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1*

BULLETIN

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1874.

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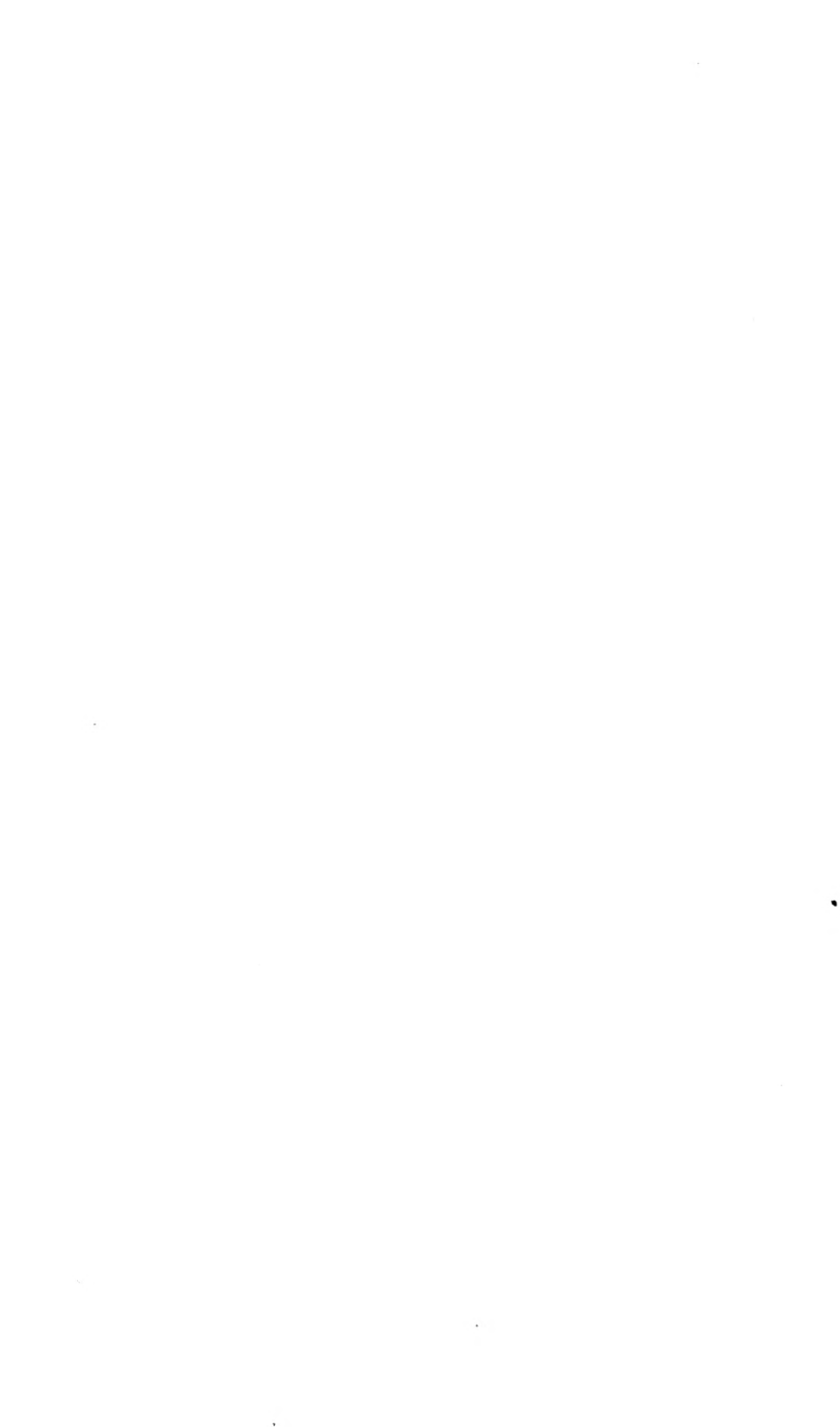
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OF THE
ESSEX INSTITUTE.

VOL. 6. SALEM, MASS., JAN., 1874. No. 1.

One Dollar a Year in Advance. 10 Cents a Single Copy.

REGULAR MEETING, MONDAY, JAN. 5, 1874.

MEETING this evening at 7.30 o'clock. Adjourned to Thursday, the 8th.



ADJOURNED MEETING, THURSDAY, JAN. 8, 1874.

MEETING this evening at 7.30 o'clock, adjourned from Monday, the 5th. The PRESIDENT in the chair. Records read.

The SECRETARY announced the following correspondence:—

From John J. Babson, Gloucester, Dec. 8; Samuel A. Drake, Boston, Dec. 4; G. L. Gleason, Manchester, Dec. 23; J. L. Hawley, Brooklyn, N. Y., Dec. 1; Frank E. Hotchkiss, New Haven, Dec. 4; J. F. LeBaron, Lynn, Dec. 1, 13; H. M. Meek, Dec. 2; J. L. Robinson, Wenham, Dec. 1, 8; A. C. Goodell, Jr., Dec. 9; Sampson, Davenport & Co., Boston, Dec. 5; Wisconsin State Historical Society, Dec. 2; John M. Bradbury, Ipswich, Dec. 20, 26; Oliver Carlton, Dec. 18; George W. Clark, Newburyport, Dec. 25; N. Cleveland, Westport, Conn., Dec. 18, 29; Henry Dexter,

Cambridge, Dec. 18; Joseph P. Fessenden, Dec. 22; Lucian H. Frary, Middleton, Dec. 20; Byron Groce, Peabody, Dec. 28; P. A. Hanaford, New Haven, Conn., Dec. 19; J. C. Holmes, Detroit, Mich., Dec. 20; A. H. Hoyt, Boston, Dec. 9; J. L. LeBaron, Charlestown, Dec. 17; Marshall Pierce, Saco, Maine, Dec. 20; Sampson, Davenport & Co., Boston, Dec. 31; Augustus D. Small, Dec. 19; J. Wingate Thornton, Boston, Dec. 17; B. Westermann & Co., New York, Dec. 12, 31; Charles K. Whipple, Boston, Dec. 19; William C. Wood, Wenham, Jan. 1; Ashbel Woodward, Franklin, Conn., Dec. 19; Buffalo Historical Society, Dec. 18; Cincinnati Public Library, Dec. 24; Davenport Academy of Natural Science, Dec. 27; New England Historic-Genealogical Society, Dec. 17; New York Historical Society, Dec. 17; New York Lyceum of Natural History, Dec. 22; Ohio Historical and Philological Society, Dec. 19, 20; Rhode Island Historical Society, Dec. 19.

The LIBRARIAN reported the following additions:—

By Donation.

ADAMS, C. F., of Boston. Address on the Life, Character and Services of Wm. H. Seward, delivered at Albany, Apr. 18, 1873, by donor.

ALMY, JAMES F. Salem Journal of Fashion for Sept., Oct., Nov., Dec., 1873.

APPLETON, W. S., of Boston. Description of Medals of Washington in the collection of the donor. Boston, 1873.

BARKER, JOHN G., of Lynn. Transactions of the New York State Agricultural Society for 1813-1862 inclusive. 20 vols. 8vo. Catalogue of the New York State Cabinet. 1 vol. 8vo.

BRIGHAM, WM., of Boston. Miscellaneous pamphlets, 10.

BUTLER, B. F., of U. S. House of Reps. Report of the Commissioners of the Sutro Tunnel, 1872. 1 vol. 8vo.

HOTCHKISS, F. E., of New Haven, Conn. Report of the Board of Education of Conn. for 1872, 1873. 2 vols. 8vo. New Haven City Year Book for 1871-72, 1872-73. 2 vols. 8vo.

HUMPHREYS, Brig. Gen. A. A., of Washington, D. C. Professional Papers of the Corps of Engineers of U. S. Army, No. 12. 1 vol. 8vo. Washington, 1873. Report of the Chief of Engineers for 1873. 1 vol. 8vo. Washington, 1873.

LEE, JOHN C. Commercial Bulletin for Aug. 23, 30, Sept. 3, Nov. 22, 29, Dec. 6, 13, 20, 27, 1873.

ROBINSON, JOHN. American Naturalist, 18 numbers. The Agriculturist, 23 nos. Miscellaneous pamphlets, 75.

SAMPSON, DAVENPORT & Co., of Boston. Lynn Directory, 1873. 1 vol. 8vo. Providence and Rhode Island Business Directory and Register, 1873. 1 vol. 8vo. Albany Directory, 1873. 1 vol. 8vo. Manchester Directory, 1873. 1 vol. 8vo. Lawrence Directory, 1873. 1 vol. 8vo. Salem Directory, 1872. 1 vol. 8vo. Fall River Directory, 1872-3. 1 vol. 8vo. Tamton Directory, 1872. 1 vol. 8vo. Charlestown Directory, 1874. 1 vol. 8vo. Gloucester and Rockport Directory, 1873. 1 vol. 8vo. Newburyport, Amesbury and Salisbury Directory, 1873. 1 vol. 8vo. Boston Directories, 1872, 1873. 2 vols. 8vo. Troy, West Troy and Cohoes Directory, 1873. 1 vol. 8vo.

STONE, HENRY R. Vocabulario De La Lengua Tagala. 1 vol. 8vo. 1835.

U. S. PATENT OFFICE. Official Gazette, Nov. 18, 25, Dec. 9, 16, 1873.

VERRILL, A. E., of New Haven, Conn. Eighth Annual Report of the Sheffield Scientific School of Yale College, 1872-3.

WATERS, HENRY F. Miscellaneous pamphlets, 35.

By Exchange.

BIBLIOTHEQUE UNIVERSELLE ET REVUE SUISSE. Archives des Sciences physiques et naturelles. Sept., Oct., Nov., 1873.

CANADIAN INSTITUTE. The Canadian Journal of Science, Literature and History. Vol. xiv. Nov., 1873.

CONN. ACADEMY OF ARTS AND SCIENCES. Transactions of. Vol. ii, Pt. II. 1873.

HISTORICAL AND PHILOSOPHICAL SOCIETY OF OHIO. Col. May's Journey to the Ohio Co., 1788-89. 1 vol. 8vo. Cincinnati, 1873. Geological Survey of Ohio for 1869, 1870, 1873. 4 vols. 8vo. Maps for 1873.

LITERARY AND HISTORICAL SOCIETY OF QUEBEC. Transactions of the. Session of 1872-3.

NEW JERSEY HISTORICAL SOCIETY. Proceedings of the. 2d Series. Vol. iii, No. 3. 1873.

PEABODY INSTITUTE OF PEABODY. Twenty-first Annual Report of the Trustees of the Peabody Institute. 1873.

WISCONSIN STATE HISTORICAL SOCIETY. Private and Local Laws of Wisconsin. 1867, 1868, 1870, 1871, 1872. 6 vols. 8vo. Senate Journal of Wisconsin, 1867, 1868, 1869, 1870, 1871, 1872, 1873. 7 vols. 8vo. Governor's Message and Accompanying Documents of Wisconsin. 1866, 1867, 1869, 1870, 1871, 1872. 11 vols. 8vo. Assembly Journal of Wisconsin, 1867, 1868, 1869, 1870, 1871, 1873. 6 vols. 8vo. Transactions of the Wisconsin State Agricultural Society. 1861-8, 1869, 1870, 1871, 1872-3. 5 vols. 8vo. First Annual Report of the State Board of Charities and Reform of Wisconsin. 1871. 1 vol. 8vo. Laws of Wisconsin, 1867, 1868, 1869, 1870, 1871, 1872, 1873. 7 vols. 8vo. Catalogue of the Wisconsin State Library, 1872. 1 vol. 8vo.

PUBLISHERS. Bossange's Catalogue. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Hardwick's Science Gossip. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Salem City Post. Salem Observer.

David Coggin, of Salem, was elected a resident member.

Mr. BYRON GROCE, master of Peabody High School, Peabody, Mass., read a communication. An abstract is here annexed.

NATURAL HISTORY IN THE SCHOOLS.

THE speaker stated his purpose to be to speak of the state of things regarding natural history in the schools as it is at present, to tell what he thought it ought to be, and to give some brief suggestions as to how the desired end might be brought about.

The present may be described by the brief but fair statement that there is no natural history in our schools, for, while it is true that botany has a place in the printed programme of most of our high

schools, and is accompanied by mineralogy in others, two considerations make this fact consistent with the original statement. First, the number of pupils in high schools, as compared with the number in the lower grades, is extremely small. Second, even in high schools, the method of study is such as to indicate the light esteem in which it is held; and the few good results from the study are not seldom quoted to the discredit of the study itself. As an illustration of "how not to do it," the method of teaching in a college, with which the speaker was familiar, was cited.

A genial, well-informed gentleman of mature years and fine culture occupies the position of instructor in the department of natural science in this well endowed, vigorous and flourishing New England college. During the fifteen or twenty weeks given to botany, with three or four recitations weekly, in one year less than half a dozen plants were examined by the pupils, in the class-room, and, worse than this, the time was spent instead, in committing to memory, *verbatim et literatim*, the glossary of technical terms at the end of the book, with the definitions, on the ground that if these were first learned the things corresponding could be easily recognized on occasion.

This was the introduction to nature, and this is not a solitary example. There are hundreds of high schools and academies, as well as colleges, where thus the method curses the subject. This means a great deal. What a plea against such methods was the whole life of Prof. Agassiz!

There are being made well directed efforts, in some of our cities and towns, to have the subject introduced into the common schools, and this fact, with the other fact that the subject is in our high school programmes, permits us to estimate the condition of natural history in the schools to-day. The reason for the present state of things is perhaps unimportant, but it is not because educators for half a century have not been agreed as to the principles which govern the case. It is curious to observe that in the face of this agreement, and the fact that the statement of the principles has become so frequent in convention as to be almost stale, few in authority have essayed to take the first logical step in the indicated direction.

The speaker prefaced his remarks upon the condition of natural science as it ought to be in the schools, by saying that he was not a proficient in the subject, and in no sense a specialist, being personally more interested in other subjects.

As it was shown to be true on the one hand that natural history is not in the schools, the speaker maintained on the other hand that it ought to be there. First, for the knowledge it offered, which answered one aim of education. Second, because the knowledge is

more valuable and practical than much now given. Third, it answers the purpose of a right training of faculties, according to natural and acknowledged laws. This answers a second aim of education; it answers the demand for a method which shall be in accordance with the natural development of the mind. Attention, observation, perception, discrimination, comparison, deduction, induction. Attention is first called to sensible objects. To train the senses then is important. What studies do it? Do we not need keen senses? Prof. Chadbourne says, "the material world is the means which God has appointed first to arouse the mind of man to action, and the only foundation for the highest processes of thought in the boundless field of mental speculation. It is only through the senses that this outward world can reach the mind, to excite its action or furnish it with materials." Here, then, is the first work of natural history in education, to educate the senses. Is not the introduction of drawing into our schools a testimony to the demand for educated senses as well as educated tastes?

Not only do natural history studies educate the senses to observe, but to compare and lead the mind to judge, and in other ways train the highest mental powers. As the matter now stands much of our work is a pyramid set upon its apex; we deal with babes in intellect as with grown men and women. To ring the changes upon perception and observation and then assign abstruse problems in induction is too common. To sharpen razors on a grindstone and wonder they will not shave is no worse. Nature kicks at it, scholars don't like it and rebel, mothers and fathers wonder what's the matter and worry because children are crowded so.

A part of the trouble is due as much to bad methods in arithmetic, grammar and geography as to the wrong position of those studies, or the expectation that they will do the work for the young mind that is not suited to them and is suited to natural history.

The speaker disavowed any claim for natural history as a panacea for all the ills the educational flesh is heir to, but thought that fresh air from the natural world was a necessity for healthful lungs and minds, and that this subject put naturally into the primary schools would remedy much of the difficulty in our foundation work.

The movement of education is evidently in the direction more favorable to natural history. Sup't Harris' masterly scheme of study in this department for the St. Louis schools, from lowest to highest, was an early wave, and the recent introduction of books on nature into the Boston schools and into those of other progressive cities and towns is significant.

It will soon be quite the fashion to study natural history. Salem will come to it, and Peabody and Beverly and Wenham and Essex

will sooner be out of the world than out of the fashion, and we shall all study it.

Look out then that it doesn't swamp us. The book-makers will enter the field, and we shall not lack for book instruction, and since that is so easy to give, the spread of natural history will be rapid as it will be *killing*, for, mark just here, that it is not arithmetic, nor geography with which we are dealing,—it is Nature, and every unnecessary remove from herself in the study, is a move toward dulling faculties instead of quickening them, is a move toward death, not life. Nature herself should be the study if it is possible, and it almost always is, even in cities.

The nearest approach to nature in the shape of pictures, models and dried specimens should be the only permitted plan in lieu of the former. To recite from a text-book alone, here, even the interesting glossary, is to kill enthusiasm, dull perception, blind observation, and make an added routine, where it was to be especially avoided. The speaker said that the brief half-hour did not permit an exhaustive statement of the reasons for his second proposition, viz., that natural history ought to be in the schools, but trusted that with the following from Mr. Chadbourne he had given some answer to those who asked the educational value of natural history.

“It gives problems for the deepest thought; it has power to make the earth yield her mineral treasures and to bring forth more abundantly every desirable form of vegetable and animal life. It is a volume ever open, ever inviting the mind to activity without weariness. It saves from the confinement and wear of other studies, and makes the hours of physical exercise the most profitable in storing the mind. It gives standards of the beautiful, and, by developing a true taste, gives to the student the highest type of mental cultivation and secures to him unfailling sources of enjoyment, so long as sight and hearing remain.

It goes deeper still, and, revealing the divine nature, leads to the sublimest contemplations, elevating the moral nature, thus ennobling the whole man, and strengthening the only sure foundation of all that is truly noble in our natures. Shall such a study be ignored in our systems of education? Shall it be left like a beggar to find here a hearty welcome and there to be driven from the door?”

The final question is, then, What are we going to do about it? The speaker said his answer to this third point would be as brief as his propositions regarding the first two. 1. Natural history is not in the public schools. 2. It ought to be there. 3. Put it there. If two bodies or studies cannot occupy the same space at the same time, something must give way, if the school curriculum is full. The speaker was ready to accept the logic of the situation. If primary schools cannot find time for it, those in authority must be shown how

it may be reading, spelling, writing, and almost arithmetic lesson, and these will at once become more agreeable. Some would find time and place in one way, some in another. Prof. Thompson, of Worcester, says there is a chance for it as a substitute for much of present English grammar.

The speaker thought that a good teacher would find the easiest way to prepare a scholar to pass a high school admission examination would be to give him through his earlier years arithmetic, geography, etc., with natural history, rather than without, and that he could be better prepared in this way for his future studies. So the logic of the matter will not abide the objection that it interferes with curriculum.—remodel the curriculum is the stern necessity.

The question of time may be partly solved by considering that the routine of daily school work needs frequent breaks and "it is often a gain to lay aside common studies and spend an hour in natural history." Even an hour a week would be of good advantage if the method were in harmony with the topic.

The objection regarding lack of knowledge on part of teachers was also considered and answered. The speaker said that if the thing was a necessity, all the lions in the way must yield. He thought teachers were more alive to the matter than school committees. In conclusion he offered as an illustration of how something might be done, an account of a plan he had tried, partly on the suggestion of Dr. Ebell, of New York. It had not been tried long enough to permit him to speak much of the results, but it at least offered a beginning. We find in the "Massachusetts Teacher" for July an account of the plan, which we give in place of an abstract of the speaker's remarks.

"Natural history finds no place in the curriculum of study in our schools (in P.), except in the high school, in the subject of botany. The high school teachers are not specially scientific in their tastes, and natural history furnishes to none of them the attractiveness or congeniality that literature or mathematics would afford.

Yet, moved by many motives which space forbids mentioning, we have organized a society of natural history. It is a voluntary organization. It has its by-laws, drawn up by a committee of members, crude but satisfactory. It admits anybody, in school and out, who will pay ten cents and sign its rules. Its object is, primarily, to collect and preserve specimens of all the plants in the limits of the town. But secondarily, exercise and pleasure are its objects. The observation and collection of minerals, insects, etc., furnishes a further attraction.

It has a president, vice-president, treasurer, two recording and one corresponding secretary, an executive committee, a cabinet committee and a librarian: and thus far all except the librarian have had employment. It requires an excursion every Wednesday afternoon, for which the executive committee arrange, and in which every mem-

ber must unite or present some specimen of real value to the cabinet or pay a small fine. It keeps a careful record of all its doings and excursions, and means to get help wherever it can.

It has not yet attracted many persons of mature years to its ranks, but it has called in members from outside the school, and its influence is just beginning.

All will recognize the difficulties attending such a society, but the result is worth the care. We hire a large team, or use the horse or steam cars, or go on foot, to reach our fields of work. We take bottles, knives, baskets, a hammer, and other implements for collection, botany cases if convenient, a book for pressing, or whatever can be easily obtained,—to be carried by different members, or by each member; rubbers and old clothes for all.

We laugh and talk, and hammer stone walls, and dig roots and search meadows; we climb hills, struggle through brambles and find rich reward for our search. We hunt for crabs on the beach and chase butterflies in the field, and drink fresh water from the springs. In short, we have a good time, *and* study natural history. We carry text-books sometimes, we read in the library at others; what one learns is common property. If the afternoon of Wednesday is rainy, we spend it in the school-room examining and studying specimens. The town gives us a cabinet, and the scientific society in the neighboring city loans us a box of representative insects and other specimens of interest.

The society has collected but little except in botany. But everything is fish that comes to our nets. We have several crabs in alcohol, star-fish, sand-skipper, a lizard, a frog, shells and sea-weeds, butterflies and insects, minerals, and some last year's bird's nests—we are too pitiful to take the new ones. The cabinet has had some gifts of minerals and curiosities, and it asks and expects more.

Its members get tired and do not feel like listening to lectures after their long tramp, but they hear patiently a few words from their president, and ask and answer many questions. But they have rosy cheeks and broadening chests, and they know there is a world to observe, more clearly than they have ever known it before. They all like it; and, although not so scientifically inclined as born naturalists would be, answer, we think, every reasonable expectation. If they will learn to observe, compare, and classify, we think it may help them to buy sugar and cotton cloth, coffee and ribbons, when they become merchants; and likewise to keep these things in order. And who knows but that one of our uneasy boys, or meek and gentle girls, may find a life path open from among the hills of our excursions?

We could write much more of what we have seen and what we see ahead; of what we have done and what we intend to do. We have not tried to make the whole operation clear in these pages, but to us our experiment looks like a success. We do not think it more particularly suited for trial in high than in Grammar, or even Primary Schools. And we are very sure that in the latter something of the sort might be an invigorating auxiliary to the *study* of the *alphabet*, which is the alternate horror with folded arms and stiffened necks, in so many of our primary schools."

Mr. F. W. PUTNAM said that he had listened with

great pleasure to the paper by Mr. Groce, and he congratulated the Institute that at last a teacher in our public schools had taken the platform of the Institute, and declared that, though no naturalist himself, he had become convinced that the judicious teaching of natural history in the schools would do more good to the pupils than some of the studies they now pursue. This being the stand that the Institute has taken for years, it has done all it could to bring about such a feeling on the part of the teachers, but with one or two exceptions the teachers themselves would not be taught, and they consequently did not appreciate the value of the study of nature. He felt confident that the day was not far distant when a teacher, before being considered qualified to take charge of a school would have to convince its committee that he at least was acquainted with the general structure of animals and plants, and the leading principles of mineralogy and geology, as well as with the rules of grammar and algebra, and now that natural history was no longer mainly the learning of the names of objects, the old plea that to study it meant simply to commit a list of names to memory would not hold. The study now consisted in reading the great principles and laws of nature, and though a naturalist was all the better able to study them by being familiar with an immense number of forms, which he must classify and have names for in order to make his knowledge easily known to others, yet it was not necessary for the pupils to know more than a few of the leading and common types and to be taught the general principles of nature, in order to lay a foundation which, as Mr. Groce had so well said, would be one that, throughout all walks of life, would prove of far greater value than much of the routine instruction now given, if, indeed, the word instruction can be used to express that

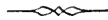
which is forced into the young mind to-day, to be forgotten, or put aside as useless, on the morrow.

