi, reflexo, obliquè truncato. Long. $\frac{1}{2}$, lat. $\frac{6}{10}$, alt. $\frac{1}{4}$ poll. *Hab.* Port Praya, Cape de Verds.

Allied to C. *equestris*. Its depressed, orbicular and comparatively regular form, its short cup, and its color, are its characteristics.

HIPPONIX IMBRICATA. Testa solida, obliquè elevato-conica, rubescens, costulis acutis radiantibus 40–50, et lamellis concentricis concinnè imbricato-clathrata; apice submediano: apertura rotundato-ovata: intus coccinea. Long. $\frac{13}{32}$, lat. $\frac{11}{32}$, alt. $\frac{8}{32}$ poll. *Hab.* Sandwich Islands.

Most like H. *pilosa* in sculpture, though the pattern is much coarser. The apex is far more central and elevated. The color of the interior is like H. *foliacea*, but more intense.

PILEOPSIS CRYSTALLINA. Testa parva, candida, crystallina,

nitidissima, semiglobosa, ad basim ovata, sulcis profundis creberrimis radiantibus acutis insculpta; apice terminali, acuto, vix curvato, submarginali: subtus ad marginem anticè acuminata, posticè septiformis. Long. $\frac{1}{2}$, lat. $\frac{3}{8}$, alt. $\frac{1}{4}$ poll. *Hab.* Feejee Islands.

The beautiful crystalline, quartz-like lustre of this shell, its deep, regular sulci, and its crepiduloid base very distinctly mark this species.

A communication from C. G. Forshey, Esq., concerning the appearance of the Locust, *Cicada septemdecim*, in Louisiana, in 1835, was read.

Mr. Forshey gives in the main an account of the animal, very similar to that given by others. He states, however, that the number of ova deposited in one nidus is uniformly sixteen. The insect appeared to prefer the oak, small twigs of which being selected, the ovipositor was thrust into the medulla and killed it; the eggs were then deposited, two by two, symmetrically, in the ligneous fibres, on each side of the medulla. Three nidi are usually found in the same twig. The branches thus pierced, all die and drop off, and the larvæ pass from the eggs into the ground.

The singing apparatus of the male is described as situated on each side of the base of the abdomen, where two cartilages or lids cover two cells or cavities, bounded internally by delicate elastic tympana or timbals of triangular form, which are caused to vibrate by a sudden muscular contraction and expansion. The sound is one of sadness, as heard in the deep woods, according well with the superstition that the W marked on their wings is a harbinger of war. Some persons have been so fanciful as to find W on one wing, and by inversion M on the other, which is supposed to indicate war with Mexico.

The Mississippi appeared to be a boundary to their progress in that neighborhood, as none had been noticed west of the river. Neither had they appeared anywhere in the alluvial lands, which fact, the writer suggested, was probably owing to their inability to survive the long continued inundations to which these lands are occasionally subjected.

Mr. Forshey forwarded with the preceding communication, a drawing of *a cranium* of an unknown animal, from the cabinet of W. P. Mellen, Esq., of Natchez, Miss., said to have been found in "the great mound near Lelsentoun, nine miles east of Natchez.

Mr. Forshey suggested that this cranium is that of the polar bear, and Prof. Wyman remarked, that it certainly bore a considerable resemblance to it, but as the drawing presented only a lateral view, it was desirable to have a vertical drawing exhibiting the sutures, and also a view of the base, before a satisfactory opinion could be adopted. The identity of this cranium with that of the polar bear might have some bearing upon the northern origin of the races by which the tumulus was raised.

Prof. Jeffries Wyman exhibited two species of entozoa, from the muscles of a rattlesnake. He had not been able to ascertain whether they had been before observed, but proposed to make further investigations in relation to them. They were contained in a small cyst, and coiled up in an oblong spiral form; in their general appearance resembling the genus *Ascaris*.

DONATIONS TO THE CABINET.

Several jaws of reptiles, fishes and mollusks. From *Lieut. Charles Henry Davis, U. S. Navy*, of the coast survey.

Cranium of the Manatee of Cuba, (Manatus.) From *Mr. Bartlett*, of Sagua la Grande, Cuba.

ADDITIONS TO THE LIBRARY.

Proceedings of the Academy of Natural Sciences of Philadelphia, Vol. III., Nos. 1, 2, and 3. January to June, 1846. From the *Society*.

Report of the Joint Committee of the Library of the Congress of the United States, on the expediency of publishing additional copies of the Scientific works of the Exploring Expedition. Washington, June, 1846. From the *Hon. R. C. Winthrop*.

August 5, 1846.

D. H. Storer, M. D., Vice President, in the Chair.

Dr. John Bacon, Jr. read notices of *Polythalamia*, in the sand of Sahara Desert.

Under the microscope the sand is seen to consist mainly of irregular quartzose grains, of a reddish yellow color, and a pretty uniform size, ranging between 0.01 and 0.03 of an inch. These grains are more or less rounded on the angles and edges. A few minute quartz crystals are also met with, presenting the usual six-sided prism, with pyramidal terminations, rounded in the same manner. It is easily understood how the wind raises in clouds and conveys to great distances, sand so fine as this.

Among the translucent particles of quartz, a considerable number of rounded, white, opake grains are perceived by the unassisted eye — submitted to chemical tests these proved to be calcareous, and under the microscope were seen to be *polythalamia.* They were generally broken, worn and rounded. Six or seven species only could be found, and of these Dr. Bacon could ascertain only two, *Textilaria globulosa*, and *Rotalia globulosa ;* another species, is probably *Textilaria aciculata.* The cells of these polythalamia are sometimes filled with calcareous matter, though most frequently empty. Dr. Bacon did not consider himself authorized to draw any inferences concerning the geological age of the sands of Sahara, from the presence of those polythalamia, as the species detected are found both in the cretaceous formations, and in every age of the tertiary, and are believed to exist in a living state in our modern seas.

Dr. Bacon had also examined sand from the desert of Arabia, described by Dr. Hitchcock, in a memoir on the Geology of Western Asia, in the Transactions of American Geologists and Naturalists. Its general appearance is similar to that of the specimens from the Sahara desert, except that the eye can detect no calcareous particles in it, the quartzose grains are, however, larger, average .06 of an inch. The specimen examined was entirely free from Polythalamia.

Dr. Gould described the following new species of Helix, from the Shells of the Exploring Expedition.

HELIX LABIOSA. Testa depresso-conica, subtus convexa, arctè umbilicata, luteo-cornea, pilis sericeis quincuncialiter dispositis undique villosa: spira anfr. 6 convexis, ultimo immodicè crescente et pone labrum valdè contracto: apertura angusta, lunata; labro albo, latè revoluto; fauce lividâ. Lat. $\frac{7}{10}$, alt. $\frac{4}{10}$ poll. *Hab.* Astoria, Oregon.

Closely allied to H. *palliata*, but is smaller, lacks the tooth on the columella, which, with the greater convexity beneath, and the rapid enlargement of the last whorl near the aperture, are sufficiently distinctive characters. It seems to be nearly like H. *Columbiana*, Lea, a shell with which I am not acquainted.

HELIX LORICATA. Testa parva, depressa, flavo-viridis, arctè umbilicata, squamulis crescentiformibus undique loricata, subtus convexa: spira anfr. $5\frac{1}{2}$ convexiusculis, arctè volutis, ultimo supernè ad peripheriam subangulato: apertura contracta, lunata, trilobata, dente laterali, dente basali, et dente columellari lamelliformi ringens; peristomate albo, reflexo, callo copioso conjuncto. Lat. $\frac{1}{4}$, alt. $\frac{3}{10}$ poll. *Hab.* California.

Form much like H. *inflecta*, but smaller, and teeth less developed. Its peculiar surface, resembling a scaly coat of mail, is highly characteristic.

HELIX DEVIA. Testa orbiculato-depressa, obliquè striata, dilutè viridi-cornea, umbilico modico canaliculato perforata: spira anfr. 6 convexis, ultimo ad peripheriam rotundato: apertura transversa, obliquè lunata, ad anfractum penultimum unidentata, dente trigono; labro albo, latè reflexo, ad basim horizontali, umbilicum aliquanto ambiente. Lat. $\frac{4}{5}$, alt. $\frac{8}{20}$ poll. *Hab.* Oregon.

Much like H. *pedestris*, but more solid, and lacks the peculiar wrinkling of the epidermis. The lip is more broadly reflected, and the aperture toothed. Placed by the side of the southern variety of H. *palliata*, somewhat blanched, it would hardly be distinguished except by the umbilicus.

HELIX GULOSA. Testa globulosa, crassa, rudis, sub-perforata, obsoletè carinata, pallidè castanea, colore saturatiori nubilata, et interdum fasciata: spira anfr. 6 rotundatis, striatis;

ultimo amplissimo, et obsoletè costato-carinato; suturâ profundâ: apertura magna, rotundata, fauce lividâ; labro modicè reflexo, albido, propè columellam latiore, umbilicum rimatum tegente. Lat. $1\frac{1}{10}$, alt. $\frac{4}{5}$, apert. $\frac{3}{5}$ poll. *Hab.* New South Wales.

Remarkable for the great altitude of its outer whorl and its large aperture. It is like H. *Californianus* in form, H. *albolabris* in texture, and H. *badia* in color.

Helix ziczac. T. parva, rotundata, depressa, stramineo-albida, lineolis obliquis fulminantibus fuscis picta, et laminis acutis confertis reflexis pilosis lyrata: subtus convexa, umbilico magno scalariformi perforata: spira anfr. 6 convexis, angustis: apertura subcircularis, ad basim subangulata; labro simplici, propè umbilicum reflexo. Lat. $\frac{3}{10}$, alt. $\frac{1}{8}$ poll. *Hab.* New Zealand.

A very beautiful shell, unlike any other described except H. *dissimilis*, D'Orb., which is larger, more dotted, and is not noted as hairy. In general form, striation, umbilicus, &c., it is like H. *striata*.

Helix pedestris. Testa rudis, depresso-globosa, latè perforata, luteo-cornea, ad apicem virens, striis incrementalibus conspicuis inequalibus, et striis minutissimis confertis volventibus decussata: spira anfr. $5\frac{1}{2}$ convexiusculis; ultimo ventricoso, prope aperturam deflexo: apertura obliqua, transversa, rotundato-lunaris; peristomate reflexo, albo, ad basim dilatato, juxta columellam sinuato. Lat. $\frac{7}{8}$, alt. $\frac{1}{2}$ poll. *Hab.* New South Wales.

It has the shape and aspect of H. *zaleta*, but is more like H. *profunda* inferiorly.

Instead of the usual sliding motion of the Helices, the mollusk of this shell flexes its foot into about four vertical undulations, so as to touch the plane of motion at as many points only; and these undulations pass from the head towards the tail, as in the motions of a caterpillar or a millipede.

Helix strigosa. Testa orbicularis, depressa, scabrata, latè umbilicata, cinereo-grisea vel fuscescente, fasciis linearibus volventibus pallidè fuscis interdum subtus notata: spira anfr. 5 convexiusculis; ultimo angulato et prope aperturam deflexo: apertura circularis; labro simplici, continuo. Lat. $\frac{9}{10}$, alt. $\frac{2}{3}$ poll. *Hab.* Interior of Oregon.

Of the shells of this continent, it may be compared with H.

alternata in form; but in its opaque and rugged aspect, and in most of its characters, it nearly resembles H. *alpina* of Europe.

HELIX SPORTELLA. Testa planulata, fragilis, nitida, luteo-cornea, subtus concava, latè umbilicata, lineis incrementi conspicuis et lineis volventibus subtilissimis confertim decussata: anfr. 5, ultimo magno; suturâ profundâ: apertura rotundata, infra subangulata; labro acuto, simplici. Lat. $\frac{1}{2}$, alt. $\frac{11}{40}$ poll. *Hab.* Puget Sound, Oregon.

Much like H. *concava*, but has a smaller umbilicus, and larger aperture, and the transverse incisions of the striæ are sufficiently distinctive.

HELIX MUTATA. T. orbicularis, depressa, tenuis, cerina, infrà rotundata: spira anfr. 4 convexis, nitidis, junioribus glabratis, majoribus suprà crassi-striatis, subangulatis; sutura impressa: subtus glabra, sulcis radiantibus remotis radiatim divisa, umbilico modico perforata; apertura ampla, lunata, basi subangulata; labro simplici. Lat. $\frac{3}{10}$, alt. $\frac{3}{20}$. *Hab.* Rio Janeiro.