Mr. Putnam hoped that this was only the commencement of a series of similar papers to be brought before the Institute by our teachers, and he assured them that all true naturalists would give their aid in bringing about so desirable a result as the proper teaching of natural history in our schools.

Vice President, A. C. GOODELL, related some of his experiences at school, and said that these had taught him the importance of knowing *things* rather than terms; in other words, that scientific education was the only real learning.

The Secretary, Mr. JOHN ROBINSON, presented a collection of presidential medals of 1860, Lincoln, Bell, Douglass, Breckenridge; of 1864, Lincoln and McClellan; and many specimens of the tokens of 1837 to 1841. He gave a very interesting historical notice of the several issues, and spoke of the desirableness and importance of making a complete series of these memorials of the different presidential campaigns.

Adjourned.



REGULAR MEETING, MONDAY, JAN. 19, 1874.

Meeting this evening at 7.30 o'clock. The PRESIDENT in the chair. Records read.

The SECRETARY announced the following correspondence:—

From F. E. Hotchkiss, New Haven, Conn., Jan. 12; F. B. Hough, Lowville, N. Y., Jan. 5; Charles D. Smith, Goshen, N. Y., Jan. 8; William C. Wood, Wenham, Jan. 10; W. H. Youmans, Columbia, Conn., Jan. 5; Belfast Naturalist's Field Club,

Oct. 16; Société National des Sciences Naturelles de Cherbourg, Sept.; Société d' Agriculture, Sciences et Arts de la Sarthe, Nov. 27; Literary and Philosophical Society of Liverpool, Dec. 1; New York Genealogical and Biographical Society, Jan. 5; Yale College, New Haven, Jan. 14.

The LIBRARIAN reported the following additions:—

By Donation.

- BOLES, E. C. Miscellaneous pamphlets, 6.
 BROOKS, Mrs. H. M. Woman's Journal for 1873.
 BUTLER, B. F., of U. S. H. R. Speech in the U. S. H. R., Jan. 7, 1874, by donor.
 Speech of Hon. R. B. Elliott in the U. S. H. R., Jan. 6, 1874.
 CROSBY, A. The Commonwealth for 1873.
 HALL, E. W., of Waterville, Me. Historical Discourse at the Fiftieth Anniversary of Colby University, Aug. 2, 1870, by J. T. Champlin. Catalogue of the Colby University, 1873-74. Obituary Record, with Supplement, 1822-73.
 HARRIS, D. L., of Springfield, Mass. Annual Report of the City Library Association of Springfield, May 6, 1873.
 NATIONAL ASSOCIATION OF WOOL MANUFACTURERS. Bulletin, Oct.-Dec., 1873.
 RICHARDSON, W. A., of Washington, D. C. Annual Report on the State of the Finances to the Forty-Third Congress, 1st Session, Dec. 1, 1873. 1 vol. Svo.
 U. S. PATENT OFFICE. Official Gazette, Jan. 6, 13, 1874.
 WATERS, J. L. Miscellaneous pamphlets, 15.
 WILDER, M. P., of Boston. Address of donor at the Annual Meeting of the New England Historic-Genealogical Society, Jan. 7, 1874.
 WILLIAMS, Mrs. C. F. Miscellaneous Log Books, 31.

By Exchange.

- BOSTON PUBLIC LIBRARY. Bulletin, Jan., 1874.
 HARVARD COLLEGE. Forty-eighth Annual Report of the President. 1872-73.
 IOWA STATE HISTORICAL SOCIETY. The Annals of Iowa, Oct., 1873.
 NEW YORK GENEALOGICAL AND BIOGRAPHICAL SOCIETY. Genealogical and Biographical Record, Jan., 1874.
 PUBLISHERS. Forest and Stream. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Peabody Press. Salem Observer. Salem Post.

Mr. F. W. PUTNAM exhibited several rare and interesting fishes from the harbors of Marblehead, Salem and Beverly, as follows:—

Cryptacanthodes inornatus Gill. The Ghost-fish. A fine specimen of this very rare species was taken in Marblehead harbor by Mr. Tucker of that town, while spearing for eels through the ice in December last, and presented to the Peabody Academy of Science by Mr. Wm.

Goodwin, 4th, of Marblehead. This species was first described by Dr. Gill from a specimen obtained on the coast of Maine by Dr. Stimpson, and now in the collection of the Smithsonian Institution. Two other specimens, a male and a female, are also in the Museum of Comparative Zoology; one was taken on the coast of Maine, and the other at Swampscott, Mass. The only other specimen known is the one now exhibited.

Liparis lineatus Kroyer. Sea Snail. One of the most interesting additions to our county collection of fishes was made by Mr. J. H. Sears in October last, when he found adhering to a root of kelp in about six feet of water near Baker's Island, a fine specimen of the striped variety of this fish. While living, the stripes were red, with lighter lines between. This is the first instance of the capture of the striped variety of this species in our New England waters, though several specimens of the brown and marbled variety have been obtained. It is therefore a very important addition to our fauna, as it proves that both varieties occur in our waters, as well as in the northern waters of Europe. As there has been some question as to the *Liparis lineatus* being the same as *L. vulgaris*, I will state that from an examination of a number of specimens from European waters, embracing both varieties, and several from our own waters, I have been unable to separate the two forms specifically, and even the markings of the varieties, though so distinct in some specimens, run into each other. The name of "sea snail" was given to this fish by the old writers from its sluggish habits and its soft, slimy body. It never attains a size of more than four or five inches, and is allied to the lump-fish of our waters.

Platessa glabra Storer. Smooth Flounder. For a long time this fish was known only from the description and

figure of the single specimen obtained in Massachusetts Bay by Dr. Storer, but during the last season it was found in numbers on the coast of Maine by the United States Fish Commission under Prof. Baird, and on recently looking over the collection of fishes in the Museum of the Academy, I found several specimens, including a very young one, taken in our harbor, which have been presented to the Academy at various times during the past six years by Mr. Walker, the well known fisherman of this city, who has added so many interesting specimens to our collections.

Mr. ALFRED PEABODY, one of the pioneers in the California enterprise, read a very interesting paper on the early days and rapid growth of California. After a brief review of the acquisition of the territory and the discovery of the gold fields, he proceeded to the narration of his personal experience. Immediately after the announcement of the discovery, and the knowledge that a large immigration from the neighborhood had set in, Mr. Peabody applied to John Bertram, Esq., of Salem, who, with his usual energy, engaged in the enterprise. With five others Capt. Bertram fitted out the barque "Eliza," which sailed from Salem for San Francisco, Dec. 23, 1848, under command of Capt. A. Staniford Perkins, with a cargo of provisions, clothing, mining tools, lumber, etc., and a scow for dredging. She took as passengers, Messrs. Alfred Peabody, who was part owner and supercargo, John Beadle, Jr., Dennis Rideout, Geo. R. Buffum, Geo. W. Kenny, and Jona. Nichols, of Salem, and J. H. Parker, of Boston.

The "Eliza" was the first vessel from Massachusetts fitted expressly for California with such a cargo, although Capt. Eagleston had actually cleared the brig "Mary & Ellen" for the Sandwich Islands *via* California, and sailed Oct. 28, changing his first destination on account of the

fever having set in. The circumstances of the sailing of the "Eliza" were vividly narrated, including the singing of the famous California ditty, with the refrain:—

"Oh! California! That's the land for me!

I'm going to Sacramento with my wash-bowl on my knee—"

composed by Mr. Jonathan Nichols, well remembered as a humorist of rare poetical and musical talent.

The "Eliza" arrived at San Francisco, June 1, 1849, after a passage of one hundred and sixty days, landing at a wharf forty feet long, the only one in the place. They afterward took the barque up the river to Sacramento, paying a pilotage of one thousand, seven hundred and twenty-five dollars for one hundred and twenty miles, the feat having been successfully performed in six days by the best pilot upon the river. The vessel was for a long time used as a store house, boarding house, wharf, etc. Mr. Peabody traced the gradual rise and growth of the city, the prevalence of lynch law, the custom which had grown up of disregarding the Sabbath, the gambling places, the rough ways, and the disposition of everybody to do something in the way of work to make money, regardless of previous social position.

Mr. Peabody gave some very interesting details respecting the disposal of the cargo and the prices then prevailing. In one instance the sum of eighty-five dollars was paid for a bag of onions (two bushels) which passed through his hands.

Mr. Peabody's knowledge of the development and growth of business was of necessity closely connected with his personal experience in the house of Flint, Peabody & Co., begun Dec. 1, 1850. The trade was pursued with energy, and three vessels, sent out by Capt. Bertram, arrived in the spring of that year. Capt. Perkins sailed for home in June, 1850, and was the first to

verify the song about returning with "a pocket full of rocks."

At about this time the need of quick passages and clipper ships became apparent. In September, 1850, a contract was made with East Boston parties to build a clipper of eleven hundred tons, and she was built, rigged and fitted so as to sail on Jan. 10 following, with a full cargo. She was one of the Glidden & Williams line, and the freight was one dollar per foot. She was named for Capt. John Bertram, who had manifested so much energy and spirit in this new trade. The croakers said the vessel was "thrown together," and would not last long; but she was sold eighteen years ago and has been running ever since. On the 12th of last month she was in New York, and the captain, her present owner, wrote to a gentleman in this city, asking for a portrait of Capt. Bertram to hang in her cabin. This was the first clipper built for the California trade; but she was soon followed by the "Witch of the Wave" and four others, averaging fifteen hundred tons each.

In 1853, Messrs. Bertram and others, with Flint, Peabody & Co., established the ice trade; but afterwards this article was introduced from Sitka (Russia) at lower cost than from Boston, and so this trade was destroyed.

In June, 1851, a great fire occurred, destroying property to the amount of four million dollars, and burning out Messrs. Flint, Peabody & Co., who lost heavily, having no insurance.

As illustrating the changes which have taken place in the commerce of San Francisco, the San Francisco almanac for 1859 gives a statement of the amount paid as freight to, and the number of tons of cargo carried by, and the vessels consigned to, a single house, Messrs. Flint, Peabody, & Co., agents for Messrs. Glidden & Williams' line between Boston and California, commencing with the

arrival of the first ship of that line, the J. Bertram. During six years there were two hundred and seven ships, three hundred and forty-five thousand, three hundred and ninety-eight tons of goods—the amount of freight being \$5,965,802.14. In one year, four ships arrived in a single month. In 1859 Messrs. Flint, Peabody & Co. received a full cargo of flour from Boston, six thousand, five hundred barrels, which paid a fair freight. In 1869, during the six months from July to December 31, the shipments *from* San Francisco of wheat and flour were equal to one million, six hundred thousand barrels. The same year the wool clip of California was fifteen million pounds, all of fine quality. The value and destination of treasure shipped from San Francisco in sixteen years, from 1854 to 1869, are as follows:—

Eastern ports,	\$462,088,066
England,	167,703,292
China,	68,050,250
Panama,	9,053,526
Other ports,	17,598,824
	<hr/>
	\$724,493,958

The duties on imports in 1859 were \$8,339,384.14. The value of mining stocks sold at the broker's board at San Francisco the same year was thirty millions. During the past year only two ships loaded in Boston for San Francisco.

In 1854 the amount of gold mined had been \$15,000,000; sixteen years later, it had increased to nearly \$725,000,000.

In 1859, sixty-five hundred barrels of flour were *imported* into San Francisco from Boston; in 1869, wheat and flour equivalent to one million, six hundred thousand barrels were *exported* from San Francisco, and in 1873 the wheat crop of California was equal to eight million barrels of flour.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 6.

SALEM, MASS., FEB., 1874.

NO. 2.

One Dollar a Year in Advance. 10 Cents a Single Copy.

REGULAR MEETING, MONDAY, JAN. 19, 1874.

[*Continued.*]

MR. JOHN ROBINSON, after expressing his pleasure at the reading of the foregoing paper, moved that the thanks of the Institute be presented to Mr. Peabody, and that a copy be requested for printing in the Publications of the Institute—adopted.

MR. F. W. PUTNAM followed, and alluded to the sailing of the barque "Eliza" in 1848, and his presence on the wharf on the interesting occasion, he being then a boy and entering into all the enthusiasm of the crowd that had there assembled, and said that he had listened with great interest to the paper by Mr. Peabody, from its bearings on archæological facts. Here was a case illustrating the sudden rise of numerous and large towns, embracing extensive works, during his own boyhood, and in less than a quarter of a century many of their well

known and thriving towns and settlements had been deserted and left to decay; the agencies of nature had been at work, and now the sites of many once extensive mining towns could only be made out by researches similar to those by which prehistoric cities were re-discovered. Such facts should certainly teach us to be careful in our deductions regarding the time required for the rise and fall of more ancient cities.

After remarking on the older and prehistoric races of men that had once inhabited our country, he alluded to the probably more recent Indian race found in New England at the time of its settlement by our forefathers, and passing in review some of the more ancient relics from the graves of the departed race, he exhibited a small collection of articles and two human skulls which he considered as possessing great interest in connecting the past with the present, and as illustrating the transition period in this country, when people of the stone age were brought suddenly face to face with the highest civilized race.

The collection referred to consisted of two well preserved Indian skulls, two fish spears cut out of bone, quite a number of shell beads, or wampum, a pair of iron scissors very much rusted and corroded, and a brass handled pocket knife of very old style. These had all been found in a few Indian graves that had been discovered in digging away a gravel hill at Saugus, on the farm of Joseph Ballard, Esq., who presented them to the Institute. The association of the various articles found in the graves shows that the habit of depositing the choice possessions of the departed with the body in the grave was continued after the Indians had come in contact with the whites.

Mr. Putnam then alluded to the probably universal

custom with uncivilized races, of depositing articles of various kinds in the grave with the body, or of making offerings at the grave, a custom that, more than all others, has enabled us to discover so much in the history of what would otherwise be indeed the lost races of the world; and he thought that our own tender offerings of flowers, at the graves of our loved and gone, were but a civilized method of expressing the same feeling that induced the savage and barbarian to place with the body the articles that had been cherished while living, or to offer sacrifices at the grave. Though with the savage the cause of the act is to provide for the future and unknown life, while with us it is a tribute to the life that has passed.

The SECRETARY spoke of the good condition and extent of the continental paper currency in the rooms of the Institute, and mentioned that the exchange of specimens which he was arranging with William S. Vaux, Esq., of Philadelphia, if consummated, would add very materially to its interest and value. He moreover solicited contributions to this department of our collections while the same may be found in many of our old houses before being irrevocably lost.

Harriet E. Carlton, Frank N. Chapman, Andrew Fitz, Horace S. Perkins, Octavius B. Shreve, John P. Tilton, all of Salem, and Albert S. Rowell, of Lynn, were elected resident members.

REGULAR MEETING, MONDAY, FEB. 2, 1874.

MEETING this evening at seven and one-half o'clock.
The PRESIDENT in the chair. Records read.

The SECRETARY announced the following correspondence :—

From A. A. Agge, Jan. 22; Mary J. Safford Blake, Boston, Jan. 26; E. P. Boon, New York, Jan. 20; Francis N. Chapman, Jan. 28; Andrew Fitz, Jan. 20; G. L. Gleason, Jan. 20, 29; James J. H. Gregory, Marblehead, Jan. 27; Edward W. Hall, Waterville, Maine, Jan. 24; O. B. Shreve, Jan. 24; A. A. Scott, Saugus, Jan. 28; Walter P. Willett, New York, Jan. 19; Boston Society of Natural History, Jan. 22; Buffalo Historical Society, Jan. 26; New York Mercantile Library Association, Jan. 28; New England Historic-Genealogical Society, Jan. 27.

THE LIBRARIAN reported the following additions :—

By Donation.

- APPLETON, FRANCIS H., of Boston. Bulletin of the Bussey Institution, 1874.
BUSWELL, E. W., of Boston. Transactions of the Mass. Horticultural Society for 1873.
CUTTER, ABRAM E., of Charlestown, Mass. Annual Report of the School Committee of Charlestown for 1873.
FITTS, JAMES H., of Topsfield. Manual of the Congregational Church in West Boylston, by donor. Genealogy of the Pitts or Fitz Family in America, by donor.
HANAFORD, P. A., of New Haven, Conn. Historical Sketch of the First Universalist Church and Society in New Haven. 1873. Constitution, By-laws and Register of the First Universalist Church in New Haven. 1874.
HOLMES, JOHN C., of Detroit, Mich. Second Annual Report of the Michigan State Pomological Society for 1872. 1 vol. 8vo. Lansing, 1873.
PACKARD, A. S., Jr. Our Common Insects, by donor. 1 vol. 12mo. Salem, 1873. Catalogue of the Phalanidae of California. No. 2. Boston, 1874.
SEVENTH-DAY ADVENTIST TRACT SOCIETY OF NEW ENGLAND. The Constitutional Amendment, a Discussion. 1 vol. 12mo. Battle Creek, Mich. 1873.
STEVENS, CAROLINE. Sermons at Salem on the Death of Gen. Geo. Washington. 1 vol. 8vo.
TUCKER, JONA. The Autobiography of an Octogenarian, by D. N. Prime. 1 vol. 12mo.
UPTON, E. W., of Peabody. The Upton Memorial by John A. Vinton. 1 vol. 8vo. Bath, Me. 1871.
UPTON, JAMES. The Upton Memorial, by John A. Vinton. 1 vol. 8vo. Bath, Me. 1871.
U. S. PATENT OFFICE. Official Gazette for Jan. 20, 27, 1874.
WEBBER, CHAS. H. Laws of North Carolina. 1797.
WHEATLAND, S. G. American State Papers. 8 vols. 8vo. Adjutant General's Report for 1863, 1864. 2 vols. 8vo. Railroad Returns, 1861. 1 vol. 8vo. Manual for the General Court, 1861, 1862, 1867. 3 vols. 12mo. Twenty-First Annual Report of the Board of Education. 1 vol. 8vo. Salem Directory, 1859. 1 vol. 12mo. Boston Almanac, 1858. 1 vol. 16mo. Miscellaneous pamphlets, 205.

By Exchange.

BOSTON PUBLIC LIBRARY. Bulletin of the, for Dec., 1867, Feb., 1868, Dec., 1869. Second and Fourth Annual Reports of the, 1854, 1856.

ENTOMOLOGISCHEN VEREINE ZU STETTIN. Entomologische Zeitung. Jahrg 34. I vol. 8vo. 1873.

KÖNIGLIGA VETENSKAPSSOCIETETEN ZU UPSALA. Nova Acta, Vol. viii. Fasc. ii, 1873. Bulletin Météorologique Mensuel, Vol. iv, Nos. 1-12, 1871-72. Vol. v, Nos. 1-6, 1872-73.

KÖNIGLICHEN AKADEMIE GEMEINNÜTZIGER WISSENSCHAFTEN ZU ERFURT. Jahrbücher, Neue Folge, Heft. vii. 1873. I vol. 8vo.

LITERARY AND PHILOSOPHICAL SOCIETY OF LIVERPOOL. Proceedings, No. xxvii, 1872-73. I vol. 8vo. 1873.

NATURHISTORISCHER VEREIN DER PREUSSISCHEN RHEINLANDE UND WESTPHALENS IN BONN. Verhandlungen, Jahrg. 29, 30. 3d Folge, ix and x. Bd., 1872-73. 2 vols. 8vo.

NATURWISSENSCHAFTLICHEN GESELLSCHAFT ZU CHEMNITZ. Vierter Bericht, 1871-72.

NEW ENGLAND HISTORIC-GENEALOGICAL SOCIETY. Proceedings of the, at the Annual Meeting, Jan. 7, 1874.

NEW YORK LYCEUM OF NATURAL HISTORY. Annals, Nos. 6, 7, 8, 9. 1872-1873.

PHYSIKALISCH-MEDICINISCHE GESELLSCHAFT IN WÜRZBURG. Verhandlungen. Neue Folge, Bd. iv, Heft. 2-4. 1873. Bd. v, Heft 1, 2, 3, 1873.

PUBLIC LIBRARY OF INDIANAPOLIS. Catalogue of the, for 1873. I vol. 8vo.

SENCKENBERGISCHEM NATURFORSCHENDE GESELLSCHAFT ZU FRANKFURT A M. Bericht, 1872-73. I vol. 8vo.

SOCIÉTÉ DE PHYSIQUE ET D' HISTOIRE NATURELLE, GENÈVE. Mémoires, Tome xxiii. I vol. 4to.

PUBLISHERS. American Journal of Science. American Naturalist. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Hardwicke's Science Gossip. Haverhill Gazette. Historical Magazine. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Sailor's Magazine and Seaman's Friend. Salem Post. Salem Observer.

John E. Lyon, of Salem, was elected a resident member.

Richard A. Proctor, of London, England, was elected a corresponding member.

The Secretary, Mr. JOHN ROBINSON, stated that the donation of paper money from W. S. Vaux, Esq., of Philadelphia, had been arranged in the collection of the Institute.

He gave a very interesting account of the continental

paper currency, and alluded especially to the recent very valuable addition of some one hundred and fifty specimens of the currency of the colonies of New Jersey, Pennsylvania, Delaware and Maryland, and also of the United States issue. Many of these specimens are very rare and interesting.

Mr. F. W. PUTNAM gave an account of the Blackfish shot in Salem harbor in October last by Capt. Charles Osgood, and now on exhibition. He also exhibited a stereoscopic view of the animal, and stated that a large photograph was to be taken.

Unless this species proves on comparison to be the European *Globiocephalus melas*, it will be known under the name of *G. intermedius*, given it by Dr. Harlan,* who first described the American animal from a specimen captured in our harbor in September, 1823. Dr. Harlan's specimen was sixteen and one-half feet in length, and his description applies to the present specimen, though the figure which he gives is very poor and would mislead in several particulars.

Mr. Putnam then gave an account of the several families of cetaceans and the general structure of the order, and stated that while the blackfish was more closely united to the grampus and dolphins than to the large and true whales, yet, in the general acceptance of the term, the blackfish was a whale. He then gave the following notes, taken soon after the specimen was captured.

Head very blunt. A slight protuberance of the upper jaw beyond a line dropped from the top of head, which is slightly rounded. Line of back to the dorsal fin, straight; posterior to the fin the outline is slightly descending to

*Journal Academy Natural Sciences of Philadelphia, vol. vi, part i, p. 51, pl. 1, 3 (1829).

near the tail fin, where it drops suddenly to the base of the fin. The abdominal outline is flat from tip of under jaw to the pectorals, thence slightly bulging for the length of the pectorals, thence ascending to the tail fin. Body rounded; sides of head and tail compressed. Jaws nearly straight. The teeth in front of jaws had been dropped, leaving but ten teeth on one side of upper jaw and nine on the other, while the under jaw had ten on one side and eight on the other. The teeth small and bluntly pointed. Upper jaw fourteen inches in length; under thirteen inches. Pectoral fins long, narrow and pointed. Blow hole in centre of top of the head, directly over the eye; width of the opening three and three-fourths inches.