Not unlike H. *alliaria*, or small specimens of H. *cellaria*, in general aspect; but it is more globose and coarsely rib-striate, like H. *Pennsylvanica*. It may be H. *insignis*, D'Orb.

HELIX LYRATA (COUTHOUY MS.). Testa minuta, depressa, rufo-cornea, umbilicata: spira anfr. 4 cylindricis, et striis elevatis confertis lyratis; suturâ canaliculatâ: apertura circularis; labro simplici. Lat. $\frac{1}{5}$, alt. $\frac{1}{20}$ poll. *Hab.* Terra del Fuego.

About the size and color of H. *rupestris*, but more depressed, and with a less expanded umbilicus. It may be H. *costellata*, D'Orb.

A paper was communicated by Prof. James Hall, on the geological relations of the fossil cranium mentioned on a preceding page, and called *Castoroides Ohioensis*.

The cranium was received from Rev. Benjamin Hall, D. D., President of Geneva College, and was discovered in a swamp on the farm of Gen. W. H. Adams, of Clyde. The situation in which it was found is an elevated plateau or level tract of land, a portion only of which would be denominated a swamp, though the whole surface is covered with a peaty soil which supports a

heavy growth of elm, hemlock and ash, with some maple and beech. This elevated ground is the summit level, from which the waters flow in opposite directions, into Lake Ontario on the north, and into the Clyde river, and thence into the Cayuga and Seneca lake outlets on the south. The country probably then formed an estuary through which water flowed into Lake Ontario, which was then probably at an elevation of 150–200 feet higher than at present.

A section at this place, and at numerous others near the same spot, presents the following characters:

1. Muck, or vegetable soil, supporting a heavy growth of timber, two feet or more in thickness.

2. Fine sand, with occasional thin bands of clay, often consisting of alternating layers of sand, twigs, leaves and other fragments of vegetable matter, and much blackened thereby; two to three feet thick.

3. Muck, or peaty soil, composed of decayed fragments of wood, bark, leaves, &c., enclosing trunks of trees of large size, about four feet thick.

Skull of Castoroides Ohioensis.

4. Fine sand, with shells of Planorbis, Valvata, Cyclas, &c., one to two or three feet thick.

5. Ancient drift, with northern bowlders and fragments of the sandstones and limestones, which occur in place a few miles farther north — depth unknown.

The thickness of 2, 3, and 4, is variable, though the bottom of No. 3 usually varies little from the depth of eight feet from the surface. A glance at the section reveals the true period of the deposit, showing conclusively that the whole is a lacustrine formation, made subsequent to the deposition of the ancient drift, (No. 5,) which is characterized by its foreign materials, while in the later deposit not a pebble of the size of a pea can be found.

The fossil is doubtless of the same age as the remains of the mastodon. These are all found in situations showing that this period was subsequent to that when the earth has undergone any great change.

Its geographical distribution must have been extensive, as it has been found in Ohio, and lately at Natchez.

Robert W. Gibbes, M. D., of Columbia, S. C., was elected a corresponding member of the Society.

Samuel Kneeland, Jr., M. D., was elected an ordinary member.

ADDITIONS TO THE LIBRARY.

Abhandlungen der Mathem-Physikalischen Classe der Kœniglich Bayerischen Akademie der Wissenchaften. 3 vols. 4to. München, 1837–1845. From the *Royal Bavarian Academy.*

Gelehrte Anzeigen. 4 vols. 4to. München, 1843 and 1844.

Bulletin der Kœnig. Acad. der Wissenchaften, for 1845, and Nos. 1 to 5, for 1846. From the *same.*

Vergleichende Betrachtungen über die Mannigfaltigkeit in der organischen und unorganischen Natur, von Dr. Franz von Kobell. 4to pamph. München, 1836. From the *same.*

Akademischen Almanack auf das jahr 1845. 12mo pamph. München. From the *same.*

Uber Vergiftungen, nebst einigen Versuchen an Thieren, von Dr. Ignaz Rudolph Bischoff. 12mo pamph. Wien, 1844.

Zuccarini, J. G. Ueber die Vegetationsgruppen in Bayern. 4to pamph. München, 1833.

Döllinger, I. Gedächtnissrede auf Samuel Thomas von Sömmering. 4to pamph. München, 1830.

Schafhäutl, Karl. Die Geologie in ihrem Verhältnisse zu den übrigen Naturwissenchaften. 4to pamph. München, 1843.

Wagner, A. Andeutungen zur Characteristik des organischen Lebens nach seinem Auftreten in den verscheidenen Erdperioden. 4to pamph. München, 1845.

Von Martius, C. F. P. Die Kartoffel-Epidemie der letzten Jahre. 4to pamph. München, 1842.

Rede zum Andenken an Ignaz Döllinger. von Dr. Ph. Fr. von Walther. 4to pamph. München, 1844. From the *same.*

Uber das Magnetische Observatorium der Kœnigl. Sternwarte bei München. Von Dr. J. Lamont. 4to pamph. München, 1841.

Systema Materiæ Medicæ Vegetabilis Brasiliensis. Composuit C. F. P. De Martius. 8vo pamph. Lipsiæ, 1843.

Reise in Brasilien auf Befehl Sr. Majestät Maximilian Joseph I. Von Dr. J. B. von Spix und Dr. C. F. P. Von Martius. 3 vols. 4to. München, 1823–31. From *Dr. Von Martius.*

History of British Fossil Mammals and Birds. By Richard Owen. 8vo. London, 1844. *Audubon Fund.*

August 19, 1846.

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

Dr. D. H. Storer observed that a recent visit to Martha's Vineyard had enabled him to collect numerous ichthyological facts of considerable interest.

In his Report on the Fishes of Massachusetts, he had stated, upon the authority of Dr. Yale, that a *sting-ray* was common at Holmes Hole. He had now had the opportunity of seeing both a male and a female specimen, and ascertained it to be *Trygon hastata.*

Previous to his visit to Martha's Vineyard, he had not known that *Torpedo occidentalis* occurred on the coast of Massachusetts, except on the inner or bay side of Cape Cod, from Provincetown to Wellfleet, but while at Chilmark he had learned that it was taken every year at that place, as many as fifteen or twenty individuals being captured in the spring months, in seines and by hook and line.

Dr. C. T. Jackson read the results of a chemical analysis of Sand from the desert of Sahara, taken from specimens in the Society's cabinet, viz.:

Organic matter and water, ...	2.30
Insoluble silicious matter, ...	91.30
Perox. Iron and alumina, ...	2.68
Carbonate of Lime, ...	3.70
	99.98

The Insoluble silicious matter attacked by fusion with Carbonate of soda, and analyzed, yielded

Silex, ...	84.7
Alumina and Perox. Iron, ...	3.0

Dr. Gould continued his descriptions of new Shells, collected by the United States Exploring Expedition, and belonging to the genus Helix.

HELIX PUSILLUS. Testa minuta, tenuis, depressa; suprà obliquè striata, albido-virens; infra viridior, sub-polita, perforata: spira anfr. 4 sub-planulatis; suturâ profundâ: apertura circularis; labro simplici. Long. $\frac{7}{40}$, lat. $\frac{3}{40}$ poll. *Hab.* Mountains of Maui, Sandwich Islands.

Scarcely to be distinguished from H. *electrina*, Gould, in size and form, but it is more coarsely striated. It is also like H. *spirillus*, but has a much smaller umbilicus.

HELIX SAXATILIS (COUTHOUY MS.). Testa parva, sub-globosa, lucida, viridis, infrà convexa, umbilico modico perforata, leviter striata: spira anfr. vix 4 cylindricis, citò crescentibus; suturâ canaliculatâ: apertura sub-orbicularis, ampla; labro simplici, ferè continuo. Alt. $\frac{1}{10}$, lat. $\frac{1}{4}$ poll. *Hab.* Terra del Fuego.

Resembles, in general, H. *lucida*, and is remarkable for its globular form and fresh green color.

HELIX EXÆQUATA. T. parva, discoidea, tenuis, lucida, glabrata, succineo-cornea, ad peripheriam rotundata, infra sub-plana, in foveam centralem devexa: spira anfr. 7 arctè volutis, suprà planulatis, suturâ marginatâ benè impressâ discretis, spiram planam efformantibus: apertura angusta, transversa; labro simplici, portione sinistrâ ferè horizontali, recedente, subreflexâ. Lat. $\frac{7}{20}$, alt. $\frac{3}{20}$. *Hab.* Kauai, Sandwich Islands.

A very beautiful and polished symmetrical shell; beneath like H. *interna* and *indentata*.

HELIX CICERCULA. T. depresso-globosa, tenuis, sub-opaca, imperforata, albido-virescens, striis incrementi conspicuis et striis volventibus sparsis insculpta: infrâ rotundata, foveâ centrali modicâ: spira anfr. 5 convexis, ultimo angulato: apertura lunata; labro simplici; columellâ supernè vix reflexâ. Lat. $\frac{1}{4}$, alt. $\frac{3}{20}$ poll. *Hab.* Mountains of Hawaii.

Distinguished from the other small subglobular shells here mentioned by its pea-green color and more globular shape, both above and beneath, its deeper umbilical pit, and by having no semblance of contortion of the columella.

HELIX CRYPTOPORTICA. Testa parva, orbiculari-depressa, ad apicem acuta, tenuis, pellucida, nitida, luteo-virescens, leviter striata: infrà rotundata, imperforata, foveâ parvâ centrali: spira anfr. $5\frac{1}{2}$ convexiusculis, ultimo carinato; suturâ impressâ, mar-

ginatâ: apertura lunata, labro simplici; columellâ supernè valdè intortâ, sinum angustum centralem formante.

Very similar to H. *subrutila*, Mighels, but is distinguished from it by the want of revolving striæ, and by the manner in which the columella joins the whorl above.

HELIX CULTRATA. T. parva, orbicularis, depressa, glaberrima, lucida, fusco-viridis, infrâ rotundata, in foveam umbilicalem devexa, imperforata: spira anfr. 5 convexis, ultimo supernè carinato; apice obtuso; suturâ marginatâ: apertura angusta, lunata, labro simplici; columellâ obliquâ, callosâ, albâ, planulatâ, inflexâ, infernè dentem simulante. Lat. $\frac{9}{40}$, alt. $\frac{1}{10}$ poll. *Hab.* Taheiti and Eimeo.

A beautiful, smooth, lenticular, dark-green shell, not unlike H. *interna*, Say, distinguished by its curious broad, white, inflected, columellar lip.

HELIX PERTENUIS. Testa minuta, subglobosa, pellucida, nitidissima, viridi-aurèa, imperforata: spira depressa, anfr. $4\frac{1}{2}$ convexis, ultimo amplo, ad peripheriam angulato, infrà sulcis remotis radiato: apertura ampla, lunata; labro simplici. Lat. $\frac{1}{8}$, alt. $\frac{1}{10}$ poll. *Hab.* Aurora Island.

A small Matea, or very pellucid shell, somewhat like H. *electrina* and *lucida*, but more globular.

HELIX GRADATA. Testa parva, planorboidea, tenuis, nitida, rufo-viridis, luteo radiatim variegata, supra depressa, infra acetabuliformis: spira anfr. 5 convexis, intra umbilicum angulatis, obliquè et confertim striatis et cum striis interruptis volventibus decussatis; ultimo subangulato, versus aperturam deflexo; suturâ canaliculatâ: apertura obliqua, subcircularis; labro acuto, ad umbilicum reflexo. Lat. $\frac{1}{5}$, alt. $\frac{1}{2}$ poll. *Hab.* Tongataboo.

Shape and size of H. *striatella*, Anthony, but has the umbilicus broader, deeper, and more shelving.

HELIX FORNICATA. Testa parva, planorboidea, tenuis, dilutè rufa, supra convexiuscula, infra concava, obliquè ordinatim et confertim costato-striata: spira anfr. 4 convexis; ultimo ad peripheriam rotundato; suturâ profundâ: apertura transversa, rotundato-elliptica. Lat. $\frac{1}{4}$, alt. $\frac{1}{10}$ poll. *Hab.* Kauai, Sandwich Islands.

A small, dome-shaped shell, marked like H. *striatella*, but more like H. *indentata*, in the form of the spire.