Eye three and one-half inches distant from angle of mouth, small, one and one-quarter inches long and one-half an inch in transverse diameter. Height of head from tip of upper jaw to top of forehead, one foot. Distance from forehead to blow hole, one foot, seven inches; from blow hole to base of dorsal fin, two feet, nine and one-half inches; length of dorsal fin, three feet, one inch; distance from anterior base of dorsal to its point, measured along the curve of the edge of the fin, two feet, eleven inches; distance between the same points measured across the fin, two feet, eight inches; from the point of the fin to its posterior base, measured along its back edge, one foot, four inches, and on a vertical line, one foot. Distance from anterior base of dorsal to base of tail fin, nine feet; to tip of flukes, eight inches more. Expanse of flukes, three feet, four inches. Distance from tip of under jaw to anterior base of pectoral fin, two feet, two inches; width of pectoral at base, eleven inches; at about its anterior third, eleven inches; length of pectoral, four feet. Distance from tip of under jaw to base of penis,

seven feet, six inches; to anus, nine feet, one inch; to centre of flukes, fourteen feet, two and one-half inches. Total length measured over the surface of the body, fourteen feet, five inches. Penis slender, six inches long, enclosed in a sheath. Greatest circumference of body at anterior base of dorsal, six feet, eleven inches. Circumference at penis five feet, ten inches; at anus, four feet, eight inches. Distance between pectorals, one foot, two and one-half inches.

Color lustrous black above, lighter on sides, under parts with a broad white band, heart-shaped forwards on the throat, extending backwards, gradually narrowing to the anus.

The stomach contained a number of bones of codfishes and several large pieces of kelp. The intestine measured one hundred and eighty-nine feet in length.

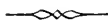
Mr. C. H. HIGBEE, of the curators on the Arts, reported that arrangements had been made with Prof. Walter Smith, principal of the State Normal Art School in Boston, to deliver a lecture on "Art Studies" at the next meeting of the Institute, and that several persons had expressed great interest in this object and would aid in sustaining meetings for the discussion of subjects on art matters and contribute to occasional exhibitions of paintings, drawings and other specialties in this department, that may be held under the auspices of the Institute.

QUARTERLY MEETING, WEDNESDAY, FEB. 11, 1874.

MEETING this afternoon at three o'clock. The President in the chair.

William S. Vaux, of Philadelphia, was elected a corresponding member.

After the transaction of the ordinary business of the meeting, adjourned.



REGULAR MEETING, MONDAY, FEB. 16, 1874.

The meeting was devoted to a lecture by the Rev. Charles Kingsley, the distinguished canon of Westminster, which was followed by a reception. This was the introductory lecture of the supplementary course of entertainments under the auspices of the Institute, and was Mr. Kingsley's first public lecture in America. He was introduced to the audience by Vice President D. B. HAGAR, who said:—

LADIES AND GENTLEMEN :

I am sure that it is with no common pleasure that we welcome to our platform, to-night, the distinguished lecturer. We welcome him not only as one whose works have been read by us with delight, but as our personal friend ; for surely he is a friend to us who has contributed so much to us, and we, from admiring gratitude, certainly are friends of his. I have the honor of introducing to you Charles Kingsley, Canon of Westminster, and Chaplain in ordinary to Her Majesty the Queen.

Mr. KINGSLEY, after a few prefatory remarks, proceeded to discourse of Westminster Abbey; from what he

termed a puritan and international standpoint. His presentation of the subject was masterly, and one soon forgot the peculiar style of delivery in the great thoughts, the glowing periods, and the inspiring earnestness of the speaker.

THE RECEPTION.

At the close of the lecture a reception was given in the rooms of the Institute, where many ladies and gentlemen were assembled to greet and welcome the lecturer. After a period of social intercourse the company were invited to partake of refreshments which were provided in Cassell's usual style; a profusion of flowers from the green-houses of Francis Putnam being conspicuous ornaments gracing the tables. The divine blessing was invoked by Rev. E. S. Atwood, and at the conclusion of the feast, the President of the Institute, HENRY WHEATLAND, addressed the company as follows:—

LADIES AND GENTLEMEN:

We are assembled to welcome the distinguished gentleman, whose eloquent lecture we have listened to with such pleasure this evening. And it is highly fitting, sir, that Salem should extend to you a cordial welcome—the oldest municipality in the colony of Massachusetts; settled in 1626 by Roger Conant and his companions; the sites of several of their dwellings are passed in going from this place to the railroad stations; many of their descendants are daily in our streets, and some are with us this evening. Several of the sons of Salem have, in the past, as well as recently, had peculiar relations with the mother country. Two instances may be cited: In 1638 Emmanuel Downing of the Inner Temple, London, came to Salem, and had his residence on this spot; his son George, a lad of fourteen summers, was fitting, under the

tuition of the Rev. John Fisk, for the college, where he graduated in 1642, and is the first on the roll of the Salem alumni of Harvard. Afterwards, he went to England, entered the service of Cromwell, became his Minister to the Hague, which office he retained after the restoration, and, from Charles II, received a baronetcy. Marrying Frances, sister of the first Earl of Carlisle, he became united with "the blood of all the Howards," and consequently took a high position among the leading families of the realm. Two centuries pass; another son of old Salem, born in that part now within the township of Peabody, goes to London, engages in business, is eminently successful, distributes his money by millions in founding a noble charity in London and institutions in this country for the promotion of education and general information among the people, and has tendered to him by the Queen a baronetcy, which he respectfully declines, preferring to remain an American citizen. After his death, two nations, by their representatives, two state governments, several municipalities and various literary and scientific societies and other institutions, united in doing honor to his memory. A parallel probably cannot be found on the pages of history. His remains for a short time were deposited in your Westminster Abbey, but now rest in yonder cemetery, within the limits of this city, and in the immediate proximity to the place of his birth and all the associations of his early life.

Notwithstanding, sir, this building and the portraits, books and various relics therein deposited have each a history, and many of the incidents connected therewith have an important historical value, yet the site on which it is erected is not devoid of interest, and is noted not only as the place where Downing lived in early life, but where Prescott first saw the light of day; and in the

immediate vicinity, a few rods in one direction, is the birthplace of Bowditch, and about the same distance in another that of Hawthorne—three brilliant constellations in the fields of history, science and letters.

Aside from these considerations there is one, which cannot be passed over in silence, that should induce us on this occasion to tender to you our most grateful acknowledgment, and to express to you the pleasure we all feel in having you as our guest, this evening. The nucleus of the Institute, around which cluster the various departments, as now constituted, was the Natural History Society, organized some forty years since by a few persons, some scarcely out of their teens, devoted and humble workers in the cause of natural history, and desirous that a taste for its study should be diffused throughout the community, and that a complete record of all the natural productions of this section of our state should be made and printed. Many of these early pioneers have now passed to the better land; a few remain—a connecting link between those days of small things and the present. Your writings, having contributed so much to the promotion of those objects which we have so long been striving to accomplish, will always make us your debtor, and for which we cannot cease to extend grateful acknowledgments.

Dr. Wheatland next called up Mayor COGSWELL, who said :—

It gives me great pleasure, Mr. President, to unite with you in doing honor to the distinguished guest of this occasion, and in behalf of the inhabitants, and in their name, to bid him welcome to the city of Salem, where he comes not as a stranger, but only to find that here as else-

where his fame had long since preceded him. Whether he comes as the peerless divine, the vigorous, gifted and sympathetic author, or, better still, as the man of broad and generous sympathies with all struggling for a higher, better level of humanity, he is alike welcome to our hospitality and good cheer. That he has chosen this city in which first to present himself in person to the American public is a matter of congratulation for us, and I feel that I can assure him a cordial welcome wherever he may go; and that his experiences in this country may be as agreeable and useful as his recital of them hereafter will be frank and honest is the best wish I can express for him or for you who have come to know him. Again, sir, I bid him welcome to Salem.

Mr. KINGSLEY replied as follows :—

I thank you and the gentlemen who have just sat down for all your kindness. I will not trespass on you with a long speech. I think you have heard enough of my voice this evening, but I cannot sit down without expressing the conviction which has already ripened, that my stay in America is to be, by the blessing of God, a very pleasant one. I have met with nothing but kindness ever since I touched the shore of this land. My highest desire is to be able to interest such Americans as may listen to what I have to say, and that at some time upon the other side of the water I may meet some of those who have been my kind hosts here, and try to repay in my humble way the obligation under which they have laid me. I do feel it an honor to me that Salem should have been the point at which I made my début in this new world, and I shall always cherish most grateful recollections of that which has to-night brought me to feel that this is one of the great little spots of the earth. Ladies and gentlemen of

Salem, I thank you most heartily for your hospitality, and I wish your city may prosper for many years to come as it has prospered already.

The President of the Massachusetts Senate, Hon. GEORGE B. LORING, was next called upon, and made an eloquent response, concluding with the sentiment:—

HAWTHORNE and KINGSLEY, the two men of thought, culture and feeling whose duty and privilege it has been to teach Englishmen and Americans that they are of one nationality.

Other interesting addresses were delivered by Vice President F. W. Putnam, Rev. E. C. Bolles, Vice President A. C. Goodell, Jr., and Rev. E. S. Atwood, who were successively called upon, and the company separated at a seasonable hour, after an evening of great intellectual and social enjoyment.

After the reception the meeting was adjourned to Friday evening, Feb. 27, at 7.30 o'clock.



ADJOURNED MEETING, FRIDAY, FEB. 27, 1874.

MEETING was held this evening, according to adjournment, at 7.30 o'clock. The PRESIDENT in the chair. Records read.

Henry J. Pratt, Abraham Towle, Nathan P. Cutler, Anna C. Cutler, all of Salem, were elected resident members.

Stephen M. Allen, of Boston, was elected a corresponding member.

Prof. WALTER SMITH, of the State Normal Art School, of Boston, occupied the hour of the meeting with some interesting remarks on "Art Studies." The subject was treated under four heads. First, art museums. In this connection he explained their advantages in any city, giving as it would an opportunity to those who have artistic ability to display their own productions, or gratifying the people by exhibiting the art treasures of the favored few. He advocated the collection of antiquities, as a great desire was expressed by many people to know what had been going on in past ages in that particular line of enquiry. A museum of antiquities not only aided this interest, but enabled one to see the progress of manufacture. A picture gallery in connection was of course a most valuable adjunct. Secondly, occasional exhibitions of specialties aided very much in awakening a general interest in this object. Thirdly, a studio, with the requisite facilities, where members can pursue their work under the most favorable advantages. Fourth, lectures and discussions.

Mr. Smith, in the course of his instructive lecture, gave an account of some of the art schools in England, especially of that at South Kensington. He showed the important and intimate connection which exists between art and the great industries of a country, illustrating the subject by a reference to the advance made, of late years, in England, in various departments of labor.

Mr. Smith also alluded to the subject of drawing as a common school study. He strongly favored the teaching of drawing, as affording a useful preparation for many industrial arts, and as being, therefore, of great practical use.

The lecture afforded much valuable instruction, and was highly appreciated.

The PRESIDENT expressed his pleasure in listening to the communication of Mr. Smith, and suggested some plans by which the objects proposed could be accomplished ere long; it would require, however, the untiring industry and perseverance of some two or three interested and zealous persons, to produce the desired results. He mentioned that the adjoining estate of the late Col. F. Peabody was for sale, and spoke of the desirableness to obtain the same; this, in connection with the Plummer Hall estate, would afford a fine site for the erection of suitable buildings for scientific and art museums, libraries, reading and lecture rooms, and for other purposes.

Vice President F. W. PUTNAM followed, and expressed his interest in this movement. He alluded to the success that had attended the department of Natural History, and considered that a like success would undoubtedly attend the art department if the same labor should be given to the furtherance of that object.

Vice President D. B. HAGAR, after some preliminary remarks, moved that the thanks of the Institute be tendered to Prof. Smith for the interesting and valuable suggestions which he had presented to our consideration this evening on the subject of art studies.

Unanimously adopted.

Mr. Hagar also moved that the subject that had been introduced this evening be continued at the meeting of the Institute on Monday evening, March 16.

Adjourned.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 6. SALEM, MASS., MARCH, 1874. No. 3.

One Dollar a Year in Advance. 10 Cents a Single Copy.

REGULAR MEETING, MONDAY, MARCH 2, 1874.

MEETING this evening at seven and one-half o'clock.
The PRESIDENT in the chair. Records read.

The SECRETARY announced the following correspondence:—

From Charles H. Bell, Exeter, N. H., March 2; John Batchelder, Lynn, Feb. 10; Phillips Brooks, Boston, Feb. 16; Charles T. Brooks, Newport, R. I., Feb. 14; D. P. Corey, Boston, Feb. 27; W. C. Endicott, Feb. 16; J. H. Fitts, Topsfield, Feb. 5; George L. Gleason, Manchester, Feb. 2, 7, 9, 23; William Graves, Newburyport, Feb. 7; Byron Groce, Peabody, Feb. 19, 24; J. C. Holmes, Detroit, Mich., Feb. 6; M. L. Huntley, South Lancaster, Feb. 12; Robert Manning, Feb.; J. Munsell, Albany, N. Y., Feb. 10; Daniel A. Rogers, Chicago, Ill., Feb. 28; N. A. Very, Feb. 16; Rose S. Whiting, Boston Highlands, Feb. 6, 10, 20; Naturforschende Gesellschaft in Emden, Oct. 15; Société de Physique et D' Histoire Naturelle de Genève, Sept. 15; Society of Antiquaries of London, Feb. 3; Société des Sciences Naturelles de Neuchâtel, Oct. 2; New York State Library, Feb. 9; New York Genealogical and Biographical Society, Feb. 11; New York Historical Society, Jan. 26; Société Royale des Sciences à Upsal, Nov.

The LIBRARIAN reported the following additions:—

History of Lewis County, by F. B. Hough. 1 vol. 8vo. Albany, 1860. Gazetteer of the State of New York, by F. B. Hough. 1 vol. 8vo. 1872. Memoria's of the
ESSEX INST. BULLETIN. vi 3

Death of Washington. 2 vols. Svo. Siege of Charlestown, 1780. 1 vol. Svo. Siege of Savannah, 1779. 1 vol. Svo. History of the Bills of Credit, by J. H. Hitecock. 8vo pamph.

By Donation.

APPLETON, W. S., of Boston. A Rough Sketch of the Appleton Genealogy. 1873
 BUSWELL, E. W., of Boston. Schedule of Prizes offered by the Mass. Horticultural Society for 1874.
 GREEN, S. A., of Boston. Miscellaneous pamphlets, 15.
 HAWKINS, DEXTER A. Report on Compulsory Education. Dec. 30, 1873.
 HOUGH, F. B., of Lowville, N. Y. Meteorology of New York, 1850-1863. 1 vol. 4to. Transactions of the American Institute, 1853, 1867. 2 vols. 8vo. Transactions of the New York State Agricultural Society, 1866, 1867. 3 vols. Svo. Assembly Documents, 1843-44. 2 vols. 8vo. Digest of Claims, 1810-1858. 1 vol. Svo. William's Register, 1831, 1835, 1843. 3 vols. 12mo. Manual for the Legislature of New York, 1854, 1858, 1871. 3 vols. 12mo. Report of the Secretary of State on the Criminal Statistics of New York, 1854, 1857. 2 vols. 8vo. Report of the Canal Commissioners of New York, 1860. 1 vol. 8vo. Buffalo City Directory, 1855. 1 vol. 8vo. Miscellaneous pamphlets, 32.
 LEE, JOHN C. Commercial Bulletin for Dec. 30, 1873. Jan. 3, 10, 17, 1874.
 NORTHEED, W. D. British and American Register for 1774. 1 vol. 16mo.
 PERKINS, HENRY W. Report of the Commissioners on the Great Fire in Boston. 1 vol. 8vo. Boston. 1873.
 U. S. PATENT OFFICE. Official Gazette for Dec. 23, 30, 1873.

By Exchange.

AMERICAN ACADEMY OF ARTS AND SCIENCES. Proceedings of the. Vol. iii. May, 1868-May, 1873. Boston, 1873.
 BELFAST NATURALIST'S FIELD CLUB. Tenth Annual Report of the, 1872-1873.
 CROSSE ET FISCHER. Journal de Conchyliologie, tome xiii. Oct. 1873.
 INSTITUT HISTORIQUE IN PARIS. L' Investigateur 39 Année. Mai-Juin. 1873.
 L' INSTITUT ROYAL GRAND-DUCHAL DE LUXEMBOURG. Publications, tome xiii. 1873. 8vo.
 NATURWISSENSCHAFTLICHEN GESELLSCHAFT ZU CHEMNITZ. Bericht, 1871-1872.
 NEW ENGLAND HISTORIC-GENEALOGICAL SOCIETY. The Historical and Genealogical Register, Jan.-Mch., 1874.
 SOCIÉTÉ D'ACCLIMATION IN PARIS. Bulletin Mensuel, tome x, 2me série, Nos. 6, 7, 8, 9, 1873.
 SOCIÉTÉ D'ANTHROPOLOGIE IN PARIS. Bulletins, tomes vii, viii, 1872-73. 2 vols. 8vo.
 SOCIÉTÉ NATIONALE DES SCIENCES NATURELLES IN CHERBOURG. Memoires, tome vii, 1873. 1 vol. 8vo. Catalogue de la Bibliothèque. Dec. 31, 1872.
 PUBLISHERS. American Naturalist. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Hardwick's Science Gossip. Haverhill Gazette. Historical Magazine. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Salem Post. Salem Observer. Silliman's Journal. The Commonwealth.

Adelaide M. Putnam, S. Elizabeth Hunt and Mary E. West, all of Salem, were duly elected resident members.

The Secretary, Mr. JOHN ROBINSON, exhibited two finely grown plants from Mr. David M. Balch, the *Amaryllis venusta*, having ten flowers on three flower stalks from one bulb; and the *Imantophyllum miniatum* twelve flowers on one stalk; also a forced *Trillium grandiflorum* which had flowered twice from each bulb.

The paper of the evening was communicated by Hon. JAMES KIMBALL, consisting of notes from the diary of his grandfather, William Russell, prior to and chiefly during the time he was confined in Mill Prison, England, in the war of the Revolution. The extracts read were very interesting, and embodied a vast amount of information relative to the character and condition of the prison, the treatment of the prisoners, when and where captured, their places of residence, previous occupation, etc.

After the reading, remarks were made by several persons, a vote of thanks passed, and a copy was requested for the publications of the Institute.

The paper is a valuable contribution to the history of the period of the revolution, and will be printed in the twelfth volume of the "Historical Collections of the Institute."

Adjourned.

REGULAR MEETING, MONDAY, MARCH 16, 1874.

Meeting this evening at 7.30 o'clock. The PRESIDENT in the chair. Records read.

The SECRETARY announced the following correspondence:—

From Stephen M. Allen, Boston, March 3; Edwin Bicknell, Cambridge, March 2; E. P. Boon, New York, March 5; Nehemiah Cleaveland, Westport, Conn., March 9; A. C. Goodell, Jr., March 5; Daniel A. Rogers, Chicago, Ill., March 7; J. Sabin & Sons, New York, March; Leeds Philosophical and Literary Society, Feb. 26.

The LIBRARIAN reported the following additions:—

By Donation.

BAKER, DR. H. B., of Lansing, Mich. First, Second, Third and Fourth Registration Report of Michigan, 1867-8, 1869, 1870. 3 vols. 12mo.

CROSS, H. J. Genealogy of the Wells Family, of Wells, Me. Milwaukee, 1874.
CUTLER, ABRAM E., of Charlestown, Mass. Annual Report of the School Committee for 1873. Address of Jona. Stone to the City Council, Jan. 6, 1873. Farewell Sermon by Charles E. Grinnell, Dec. 28, 1873.

FORBES, R. B. Lifeboats, Projectiles, and other Means for Saving Life. By donor. 1872.

GEORGE, W. S., of Lansing, Mich. Directory of Lansing for 1873. 1 vol. 8vo. Directory of Saginaw Valley for 1874. 1 vol. 8vo. Journal of the Proceedings of the Convention of Delegates of the State of Michigan. Sept. 26, 1836.

GREEN, S. A., of Boston. Miscellaneous pamphlets, 28.

KIMBALL, JAMES. Journal and Documents of the Valuation Committee, 1860. 1 vol. 8vo. Annual Report of the Board of State Charities, 1865. 1 vol. 8vo. Agriculture of Massachusetts, 1856. 1 vol. 8vo. Miscellaneous pamphlets, 7.

MACK, ESTHER C. Dwight's Journal of Music. 4to. 20 volumes in 10. Boston.
OSGOOD, ALFRED, of Newburyport, Mass. Annual Report of the School Committee of Newburyport for 1873. Eighteenth Annual Report of the Directors of the Public Library of Newburyport. 1873. The Mayor's Address and the Treasurer's Annual Report, etc. 1873.

PUTNAM, GEO. G. American Almanac for 1830, 1832. 2 vols. 12mo.

SMITH, NATH'L, Pembroke. Annual Report of the School Committee of the Town of Pembroke for 1873-74.

STONE, E. M., of Providence, R. I. Thirty-Second Annual Report of the Ministry at Large. Feb. 1, 1874.

STONE, MARY O. The Nation. 52 nos.

SUTTON, W., Peabody. Records of the State of Rhode Island and Providence Plantations in New England, 1781-1792. 1 vol. 8vo.

TUTHILL, F. H., Kalamazoo, Mich. History and Directory of Kalamazoo for 1869-70. 2 vols. 8vo.

U. S. NAVAL OBSERVATORY OF WASHINGTON, D. C. Astronomical and Meteorological Observations for 1871. 1 vol. 4to. Washington, 1873.

U. S. PATENT OFFICE of Washington, D. C. Official Gazette for Feb. 17, 1871.

WHITING, R. S., Boston. Memoir of Rev. Samuel Whiting, D. D. By W. G. Whiting. 1 vol. 8vo. Boston, 1873.

By Exchange.

AMERICAN PHILOSOPHICAL SOCIETY OF PHILADELPHIA. Proceedings of, June-Dec., 1873. No. 91. 8vo pamph.

PUBLISHERS. American Naturalist. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Salem Observer. Salem City Post. Silliman's Journal.

William W. Kellett of Peabody was duly elected a resident member.

Agreeably to the suggestion offered at the meeting on Feb. 27th, the evening was devoted to the discussion of subjects relating to art.

Mr. GEORGE M. WHITE gave a description of the various modes of engraving—an abstract of his remarks follows:—

COPPER-PLATE ENGRAVING.

THE art of engraving on copper and taking impressions from the engraved plates, is ascribed to a native of Florence, named Finiguerra, who flourished in the fifteenth century. He was a successful workman in an art then largely practised, namely, the engraving of church ornaments, vases, sword-blades, and other articles, and filling the engraved lines with a black composition of silver and lead. This was called working *in niello*, and had a very fine effect. One day Finiguerra wished to try the effect of an engraving he had been working upon, and for that purpose cast some melted sulphur into the hollows of the lines; on removing the sulphur he noticed that some dust and charcoal which had gathered in the engraved portion

of the plate gave an impression of his design. After this he tried the effect of moistened paper pressed down on the engraving with a roller, and met with complete success. For some time he used the discovery to make copies of his designs. Finally other engravers and goldsmiths penetrated his secret, and soon the important discovery was widely diffused.

Copper and steel-plate engraving, as now practised, is subdivided into five branches, viz., line, stipple, mezzotint, aquatint and etching. Pure line engraving is one of the most difficult and tedious methods used for the purpose of illustration, and has given place, of late years, to more expeditious and less costly modes of work. A plate of copper or steel, the latter metal being preferred on account of its greater durability, comes from the manufacturer ready for the engraver's use. The plates are prepared with a perfectly sound texture and even grain throughout, and the surface is perfectly smooth and very highly polished. For copper plates the price asked is about twenty-five cents per square inch, so that the first cost of the plate alone is sometimes a considerable amount. The engraver, having received the plate ready for use, must transfer to it a careful outline of the picture he proposes to engrave. To this end, the plate is first heated until it attains a sufficient uniform heat to melt white wax, a piece of which is rubbed over it, and allowed to spread in a thin layer till the whole surface is equally covered, after which the plate is left in a horizontal position, until the wax is cold. In the interval a careful tracing of the original design is made with black lead pencil upon thin tracing paper, and this is afterwards spread over the surface of the waxed plate, with the lead lines in contact with it, and of course reversed. The tracing being secured in this position, heavy pressure is

applied, which transfers the lead lines from the paper to the wax. The engraver now takes a fine steel point, and (the tracing paper being removed) goes over the subject lightly, so as to penetrate the wax, and touch the steel-plate. By this means a perfect and delicate outline is drawn upon the plate, and, the wax being melted off, the subject is ready to be proceeded with, and finished. The instrument used in line engraving is called the *graver*, or *burin*, and is made of highly tempered steel, ending in an unequal sized pyramidal point. This instrument is held in the hand at a small inclination to the plane of the copper, and is pushed forward in the direction required to cut the lines on the plate. As the *burin* cuts the line it raises on each side a ridge of metal, technically known as the *bur*. To remove this, the engraver has recourse to the *scraper*, a triangular instrument of steel about six inches long, and having the angles ground down to sharp cutting edges. After removing the *bur* he uses a third instrument, also of steel, called the *burnisher*, to soften down the lines, and remove accidental scratches from the plate. There are few mechanical inventions used in line engraving, for the engraver depends upon the *burin* only for his effects, and by the different depths, lengths, or widths of line he produces all the various lights or shades of the original picture. There are inventions, however, to lighten the labor of the line engraver, and where a series of parallel lines are wanted, in architectural subjects, or in skies, a ruling machine is substituted. Those engravers who work for reputation seldom employ these artificial helps, and the older engravers never used them, for they were not then invented.

Next to line engraving comes engraving in *stipple*, which is nearly as difficult as the first named art. It is used in representing the flesh in portraits, for delicate

transitions of light and shade, and for drapery, or in textile fabrics, such as silk, satin, or laces. In stipple engraving the effect is produced by the cutting of small dots, the shadows being made by increasing the number and size of the dots. This process is often combined with line engraving. Sometimes a small mallet is used to strike lightly upon the plate, and beat down the impressions to the right depth, producing the same effect as the use of the *burnisher* in line engraving.

Mezzotint engraving is a more recent invention than line, and the process is entirely different. A mezzotint plate prepared for a design presents a surface entirely roughened by minute indentations in the metal, and by a *bur* raised by the tool with which they are made. To lay a mezzotint ground the engraver uses an instrument called the *cradle*, a piece of properly tempered steel, with a spherical face cut into sharp points, and fitted to a handle, by which the pointed face is worked over the surface of the plate until the needed *bur* is obtained. A proof taken from the plate in this state would present an intensely black tint; if the slightest portion of the ground be scraped off it would be marked in the proof by a lighter tint, a pure white only being obtained by entirely removing the ground and burnishing the metal. The work of the artist, therefore, consists in availing himself of the nature of the ground to scrape out his picture from black to white, which is effected by lancet-shaped scrapers and burnishers of various forms and sizes. To prevent accidental encroachment upon portions of the ground desired to be kept black, the engraver touches such parts with a brush filled with asphaltum or india ink, removing it again when the work is sufficiently advanced to allow of it.

A plate for *aquatint* engraving is prepared by pouring

a solution of Burgundy pitch, or mastic made in alcohol, over the plate; the solution, when evaporated, leaves a granulated ground. A proof from a plate so prepared and subjected to the action of acid, would present under a lens the appearance of an elaborate network of lines. As the plate may have been more or less subjected to the action of the acid, these lines will be more or less deep and broad, and producing tints, in printing, from the faintest stain or wash of india ink, to black. To arrest the action of the acid at the proper moment, so as to secure certain gradations of tint by means of "stopping out" with an acid resisting varnish, and at the same time to give these tints their proper form, comprises the motive and effective application of aquatint.

Etching is peculiarly a painter's art, requiring less technical knowledge and more artistic capacity in the practitioner than any other branch of engraving. A plate is prepared for etching by rubbing the burnished surface with willow charcoal and water. The charcoal leaves an infinite number of fine lines or scratches in the plate, which show the same appearance in the proof as a delicate wash of india ink, and serve to tone down the obtrusive whiteness of the paper. After using charcoal the plate is heated to a temperature sufficient to melt a composition of white wax, Burgundy pitch and asphaltum, technically called the etching ground, which is rubbed over the plate in a thin, even coat and allowed to harden. The ground is then smoked to a dull, deep black, over the flame of a wax taper. The artist now prepares his design on thin paper, tracing the outline with soft red chalk; he then places the design face to the smoked surface of the plate, and again traces the outline of the subject with a sharp point of ivory or wood, and on removing the paper the chalk lines are transferred to the wax ground, re-

versed. An instrument is now used called the etching needle, to score the lines through the wax and lay bare the surface of the copper. The pressure used is just sufficient to remove the etching ground and slightly scratch the surface of the metal beneath. The artist works stroke by stroke, much the same as when drawing with a pen, only in this case every mark shows white on a black ground, just the reverse of pen drawing, and the deepest shades show as patches of white. After the drawing is completed the back of the plate is covered with a varnish and immersed in a bath composed of equal parts of nitric acid and water, the copper is attacked in those parts laid bare by the etching needle, and after a sufficient depth of line is obtained for the lightest parts, those portions are stopped out with varnish, and the plate is again bitten until the darkest shades are obtained.

To print well from copper or steel plates requires great care. The press used consists of two great rollers, between which travels a solid flat plate, called the bed, on which rests the plate. The copper-plate is first heated until it is as hot as the hand can bear, then it is inked all over with a *dabber* and some force is used to drive the ink well into the lines; next the whole of the superfluous ink is removed with a coarse muslin rag, and the palm of the hand, and the copper margin of the plate cleansed very carefully with whitening; having marked the place of the plate on a sheet of zinc, the printer lays it on the zinc in its measured place, and over it spreads a sheet of damp paper; over this he places a number of thicknesses of cloth, and the whole is forced between the rollers of the press; the pressure forces the paper into the lines of the engraving, and, removing the ink, produces the picture. Usually the first hundred impressions of a choice engraving are printed upon india paper, and are some-

times signed with the name of the artist; in this case they are called "autograph proofs," and are much more costly than an ordinary impression. After the artist proofs are printed it is customary to cut the artist's name in the right hand lower corner of the plate, while the engraver's name occupies the left hand portion, bringing them, of course, in just the opposite position in the printed proof; then another series of proofs are struck off, and called "proofs before the letter." Finally the title of the plate is engraved, and then the ordinary series of the plate is printed.

Mr. JAMES KIMBALL communicated a paper on the "Journal of Rev. Daniel Shute, D.D., chaplain in the expedition to Canada in 1758."

Referred to the committee on publications.

Vice President F. W. PUTNAM spoke of the Agassiz Memorial Fund, and urged the necessity of aiding, even if in a small way, the promotion of its objects.

The subject was referred to the curators of the Department of Natural History.

Vice President PUTNAM presented the following paper :

NOTES ON THE MAMMALS OF PORTIONS OF KANSAS,
COLORADO, WYOMING AND UTAH.

BY J. A. ALLEN.

The following incomplete lists of the mammals of four quite widely separated localities in the Middle Province of North America are based on observations made by the writer while on a recent collecting tour to the Great Plains and the Rocky Mountains, for the Cambridge Museum of Comparative Zoology. Meeting everywhere with intelligent hunters, some of whom had spent many years in the vicinity of the localities I visited, I was able to obtain from them much val-

uable information in respect to the occurrence and relative abundance of the larger species, testing of course the accuracy of their accounts by the independent observations and reports of different observers, and by my own experience and general knowledge of the subject. Respecting some of the smaller rodents, and the insectivores generally, I could obtain no satisfactory information, and they are consequently omitted from the lists.

Every naturalist is of course aware of the difficulties that one meets with in seeking to learn something of the mammalian fauna of a locality, and how inadequate a few weeks' reconnoissance is for its satisfactory exploration. Owing to the nocturnal habits of some species and the reclusiveness of others, only a comparatively small proportion of the whole are readily observed or obtained, patience and strategy and much time being requisite for the discovery and capture of the others. While a few weeks of diligent collecting may be sufficient to afford one a tolerable idea of the character and variety of the bird life occurring at a particular season at a given locality, many months are necessary to give one an equal familiarity with its mammalian life. On the other hand, one can learn at second hand much more respecting mammals than birds, the species of the former being so much fewer and in the main so diverse with each other, but more especially because all the larger mammals are objects of special interest to the hunter and trapper, either for their furs, their flesh, or as enemies, and whose pursuit is attractive and meritorious in proportion to its dangers and difficulties. Hence not only is the traveling naturalist compelled to consult those skilled in woodcraft for much information he has not time himself otherwise to obtain, but he can do so with a certainty of results attainable in respect to scarcely any other class of animals.

The collection of mammals obtained on this expedition contains much valuable material for special investigation, including, as it does, large series of skeletons of nearly all the ruminants and of several of the rodents and carnivores. As the results obtained by the examination of this and other collections of the mammals of the West are reserved for a series of special papers already in preparation (including monographic revisions of the families *Leporidae* and *Sciuridae*), it has not been deemed advisable to make the following lists in any degree revisionary, the nomenclature adopted being essentially that of the author's previous papers.

PART I.

On the Mammals of Middle and Western Kansas.

The observations which serve as the basis of the following list were made chiefly in the vicinity of Fort Hays, Kansas, in the summer of 1871, supplemented, however, by others made during two weeks spent in the field in northwestern Kansas during the following winter. All the larger and more common species are probably duly chronicled, while not a few of the rarer or more obscure species escaped notice, as I am unable to include in the list a single insectivore. The general character of the locality has been already indicated.*

FELIDÆ.

1. *Lynx rufus.* "Wild Cat." Bay Lynx. Rather frequent. Occasionally met with on the prairies remote from timber.

CANIDÆ.

2. *Canis lupus.* Gray Wolf. "Buffalo Wolf." Formerly very abundant, but during the last few years their numbers have greatly diminished, thousands having been killed for their skins every winter by means of strychnine. Comparatively few now remain.

3. *Canis latrans.* Prairie Wolf. "Coyote." Still quite common, but far less so than they were a few years ago. While their dismal cries are still familiar sounds on the plains of the western part of the state, especially in winter, hunters with their destructive poisons have reduced their numbers till comparatively few remain.

4. *Vulpes velox.* Kit Fox. "Swift." These graceful little animals are still more or less abundant.

BASSARIDÆ.

5. *Bassaris astuta.* Texas Civet Cat. Of occasional occurrence. Although I did not meet with it, an animal was described to me by different persons that so accurately agrees with the Texas civet cat that I have no doubt of its being this species. It is apparently rather rare, however, as none of my informants had seen more than two or three individuals in the region under consideration. The northern boundary of Kansas probably forms its ordinary northern limit of distribution on the plains.

* See Bull. Mus. Com. Zool., vol. iii. pp. 122, 123. July, 1872.

MUSTELIDÆ.

6. *Mephitis mephitis*. Common Skunk. Abundant. One of the most common of the smaller mammalia. The few specimens I had an opportunity of examining presented the usual wide differences of color seen in those from other parts of the country.

7. *Lutra Canadensis*. American Otter. Occasional along the streams.

8. *Taxidea Americana*. Badger. Not frequent.

Other species of this family that probably occur here are *Putorius ermineus*, *P. pusillus*, *P. lutreolus* and *Mephitis bicolor*.

URSIDÆ.

9. *Ursus arctos*, var. *Americanus*. Black Bear. Said to be more or less common along the streams. We observed its tracks in June along the Saline.

PROCYONIDÆ.

10. *Procyon lotor*. Raccoon. Common along the streams, where we frequently observed its tracks.

BOVIDÆ.

11. *Bison Americanus*. American Bison. "Buffalo." Abundant.

The great "buffalo country" of the United States is now mainly restricted to Western Kansas and Eastern Colorado, between the Arkansas and Platte Rivers,—a region extending about two hundred miles in a north and south direction and nearly three hundred miles in an easterly and westerly direction, over much of which territory they still range in countless hordes. They are, however, partially migratory, moving eastward in summer and westward in winter. In the northern part of the state their summer range, in 1871, extended eastward from the western boundary of the state to the vicinity of Fort Harker. In winter their eastern limit scarcely extended east of Ellis, on the Kansas Pacific Railway, while they ranged westward into Eastern Colorado. These movements of the buffalo are evidently influenced by the climate, the prairies of Kansas west of Ellis being rarely long covered by snow, while to the eastward of this point the snow is much more constant, and the country hence much less favorable for the existence of the buffalo there in winter than it is more to the westward. Every year, however, their range is becoming more circumscribed, owing to the rapid reduction of their numbers by hunters, and, in consequence also of constant persecution, their movements are

much more uncertain than formerly. Although the number of buffalo to be met with in this portion of Kansas is still almost beyond conception, the country sometimes seeming alive with them as far as the eye can reach, their diminution is rapid, and at the present rate of destruction a few years will suffice to exterminate them wholly. Since the completion of the Kansas Pacific Railway, some four years since, this line of communication with the east has not only opened up an unlimited demand for the products of the buffalo, but has afforded to the hunters a most convenient base from which to carry on their operations. The result is already apparent in the diminished and demoralized state of the herds in northwestern Kansas, which already so much affects the success of the hunters that they have of late in great part abandoned this portion of the country for the more promising field newly opened up to them along the line of the Atchison, Topeka and Santa Fé Railroad.

Aside from the tens of thousands killed in winter for shipment in a frozen state to the eastern markets, other thousands are killed merely for their hides, which scarcely repay the labor of gathering, their carcasses being left to decay on the ground where they are killed. Hundreds, and probably thousands, are also killed in mere wantonness, or to gratify the ambition of eastern sportsmen and tourists. The buffalos are thus perpetually harassed, and driven from place to place throughout the year. All ages are alike destroyed, those too old to be of any value for their flesh being slaughtered for their hides, and the younger animals for their "saddles." The younger animals, and particularly the young cows, are especially sought for their meat. The latter being mostly with young, two animals are thus destroyed instead of one, which, with the destruction of yearlings and two- and three-year-olds, greatly checks the natural increase of the herds, and greatly hastens their extermination. Unless vigorous government interference shall put a check upon this wholesale, shortsighted slaughter, much of which is really needless, the buffalo will soon be known here only as a thing of the past, as it now is in the vast region east of the Mississippi, where this animal once lived in countless numbers.

Respecting the whole number now annually killed in Kansas, it is almost impossible to obtain reliable statistics. Through the kindness of Mr. W. T. Bowen, General Superintendent of the Kansas Pacific Railway, I have learned that the meat and hides shipped to eastern cities over this road during the year 1871 represented about twenty thousand individuals. In the fall of 1872 forty-three thousand hides are reported to have been shipped from Fort Dodge alone, besides about a million and a half pounds of meat. The grand total killed in the season of 1872-3, in the immediate vicinity of Fort Dodge, is stated to be not less than *one hundred thousand!*

ANTILOCAPRIDÆ.

12. Antilocapra Americana. Pronghorn. "Antelope." Common in summer as far east as the middle of the state, and formerly ranged much further eastward. Not observed in winter much to the eastward of the Colorado boundary, at this season they mostly abandoning this portion of the state for the milder portions of the country to the southward and westward. We observed them in June about Fort Hays in small parties of six to a dozen. They were, however, exceedingly wary and difficult to approach. Fawns a few days old were frequently brought in to the Post during the first two weeks of June, but they usually soon died, even under the most careful treatment. The fawns, even when but a few days old, were often more wary and even fleetier than their dams, frequently taking flight first and leading the herd.

The fawns, when taken very young and without injury, are easily reared, and become thoroughly domesticated, making very graceful and interesting pets. The Indian method of capturing them by creeping up to them stealthily when they are asleep and throwing a blanket over them is the most successful, as they are then taken without experiencing an excessive shock of fright or bodily injury. When run down with horses, the common way of taking them, they generally die in three or four weeks, from the effects of the chase and the fright, not more than one in eight or ten, it is said, surviving.

Although tolerably frequent in northwestern Kansas in summer, they are far less numerous here than in eastern Colorado, or on the plains of southern Wyoming.

CERVIDÆ.

13. Cervus Canadensis. Elk. More or less common near the streams, especially on Paradise Creek, and occurs as far east at least as Fort Harker.

14. Cervus macrotis. Mule Deer. "Blacktail." More or less common along the wooded portions of the streams, especially on the Smoky and the Paradise.

VESPERTILIONIDÆ.

Bats were frequently observed flying about at Fort Hays, but as none were obtained the species were not determined.

MURIDÆ.

15. Mus musculus. Common Mouse. Common in the houses at Hays City.

16. *Mus decumanus*. Brown Rat. Abundant, and a great pest about the government storehouses at Fort Hays.

17. *Hesperomys leucopus*, var. *sonoriensis* (Coes MS). Whitefooted Mouse. A single specimen was picked up dead in the yard at our quarters at Fort Hays. Probably more or less common. (Also obtained at Cheyenne.)

18. *Neotoma cinerea*. Wood Rat. Apparently common along the timbered portions of the streams. A complete skeleton was found on the banks of Big Creek, near Fort Hays.

19. *Fiber zibethicus*. Muskrat. Occasional along the streams.

GEOMYIDÆ.

20. *Geomys*? A gopher (some species of *Geomys* or *Thomomys*) was more or less common in the moist bottom lands near the streams, but none were captured.

CASTORIDÆ.

21. *Castor fiber*. Beaver. Still quite frequent along the timbered portions of the streams.

SCIURIDÆ.

22. *Sciurus cinereus*, var. *Ludovicianus*. Western Fox Squirrel. Said to be common on some of the wooded streams, but we did not meet with it.

23. *Spermophilus tridecemlineatus*. Striped Prairie Squirrel. More or less common generally, but most numerous near the streams and damp hollows.

24. *Cynomys Ludovicianus*. Prairie Dog. Exceedingly abundant, their villages frequently covering areas of several square miles in extent, and embracing hundreds of families. Occasionally a few pairs of burrowing owls (*Speotyto cunicularia*, var. *hypogæa*) inhabited the "dog-towns." Rattlesnakes are occasional, and in one or two instances were seen in holes about the mouths of which were fresh tracks of the dogs. The theory that these three animals, the dogs, the snakes and the owls, inhabit the same hole at the same time, receives little credit among people thoroughly conversant with their habits, and the idea that they live harmoniously together as "happy families" finds still fewer supporters. The owls appear to occupy only the abandoned holes, and probably never habitually live in the same holes with the dogs. The owls are far from abundant, as often several large villages may be passed in a day's ride without meeting with a single owl. The owls may, to some extent, prey upon the

young dogs, but the stomachs of those dissected were almost invariably filled with grasshoppers, and the débris found about their holes indicated that these and other insects, with a large kind of crawfish, constitute at this season of the year their chief food. That the rattlesnakes prey upon the dogs is sufficiently established by the frequent capture of the snakes with young dogs in their stomachs. I have myself taken three young dogs from the stomach of a single snake. The entrances to most of the holes in which the snakes were seen were worn smooth by the friction of the snake's body in passing in and out, they apparently appropriating certain holes which they occupy permanently; but they doubtless enter holes occupied by the dogs. When this occurs the dogs not only immediately abandon the holes, but are said to fill them up, and thus fasten the snake in. It certainly happens that the dogs do thus frequently abandon and solidly fill the entrances to their burrows, as I have myself observed, and I do not doubt that what the old "plainsmen" thus affirm is correct.

The dogs usually select a level tract for the site of their towns, and seem to a great extent to avoid the ridges and the more broken parts of the country. In regard to their habits, or voice, there is little or nothing to suggest the name of "dog," as of course there is nothing in their structure to imply such affinities as the name "Prairie Dog" might be supposed to indicate. They are simply large ground squirrels or marmots, and their voice is quite like the so-called barking of various kinds of *Sciurus*, varied at times with a shrill whistle, not unlike that of some of the true marmots. We found them generally exceedingly shy, retreating to their holes almost invariably long before the intruder gets within sure rifle range, whether on foot, mounted, or in a wagon. They behaved differently, however, on different days and at different localities, sometimes permitting a near approach. They usually scamper to their holes at the first approach of danger, but as soon as they reach them they seem conscious of safety. From the entrance of their burrows they will salute the object of their alarm, at times almost incessantly, with their impertinent, squirrel-like bark, either seated upright on their hanches, or stretched at full length across the opening. Their combined air of confidence and impudence is at such times often highly amusing; and, thus sure of a hasty retreat from danger, they will often allow a person to approach within a few yards of them, but if approached too closely suddenly drop into their holes, from which their subdued, twittering, half-whistling bark can be faintly heard after they have disappeared. Being excessively tenacious of life, they are difficult to procure, because even if mortally wounded they almost invariably fall into their holes. If shot through the head, or through the heart, unless knocked backwards away from their holes (which not often hap-

pens) they are then rarely obtainable, and even when thus knocked over by the force of the missile, they will often wriggle into their holes before they can be secured. Their holes usually descending nearly vertically for several feet, they commonly slip down out of reach, though killed instantly. Occasionally, however, the holes slope sufficiently to allow them to lodge a few feet from the entrance, when they may be reached by means of a common gun-rod, and drawn out by twisting the wormer of the rod into their tough hides. In this way Mr. Bennett and myself one day secured seven in the space of a couple of hours at Fort Hays, though we had been many times assured it would be impossible to get them by shooting them. But this was unusual success, as ordinarily not more than one in six of those killed could be secured.

The prairie dogs are easily tamed, and make amusing, though at times rather mischievous, pets. A variety of food seems to please their palates, and whenever they can get at some delicacy in the pantry or storehouse they are sure to carry away large quantities. They also have a propensity to carry away articles for which they have no use. The mode of capturing them is usually to "drown them out" by filling their holes with water. This method is always laborious, requiring often many barrels of water, which has to be transported with teams, and is not always successful, owing to the extensive ramifications or intercommunication of their burrows. Occasionally advantage is taken of temporary pools of water left standing after heavy rains, the water being conducted into the holes by means of trenches. A more effective and ingenious way, however, has of late been adopted. This consists in placing a barrel, from which both heads have been removed, over the entrance of an inhabited burrow, and partially filling it with straw. When the animal comes out he burrows up through the straw, which he unwittingly presses so compactly behind him that he cannot descend through it, and thus remains a prisoner in the barrel above the straw.

A gentleman whom we met at Cheyenne, by carefully studying the habits of the prairie-dog, had discovered a method of capturing these animals alive by the use of water with comparatively little trouble. Their burrows usually have two entrances, one of which descends almost vertically and the other by a considerable slope. Often a single bucket of water poured suddenly into the vertical end of the hole, causes the animal to rush out in great surprise at the other entrance, where it is captured in a bag held over the hole. When the railroad first reached Cheyenne, and for some time after, these animals were in great demand by the passengers as objects of curiosity, and sold readily for ten dollars a pair. The prairie dogs being very numerous on the plains about Cheyenne, the gentleman in ques-

tion soon realized quite a large sum from the sale of these little animals, which he captured in the manner above described.

Many of the burrows of prairie dogs have a raised, funnel-shaped entrance, varying in height from a few inches to a foot or more. These have been called their "forts," and the dog sitting in the entrance defiantly barking has been compared to a sentinel on guard. The object, however, of these raised entrances is sufficiently obvious, these embankments being formed to keep out the water, which in violent rains soon covers the whole surface of the ground. Often the holes are situated in very slight depressions, and would hence be filled by the drainage into them, were they not thus protected; and under these circumstances the embankments are generally higher than when the holes are in this respect more favorably situated. They are formed of earth scraped up from the surface outside the hole, and are symmetrical in shape, very hard and smooth. These embankments, or "forts," are seen in greatest perfection when the site of the "village" is on low or very flat land; they are always kept in excellent repair as long as the burrows are inhabited. In the excavation of their holes the earth is all disposed of without bringing it to the surface.

In winter, during fine weather, the prairie dog villages present as active and populous an appearance as in summer, the dogs only retiring for a few days at a time during the continuance of the severest weather.

HYSTRICIDÆ.