HELIX RUBIGINOSA. T. orbicularis, depressa, ferrugineo-cornea, fusco tessellata, obliquè costato-striata, latè umbilicata; spira anfr. 6 arctè volutis; suturâ impressâ: apertura subrecta, lunata; labro simplici; lamellâ unicâ secundum anfractum penultimum volvente. Lat. $\frac{7}{30}$, alt. $\frac{3}{20}$ poll. *Hab.* Kauai, Sandwich Islands.

Larger than the other checkered shells of this group; like H. *striatella*, Anthony, in form, size and sculpture, or like H. *radiata*, Mull., as to coloring.

HELIX DÆDALEA. Testa parva, discoidea, rubro-castanea, fusco tessellata, costellis radiantibus acutis confertis scabra, subtus acetabuliformis: spira anfr. ad 6 arctè volutis, duplo altioribus quàm latis, ad peripheriam rotundatis, infrà haud planulatis: sutura impressa: apertura angusta, verticalis, lunata; fauce lamellis 9 volventibus instructa, quorum 4 ad anfractum penultimum, uno ad columellam, 2 ad basim, 3 ad labium dispositis. Alt. $\frac{1}{20}$, lat. $\frac{1}{10}$ poll. *Hab.* Matea Islands.

Size and color of H. *contorta*, Fer.; but the whorls are more numerous and compact, and there are twice as many lamellæ on the penult whorl. The umbilicus is similar in form to that of the young H. *bursatella*, only the whorls remain rounded instead of being flattened.

ADDITIONS TO THE LIBRARY.

Gray, G. R. Genera of Birds. 4to, No. 28. By *purchase.*

Audubon and Bachman. Quadrupeds of North America. Folio, plates, 86 to 90. From *Subscribers.*

Geological Report on the Mineral Lands of the United States. 8vo. Printed by order of Congress. From *Hon. R. C. Winthrop.*

Proceedings of the Academy of Natural Sciences of Philadelphia. No. 2 and 3, Vol. III. From the *Society.*

American Quarterly Journal of Agriculture and Science, edited by Prof. Emmons. No. 11. From the *Editors.*

Remarks on fossil footmarks and icemarks, in the sandstone of Middletown, Conn. By Joseph Barratt, M. D. (Newspaper sheet.) From the *Author.*

Annales des Sciences Physiques et Naturelles d'Agriculture et d'Industrie, publiées par la Société Royale d'Agriculture, d'Histoire Naturelle, et Arts Utiles de Lyons. 8 vols. royal 8vo. 1838 to 1845.

September 2, 1846.

T. Bulfinch, Esq. in the Chair.

In consequence of the absence of several members attending the meeting of the Association of American Geologists and Naturalists in New York, no business was transacted.

September 16, 1846.

Mr. Thomas T. Bouvè in the Chair.

A communication was read from Dr. William Wood, of Portland, Me., containing a description of a species of Shark supposed by him to be hitherto undescribed.

The specimen was taken about eighty miles east of Portland, to which place it was brought. It was skinned and stuffed without any accurate drawing or measurements having been taken, and was not seen by Dr. W. until several days after its preparation. Dr. Wood having found it difficult to place the species under any recognized genus, proposes to establish a new genus for its reception. It approaches nearest the genus *Scymnus*, of Cuvier, but differs widely from it in the characters of the teeth, and in the absence of the temporal orifice. The principal distinctions are that the teeth in the present genus are quadrilateral in the upper, and not crooked in either jaw, are lancet-shaped in the lower, and not divergent from the centre, and differ from every species in being smooth in both jaws. Dr. Wood proposes for the new genus the name of *Leiodon*.[1]

Leiodon echinatum. Head prominent, muzzle blunt, body subtriangular to posterior line of first dorsal. Skin densely covered with conical, curved, long points or spines. A lateral line of oblique dark spots, running the whole length of the body. Color of species, *lilac*. Length, 16 feet.

[1] ΛΕΙΟΣ ΟΔΟΥΣ.

Dr. Gould continued his descriptions of the species Helix, from the Shells of the United States Exploring Expedition.

HELIX OBOLUS. T. parva, discoidea, deorsum compressa, suprà planulata, infrà concava, radiatim minutissimè et inequaliter striata, fusco-ferruginea, piceo tessellata: spira anfr. 5½ suprà excavatis, ultimo supernè costato-carinato: apertura sub-rhomboidea; fauce lamellâ unicâ secundum anfractum penultimum volvente. Lat. $\frac{1}{5}$, alt. $\frac{1}{30}$ poll. *Hab.* Taheiti.

A most singular discoidal shell, resembling *Planorbis vortex.*

HELIX BURSATELLA. Testa parva, per-variabilis, rotundata, conica vel planulata, suprà maculis fuscis et albidis alternantibus flexuosis, tessellata, infrà cinereo-albida vel flammulis fuscis flexuosis radiata, costis numerosissimis acutis radiantibus lyrata: subtus convexiuscula, interdum simplex, interdum concentricè striata, nunc radiatim costellata, nunc albida, nunc fusco flammulata: spira anfr. ad 8 externè excavatis, ultimo carinato; suturâ impressâ, plerumque marginatâ: apertura parva, transversa; fauce cum lamellis 7 volventibus, quorum 2 superiores, 1 columellaris, 4 remotis (1 suprà, 3 infra carinam) ad labium; labro simplici; umbilico cavernoso, in junioribus acetabuliformi, in majoribus ad januam parvo, constricto, margine acuto, una cum labio continuo. *Hab.* Taheiti and Eimeo.

The above characters are found combined in every possible manner. The variations in size, color, solidity, and umbilicus, may all be reasonably ascribed to differences in age, food, and perhaps to the elevation, between 2000 and 5000 feet, at which they were collected. The armature of the mouth and the peculiar umbilicus, at first broad, and at maturity contracted, or pursed up, so that the flattened edges of the whorls form a large spherical cavity, are the characteristic marks. Two principal varieties may be noticed.

α. Large, elevated, conical specimens, which are without mottling, rib-like striæ, or revolving lines beneath. Lat. $\frac{3}{10}$, alt. $\frac{2}{10}$ poll.