25. Erethizon dorsatus, var. epizanthus. Porcupine. A few are reported still to occur on the Paradise. Formerly more or less frequent on all the wooded streams.

LEPORIDÆ.

26. Lepus sylvaticus. Gray Rabbit. Abundant, not only near the streams but quite distant from timber. Many were seen about the military post at Fort Hays, making their homes in the piles of wood in the woodyard at the post.

27. Lepus campestris. Prairie Hare. A few seen in summer on the plains north of Fort Hays, and in winter from the western border of the state as far east as Bunker Hill Station. They were quite often met with in December and January near the northwestern border of the state. About half of those obtained during these months still retained their summer color.

28. Lepus callotis. Jackass Rabbit. We obtained this species at Cheyenne, and I have good authority for its occurrence in Eastern Colorado and the western part of Kansas.

[To be continued.]

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REGULAR MEETING, MONDAY, MARCH 16, 1874.

NOTES ON THE MAMMALS OF PORTIONS OF KANSAS, COLORADO, WYOMING AND UTAH.—BY J. A. ALLEN.

[*Continued.*]

PART II.

On the Mammals of Park County, Colorado.

THE following notes are based on observations and inquiries made during four weeks spent in and about South Park, Colorado, in the summer of 1871. They refer not only to the Park itself, but also embrace a part of the Snowy Range. A week was spent in the vicinity of Montgomery, near the timber line, from which point excursions were made to the snow region. A few facts were also obtained from miners and hunters.

FELIDÆ.

1. *Felis concolor.* Panther. Not uncommon. Well known under the name of Mountain Lion. Its cry was once heard near our camp at Montgomery.

2. *Lynx Canadensis.* Represented as common. Saw skins of this species in the possession of hunters, taken in the vicinity of Mount Lincoln.

3. *Lynx rufus.* "Wild Cat." Not uncommon.

CANIDÆ.

4. *Canis lupus*. Gray Wolf. Formerly abundant, but now comparatively scarce.

5. *Canis latrans*. Prairie Wolf. Formerly exceedingly numerous, but now greatly reduced in numbers, though still more or less troublesome.

6. *Vulpes vulgaris*, var. *fulvus*. Common Fox. Common. The color is generally grayer than in the eastern form, and the "black" and "cross" varieties are more frequent. In a series of some thirty-five or forty skins, taken in the winter at Montgomery, which I had an opportunity of examining, none were as brightly colored as the red fox of the Eastern States. One was entirely black, and nearly half of the others were more or less well-marked "cross" foxes, some of them typically so, but they graded almost insensibly into the ordinary type. The *V. macrourus* seems to represent only a common phase of the "cross" fox, a type so much more common in the western and elevated parts of the continent than at the eastward.

MUSTELIDÆ.

7. *Mustela martes*. Marten. Common.

8. *Mustela Pennanti*. Fisher. Said to be more or less common.

9. *Putorius ermineus*. Ermine Weasel. Common.

10. *Putorius lutreolus*, var. *vison*. Mink. Common along the streams up to about ten thousand feet, above which I could not obtain evidence of its occurrence.

11. *Gulo luscus*. Wolverine. Said to be not uncommon. Saw the skin of one taken near Montgomery.

12. *Mephitis mephitis*. Common Skunk. Common, ranging to above timber line.

13. *Taxidea Americana*. Badger. Common in South Park.

URSIDÆ.

14. *Ursus arctos*, var. Bear. Common. Both the black and cinnamon varieties occur in about equal numbers. The cinnamon variety is represented as averaging the larger, and as being the more dangerous to encounter. Both vary greatly in color and size, and appear evidently to intergrade. The cinnamon is often quite gray, when it often passes for the grizzly, though not generally regarded as the "true" grizzly.

BOVIDÆ.

15. *Bison Americanus*. American Bison. A few still remain in the southern portion of South Park, chiefly near Buffalo Springs. A small band came up the valley of the Platte from the

eastward into the Park in June, 1871. They moved rapidly, and a calf accompanying the herd becoming fatigued and lagging behind was captured. This I saw in the following August, at a ranch fifteen miles below Fairplay. It was apparently some ten or twelve weeks old, and had already begun to turn dark colored. As recently as 1862 the buffalo are said to have been abundant throughout South Park, where their skulls and other bones are still everywhere frequently met with, as well as thence eastward throughout the smaller parks and mountain valleys. It seems also to have wandered in summer to above timber line on the Snowy Range, to feed on the grassy slopes that occur above the limit of trees. We found its bleached skulls in the Valley of the Platte, up to the extremest sources of the stream, and Mr. Bennett met with them on Mt. Lincoln, far above timber line.

The buffalo of the Parks and mountain valleys is said to differ from the buffalo of the plains, and is hence generally distinguished as the "Bison," or "Mountain Bison." Although this opinion is widely entertained, the reports respecting the differences that distinguish these two varieties are extremely varied and conflicting. Persons claiming familiarity with both hold opposite opinions as to their diversity, some failing to perceive any essential differences, while others maintain that they differ so widely that they must be different species. I found, however, that those whose experience with both seemed to render them the most competent to judge were those who placed the lowest estimate on their differences, while those who magnified them most belonged to a class more or less prone to exaggeration in matters of even trivial importance. The alleged differences varied with almost every individual whose opinion in the matter was consulted. The mountain buffalo is, however, generally regarded as smaller than the buffalo of the plains, slenderer behind, but provided with a larger hump, and with darker, finer and more abundant wool. I found, however, that the skulls met with in South Park, and in the valley of the South Platte above Fairplay, averaged larger, by actual measurement, than those of the plains, with stouter and considerably longer and more spreading horns. The "mountain bison" is said never to mix with the "buffalo" of the plains, the former being confined exclusively to the mountains, and the latter to the plains. One of my informants assured me that the mountain bison occurs in New Mexico, and that the Mexicans and Indians recognize it as different from the buffalo of the plains, with which they are also familiar, and that they call it by a different name.

16. *Ovis montana.* Rocky Mountain Sheep. Occasional, but found chiefly on or near the Snowy Range, retiring in summer to the most inaccessible parts of the mountains. Fresh "signs" were

noticed by Mr. Bennett on one of the spurs of Mt. Lincoln, while here and there a weathered skull attested their former greater frequency.

ANTILOCAPRIDÆ.

17. Antilocapra Americana. Pronghorn. "Antelope." Not uncommon in South Park.

CERVIDÆ.

18. Cervus Canadensis. Elk. Becoming rare; formerly common. In summer keeps near the upper limit of timber, descending occasionally into the valleys in winter.

19. Cervus macrotis. Mule Deer. More or less common, but in summer is said to be most frequent near the timber line, though occurring more or less generally throughout the mountains.

VESPERTILIONIDÆ.

20. Lasiurus? A small bat was a few times seen flying about camp soon after sunset, which was probably *Lasiurus Norcaboracensis*.

MURIDÆ.

21. Neotoma cinereus. Wood Rat. Common. It freely enters houses and storerooms in quest of food, and is sometimes extremely troublesome.

22. Hesperomys leucopus, var. sonoriensis (Coues Ms.). White-footed Mouse. A species of *Hesperomys*, probably *H. leucopus*, var. *sonoriensis* is quite common.

23. Arvicola——? Field Mouse. An undetermined species of short-tailed field mouse, undoubtedly an *Arvicola*, is said to be more or less frequent.

24. Fiber zibethicus. Muskrat. More or less common at favorable localities.

GEOMYIDÆ.

25. Thomomys rufescens. Fort Union Gopher. Common almost everywhere, in moderately dry soil. Observed their burrows on the Snowy Range, nearly up to the limit of vegetation.

CASTORIDÆ.

26. Castor fiber. Beaver. Quite common on the South Platte and its tributaries. Saw their last dam on the Platte a few miles below Montgomery, above which point they are said not to occur.

SCIURIDÆ.

27. *Sciurus Hudsonius*, var. *Fremonti*. Fremont's Squirrel. Not abundant.

28. *Tamias lateralis*. Say's Striped Squirrel. Common. Ranges up to timber line.

29. *Tamias quadrivittatus*. Missouri Striped Squirrel. Abundant from about seven thousand feet up to the extreme limit of vegetation.

30. *Spermophilus tridecem-lineatus*. Striped Prairie Squirrel. Everywhere common, especially in South Park.

31. *Cynomys Gunnisoni*. Gunnison's Prairie Dog. Common in South Park, and thence eastward to the plains, where it is immediately replaced by *Cynomys Ludovicianus*.

32. *Arctomys flaviventer*. Yellow-footed Marmot. Abundant about Montgomery, ranging from the valley of the Platte up to the limit of vegetation. Most numerous at and above the timber-line, where often quite a number were visible at the same moment, basking on the rocks. Specimens entirely black are of frequent occurrence. Their sharp call, in character somewhat between a clear whistle and a short, sharp bark, well entitle them to the name of "whistling marmot." They seem to be almost restricted to the alpine district, none being met with below ten thousand feet.

HYSTRICIDÆ.

33. *Erethizon dorsatus*, var. *epizanthus*. Porcupine. Common, ranging from the foot-hills upward to the timber line.

LAGOMYIDÆ.

34. *Lagomys princeps*. Little Chief Hare. "Cony." Very abundant on the Snowy Range about the sources of the Platte. Are first met with but a few hundred feet below the timber line, ranging thence upward to the limit of vegetation. Mr. Bennett observed them on the top of Mt. Lincoln, and we often found them above timber line, in places almost entirely destitute of vegetation. Their favorite haunts are taluses, and are seen almost exclusively among the bare loose rocks that cover so much of the higher slopes. They are very unsuspecting, allowing a near approach. When seated among the rocks, or when running about among them, they make known their presence by the frequent utterance of their feeble call note, which may sometimes be heard from a dozen individuals at once. They were often very abundant where there was scarcely any vegeta-

tion within a hundred yards. In other instances their warrens were met with in the upper edge of the timber, where grass and small plants were abundant, of which they had carried large quantities into the rocks, in some places filling almost every crevice for many yards around. As they crept slowly about over and among the loose stones, they looked like large, tailless rats. Their note is a feeble squeak, and very deceptive as to distances, seeming to be far away, when really but a few feet distant.

LEPORIDÆ.

35. *Lepus campestris*. Prairie Hare. Common in the parks.

36. *Lepus sylvaticus*, var. *artemisia*. Sage Rabbit. Common.

37. *Lepus Bairdii*. Another species, said to be white in winter and confined to the timber, is also mentioned as common; doubtless the *Lepus Bairdii*, the common alpine form of our *L. Americanus* of the east.

PART III.

On the Mammals of Carbon Co., Wyoming Territory.

The following list is based on observations made and information obtained during a residence of about two months in the vicinity of Percy, a station on the Union Pacific Railroad, about six miles north of the old Fort Halleck, in southwestern Wyoming. My constant intercourse with hunters of long experience in this section of the country enabled me to gather much information I could not otherwise have obtained without a long residence here. Specimens of nearly all the species mentioned below were either obtained by ourselves or purchased in a fresh state of the hunters. The area to which this list refers embraces a portion of the Medicine Bow range of mountains, Elk Mountain being one of the prominent landmarks of the locality, as well as the adjoining "sage plains" which form so prominent a feature of this section of the country.

FELIDÆ.

1. *Felis concolor*. Panther. "Mountain Lion." More or less common in the timber of the Medicine Bow Range, as it is also throughout the timbered portions of the Rocky Mountains.

2. *Lynx Canadensis*. Canada Lynx. Frequent in the mountains, and occasionally met with on the plains.

3. *Lynx rufus*. Bay Lynx. Not common.

CANIDÆ.

4. *Canis lupus*. Gray Wolf. The "Mountain Wolf" and "Timber Wolf" of the hunters. Abundant in the timber.

5. *Canis latrans*. Prairie Wolf. "Coyote." Abundant on the plains and prairies.

6. *Vulpes vulgaris*, var. *fulvus et macrourus*. Fox. Common.

MUSTELIDÆ.

7. *Mustela martes*. Marten. Not common.

8. *Putorius ermineus*. Ermine Weasel. Abundant.

9. *Putorius lutreolus*, var. *vison*. Mink. Common.

10. *Gulo luscus*. Wolverine. "Carcajou." Rather common, and reported to be quite numerous at particular localities.

11. *Mephitis mephitis*. Common Skunk. Abundant.

12. *Taxidea Americana*. Badger. Common.

The Fisher (*Mustela Pennanti*) does not appear to occur in this immediate region.

URSIDÆ.

13. *Ursus arctos*, var. Bear. The black, brown and cinnamon varieties are all frequent. The hunters not only recognize them as distinct and permanent varieties, but in addition to these, some of the more observant of them distinguish subvarieties, based on the shape of the head, the general form, size or color. Some of those with whom I conversed made three varieties each of the brown and cinnamon bears, as the "large," the "small," and the "real" brown or cinnamon bear, respectively. The black form is represented as being similarly variable in size. From the reports of hunters, there seem to be endless varieties, especially in respect to size and color, without a very sharp demarcation of either varieties or races.

The Raccoon (*Procyon lotor*) was unknown to the hunters as an inhabitant of this region.

BOVIDÆ.

The Buffalo (*Bison Americanus*) existed here abundantly not many years since, but is not now found south of the Black Hills, or nearer than sixty to eighty miles. But their skulls and skeletons, partially decomposed, are still common.

14. *Ovis montana*. Rocky Mountain Sheep. "Big Horn." Small herds are still more or less frequent in the mountains, but they are materially decreasing in numbers every year. They now occur only at distant points and in the most inaccessible places, and the professional hunters start in pursuit of them with far less confidence

of success each year. Although very wary and difficult to approach, the "professional," through an intimate knowledge of their habits and the skilful use of breechloading rifles, often succeeds in destroying a whole band when once he has satisfactorily chosen his point of attack. Our hunters brought us in thirteen obtained on a single excursion for them, and killed from a band of fifteen. The other two were killed, but could not be got at.

ANTILOCAPRIDÆ.

15. Antilocapra Americana. Pronghorn. Antelope. Abundant. Found everywhere on the plains in large herds. Their extermination, however, seems to be rapidly approaching, from the rate at which they are at present slaughtered. Thousands are killed within the radius of a few miles, every year, for the eastern and western markets, a large proportion of those killed here being sent to Utah, Nevada and California. The best of the antelope season occurs in October and November, the elk and deer being the more profitable game later in the season. The hunters select the most favorable points along the railroad for their headquarters, and for weeks together the more successful of them take from five to eight or ten saddles each per day, for which they find ready sale. One party whose camp I visited averaged over fifteen dollars a day each, during the best of the season, from the sale of their antelope saddles. Probably the antelopes occur at present in no greater numbers anywhere than in southern, and especially in southwestern, Wyoming, where bands of hundreds are often visible, and the smaller herds are innumerable. They are, however, already perceptibly decreasing in numbers in consequence of this wholesale slaughter.

CERVIDÆ.

16. Cervus Canadensis. Elk. Abundant, particularly about Elk Mountain, and neighboring portions of the Medicine Bow Range.

17. Cervus macrotis. Mule Deer. Abundant.

18. Cervus leucurus. White-tailed Deer. Not common, and appears not to associate generally with the *C. macrotis*, which is here far more numerously represented. We obtained a single specimen from our hunters, who reported it to be the only example they had met with for many months.

JACULIDÆ.

19. Jaculus Hudsonius. Jumping Mouse. Said to be common.

MURIDÆ.

20. *Mus musculus*. House Mouse. Abundant in the houses, from which it drives the native vesper mlee.

21. *Hesperomys leucopus*, var. *sonoriensis* Coues' MS. White-footed Mouse. Abundant.

22. *Neotoma cinerea*. Wood Rat. "Mountain Rat." Common.

23. *Fiber zibethicus*. Muskrat. Common.

GEOMYIDÆ.

24. *Thomomys rufescens*. Fort Union Gopher. Common.

CASTORIDÆ.

25. *Castor fiber*. Beaver. Abundant.

SCIURIDÆ.

26. *Tamias lateralis*. (*Spermophilus lateralis* Baird.) Say's Striped Squirrel. Said to be common.

27. *Tamias quadrivittatus*. Missouri Striped Squirrel. Abundant.

28. *Spermophilus Richardsoni*. Tawny Gopher.

HYSTRICIDÆ.

29. *Erethizon dorsatus*, var. *epizanthus*. Porcupine. Common in the timber.

LEPORIDÆ.

30. *Lepus campestris*. Prairie Hare. More or less common everywhere, but exceedingly abundant at certain localities.

31. *Lepus sylvaticus*, var. *artemisia*. Sage Rabbit. Very numerous everywhere.

32. *Lepus Americanus*, var. *Bairdii*. A rabbit which is white in winter occurs in the timber in considerable abundance, and is doubtless the *Lepus Bairdii* Hayden.

PART IV.

On the Mammals of Great Salt Lake Valley, Utah.

The following notes are based mainly on information kindly communicated to me by Mr. E. D. Meham, of Ogden, Utah. Mr. Meham was formerly an agent of the American Fur Company, and has spent twenty years as a trapper, hunter and guide in the Rocky Mountains. His expeditions have extended from the Saskatchewan on the north

to Texas and Mexico on the south, and from the Missouri River to the Sierra Nevada Mountains. Not only are most of the notes respecting the relative abundance of the species of the following list given on his authority, but I have thought it worth while to incorporate also some general facts relative to their range, which he has had the kindness to communicate to me. The list proper refers more directly to the northern portion of the Great Salt Lake Basin, and more especially to the immediate vicinity of Ogden. The notes hence refer in part to the neighboring portions of the Wahsatch Range as well as to the valley itself.

FELIDÆ.

1. *Felis concolor*. Not common, but quite generally distributed.

2. *Lynx Canadensis*. Canada Lynx. "Bull Cat." Common in the mountains as far south as Southern Utah.

3. *Lynx rufus*. Bay Lynx. Common, but chiefly confined to the mountains.

CANIDÆ.

4. *Canis lupus*. Gray Wolf. Common.

Respecting the color varieties of the Gray Wolf and their distribution, Mr. Mecham's observations are as follows: The gray wolves occur everywhere. The black variety he had never met with south of the Salmon River, nor had he seen any skins obtained south of that point, but to the northward this is the most prevalent color. The red wolf he had met with only in Texas and the adjoining plains. The white wolf he had not found south of northern Utah, except to the eastward of the main chain of the Rocky Mountains, where it occurs as far south as Texas. The white wolves he considered the largest, the black the next in size, the gray being generally a little smaller.

5. *Canis latrans*. Prairie Wolf. More or less common throughout the plains and deserts of the interior.

6. *Vulpes vulgaris*, var. *macroura*. Fox. Common, running into the usual varieties. The red fox, according to Mr. Mecham, is much less plentiful now than formerly. The "silver-gray," "cross," and "black" varieties prevail to the northward, but are rarely met with in the Great Salt Lake Valley. These are rather larger than the ordinary red fox, and their fur is finer and more plentiful. Among these varieties is of course included the so-called *V. macroura*.

MUSTELIDÆ.

7. *Putorius ermineus*. Ermine Weasel. Common.

8. *Putorius lutreolus*, var. *vison*. Mink. Common in Salt Lake Valley, and in the adjoining mountains along all the

streams. Has not been met with by Mr. Mecham south of the Arkansas. Respecting the fur, he says it is not more than one-third as thick at the south as it is far north, where it is also nearly jet black in color, while at the extreme south it is nearly roan.

9. *Gulo luscus*. Wolverine. Not common. Obtained from Mr. Mecham a specimen killed by him near Ogden, in June, 1871.

10. *Lutra Canadensis*. Otter. More or less frequent in Salt Lake Valley, and in the adjoining mountains.

11. *Mephitis mephitis*. Common Skunk. Common in Salt Lake Valley and throughout the plains and mountains generally.

12. *Mephitis bicolor*. Striped Skunk. Mr. Mecham gives its northern limit as about one hundred miles south of Ogden.

13. *Taxidea Americana*. Badger. Of common occurrence everywhere, as well in the mountains as on the plains.

PROCYONIDÆ.

14. *Procyon lotor*. Raccoon. Mr. Mecham gives it as rare in the mountains bordering the valley, but was not aware of its occurrence in the valley itself.

URSIDÆ.

15. *Ursus arctos*. Bear. Common in the mountains everywhere, in its principal varieties, as the black, brown, cinnamon and grizzly. In common with most hunters, he regards these forms as distinct species. The cinnamon bear he gives as the smallest, with an average weight of one hundred to one hundred and fifty pounds. The brown bear is next in size, the black third in size, and the grizzly the largest. Has killed grizzlies weighing fourteen hundred pounds. Black bears sometimes weigh four hundred pounds, but their more common weight ranges from two hundred to three hundred. At a menagerie in Salt Lake City I had an opportunity of observing alive and side by side specimens of the black, brown and cinnamon varieties. The only essential difference seemed that of color, and this is slight between the so-called brown and cinnamon varieties. The maximum differences in physiognomy and proportions were between two specimens of the "brown" bears, in which the length of the nose and the facial expression generally was markedly different.

BOVIDÆ.

The buffalo (*Bison Americanus*) appears to have been abundant at some remote time in the Great Salt Lake Valley. Fragments of their skulls are still here and there visible, but unless partially buried in the marshes they have crumbled and nearly disappeared. I met with

several well preserved skulls on the marshes just north of Salt Lake City, which had been exposed in throwing up the earth for the railroad bed. It is stated that as late as 1836, large numbers of buffalo existed in this valley, but that a winter of remarkable severity immediately following, when the snow is said to have fallen to an average depth of ten feet, nearly exterminated them, and that the few that survived soon after disappeared. They seem also to have formerly extended much to the westward of the Great Salt Lake Valley, Mr. Mecham assuring me that he has not only seen their skulls bleaching on the plains to the westward, but also on the eastern slope of the Sierra Nevada Mountains, on the so-called Hastings trail. I have also received substantially the same report from others, these accounts being wholly independent and from persons unknown to each other. They have, however, scarcely been seen west of the Green River for thirty years.

Mr. Mecham, alluding to his experience with the buffalo, says he saw "millions" of them on the Laramie Plains in 1846. When the emigrants began to cross these plains they slaughtered the buffalo recklessly, killing thousands for which they had no use. This wholesale butchery alarmed the Indians for the fate of these, to them, indispensable animals, and to save them from destruction and perhaps to annoy the whites, they drove them away from the regular emigrant trail, endeavoring to keep them as much as possible out of the reach of the emigrants. But this precaution seems to have availed little, as they continued to decrease rapidly in numbers. A few still straggle to the northern edge of these plains, from their range farther north, but over vast areas in Wyoming and Nebraska, where twenty to twenty-five years ago they existed in abundance, they have now become wholly extinct.

16. *Ovis montana*. Rocky Mountain Sheep. Found here and there in the Wahsatch Range, but are rapidly decreasing in numbers.

The Rocky Mountain Goat (*Aptocerus montanus*) occurs about two hundred miles north of Ogden, whence specimens have been received at the Museum of Comparative Zoology, collected by Mr. Mecham. This is the most southerly point of their occurrence known to Mr. Mecham.

ANTILOCAPRIDÆ.

17. *Antilocapra Americana*. Pronghorn. "Antelope." Occurs about forty miles west of Ogden, and was formerly more or less numerous throughout the Valley. Captain Stansbury, in his *Expedition to the Great Salt Lake*, speaks of finding them on Antelope and Stansbury Islands, during his survey of the lake in 1850.

CERVIDÆ.

18. Cervus Canadensis. Elk. More or less common in the mountains bordering the valley. Mr. Mecham has seen them as far south as the Mexican boundary, and speaks of having met with droves of two thousand individuals in southern New Mexico.

19. Cervus macrotis. Mule Deer. Common at favorable localities.

20. Cervus leucurus. White-tailed Deer. Found in the valleys, but less plentiful than the preceding.

JACULIDÆ.

21. Jaculus Hudsonius. Common.

MURIDÆ.

22. Mus musculus. House Mouse. Common. Lives chiefly in the houses, but also frequents the fields. It arrived here many years since, but neither *M. rattus* nor *M. decumanus* seems to have yet appeared.

23. Hesperomys leucopus, var. sonoriensis. White-footed Mouse. Abundant.

24. Neotoma cinerea. Wood Rat. Common.

Another wood rat (*N. Mexicana?*), with the tail hairy only at the base, is said by Mr. Mecham to occur two or three hundred miles farther south.

25. Arvicola —? A large dark-colored *Arvicola*, of the size of *A. riparius*, is represented as common.

26. Fiber zibethicus. Muskrat. Common in the Great Salt Lake Valley and ranges five or six hundred miles farther south.

GEOMYIDÆ.

27. Thomomys rufescens? The mounds of a species of *Thomomys* are common, but I had no opportunity of examining specimens of the animal.

CASTORIDÆ.

28. Castor fiber. Beaver. Common at favorable localities.

SCIURIDÆ.

29. Sciurus Hudsonius, var. Fremonti. Fremont's Squirrel. Common everywhere in the pineries. Said to be the exact counterpart of the eastern red squirrel in notes and habits. I could learn of the occurrence of no other species of *Sciurus* in this region.

- 30. *Sciuropterus volucella*.** Flying Squirrel. Common.
- 31. *Tamias lateralis*.** Say's Striped Squirrel. Common.
- 32. *Tamias quadrivittatus*.** Missouri Striped Squirrel. Common.
- 33. *Spermophilus Harrisii*.** Harris's Striped Squirrel. Abundant.
- 34. *Spermophilus grammurus*.** A second and larger species of *Spermophilus* is also represented as abundant. This is undoubtedly *S. grammurus*, specimens of which, collected in this vicinity have been brought in by Dr. Hayden's parties.
- 35. *Cynomys Columbianus*.** (*C. Gunnisoni* Baird.) Short-tailed Prairie Dog. According to Mr. Meham, this animal is found as far west as the Sierra Nevada Mountains, but is not of common occurrence in Salt Lake Valley. Smaller than *C. Ludovicianus*, and unfit for food; the other is regarded as excellent eating. The *C. Columbianus* lives in more desert regions and feeds so much upon the different species of *Artemisia* as to be thoroughly impregnated with their peculiar flavor.
- 36. *Arctomys flaviventer*.** Yellow-footed Marmot. Common in the higher parts of the mountains, living among the rocks.

HYSTRICIDÆ.

- 37. *Erethizon dorsatus*, var. *epizanthus*.** Porcupine. Not common. Ranges southward to the headwaters of the Arkansas, Red, Gila and Del Norte rivers. Much smaller and lighter colored southward.

LAGOMYIDÆ.

- 38. *Lagomys princeps*.** Little Chief Hare. Under the name of "Mountain Rat," this species is well known to Mr. Meham, who has often met with it, both to the northward and southward, near the tops of the higher snow-capped peaks of the Rocky Mountain Ranges. He described to me the animal and its habits so accurately as to leave its identity beyond question.

LEPORIDÆ.

- 39. *Lepus callotis*.** Jackass Rabbit. Common.
- 40. *Lepus campestris*.** Prairie Hare. Common.
- 41. *Lepus sylvaticus*, var. *artemisia*.** Common.
- 42. *Lepus Americanus*, var. *Bairdii*?** In addition to the three species of *Lepus* above named, of which we obtained specimens, a fourth was described to me as inhabiting the higher parts of the mountains. It is probably the *L. Bairdii* Hayden and is said (perhaps erroneously) to remain white the whole year.

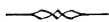
REGULAR MEETING, MONDAY, APRIL 6, 1874.

MEETING this evening at 7.30 o'clock. The PRESIDENT in the chair. Records read.

Henry C. Hewitt, George A. Bates and Olney W. Brooking, all of Salem, were duly elected resident members.

The reading of the paper assigned for this evening was postponed.

Adjourned.



REGULAR MEETING, MONDAY, APRIL 20, 1874.

MEETING this evening at 7.30 o'clock. The PRESIDENT in the chair. Records read.

In the absence of the Secretary, Mr. Maurice H. Richardson was elected Secretary *pro tem*.

The SECRETARY announced the following correspondence :—

C. D. Bradley, Boston, March 30; E. W. Buswell, Boston, March 9; J. W. Chadwick, Brooklyn, New York, March 30; N. Cleaveland, Westport, Conn., March 16; Henry B. Dawson, Morrisania, New York, Nov. 21, Jan. 16; S. G. Drake, Boston, April 7; J. A. Gillis, Salem, Oct. 13; George L. Gleason, Feb. 25, March 26; A. Gray, Cambridge, April 14; S. A. Greene, Boston, Feb. 20; John P. Minkler, Albany, New York, March 24; N. Paine, Worcester, April 14, 16; Daniel A. Rogers, Chicago, Ill., March 16; J. L. Sibley, Cambridge, Feb. 17; A. S. Tiffany, Davenport, Iowa, March 19; S. V. Summers, New Orleans, La., March 26; American Swedborg Printing and Publishing Society, New York, March 19; Naturforschende Gesellschaft in Basel, Feb. 13; Die Naturforschende Gesellschaft in Bern, May, 1873; Boston Public Library, Feb. 20, March 27; Naturwissenschaft Verein zu Bremen, Jan. 6; Buffalo Historical Society, March 23, April 15; Geological Survey of India, Calcutta, Dec. 1; Die K. Gesellschaft der Wissenschaften zu Göttingen, Jan. 21; Literary and Philosophical Society of Liverpool, Feb. 25; Die K. Bayerischen Akademie der Wissenschaften, München, Dec.; New England Historic-Genealogical Society, April 16; New Jersey Historical Society, March 23; New York Historical Society, March 24, April 15; New York Lyceum of Natural History, March 23; Ohio Historical and Philosophical Society, March 24; Rhode Island Historical Society, March 23; Société Entomologique de Russie, Sept 8.

The LIBRARIAN reported the following additions :—

By Donation.

- BOARDMAN, SAMUEL L., of Augusta, Maine. The Wealth and Industry of Maine for 1873, by W. E. S. Whitmore.
- BOON, E. P., of New York, N. Y. The Corwin Genealogy, by E. T. Corwin. 1 vol. 8vo. New York, 1872.
- BRADLEE, Rev. C. D., of Boston, Mass. "Death and the Resurrection," a Sermon preached Sunday, March 15, 1874, by donor.
- CITY OF BOSTON. City Documents for 1873. 4 vols. 8vo.
- CUTTER, ABRAM E., of Charlestown, Mass. Annual Reports of the Trustees of Charlestown Free Schools. 1874.
- DEVEREUX, GEO. H. Key to North American Birds, by E. Coues. 1 vol. 8vo Salem, 1872.
- EMERTON, JAMES. Salem Directory for 1872. 1 vol. 8vo.
- FOOTE, Rev. H. W., of Boston. Sermon at King's Chapel in Memory of Charles Sumner, March 22, 1874, and Services at the Funeral, March 16, 1874.
- GREEN, S. A., of Boston. Miscellaneous pamphlets, 27.
- HILL, WM. M. Manual of the Common Council for 1874.
- HOLDEN, N. J. The Commonwealth for 1873.
- JAMES, Mrs. THOMAS P., of Cambridge. The Potts Memorial, by donor. 1 vol. small 4to. Cambridge, 1874.
- MACK, E. C. The Daguerrotype and Foreign Miscellany. 36 numbers. The Radical. 30 numbers.
- MASSACHUSETTS HORTICULTURAL SOCIETY. Miscellaneous pamphlets, 50.
- MORSE, E. S. Miscellaneous pamphlets, 31.
- NUTTING, Miss M. O., of South Hadley, Mass. Catalogue of the Mount Holyoke Female Seminary. 1873-4.
- PHILLIPS, W. P. Annual Report of the Mass. Charitable Eye and Ear Infirmary. 1874.
- PUTNAM, F. W. Manual of Instruction and Check List of the Birds of North America, by E. Coues. 1 vol. 8vo.
- SILSBEE, Mrs. B. H. Miscellaneous pamphlets, 200.
- STATE BOARD OF HEALTH OF MASS. Fifth Annual Report, Jan., 1874.
- STEPHENS, W. H., of Lowville, New York. Memorial of Dr. J. M. Sturtevant. 1 vol. 8vo. New York, 1874.
- STICKNEY, M. A. Christian Observer, 1815, 1816. 2 vols. 8vo.
- U. S. PATENT OFFICE. Official Gazette for Feb. 24, March 3, 10, 17, 24, 1874.
- WHTAKER, A. E., of San Francisco, Cal. Annual Report of the President, Treasurer and Librarian of the Mercantile Library Association of San Francisco. 1873.
- WILLIAMS, H. L. The Fiji Gazette, Oct. 11, 1873.

By Exchange.

- ARCHIV DER ANTHROPOLOGIE. BRAUNSCHWEIG. Band vi. Heft 3, 1873.
- BIBLIOTHEQUE UNIVERSELLE ET REVUE Suisse. Archives des Sciences Physiques et Naturelles. No. 192. Dec., 1873. Genève.
- BOTANISK TIDSSKRIFT I KJÖBENHAVN Tidsskrift. Anden Række. Andet and Tredje Bind, Fjedje and Forste Hæfte, 1872-73. 2 pamphlets 8vo.
- GEOLOGICAL SURVEY OF INDIA. Memoirs of the, Palæontologia India. Vol. i, pt. 1, Vol. iv, pts. 3, 4, 1873. 3 pamphlets, 4to. Records of the, Vol. vi, pts. 1, 2, 3, 4, 1873. 4 pamphlets, 8vo. Memoirs of the. Vol. x, pt. 1, 1873. 8vo pamphlet.

GESELLSCHAFT NATURFORSCHENDER FREUNDE IN BERLIN. Festschrift zur Feier des Hundertjährigen Bestehens der Gesellschaft. 1 vol. 4to. Berlin, 1873.

INSTITUT HISTORIQUE IN PARIS. L' Investigateur, 39 Année Juillet-Dec., 1873. 2 pamphlets, 8vo.

INSTITUT NATIONAL GENEVOIS. Bulletin, tome xviii, 1873. 1 vol 8vo.

KÖNIGLICHE GESELLSCHAFT DER WISSENSCHAFTEN GOTTINGEN. Nachrichten, 1873. 1 vol. 12mo.

KÖNIGLICH BAYERISCHEN AKADEMIE DER WISSENSCHAFTEN IN MÜNCHEN. Sitzungs-berichte, der Philos. Classe. Heft iv, v, 1872. Heft i, ii, iii, iv, 1873. 6 pamphlets, 8vo. Sitzungs-berichte, der Math. Classe. Heft iii, 1872, Heft i, ii, 1873. 3 pamphlets, 8vo.

KÖNIGLIGE DANSKE VIDENSKABERNES SELSKAB IN KJØBENHAVN. Oversigt, No. i, 1873.

MINNESOTA HISTORICAL SOCIETY. Annual Report of. 1873.

NATURAL HISTORY SOCIETY OF MONTREAL. The Canadian Naturalist, Vol. vii. No. iv, 1871.

NEW HAMPSHIRE HISTORICAL SOCIETY. Proceedings of the. 1872-73, including the Semi-Centennial Exercises, May 22, 1873.

PHILADELPHIA ACADEMY OF NATURAL SCIENCES. Proceedings of the. Pt. iii, Oct., Nov., Dec., 1873.

SOCIÉTÉ D' ACCLIMATATION. Bulletin Mensuel, 2me série, tome x, No. x, xi, Oct., Nov., 1873. 2 pamphlets, 8vo.

SOCIÉTÉ D' AGRICULTURE, SCIENCES ET ARTS DE LA SARTHE, LE MANS. Bulletin, tome xxi, 4e Trim, 1871-72, tome xxii, 1er, 2e and 3e Trim, 1873-74. 2 pamphlets, 8vo.

SOCIÉTÉ ENTOMOLOGIQUE DE RUSSIE IN ST. PETERSBOURG. Horæ Societatis Entomologicæ Rus-sicæ, tome viii, Nos. iii, iv, 1871-72, tome ix, Nos. i, ii, 1872. 2 pamphlets, 8vo.

STATE HISTORICAL SOCIETY OF IOWA. The Annals of Iowa for Jan., 1874.

PUBLISHERS. American Justifier. Forest and Stream. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Salem Observer. Salem Post. Peabody Press.

Daniel A. Varney, of Salem, was elected a resident member.

A committee, consisting of Messrs. James Kimball, W. P. Upham, John Robinson, Caleb Cooke and William Neilson, was appointed to nominate a list of officers to be presented for election at the annual meeting.

Prof. E. S. Morse, of Salem, presented some interesting and highly instructive remarks on the various modes of illustration, with brief historical sketches of the same. He first alluded to some of the earlier forms known to have been used, and specified several books

printed at that period, with appropriate and apt illustrations.

He then spoke of wood engraving, the kind of wood used, the manner of preparing the same, the peculiar tools, etc.; also the process of electrotyping, which is now so universally adopted. Copper plate and steel engraving were next described; then the process of lithography; and he alluded briefly in conclusion to the heliotype, albertype and woodburytype. Mr. Morse stated that he would like to speak more fully at some future meeting on the last named processes of illustration. He exhibited several striking specimens of the various styles, and illustrated his remarks by sketches on the black-board.

Vice President F. W. Putnam thought that perhaps the printing by uncivilized races, by the use of hand stamps for the impression of designs in color upon various materials, especially the several kinds of "cloth" made from wood-fibre, really involved all the principles of the arts of engraving and printing, and, like many other things common in our daily life, proved that the principles involved were discovered or gradually developed under various circumstances and in various ways by the wants and desires of man, showing a uniform working of the human intellect, though of course modified by surrounding conditions.

A brief discussion followed, participated in by Messrs. G. A. Perkins, F. W. Putnam, E. S. Morse and others.

Mr. F. W. PUTNAM exhibited a photograph of a skull received from the Davenport Academy of Natural Sciences, as that of a Moundbuilder. The description

printed on the back of the photograph reads, "Skull of 'a Mound Builder' from shell-bed on Rock Island." Mr. Tiffany, in his letter accompanying the photograph, states that there were six other skulls found in the "shell-bed," and also a plate of mica and several other articles. The following description of the locality in which the skull was found accompanied the photograph:—

"The skull known as the shell-bed skull was discovered by A. S. Tiffany in Nov., 1871, and contributed by him to the Davenport Academy of Natural Sciences, with description.

On the Rock Island Arsenal grounds, near the western extremity of the island, there had been an excavation about three hundred feet long and eight feet deep. Three feet from the top there was a deposit of shells, mostly species of *Unio*, *Melania subsolida*, and two or more species of *Helix*. The shell-bed at this place varies from six to sixteen inches thick.

In this shell-bed the skull and bones belonging to one individual were found; all the covering above the bones was an aqueous deposit; above the shells, as well as with them, there were water-worn pebbles and sand, the material becoming finer towards the top, the last foot being fine alluvium and vegetable mould; the sedimentary lines were perfect and unbroken. The excavations had made the means of observing all that could be desired.

The place was visited by many members of the Society and by Prof. Alexander Winchell, while some of the bones were in place, and all agree that the soil covering this prehistoric man was a sedimentary deposit.

Accurate levelling proves the top of this deposit to be eighteen feet above the highest water known in the Mississippi since Fort Armstrong was established on the island."

Mr. Putnam thought that the indications were that the relics were those of the ancient Indians rather than Moundbuilders. He did not know of any shell-beds

formed by the Moundbuilders, though common as Indian refuse heaps, and the fact that large pieces of mica had been found in Indian graves here in Massachusetts proved that the Indians as well as the Moundbuilders placed a special value on that substance.

Mr. PUTNAM also exhibited a large tooth of a shark, presented by Rev. D. P. Noyes of Pigeon Cove, who obtained it from Mr. Andrew Johnson, one of two men who, while in a dory deeply laden with fish, near St. Peter's Bank, had been fiercely attacked by a large shark, which bit at the dory, leaving the marks of one jaw on the bottom of the boat and of the other on the side. The boat was tipped by the shark to such an extent as to spill part of the fish and take in water, and was kept afloat only by vigorous bailing. The fragments of several teeth were found in the wood. The perfect specimen was from the front of the under jaw, and was 1·8 inches in length from the centre of its root to its point, and from the extreme end of its root, 2·1. Its extreme width at base, across the root, was 1·5 inches. On comparison with specimens of large sharks in the Museum of Comparative Zoology, made by Mr. Garman, it was estimated that a tooth of this size would indicate a total length for the animal of more than thirteen feet. Judging from the single tooth, the shark was probably a specimen of the *Carcharias (Prionodon) lamia*, or a closely allied species, and is a very interesting addition to the fauna of our eastern coast.

Aug 8/84

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 6.

SALEM, MASS., MAY, 1874.

NO. 5.

One Dollar a Year in Advance. 10 Cents a Single Copy.

REGULAR MEETING, MONDAY, APRIL 20, 1874.

[*Continued.*]

PREVIOUS to the adjournment the PRESIDENT alluded to the recent death of Prof. Alpheus Crosby, who during his residence in Salem had been an interested member, held several offices, and taken an active part in some of the operations of the Institute. He had also been President of the Salem Athenaeum, and from 1858 to 1864 Principal of the State Normal School in Salem.

Dr. GEORGE A. PERKINS, after some appropriate remarks, introduced the following resolutions:—

WHEREAS, in the providence of God, the earthly life of our associate and friend, Professor ALPHEUS CROSBY, has reached its close:

Resolved, That, with profound sorrow at the loss we sustain in his lamented death, we place on record our sincere testimony to his eminent talents and exalted worth.

Resolved, That, with honorable pride and reverent regard, we shall remember our departed friend as a distinguished Scholar, whose works were a blessing to the student and an honor to his country; as an Educator, whose zeal inspired all that came within the broad circle of his influence, and whose wisdom guided many in the paths of true knowledge; as a Philanthropist, who kindly, but fearlessly, labored for the relief of the suffering and the oppressed of every race; as a Citizen who was always ready to perform the duties which every man owes society; and as a Neighbor and Friend, whose genial spirit, tender sympathies and kindly acts will long be cherished in grateful memories.

Resolved, That, while we proffer our heartfelt sympathy to the family of our friend, we rejoice with them in the full assurance that his death is but his entrance into immortal life.

Mr. F. W. PUTNAM seconded the resolutions, and in his remarks alluded to the interest Prof. Crosby had always taken in the Natural History Department of the Institute, and his appreciation of Science. He also spoke of the formation of the Cabinet of Natural History at the State Normal School in this city as due to Prof. Crosby, who, while principal of the school, had greatly encouraged the study of the Natural Sciences and commenced the museum. At that time and for many years after he took an active interest in the encouragement of the study, and it was most fitting that the Institute should do honor to his memory, and thus acknowledge his great scholarship, his sympathy in its work and his worth as a valued member.

The resolutions were then adopted, and the Secretary was requested to enter them upon the records and to send a copy to the family of the deceased.

Adjourned.

REGULAR MEETING, MONDAY, MAY 4, 1874.

MEETING this evening at 7.30 o'clock. The PRESIDENT in the chair. Records read.

In the absence of the Secretary, MAURICE H. RICHARDSON was requested to act.

The SECRETARY announced the following correspondence:—

From George H. Allen, May 1; Samuel Dawson, Montreal, April 23; R. R. Endicott, Beverly, April 29; Oscar Faulhaber, Haverhill, May 2; H. W. Lowry, Lane Seminary, Walnut Hills, Ohio, April 2; Robert Manning, April 21; George H. Preble, Boston, April 23; E. A. Silsbee, Boston, May 2; William H. Yeomans, Columbia, Conn.; Buffalo Historical Society, April 27; Iowa State Historical Society, April 16, 23; Minnesota Historical Society, April 20; New Jersey Historical Society, April 29; New York Lyceum of Natural History, April 27; Ohio Historical and Philosophical Society, April 17; U. S. Department of Interior, April 29; Smithsonian Institution, April 18, 24.

The LIBRARIAN reported the following additions:—

By Donation.

APPLETON, FRANCIS H., of Peabody. Bulletin of the Bussey Institution. P. H. 1874.

DAWSON, SAMUEL, of Montreal, Ca. The Canadian Naturalist and Geologist. Vol. v. Vol. iii. d. s., No. 4. Jan., 1868. Vol. vi, n. s., No. 2. 1871.

DEPARTMENT OF THE INTERIOR, WASHINGTON, D. C. Report of the Committee, 2d Session, 42d Congress, 1871-72. 3 vols. 8vo. British Counter Case and Papers, Arbitration at Geneva, 2d Session, 42d Congress, 1871-72. 1 vol. 8vo. House Journal, 2d Session, 42d Congress, 1871-72. 1 vol. 8vo. Treatise and Conventions since July 4, 1776, 3d Session, 41st Congress, 1870-71. 1 vol. 8vo. British Case and Papers Arbitration at Geneva, 2d Session, 42 Congress. 1871-72. 3 vols. 8vo. Patent Office Reports, 2d Session, 41st Congress, 1869-70. 3 vols. 8vo. Executive Documents, 1st Session, 42d Congress, 1871. 2 vols. 8vo. House Miscellaneous, 1st Session, 42d Congress, 1871. 1 vol. 8vo. House Journal, 1st Session, 42d Congress, 1871. 1 vol. 8vo. Senate Reports, 1st Session, 42d Congress, 1871. 1 vol. 8vo. Senate Documents, 1st Session, 42d Congress, 1871. 1 vol. 8vo. Senate Journal, 1st Session, 42d Congress, 1871. 1 vol. 8vo. Senate Miscellany, 1st Session, 42d Congress, 1871. 1 vol. 8vo. Senate Journal, 2d Session, 42d Congress, 1871-72. 1 vol. 8vo. Senate Documents, 2d Session, 42d Congress, 1871-72. 2 vols. 8vo. Senate Miscellaneous, 2d Session, 42d Congress, 1871-72. 1 vol. 8vo. Senate Reports, 2d Session, 42 Congress, 1871-72. 5 vols. 8vo. Executive Documents, 2d Session, 42d Congress, 1871-72. 7 vols. 8vo. Report of the Secretary of War, 2d Session, 42d Congress, 1871-72. 2 vols. 8vo. Report of the Secretary of the Interior, 2d Session, 42d Congress, 1871-72. 2 vols. 8vo. Report of the Comptroller of the Currency and Commissioners of Internal Revenue, 2d Session, 42d Congress, 1871-72. 1 vol. 8vo. Affairs in the late Insurrectionary States, 2d Session, 42d Congress. 13 vols. 8vo. Camp Mohave, Commerce and Navigation Customs Tariff

Legislation, 2d Session, 42d Congress, 1871-72. 1 vol. 8vo. Explorations and Surveys for a Ship-Canal Isthmus of Tehuantepec, 2d Session, 42d Congress, 1871-72. 1 vol. 16o. Report of the Department of Agriculture, 2d Session, 42d Congress, 1871-72. 1 vol. 8vo. Message and Reports of Department, Foreign Relations of the United States, 2d Session, 42d Congress, 1871-72. 1 vol. 8vo. Annual Reports Secretary of the Treasury, Postmaster General, Secretary of the Navy, 2d Session, 42d Congress, 1871-72. 1 vol. 8vo.

HODGES, MARY O. The Boston Fire, by T. E. Frothingham. 1 vol. 12mo. Plan of Greenwood Cemetery.

LEE, JOHN C. Commercial Bulletin for March, April, 1871.

MERRITT, LUCINDA F. The Shanghai Budget, Dec. 31, 1873. Jan. 8, 15, 22, 29, Feb. 5, 12, 19, 1871.

MORSE, E. S. Forty-fourth Annual Report of the Common Schools of Cincinnati, 1874.