β. Smaller, depressed specimens, more or less coarsely ribbed, striated and mottled, both above and beneath. Lat. $\frac{1}{5}$, alt. $\frac{1}{10}$ poll.

HELIX TUMULUS. Testa parva, solida, flavida, orbiculato-pyramidata, basi sub-planulata, umbilico modico perforata: spira

elevata, conico-rotundata ; anfr. 6–7 convexiusculis, striis perobliquis exaratis, ultimo obtusè ad peripheriam angulato, prope aperturam compresso : apertura parva, transversa, lunata ; peristomate simplici. Long. $\frac{2}{5}$, alt. $\frac{7}{20}$ poll. *Hab.* Feejee Islands.

This bears a general resemblance to H. *pyramidata*; but with the same diameter, it is less elevated, and more rounded at apex.

HELIX TENTORIOLUM. Testa parva, elevata, trochiformis, ad apicem rotundata, pallidè virescens, obliquè et concinnè striata, basi in umbilicum mediocrem devexâ : spira anfr. 6 planulatis, et carinâ acutissimâ, albâ, cinctis : apertura subtriangularis, basi rotundatâ ; labro simplici, ante umbilicum reflexo. Lat. $\frac{2}{5}$, alt. $\frac{3}{10}$ poll. *Hab.* Upolu.

Its elevated form and rounded summit, resembling a nipple, is very remarkable.

HELIX (CARACOLLA) TROILUS. Testa variabilis, depresso-conica, sub-discoidea, leviter et obtusè striata, flavescens, subtus convexa, in umbilicum amplum incurvata, carinata ; carinâ utroque lineâ spirali castaneâ marginatâ : interdum coloribus inversis : spira anfr. $5\frac{1}{2}$ rotundatis : apertura semilunaris, supernè angulata ; labro acuto. Lat. $\frac{3}{4}$, alt. $\frac{3}{10}$ poll. *Hab.* Samoa Islands.

Is somewhat like H. *explanata*, Quoy, but much smaller and more umbilicated, and differently colored. Not unlike H. *alpina* in form. Some specimens are much elevated ; others have the chestnut color with a yellow line ; and one has the two bands coalescing and covering the whole periphery.

HELIX CRESSIDA. Testa variabilis, solida, depressa, lenticularis, acutè carinata, nitida, densè et acutè striata, coloribus flavo-viridibus et castaneis coalescentibus fasciata, infrà sub-planulata, umbilico magno et profundo perforata : spira anfr. 5 vix convexis : apertura triangularis ; labro acuto ; fauce lilacinâ. Lat. $\frac{7}{10}$, alt. $\frac{1}{4}$ poll. *Hab.* Samoa and Taheiti.

In some respects similar to H. *Troilus*, but more lenticular, flatter beneath, the colors are differently disposed, and the surface sculptured with more numerous and much sharper lines. The animal is also different in coloring. Shape very much like H. *acies*, Fer. but flatter beneath and smaller.

Gray's Genera of Birds. Part 29. For September, 1846. *Exchange.*

Annals of the Lyceum of Natural History of New York. Vol. III., Nos. 1–4, and Vol. IV., Nos. 1–4, and 6, 7. 8vo. New York, 1828–'46. *From the Lyceum Nat. History.*

Oct. 10. Naturgeschichte der Infusionsthiere von Professor S. Kutorga. 8vo. pam. St. Petersburgh, 1839.

Atlas to the above. 4to. pam. Carlsruhe, 1841. *From Charles Cramer.*

Report of the Commissioner of Patents. Congressional Document. 8vo. Washington, 1846. *R. C. Winthrop.*

Oct. 22. Gray's Genera of Birds. Part 30. *Exchange.*

Annals and Magazine of Natural History. No. 119. For October, 1846. *Purchase.*

Nov. 3. Second Annual Report on the Geology of Vermont. By C. B. Adams. 8vo. pamph. Burlington, 1846. *Author.*

Silliman's American Journal of Science and Arts. No. 6, second series; for November, 1846. *Exchange.*

Nov. 19. L'Investigateur, Journal de l'Institut Historique; 145me livraison. September, 1846. 8vo. pam. *Institute.*

Haldeman's Monograph of Fresh water Univalve Mollusca. 8vo. pam. No. 8. Philadelphia. *Author.*

Volcanoes of the Moon, by James D. Dana. 8vo. pam. New Haven, 1846. *Author.*

Proceedings of the American Philosophical Society. Vol. IV. No. 35, for January – June. *American Phil. Society.*

Gray's Genera of Birds. Part 31. *Exchange.*

Annals and Magazine of Natural History. No. 120. For November, 1846. *Purchase.*

Nov. 20. Plates to Audubon's Quadrupeds of North America. Nos. 91–95. *Subscribers.*

Nov. 29. American Quarterly Journal of Agriculture and Science. Vol. IV., No. 2. 8vo. New York, 1846. *Editors.*

Proceedings of Academy of Natural Sciences. Vol. III., Nos. 4, 5. 8vo. pamph. Philadelphia.

Dec. 12. Caricis Species Novæ, vel minus cognitæ. Auctore Francisco Boott. 4to. pamp. London, 1846. *Author.*

Dec. 17. Plates, 96–100, Audubon's Quadrupeds of North America. *Subscribers.*

Dec. 18. Gray's Genera of Birds. Part 32. For December, 1846. *Exchange.*

Annals and Magazine of Natural History. No. 121. For December, 1846. *Purchase.*

Report of the Season of 1846. Published by request of the Middlesex County Agricultural Society. By Joseph Barratt. 8vo. pamp. Middletown, Conn. *Author.*

December 16, 1846.

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

Dr. Gould continued his description of Shells from the Exploring Expedition.

Bulimus elobatus. Testa solidula, elongato-ovata, longitudinaliter plicoso-striata et lineolis volventibus interruptis corrosa, epidermide sordidè luteo et viridi marmoratâ induta, arctè umbilicata: spira anfr. 5 convexis, ultimo magno: apertura angusta, sub-elliptica; labro simplici, obtuso, aurantio; plicâ columellari perobliquâ. Long. $2\frac{1}{4}$, lat. $1\frac{2}{5}$ poll. *Hab.* Feejee Islands.