PALFRAY, C. W. The American Law Register, 11 numbers. The Mining Magazine, 6 numbers. The Republic, 4 numbers. Blackwood's Edinburgh Magazine, 8 numbers. Miscellaneous Reviews, 16 numbers. Miscellaneous pamphlets, 25.

POOLE, W., Wenham. Annual Report of the School Committee of Wenham, March, 1871. Annual Report of the Selectmen of Wenham. Feb., 1874.

WALLIS, Mrs. C. A. The Naval Gazetteer. 1 vol. 8vo. London, 1871. Massachusetts Register and Military Record, 1862. 1 vol. 8vo. Public Documents for 1838, 1839, 1846. 4 vols. 8vo. A Treatise on the Plague and Yellow Fever. 1 vol. 8vo. 1799. The Hierophant. 1 vol. 8vo. United States Weekly Telegraph, 1831, 2 vols. 8vo. Patent Office Report, 1848, 1850-51, 1852-53, 1857. 1 vol. 8vo. Twenty-third Annual Report of the Board of Education, 1860. 1 vol. 8vo. Political Works of Thomas Paine. 1 vol. 8vo. Mitchell's United States. 1 vol. 8vo. Illustrations of the Divine Government. 1 vol. 8vo. Sermons by O. Dewey. 2 vols. 12mo. Triumph, by Rev. Samuel Hutchinson. 1 vol. 16mo. History of Charles the Twelfth. 1 vol. 12mo. 1833. Dictionary of Thomas Sheridan. 1 vol. 16mo. 1796. Names and Titles of Jesus. 1 vol. 8vo. The Principles of Grammar. 1 vol. 12mo. A Geological Reconnoissance of the State of Tennessee. 1 vol. 8vo. 1856. Memoir of Philip Lindsay. 1 vol. 8vo. 1859. Life of Bonaparte. 1 vol. 12mo. Inquiry, by W. Balfour. 1 vol. 12mo. Memoirs of Lafayette. 1 vol. 12mo. Messages of General Andrew Jackson. 1 vol. 12mo. Election Sermon by W. E. Channing. 1 vol. 8vo. American Almanacs, 1831, 1833. 2 vols. 12mo. Public and Private Economy. 1 vol. 12mo. Capital Punishment. 1 vol. 8vo. The Heavenly Union, by W. H. Porter. 1 vol. 12mo. The Constitution of the Fifteen States. 1 vol. 12mo. Memoir of Rev. E. Payson. 1 vol. 16mo. Chesterfield's Letters to his Son. 3 vols. 6mo. Manual for the General Court for 1857, 1858. 2 vols. 12mo. Mrs. Chapone's Letters. 1 vol. 18mo.

WATERS, J. L. Arnold's First Greek Book. 1 vol. 12mo. Adjutant General's Report of Illinois, 1861-62. 1 vol. 8vo. Report of the Committee on Accounts, 1871. 1 vol. 8vo. Report on Insanity and Idiocy in Mass. 1 vol. 8vo. Commerce and Navigation, 1851. 1 vol. 8vo. Transactions of the Illinois State Agricultural Society, 1857-8. 1 vol. 8vo. Miscellaneous pamphlets, 37.

WILLSON, E. B. Record of Unitarian Worthines for April, 1871. 8vo pamph.

By Exchange.

AMERICAN ANTIQUARIAN SOCIETY. Proceedings of the Annual Meeting, Oct. 21, 1873.

BOSTON PUBLIC LIBRARY. Bulletin for April, 1871.

BUFFALO SOCIETY OF NATURAL SCIENCES. Bulletin of. Vol. i, No. 4. 1873-74.

CANADIAN INSTITUTE OF TORONTO. The Canadian Journal for April, 1874.

NEW ENGLAND HISTORIC-GENEALOGICAL SOCIETY. Historical and Genealogical Register for April-June, 1874.

NEW YORK GENEALOGICAL AND BIOGRAPHICAL SOCIETY. Record of the Vol. v, No. 2. April, 1874.

PUBLISHERS. American Naturalist. Forest and Stream. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Salem Observer. Salem Post. Silliman's Journal.

Edward Thompson, of Salem, was elected a resident member.

EDW. A. SILSBEE, of Salem, gave a familiar talk on art matters. The following is an abstract of his remarks:—

WE must go to Europe to see art in its greatness and extent. Driven through a hundred galleries, we come to know something at last. One day we wake and find ourselves *connoisseurs*. We grow confident. We go alone. But time is needful to mature taste. It grows by lying fallow, and is a constant revision of previous judgments. It is an induction like science, and should be wide as the subject.

Art is a double sense, an eye behind the natural eye. Artists look upon nature with subtler vision. They interpret it for us. We must look with their eyes to enter into their work. They multiply our senses and give us enjoyments undreamt of before. Poets do the same. Without being artists or poets we can get from them their key of vision, as families and friends grow alike by natural imbuing and like atmosphere. Thus we have the genius of the world at command, and live on the top of all the ages. Goëthe went far to realize this. It is culture in its ideality and entirety. Emerson would do it with more artistic temperament. Artistic sense differs from the poetic. The one is general, emotional; the other professional. They should play into each other. Artist should be poetic; poet artistic.

Poetry, painting, music, sculpture, architecture, are varying phases of one sense of the beautiful. Criticism is interchangeable in these arts. Feeling, execution, we speak of in either. Feeling is genius; execution, talent. The comprehension of feeling is a great way in art.

American art is scenic, external, no quick sympathy with nature in her every-day mood. It must fly to mountains, Niagaras, icebergs, as if the miracle of nature were not lying around us every day, to hold us with wonder or thrill us with enthusiasm; the ineffable significance in common things, complexity in simplicity, simplicity in complexity; the infinite as conspicuous in a weed as in a world. Zoologists might as well only study elephants, botanists trees, or geologists mountains. Church, Bierstadt, do the whole of nature at a blow. Snow mountains, middle distance, foreground, waterfalls, Indians, encampments,—enough for a dozen pictures in one. They seem to say, “walk up, gentlemen, so much for your money.” One cannot take in so much at a time. You might as well put tragedy, comedy, elegy, pastoral in one poem. Turner is open to the same criticism; but he had an epic genius, sympathy, imaginative power, great artistic sensibility and expression. He is florid in taste, not simple—Byronic, the same unquiet impulses and artificial associations in subject, *tourmentée*—surfeited with, *embarras de richesse*.

The French school is simple, does not attempt rashly the sublime, nor do too much in one composition. They paint the nearness and intimacy of nature, her every-day. Nothing sensational, belittling, conventional or hackneyed comes into their work. Nature is endless, and they know it and cling to it. We, when we are not grandiose, are pretty, never subtle. They are sincere, meet nature face to face, need nothing local, romantic, trite or obvious to

inspire them. Nature is revealed to them. You walk into their pictures as into a garden or a field, every minute part is felt and well given. Our art is thin, distant objects are faint, not far; modelling, linear perspectives, relations of tint, tone, texture, color; sense of form, reflected lights, aërial perspectives; are ignored or not known. The whole is flat. These relations are "values," an inestimable word. The French level spaces, shrubs, trees and ground, shy pools and furtive grasses or weeds, carefully rendered as they are, are worth legions of rocky mountains and hearts of the Andes done in this shallow, conventional way. With its blended outline, French art gives us what we feel when we see, not what we see without feeling, which is our key, and that with half an eye. Our landscape is optical, theirs mental.

Japanese art has the same integrity, never opens its eyes but it sees a picture; more through a window pane indeed than another can see in a whole life; for art is not the seeing, the physical sense, but the significance every object bears to the artistic eye. The Belgians, Dutch, are where the French are, one with nature as she is without adornment. Constable, an Englishman, originated the school but left no following in England. The English are painstaking but unideal; metallic, positive, over brilliant in color. No subtle harmony, or subdued feeling, or gray tones. Wordsworth is yet to be grown up to in art there. German art is stilted when not influenced by the French school. Like English or American painting, it is lost without a subject, a factitious element or motive in the composition other than nature. It must have incident or association, as if nature were not enough. Art in these countries is where poetry was in the last century, artificial or uninspired. It studied form, we study feeling.

In visiting galleries we must watch the mood, not have

our eye full of the flaring colors of the street, be patient and wait for the object to glide into our mind, which one day it will do. It cannot be forced, and art is too delicate a thing to be captured *coup de main*. Our knowledge shifts, and taste winnows. It is a step, a gradation. Judgment at last becomes secure, and perception rapid. Coleridge said, "every great artist creates the taste by which he is appreciated." He brings something new into the world, his genius. He must instruct us, not we him. He can teach us to see what we did not see before.

The Greek mind drew all nature into itself, distilled it in the alembic of its imagination, and gave it forth simply as form. Hence the perfection of that form. The northern, Christian, and later mind, feels nature mystically, sympathetically, and does not attempt to embody, personify, reduce to form. Gothic architecture is the greatest fruit of this feeling. It represents the infinite, strives after it, is filled with it. It is unending, flexible, emotional, spiritual. It is a life and literature in stone. For three centuries all that men felt and knew went to it. It created the grotesque. A gray mist of stone, it grows into marvellous life under our eye. It is peopled with Calibans and *Midsummer Night's Dreams*. It suggests something beyond itself. The Greek did what he felt, the Goth felt what he could not do. The Greek is one intense concentration, fired with the beauty of the world, drawn from all experience, the genius of nature made manifest. The Roman arch expresses dominion, security, serenity, beauty. The Gothic emotion, restless but aspiring, ever pointing upward. The Roman arch, law, the Gothic, religion. Hence the sublime impulse of the northern churches.

St. Peter's fails of effect from this cause. It is prosaic, though huge. You have to accustom yourself to it to

feel it. Then it is like a new world by itself, it has enclosed so much of space. It should have been a Greek cross. In that form all mass contributes to unity and impressiveness of effect. Now the façade fritters the dome. One should enter it by the short arm of the cross, then outside and in are one, and we get the grand impression at once.

The great expressions of northern art are Gothic, Michael Angelo, Shakespeare, and, as Herbert Spencer added, Beethoven. Dante was one with Gothic, and not to be separated from it.

The great artists in modern times are Michael Angelo, who created types, and pried into the unknown; Raphael the great musical genius, endless in invention, composition, symphonious and ever graceful, feeling form as a Greek almost, and making it sensuous as Titian did color; Leonardo, who did the inscrutable; Correggio, who played with flame and softness, archness and grace, sweet as a child; Velasquez, who needed nothing but the fact to inspire him, who dignified realism by power and artistic apprehension into ideality; Titian, the great poet, intense in romantic depth of color, who brought back sensuousness without license into the world; Rubens and Rembrandt in the north, and Albert Durer. All other men are to be ranked below these.

Titian includes the Venetians, a noble company. He has, almost alone among moderns, the serenity of the Greek. His pose is unique. He is the Phidias of portrait painting. Tintoret with his fiery power is less than his depth. The "Sacred and Profane Love" is as if dropped out of the sky, and is without effort. As mere painting, it is the greatest picture in the world. Paul Veronese was frank and healthful; a subtle, ingenuous, delightful master, but more external than Titian. Vandyke comes

after Rubens and Rembrandt. Rembrandt was a magician, and discovered the poetry in light and shade. Rubens was robustious, splendid, healthful, restored enjoyment of life to men, painted up to nature more than any man, and could do so, and had the largest scope and facility. His style is not searching, or classical, but romantic and perfectly unconfined. Albert Durer was mystical, Gothic, natural, and felt the significance of things. Murillo, more of a poet, must be placed below Velasquez for power.

In sculpture there are few transcendent things, but these are superhuman, and would be incredible if they were not seen. The relics of the Parthenon, the Venus of Milo, a few other Greek fragments—these are heroic. They look as if they had grown, not been made. As in the old Italian pictures the company have happened there, not been placed, Gothic has grown not been built. It is an organic thing, a thing of nature. The Greek temple is the crystallization of all the influences for beauty of the world distilled in one form and object. Even the Belvidere torso, the Laocoon, the Apollo do not attain to this sublime repose, they are *tourmentées* in the comparison.

English art has but few names, but these are unequalled in their kind. Hogarth, Reynolds, Gainsborough, Flaxman, Stotherd, Wilkie, Turner, Constable, Morland, Leslie and Newton, "Old Crome," Blake, a prehistoric man, an artistic mystic, and a few others. The English mind expresses itself in poetry.

Kaulbach, who has just died, had a stilted, academic manner. Grandiose and imposing, full of talent, but like all the Germans, a bad colorist, he was not a genius. They are schoolmasters in art, excogitated, pedantic. If their claim were allowed according to the amount they have done, the old Italians would be dwarfed. Kaulbach's

illustrations are obvious, line-y in style, *posed*; lack mystery, imagination, suggestiveness.

Three things make sculpture, feeling for form, feeling for life, feeling for character. The Greeks are unapproached in the first two. If the moderns have done any thing it is in the last. Sculpture should take apart like literature, and every fragment should show mastery, vitality, organism. A line of Shakespeare, a passage of Milton, a square foot of Rubens, Veronese, Velasquez proves the master. Modern sculpture will not bear this test.

American organization is finer for art perhaps than the English but lacks robustness. Hunt is the best exemplification of this, and does things not equalled there for artistic sensibility, or indeed on the continent. Puritanism was not an artistic cast of mind or character. We need temperament. The Irish will give us this, and Germans intellectual industry. Puritanism chilled the blood which needs enrichment. Hawthorne, a subtle imaginative genius, was morbid, not enough flesh and blood in him. Emerson, a great teacher, is not creative. We are forty millions in a continent. Nature subdues man here, and makes him a mercantile animal. It will be so for a century or more, till the continent fills in. Meantime best forces, the outcome of forty millions, do not keep each other in countenance, are too scattered. No capital exists, school of art, literature, manners. New York is a mart, Washington a galvanized capital for six months in the year.

We lack passion in poetry. We describe nature, are not near to her. The only sensibility we know of is in Jones Very's sonnets, and Emerson's early essays. The sonnets are Hebraic in their single-mindedness and elevation. They are like voices of nature, purling of brooks

or robins' notes: innocent and carolling, they study no form, but have the best, and are Saxon and mono-syllabic in style and structure.

The community does not reflect its intelligence in criticism of painting. It is the merest commonplace. Literature, the drama, music, are criticised discriminatingly. People are impatient of criticism in painting, and think their eye as good as another's. This is an art that requires study and delicate judgment as the other arts.

The justification of painting, the reason of its being is, that we give what we feel. Otherwise photography would be the greatest artist, and dispense with all other. Science knows. Art feels. It is the interchange of the soul with the object, each affecting the other, that makes art. Goethe said art was greater than nature, because, of the two factors, soul is the greatest and most important, and summons nature to its throne and makes use of it. Music is the great living art. No great picture has been painted for two hundred years. Why genius rises in tides every two or three hundred years, and expresses itself in poetry, or painting, or architecture, and leaves the succeeding ages barren of great creative works, has never been explained. At any rate it seems we have not exhausted the dispensation of fifty years ago and have had no burst of poetry since. All is an after-math. No new phase of imaginative feeling.

Critics may judge of art more fairly than artists, for artists are constituted to feel one thing intensely. This prejudices them against other kinds of excellence. The critic may be more impartial and universal if he has sensibility, not being swayed by any predisposition, and not himself gifted with any originating power. He should be sympathetic and interpretative. What he cannot discover must be *technique* and not universal, for art

must render itself to the world and not be set a cast for mystery.

It cannot be too much insisted on, art does not depend upon subject. Rembrandt saw subject everywhere, and transmuted the dust to gold. We are getting nearer to nature in all things, life, literature, law, art, manners, religion, sloughing off the accretions of centuries. Science is lending a powerful hand. The age is her's. The American loves adornment, which is a kind of art, and is willing to spend for it. American ladies' instinct for dress is conspicuous while the English are clammy at it. Our houses are more neatly constructed than in the Provinces.

Allston was the greatest artist we have produced, a man cast in the mould of the old masters but missing his time. Like Coleridge as poet, he was potentially great. Landseer, the greatest English artist of our generation, and the only one of genius, is best seen in prints for his painting is chalky and thin. The English live among animals and should do them well as the Greeks did the human form which they constantly saw, and the Venetians were inspired by the *loggia* around them, and the vicinity and intercourse of the East.

The aesthetic is born in man as early as the religious or intellectual. The savage no sooner begins to beat his neighbor's brains out but he carves his club. He paints his own body for beauty or terror, but it requires a new birth to know beauty intimately as Wordsworth, Shelley, Blake, knew it. We must go behind the conventional, recover the "innocency of the eye," "strip the veil of familiarity from things." Artists interpret, poets make us know it. But among poets and artists there are the supersensuous, and the describers merely. Those who have insight and ideality, and spiritual imagination, and those who never get at the heart, the core, the soul of

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things; the imaginative significance of the universe, but dwell in the superficialities. That it is the province of all art to discover and give. In measure of the revelation of it is it great.



ANNUAL MEETING, WEDNESDAY, MAY 13, 1874.

ACCORDING to the notification, the meeting was held at 3 P.M. The PRESIDENT in the chair. Records read.

The annual reports of the officers and of the curators were read and accepted, and from them the accompanying

RETROSPECT OF THE YEAR

has been compiled. The placing before large and interested assemblages a series of superior entertainments, consisting of instructive lectures and essays, brilliant concerts and exhibitions of flowers, fruit and vegetables, of a high order, has been attended with eminent success. In other directions a like degree of vigor and zeal has been noticeable: thus the library and museum have been largely increased, by purchase, donations, and by exchange; the field, evening and other meetings have been well attended and at these meetings many valuable communications were presented and referred to the appropriate committee for publication.

MEMBERS.—Changes occur in the list of our associates, by the addition of new names, and the withdrawal of some by resignation, removal from the county or vicinity, or by death. In this connection, notices of six of the resident members who have deceased within the year are inserted.

1. *William Oliver Thayer*. Son of Oliver and Rachel (Bancroft) Thayer, of Salem. He had from his youth been an interested member, although his business avocations prevented him from taking an active part in the meetings; he was engaged in the lumber business with his father. Died June 9, 1873, aged thirty-nine.

2. *Richard Sultonstall Rogers*, well known to those of a past generation as an active merchant in the firm of N. L. Rogers & Brothers, who were pioneers and founders, in the United States, of the Zanzibar and New Holland trades; for many years previous to 1842 were actively engaged in foreign commerce, mainly with the East Indies, and were among the most distinguished merchants of Salem. Died June 11, 1873, aged eighty-three years.

3. *Benjamin F. Browne*, known as a druggist and apothecary for many years in this city, and latterly for his interest and zeal in the study of our local history. The results of many of his investigations and researches have been printed in the first volumes of the "Historical Collections" of the Institute, contributing largely to the importance and historical value of this publication. He was the son of Benjamin and Elizabeth (Andrew) Browne of Salem, and was born July 14, 1793. Died November 23, 1873, aged eighty years and four months.

4. *John Jewett*, for many years established in the cabinet making business, and later a partner in the firm of Prime, Kenney & Co. Son of John and Elizabeth (Hodgkins) Jewett, born at Ipswich, Dec. 24, 1795, came to Salem a young man and has since that time been a resident of this city. He was an enterprising and useful citizen; for many years a director in the Commercial (now First National) Bank, a member of the city government, representative to the legislature, and served efficiently in other local capacities. He died Feb. 28, 1874.

5. *Robert Peele*, son of Robert and Elizabeth (Smith) Peele; had during a long life been engaged in the hardware business until a few years since, when he retired. He was always much interested in antiquarian lore and in collecting materials for our local history. He died April 7, 1874, aged eighty years.

6. *Alpheus Crosby*. Widely known as a distinguished scholar and educator; died at his residence in this city, April 17, 1874. He was son of Dr. Asa Crosby, and was born in Sandwich, N. H., Oct. 13, 1810, a graduate of Dartmouth in the class of 1827, and for many years a tutor and professor in that institution. In October, 1857, he became principal of the State Normal School at Salem and continued in that office until July, 1865, and since that time has resided in this city engaged in literary pursuits. Prof. Crosby was one of the most accurate and thorough Greek scholars that our country has produced. He has published several Greek text books that are held in high repute, besides other valuable educational works, and his exhaustive labors upon a new Greek dictionary which he was preparing probably induced the disease of which he died.

Prof. Crosby had always been a valuable citizen. For ten years he had been president of the Salem Athenæum, and had been one of the officers of the Institute, in whose welfare he took a deep interest and whose cause he has advanced by his donations and efforts in other ways.

Two of our corresponding members have deceased, *Prof. L. Agassiz* at Cambridge, Dec. 13, 1873, and *Col. J. W. Foster* at Chicago, Illinois, June 29, 1873. Also *Prof. J. L. Russell*, an early member of the Natural History Society, June 7, 1873. At special meetings held for the purpose resolutions of respect were passed.

[To be continued.]

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 6.

SALEM, MASS., JUNE, 1874.

No. 6.

One Dollar a Year in Advance. 10 Cents a Single Copy.

ANNUAL MEETING, WEDNESDAY, MAY 13, 1874.

RETROSPECT OF THE YEAR.

[*Continued.*]

MEETINGS.—During the summer and early autumn *Field Meetings* and *Horticultural Exhibitions* occupied the attention of the Institute. The meetings were four in number, first at Amesbury, on Thursday, June 19, 1873, by invitation of the Amesbury and Salisbury Natural History Club, who were very courteous and attentive during the visit. At the meeting in the Universalist Church the recent decease of Messrs. R. S. Rogers, J. L. Russell and W. O. Thayer was noticed. Mr. Allen W. Dodge, after a few general remarks, alluded to some of the habits and customs of our ancestors gleaned from the records in the registers of probate and of deeds. Mr. F. W. Putnam alluded to some Indian relics belonging to the museum of the Natural History Club, particularly specifying an interesting carved stone rudely representing a porpoise, or better still, a white whale or *Beluga*.

Among the other speakers were Messrs. James H. Emerton, of Salem, Homer B. Crane, William C. Binney, Rev. Messrs. Eaton and Dinsmore of Amesbury.

The second meeting was at Lynnfield, Wednesday, July 30, 1873. The principal points of interest were visited during the forenoon. At the afternoon meeting in the church the recent decease of Col. Foster at Chicago was noticed. Mr. F. W. Putnam, Rev. E. C. Bolles, John Robinson, Rev. S. H. Taft, of Humboldt College, Gen. Josiah Newhall, of Lynnfield, and others, reported on the findings of the day, and made such observations as were suggested thereby.

The third field meeting was at Chebacco Pond, Tuesday, Aug. 12, 1873, by the kind invitation of Messrs. J. Whipple & Sons. The meeting was held on the platform in the grove, and was very largely attended, several distinguished persons being in the vicinity were present, and among the speakers were Hon. A. W. Dodge of Hamilton, George D. Phippen of Salem, Prof. Asa Gray and Prof. George L. Goodale of Cambridge, J. J. H. Gregory, Esq., of Marblehead, Mr. F. W. Putnam and others.

The fourth meeting was at Danvers Centre, formerly Salem Village, the seat of the witchcraft delusion in 1692. The afternoon session was held in the church. Messrs. F. W. Putnam, John Robinson, E. C. Bolles, C. B. Rice, David Stiles, Jeremiah Spofford, Augustus Mudge, W. P. Upham, George Tapley and others addressed the meeting. A communication was presented from Philip P. Carpenter, of Montreal, "On the Generic Affinities of the New England Chitons." (See Bulletin, Vol. v, p. 152.)

Evening meetings have been held at the rooms usually on the first and third Monday evenings of each month.