Belongs to the same group as B. *fulguratus* and B. *malleatus*, characterized by the large fold on the columella. It is the largest of the three, resembling the former in its sculpture and the coloring of the aperture, and the latter in coloring. It is distinguished by its unreflected lip, its narrow aperture, less conspicuous and more oblique columellar fold, more ventricose and less oblique whorls.

Bulimus morosus. Testa crassa, rudis, ovata, albido-cinerea, longitudinaliter striata, arctè umbilicata; spira anfr. 5 convexis: apertura subauriculata; peristomate latissimè revoluto, albo, posticè angulato; plicâ columellari amplâ. Long. $1\frac{3}{4}$, lat. 1 poll. *Hab.* Feejee Islands.

Of the same group as the preceding, but is smaller, more solid and less elegant than its associates. Its want of epidermis and colors, its angular outline and very broad, revolute lip, characterize it.

Bulimus prolatus. Testa ovoidea, antrorsum angustata, leviter striata, albido-cinerea, fasciis quatuor liturarum ferrugineearum cincta : spira ovato-conica ; anfr. 5 convexiusculis : apertura elliptica, totius longitudinis dimidium adequans ; labro simplici, acuto : columella brevis, latè reflexa, alba, umbilicum parvum tegens. Long. $1\frac{3}{4}$, lat. 1 poll. *Hab.* Santiago, Chili.

A shell of a remarkably regular, elongated ovoid form, somewhat like B. *Favannii*, only more narrowed anteriorly, and distinguished by its four bands of rusty blotches.

Bulimus ciliatus. Testa tenuis, ovato-conica, viridis, striis volventibus, cilias rigidas nunc longas nunc breviores gerentibus, cincta : spira acuta, anfr. 6 convexis, ultimo magno, ventricoso, sub-angulato : apertura sub-ovata, anticè angustata ; labro simplici ; columellâ rectâ, albâ, umbilicum parvum obtegente. Long. $\frac{9}{10}$, lat. $\frac{6}{10}$ poll. *Hab.* Organ Mountain, Brazil.

This shell, with its thick, dark green epidermis, looks like a Paludina. P. *velutino-hispidus* of Moricand, another hairy species, is more globular.

Bulimus pruninus. Testa ovato-turrita, solida, leviter striata, livido-purpurea, infra suturam et circa umbilicum albido zonata · spira acuta, anfr. 6, convexiusculis, subtabulatis : apertura modica, ovata ; labro simplici, intus callo stramineo incrassato, ad columellam reflexo ; fauce livido. Long. $\frac{7}{8}$, lat. $\frac{3}{8}$ poll. *Hab.* ?

This is a solid, elongated, peculiar species, probably belonging to South America.

Bulimus hybridus. Testa crassa, elongato-ovata, polita, castanea, lituris ochraceis admodum obliquè ordinatis maculata : spira anfr. 6 convexis, sub lente spiraliter striatis ; ultimo magno sub-compresso, ad basim obliquè carinato et rimâ umbilicali perforato : apertura angustata, elongato-elliptica, anticè angulata et canaliculata ; labro crasso, latè reflexo, rubro-purpureo ; fauce roseo. Long. $1\frac{3}{4}$, lat. $\frac{5}{8}$ poll. Vicinity of Rio Janeiro.

A beautiful shell, intermediate between B. *goniostoma* and B. *multicolor*, having the aperture of the former, and the size, form and marking of the latter.

Bulimus junceus. Testa parva, elongato-conica, tenuis, translucida, dilutè virens, concinnè striata, vix perforata : spira

ad apicem obtusa; anfr. 7, convexiusculis, supernè con-tabulatis: apertura elongato-ovata; labro simplici, ad columellam vix reflexo. Long. $\frac{3}{10}$, lat. $\frac{1}{10}$ poll. *Hab.* Society and Sandwich Islands.

A delicate, slender shell, varying a good deal in size, and closely allied to, if not the same as B. *clavula*, Quoy, B. *bacterionides*, D'Orb., and B. *octonoides*, Adams, from the West Indies. Perhaps it is a species attached to the plantain, cocoa-nut, or some other tropical plant.

Mr. Bouvé exhibited an Echinus from the Millstone Grit of Georgia, which he considered a new species of the genus Pygorhynchus of Agassiz; and of which he gave a description.

PYGORYNCHUS GOULDII. Bouvé. Above, conico-convex, a little more sloping posteriorly than anteriorly. Margin somewhat rounded, except, near and under the anus, where by an excavation or depression, it becomes acute. Inferior surface sub-circular. Mouth situated about one third of longitudinal diameter from the anterior margin. Apex sub-central, a little anterior, but not so much so as the mouth. Ambulacra radiating at unequal angles, the interambulacral spaces dividing the three anterior from the two posterior, being wider than the rest. The pores of each diverge considerably from the apex, becoming quite dilated a short distance from it, then converge as they descend, until about two-thirds the distance from the summit to the margin, where they are very limited in width, and where the double rows become single. On the margin they again slightly dilate, and are readily traceable to their termination about the mouth, where they are prominent. The anterior ambulacrum is much narrower than the rest. Anus transverse, and situated at about one-fifth the distance from the posterior margin to the apex. Whole length, as shown by three individuals examined, $1\frac{7}{8}$ inches, greatest width $1\frac{3}{4}$ inches, height 1 inch. Locality, Baker County, Georgia. Description of characters from specimens in Cabinet of the Society.

I take great pleasure in naming this beautiful species after my respected friend, Dr. Augustus A. Gould.

Professor Agassiz remarked of the rock in which this specimen occurred, that it was the oldest member of the tertiary group, if not, as some supposed, belonging to the cretaceous; the name of Pisolitic system had been applied to it by Elie de Beaumont.

He also pointed out the characters in which his genus Pygorhynchus differs from Clypeaster and Echinolampas.

Both have the ambulacra petaloid, an anterior mouth, and posterior anus. Echinolampas has no teeth, and the interior of the body is a simple cavity. Clypeaster has five teeth, and the internal cavity divided by columns. Pygorhynchus is distinguished by a depression at the anus, the ambulacra elongated and distinct to the margin. The mouth is transverse, but in the other genera direct. He pronounces the species exhibited by Mr. Bouvé decidedly new.

Dr. W. F. Channing gave an account of the Crawfish from the Mammoth Cave, Kentucky, presented by him at the last meeting.

He remarked that, like everything else having life in the cave, it was colorless. There were points, in the ordinary position of the eyes, which might prove to be those organs or their rudiments. A Crawfish of the common species was caught in the cave at nearly the same time as the present specimen, having undoubtedly entered during a flood of Green River, which occurred at the time, and during which the waters back up into the cave. This would explain, perhaps, the original introduction both of the blind fish and of the crawfish, but would make it remarkable that the species had continued distinct.

Professor Agassiz had examined the Crawfish presented by Dr. Channing.

The eye of this class of Crustaceans is placed upon a pedicle, and appears like a bulb covered with facets. In this specimen the pedicle exists, but the bulb with facets is wanting; and consequently there is no eye, though he supposed the eye to exist in a rudimentary state; but the specimen was not in a state to admit of ascertaining whether or not the optic nerve existed. The

species had been described by Tellkampf, and named *Astacus pellucidus*.

Prof. A. mentioned a remarkable fact, ascertained by Erichson, with regard to the Crawfishes of America. They have all one pair of gills less than those of the old world.

Dr. Channing also presented to the collection of the Society a large umbel-shaped mass of Fossil Coral, which seemed to constitute an entire individual, and which is a specimen of similar masses which occur scattered through the limestone near Sharon Springs, Schoharie county, New York. No attempt was made to name it, or give its special characteristics.

Dr. C. placed upon the table some of the Seeds of the Wild Oat, with the beard attached, procured by him from the uplands of the prairies in Wisconsin during the past summer. The beards of these were in some instances five inches long, and presented the spiral structure which gives the smaller variety of animated oat its peculiar sensitiveness to moisture. These specimens were picked on the 28th of June, before the seed was quite mature, and, perhaps on this account, seemed to be only slightly influenced by hygrometric changes. The stalk grows about three feet high; and as the supply is very large, especially in Middle and Northern Wisconsin, it may be worth while to remember the locality.

Dr. C. also exhibited some cases of the larvæ of trichopterous insects from a pond in the north of New Hampshire. These cases were spoken of as remarkable from their shape, which was an elongated quadrilateral pyramid, presenting right angles and flat sides. The larva exhibits very brilliant colors of black and green.

Dr. Channing presented a fragment of a leaden conduit from Pompeii.

He had intended to have made an examination of the change the metal had undergone from the lapse of time, but had not yet done so. He offered it to any gentleman who might be disposed to examine it. At the request of Dr. Jackson, he consented to resume it, and pursue the inquiry himself.

Dr. C. T. Jackson read, from English papers and periodicals, notices of Gun cotton, with a view of showing the date

at which the process of preparing the article was disclosed in this country.

Dr. Bacon stated that he had examined, under the microscope, specimens of Gun cotton prepared by Dr. C. T. Jackson, and also some prepared by himself.

Specimens of the Cotton, before and after preparation, were put up in Canada balsam on slips of glass, and covered by very thin glass. When viewed by transmitted light, with powers from 150 to 800, many of the fibres of the Gun cotton appear thickened, but no other change can be perceived on comparison with the unprepared article. There is no appreciable difference in the transparency of the two.

They were now examined in polarized light by means of the polarizing attachment to the microscope. When the polarizing and analyzing prisms are so arranged as to afford a dark field, the riband-like fibres of the cotton before preparation are seen as luminous objects upon a black ground, and are tinged with bright and varied colors. They are thus proved to possess a strong polarizing power. The Gun cotton, under the same circumstances, presents an entirely different appearance. Its fibres are much less luminous, and have a nearly uniform dull blue color. It is evident that the process of preparation has so altered the structure of the fibres as to lessen very greatly their action on polarized light.

Gun cotton prepared by Dr. Jackson by immersion for twelve and for eighteen hours in the strongest acids, has not lost its polarizing power in any appreciably greater degree than after an immersion of three minutes only. This agrees with the results of other modes of trial in indicating that the latter period is sufficient for the complete preparation of the Cotton, when the acids are of full strength. In all the specimens there are some filaments so nearly destitute of polarizing power as to be scarcely visible on the black ground, but none have been found entirely without action. When the polarizing and analyzing prisms are in such a position as to give a bright field, a portion of the fibres becomes tinged with a color approaching to orange, while the remainder appear colorless as in ordinary light.

Mr. Horace Gray, Jr. was nominated for election as a member of the Society, by Mr. Dillaway.

ADDITIONS TO THE LIBRARY.

Plates to Audubon's Quadrupeds of North America, Nos. 91 to 95. *Subscribers.*

American Quarterly Journal of Agriculture and Science, Vol. IV. No. 2. 8vo. New York. *Editors.*

Proceedings of the Academy of Natural Sciences, Vol. III. Nos. 4, 5. 8vo. pamph. Philadelphia. *The Academy.*

Caricis Species Novæ vel minus cognitæ. Auctore Francisco Boott. 4to. pamph. London, 1846. *Author.*

January 6, 1847.

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

Dr. Gould gave descriptions of the following species of Partula, Pupa, and Balea, collected by the Exploring Expedition.

PARTULA CONICA. Testa elongato-conica, interdum sinistrorsa, flavida vel castanea, leviter striata et lineis crebris volventibus decussata, latè perforata: spira elevata, acuta, anfr. 6 ventricosis, ultimo permagno; suturâ impressâ, albidâ: apertura obliqua, ovalis; peristomate albo vel rosaceo, latè reflexo, sub-planulato. Long. $1\frac{1}{10}$, lat. $\frac{11}{20}$ poll. *Hab.* Samoa Islands, Raraka Island.

Larger than any species hitherto described, and resembling *Bulimus lævus* in form. It may possibly be P. *bulimoides*, Lesson.

PARTULA ZEBRINA. Testa variabilis, ovata, tenuis, alba, flava vel fulva, plerumque strigis longitudinalibus flexuosis albis variegata, spiraliter tenuistriata, umbilico rimato perforata: spira anfr. ad 5 rotundatis, ultimo ventricoso: apertura elliptica, peristomate albo, latè reflexo, planulato; plicâ columellari magnâ. Long. $\frac{8}{10}$, lat. $\frac{1}{2}$ poll. *Hab.* Tutuilla, Samoa Islands.

A rather large and very fine species, more ventricose than