At these meetings an increasing interest was manifested, and several valuable communications were presented, abstracts of which have been printed in the BULLETIN or reserved for the "Historical Collections." The following may be specified:—"On the Mechanism of the Flight of Birds," by C. J. Maynard, "Notes on the Bird Fauna of the Salt Lake Valley and the Adjacent Portions of the Wahsatch Mountains," by Robert Ridgway, "The Birds of Colorado," by Robert Ridgway; "On Some New Forms of American Birds," by Spencer F. Baird and Robert Ridgway; "Natural History in the Schools," by Byron Groce; "Notices of Several Rare and Interesting Fishes from the Harbors of Marblehead, Salem and Beverly," by F. W. Putnam; "On the Early Days and Rapid Growth of California," by Alfred Peabody; "Notice of the Black Fish shot in Salem Harbor, October, 1873," by F. W. Putnam; "On Art Studies," by Walter Smith; "Notes from the Diary of Wm. Russell, prior to and chiefly during the Time of his Confinement in Mill Prison during the War of the Revolution," communicated by James Kimball; "On Copperplate engraving," by Geo. M. White; "Journal of Rev. Daniel Shute, D. D., Chaplain of the Expedition to Canada in 1758," by James Kimball; "Notes on the Mammals of Portions of Kansas, Colorado, Wyoming and Utah," by J. A. Allen; "On Various Modes of Illustration," by E. S. Morse; "Description of a Skull of a Mound-builder, from Shell Bed on Rock Island," by A. S. Tiffany; "A Familiar Talk on Art Matters," by Edward A. Silsbee. A special meeting was held on Thursday evening, in the Whitfield church, Newburyport, for the reading of the memorial address upon the late Henry Coit Perkins, M. D., an esteemed member of the Institute, by Rev. Samuel J. Spalding, D. D. A special meeting was also

held on Tuesday evening, Dec. 16, 1873, to celebrate the destruction of the tea in Boston Harbor, Dec. 16, 1773. On this occasion a paper was read by James Kimball. On Monday evening, Feb. 16, 1874, a reception was given to Rev. Charles Kingsley, the distinguished Canon of Westminster.

LECTURES.—The series of lectures alluded to in the last annual report,* in course of delivery, by Rev. E. C. Bolles, at Danvers, "On the Microscope and its Teachings, and at the rooms of the Institute "On the Microscope," were delivered according to agreement. During the latter part of the autumn and early winter a course of six lectures was delivered in Wenham, two by Rev. E. C. Bolles, two by Mr. F. W. Putnam and one each by Rev. E. S. Atwood and Rev. J. Coit. Also a course of eight lectures at Ipswich, three by Mr. Bolles, two by Mr. Putnam, and one each by Messrs. Atwood and Coit and C. M. Tracy of Lynn. Mr. Bolles has also delivered two lectures each at Gloucester and Manchester and one at Peabody. Richard A. Proctor of London, Hon. Sec'y of Roy. Astron. Soc., gave three lectures at the rooms of the Institute in November, "On Planets," "On Comets and Meteors," and "On the Moon and Stars." Rev. E. C. Bolles gave four lectures on the microscope in the rooms of the Institute on Wednesday evenings, March 25, April 1, 8 and 15 of the present year.

LECTURES AND CONCERTS under the direction of the curators of the department of arts. A series of eight entertainments, with an extra and a supplementary course of three were given in the Mechanic Hall to large and appreciative audiences. 1st, Mon., Oct. 27, Richard A.

* See Bulletin of Essex Institute, Vol. 5, p. 45.

Proctor, of London, Hon. Sec. Roy. Astron. Soc., subject, "The Sun." 2d, Wed., Nov. 12, concert by the English Glee Club, of New York City. 3d, Mon., Dec. 1, Readings by Prof. George W. Blish. 4th, Mon., Dec. 8, Rev. Newman Hall, of Surrey Chapel, London, subject, "Reminiscences of Mountain Rambles." 5th, Mon., Dec. 22, Prof. W. H. Niles, of Cambridge, subject, "The High Alps." 6th, Mon., Jan. 5, Charles Bradlaugh, M.P., of England, subject, "Republicanism in England." 7th, Wed., Jan. 14, concert by Mr. B. J. Lang, of Boston, with assistants, and the Essex Institute Chorus. 8th, Mon., Jan. 26, concert by Harvard Glee Club of Cambridge. *Extra*, Fri., Jan. 30, Wilkie Collins of London, reading of "The Dream Woman." *Supplementary course*, 1st, Mon., Feb. 16, Charles Kingsley, Canon of Westminster, subject, "Westminster Abbey," his first lecture in America. 2d, Wed., March 18, concert by Adelaide Phillips. 3d, Mon., March 30, a concert by the Essex Institute Chorus.

HORTICULTURAL.—The operations of this department have been very successfully conducted during the past season. Six exhibitions have been held, three devoted to the show of special flowers, the others more general in their character. 1st, on Friday evening, June 13, for the exhibition of several magnificent specimens of *Cereus grandiflora*, *Lilium auratum*, *Philocactus crenatus* (white cactus) and other species of cacti. 2d, Monday and Tuesday, June 23 and 24, the rose show, one of marked excellence. The conservatories also contributed many choice plants. 3d, Monday, July 28, special exhibition, a fine plant of *Eucharis grandiflora*, also Gloxinias, *Lilium auratum*, night blooming cereus and other plants. 4th, Thursday, Aug. 14, continued on Friday on account of

the weather, *Caladium argyrites* from D. M. Balch, white oleander from F. Putnam, varieties of Coleus and ferns from Mrs. C. Hoffman. 5th, Wednesday, Sept. 3, a very large and beautiful display of German and French asters from the garden of John Robinson, and a flower of the *Antheoliza prealta* from the Cape of Good Hope, by Alfred Peabody. 6th, the annual, from Tuesday, Sept. 16th to Friday, the 19th, was decidedly fine in every respect, and fruit, flowers and vegetables were exhibited from all parts of the county, though by far the largest portion from Salem and its vicinity. The main hall and the two anterooms on the first floor were used, and all the tables were filled to overflowing. The hall was tastefully arranged and the bright tints of the beautiful flowers and the bold broad or pinnated points of the tropical palms placed at the entrance and down the centre of the hall, produced a highly pleasing effect, which was materially aided by the gentle stream of water from a miniature fountain rippling over a bed of shells and stones, among which were growing ferns and several aquatic plants. This exhibition was, in many respects, the finest ever attempted in this city or its vicinity, and for the beauty of the articles shown it was superior to, and in the attendance it exceeded, any before held under the direction of the Institute.

There have been in some previous years larger displays of fruit, but rarely a show which combined so much that was interesting and attractive, and never one where there had been gathered so fine a collection and variety of plants. The fruit exhibited, especially of pears, was characterized by general and uniform excellence of quality and appearance rather than by mammoth growth or other exceptional peculiarities. Some very fine specimens of the St. Michael pear suggested the possibility of

a revival of this variety, the pride of the Salem gardens a half century ago. The show of vegetables was also quite extensive.

The following prizes and gratuities were awarded:—

FLOWERS.

Pot-plants.—First, D. M. Balch; second, Hugh Wilson.
 Coleus "Chameleon."—Kernwood.
 Hanging Basket.—First, W. H. Gardner; second, John Meiklejohn.
 Stand, growing plants.—W. H. Gardner.
 Basket cut flowers.—First, W. H. Gardner; second, Miss Alice Beckford.
 Gladioli.—First, Francis Putnam; second, D. M. Balch.
 Bouquets.—W. H. Gardner.
 Floral Design.—John Meiklejohn.
 Gratuity.—Mrs. Horner, Georgetown, native plants; Hugh Wilson, and Mrs. J. D. Hammond, garden stands; J. H. Hill, Amesbury, collections; John Meiklejohn, well grown plants.

FRUIT.

Collection pears.—First, Wm. Maloon; second, Charles A. Ropes.
 Best plate.—Seckel, T. P. Symonds; Bartlett, G. P. Rust; Beurre Hardy, B. R. Symonds; Duchesse and Louise Bonne, A. H. Hubbard; Flemish Beauty, James Donaldson.
 Collection apples.—First, A. B. Woodis, Ropes Farm; second, D. P. Carpenter.
 Single Dish.—Baldwin, Charles E. Symonds.
 Native Grapes.—First, D. M. Balch; second, C. Higbee.
 Best Rogers, No. 15, W. P. Locke; Hartford Prolific, Edwin Verry; Delaware, T. P. Symonds; Foreign (single dish) Chas. R. Waters.
 Collection peaches.—First, Geo. Bowker; second, C. M. Richardson.
 Single Dish.—Fred. Lamson.
 Gratuity.—Peaches, to Mrs. G. W. Downing; Figs, Aaron Smith; collection, H. F. Skerry.

VEGETABLES.

Collection.—First, David Wentzell; second, Geo. W. Rogers; third, City of Salem (farm).

Early Rose potato.—C. S. Emmerton; other varieties of potato, C. S. Emmerton; marrow squash, E. C. Larrabee; tomato (best 12) trophy, E. C. Larrabee; cabbage, F. W. Lyford; tomato (sort not trophy), Plummer Farm School; Beets, A. B. Woodis; Beets (mangels), A. B. Woodis; water melons, Plummer Farm School; Mammoth squash (102 lbs.), David Wentzell, who had two on one vine weighing together 174 pounds, and a fourth 87 pounds.

The prizes awarded on the first day for "cut flowers" were, first, Francis Putnam; second, John Meiklejohn; third, Charles A. Beckford; gratuity to Miss Alice Glover for "tasteful arrangement of flowers."

The contributors were as follows:—

FLOWERS, POT PLANTS, FERNS, BASKETS, ETC.—D. M. Balch, Hugh Wilson, Francis Putnam, George W. Rogers, John Robinson, John Meiklejohn, C. A. Beckford, John Doig, Mabel Emery (Lynn), J. Henry Hill (Amesbury), John Webster, Mrs. Horner (Georgetown), Miss Annie Bancroft, Mrs. J. B. Osborne, Mrs. James

O. Safford, Mrs. W. F. Gardner, Miss C. A. Neal, Miss Grace A. Glover, Mrs. Miller, Miss Alice Beckford, Henry D. Johnson, Miss S. W. Chandler, Mrs. S. H. Smith, William H. Gardner, Mrs. R. Winn, William P. Parker, B. D. Hill (Peabody), Miss Mary T. Ropes, Mrs. Clough, Mrs. David Pingree, C. A. Ropes, Clifford Burnes, C. H. Pulsifer, S. Killam, Dr. G. A. Perkins, Mrs. J. D. Hammond, E. S. Atwood, Mrs. E. D. Kimball.

PEARS, PEACHES, APPLES, PLUMS, GRAPES, ETC.—A. J. Hubbard (Peabody) Mrs. John Goldsmith, W. H. Nichols, Mrs. Walter Leavitt, S. P. Fowler, Mrs. F. L. Ward, V. C. Stowe, J. B. Osgood, Miss Richardson, C. M. Richardson, B. Ballard, J. W. Goldthwait, D. P. Carpenter, George D. Glover, Charles E. Symonds, Mrs. Kimball, R. C. Manning, G. P. Rust, Wm. Maloon, Jona. Davis, George Merrill, Mrs. Edward Lamson, A. P. Weare, Jno. Daniels, Miss H. Short, Thorp Fisher, E. Emmerton, C. R. Waters, Alfred Peabody, Mrs. E. Moore, W. H. Rice, Benjamin Edwards, S. P. Walcott, C. Higbee, Alfred Whalen, L. D. Pettingill, S. W. Bancroft, N. A. Horton, B. R. Symonds, K. Babbage, Mrs. P. English, George A. Newhall, Geo. Bowker, W. B. Aiken, Charles Creesy, T. P. Symonds, Frederick Lamson, J. P. Cooke, James Donaldson, C. H. Buxton, H. F. Skerry, J. Margati, J. R. Chase, C. Harrington, C. A. Ropes, S. G. Jones, Samuel Newman (Peabody), Wm. Hill, J. F. Dodge, M. P. Locke, Aug. Very, G. F. Putnam, F. L. Ward, Thomas Symonds, B. H. Silsbee, D. M. Balch, Mrs. George Downing, Mrs. Henry Webb, C. H. Webber, Mrs. J. Pierce, Mrs. G. A. Newhall, J. Goldsmith, Mrs. Wilkinson, E. H. Dodge, Aaron Smith.

VEGETABLES.—David Wentzell, George W. Rogers, City of Salem, Plummer Farm School, H. W. Lyford, C. S. Emmerton, E. C. Larrabee, L. D. Pettingill, A. B. Woodis, Mrs. Ward, Alfred Ware, W. S. Messervy, B. H. Silsbee, George A. Newhall, John Meiklejohn.

HONEY.—George D. Glover, B. R. Symonds.

LIBRARY.—The additions during the year now closed are as follows:—

<i>Donations.</i>	
Folios,	1 Pamphlets and Serials, 4,511
Quartos,	29 Almanacs, 39
Octavos,	333
Duodecimos,	110 Total, 4,550
Sextdecimos,	67 Total of bound volumes, 510
Total,	540 Total of donations, 5,060

<i>Exchanges.</i>	
Quartos,	3 Pamphlets and Serials, 897
Octavos,	110 Total of bound volumes, 115
Duodecimos,	2
Total,	115 Total of Exchanges, 1,012
	Total of Donations, 5,060
	Total, 6,102

Of the total number of pamphlets and serials, 1,324 were pamphlets and 4,084 serials.

The donations to the Library for the year have been

received from one hundred and fifteen individuals and seven societies and public bodies.

The exchanges have been received from ninety-nine societies and incorporate bodies, of which sixty-nine are foreign.

From the editors of the "American Naturalist" fifty-one serial publications.

In this connection the Librarian would state that there is a box or shelf catalogue of the books in the upper hall; an accession catalogue, being a full list of the additions to the library, chronologically arranged, and an alphabetical catalogue of a large portion of the library. A full alphabetical catalogue of all the books and pamphlets would be a great desideratum and would facilitate very much the duties of the students and all others who may have occasion to consult the library. The early attention of the Institute is particularly requested to the consideration of this subject.

The arrangement of the manuscripts has been completed during the past year. All the manuscript papers are now carefully assorted and placed either in bound volumes or in packages, labelled on the back so that any one can ascertain whether any desired manuscript is among them without removing them from the shelves. It would be a great advantage if this arrangement could be kept up with all manuscript papers as they are brought in, for nothing seems more useless than to keep them packed away in closed drawers and in obscure corners out of sight. Our manuscripts are now often consulted by genealogists and others, and much gratification has been expressed at the manner in which a portion of them have thus been made available.

MUSEUM.—Many valuable specimens in Natural His-

tory have been given during the year and are on deposit with the Trustees of the Peabody Academy of Science, in accordance with previous arrangements. Several of these specimens have been mentioned at our meetings as contributing to the knowledge of the natural history of this county. All have been duly acknowledged to the several donors. In addition to the above several interesting specimens of an historical character have been deposited in the rooms of the Institute, and contribute very much to the interest and value now attached to the antiquarian and historical portion of the museum.

Several paintings of considerable merit and other works of art have been presented. These, in addition to those previously in the room of the Institute, will form a nucleus around which ere long it is hoped that a museum of fine arts will be formed, and that the requisite additional accommodations will be furnished by the friends of culture and of art, to enable the Institute thus to accomplish in a fitting manner this long cherished object, or at least to make good progress in this direction.

FINANCIAL.—The Treasurer's Report shows an increase in the annual income; yet additional means are requisite to perform in a fitting manner the various duties which the community may reasonably expect.

DEBITS.

General Account.

Athenæum for rent and Librarian,	\$ 350 00
Salaries, \$813 64; Coal, \$178 00; Gas, 110.86.	1,102 50
Lectures and concerts,	4,097 45
Publications,	1,216 92
Express, \$51 88; Postage, \$18.58,	73 46
Insurance, \$40; Gas Fixtures, \$68.50,	108 50
Stationery, \$20.64; Printing, \$13.92; Collecting, \$1.05,	38 61
Sundries,	13 53
Cash to balance,	182 68
Amount carried forward,	<u>\$7,183 64</u>

Amount brought forward, \$7,183 61

Historical.

Books, \$41.50; Binding, \$66, 107 50

Natural History and Horticulture.

Binding, \$50; Horticultural exhibitions, \$295.47, 345 47
\$7,636 61

CREDITS.

General Account.

Dividends Webster Bank, \$35 00
 Assessments, \$1,275; Publications, \$447.22, 1,722 22
 Miscellaneous, \$35.76; Life Memberships, \$60, 95 76
 Athenæum, proportion of coal, and janitor, 164 00
 Lectures and concerts, 4,594 74
 Cash at beginning of year, 202 42

Historical.

Dividends Naumkeag Bank, 20 00

Natural History and Horticulture.

Div. Port., Saco and Ports, R. R., \$20; Lowell Bleachery, \$72, 92 00
 Horticultural Exhibitions, 330 47

Davis Fund.

Coupons Burlington and Missouri River R. R. Bonds, 140 00
 Coupons Dixon, Peoria and Hannibal R. R. Bonds, 240 00
\$7,636 61

PUBLICATIONS. — The BULLETIN has been continued in monthly numbers, giving full reports of the doings of the Institute and abstracts of the papers read at the meetings; this makes an annual volume of from one hundred and seventy-five to two hundred pages. Vol. xii, Nos. 1 and 2 of the "Historical Collections" have been printed; it is expected that Nos. 3 and 4, completing the volume, will be issued during the present year, 1874.

During the year two schools from one of the towns of the county have visited the city for the purpose of enabling the scholars to see the valuable and instructive collections that our cabinets contain. This certainly carries out one of the first objects of the society, the dissemi-

nation of scientific and useful knowledge in the county of Essex, and it is desirable that this method be continued.

Hastily running over the year's work, we find the society in as prosperous a condition as ever before, and a decided success has attended the duties of each of the departments, divided among more persons and giving each the opportunity to do their part greater justice. But diverse as are the departments of the society, it must not be forgotten that there is underlying a grand object to be consummated by the operations, that besides working to make any department a success, or to form a great library or collection, we are to do our share towards keeping up the standard that is expected of every New England city, morally, socially and scientifically.

OFFICERS ELECTED

for the year ensuing and until others shall be chosen in their stead:—

President.

HENRY WHEATLAND.

Vice Presidents.

Of History—A. C. GOODELL, JR. *Of Horticulture*—WILLIAM SUTTON.

Of the Arts—D. B. HAGAR. *Of Natural History*—F. W. PUTNAM.

Recording and Home Secretary.

JOHN ROBINSON.

Foreign Secretary.

A. S. PACKARD, JR.

Treasurer.

HENRY WHEATLAND.

Librarian.

WILLIAM P. UPHAM.

Superintendent of the Museum.

CALFB COOKE.

Curators of Historical Department.

W. P. Upham, M. A. Stickney, John Robinson.

Curators of Natural History Department.

H. F. King, G. A. Perkins, William Neilson.

Curators of Horticultural Department.

Caleb Cooke, D. M. Balch, W. P. Andrews.

Curators of Department of the Arts.

C. H. Higbee, James A. Gillis, George M. Whipple.

Lecture Committee.

James Kimball, George Perkins, William Northey, E. C. Bolles,
A. H. Johnson.

Finance Committee.

John C. Lee, Jas. Upton, Geo. D. Phippen, Jas. O. Safford.

Field Meeting Committee.

A. W. Dodge, E. N. Walton, Caleb Cooke, N. A. Horton,
Alfred Osgood.

Library Committee.

J. G. Waters, E. B. Willson, Geo. F. Flint.

Publication Committee.

A. C. Goodell, Jr., F. W. Putnam, R. S. Rantoul,
Henry M. Brooks, E. S. Atwood.

William Agge, of Salem, was chosen a resident member.

Mr. F. W. PUTNAM exhibited a fish spear found in a field in Danvers and presented to the museum by Mr. W. A. Brookhouse, of Danvers.

Rev. E. B. WILLSON announced his memoir of the late John Lewis Russell as ready for publication; referred to the committee on publications.

Adjourned.

REGULAR MEETING, MONDAY, MAY 18, 1874.

MEETING this evening at 7.30 o'clock. The President in the chair.

CHARLES C. PERKINS, Esq., of Boston, after an introduction by the President, said that he cheerfully responded to an invitation from the Essex Institute to give

A TALK UPON ART.

He was glad that the society had entered into this field, and that exhibitions were in prospect and that an art museum was contemplated. After a few introductory remarks, he contrasted the technically perfect, but priest controlled and conventional art of Egypt, with the free, outspoken, ideally beautiful art of Greece; pointed out the undoubted influence of the east upon early Greek art, and traced its history from rude beginnings to the perfect conclusions of the Periclean period. After Greece was enslaved and despoiled by the Roman generals, art took up its abode on the banks of the Tiber, and heightened the splendors of the imperial city. A Greco-Roman school flourished there for a time, and after gradual decay died out altogether in the fourth century, when Constantine transplanted the seat of the empire to the shores of the Bosphorus, taking with him the best artists, artificers and builders to embellish his new Capitol. Oriental influences, working at Constantinople upon Greco-Roman traditions, brought thither by the followers of Constantine, produced the Byzantine school. This reacted upon Italy through Ravenna, the capital of the Exarchs, and through the Greek artists who took refuge there from the rigors of the Iconoclastic war in the eighth century, and those who followed them in the twelfth.

The successive invasion of the Italian peninsula by the

Goths (who had no art of their own, but who, through their king, Theodoric, protected the remains of ancient art from destruction), and of the Lombards (whose queen Theodelinda employed Italian architects, sculptors and painters to build and decorate the Basilica and Royal Palace at Monza), kept art traditions alive. These were further sustained by the Comacine masters, a body of Free Masons to whom the Lombards granted special privileges, and by the patronage and encouragement given by Pope Hadrian, and his friend the emperor Charlemagne, at Rome. During the Lombard period, Italian art, such as it was, was influenced by the east through Ravenna, where Byzantine artists built and decorated the splendid Basilicas of San Vitale, S. Apollinare, etc., etc., with mosaics; by Rome, which asserted her never dying power through the permanence of those classical traditions which continued all through the dark ages to assert their strength, in the architectural style known as the Romanesque or debased Roman, a style that yielded only partially to the Gothic (which never got a firm foothold in the Italian peninsula) and in that revival of classic elegance in the arts and letters called the Renaissance, which began about the middle of the fourteenth century, and culminated in the fifteenth.

Before the year 1000 the end of the world was anticipated, the arts had declined to the lowest pitch of degradation. From this they were raised in the thirteenth century by Niccola Pisano, the true father of the revival of architecture and sculpture, by Cimabue, who began the emancipation of painting from Byzantine thralldom, and by the great Giotto, who died in 1336, after having founded a school of religious art whose mystical element was developed to the highest degree by the saintly Fra Angelico in the early part of the succeeding century.

The recovery of the long buried art treasures, the formations of collections of ancient gems and marbles, by the Medici and their contemporaries, the passionate love of the antique in all forms which distinguished the Renaissance period, then combined to produce a golden age, which found its chief centre at Florence. Here Brunelleschi, Ghiberti, Donatello and Masaccio lived and worked, and produced masterpieces of architecture, sculpture and painting. These artists shed a lustre upon the reign of Cosmo de Medici, as did Leonardo de Vinci and Fra Bartolomeo and Michel Angelo upon that of Lorenzo the Magnificent.

To Michel Angelo and Raphael, in whom the glories of Italian art culminated, the lecturer could only allude in the brief time at his disposal, but he concluded with an offer to speak of them at fitting length at some future time, if desired.

Many of the illustrations were of the world famous pictures, statues, frescoes, bronzes, sarcophagi, etc., in the renowned art museums, churches and other depositories of art in Italy and Germany, and were very perfectly presented by the aid of the calcium light under the skilful manipulation of Mr. J. W. Black, of Boston. The progress of art from the earlier of the great masters to Raphael and his compeers were traced very instructively, and the characteristic differences of the masters of the several schools and periods were briefly, but comprehensively described.

Adjourned.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 6.

SALEM, MASS., JULY, 1874.

No. 7.

One Dollar a Year in Advance. 10 Cents a Single Copy.

FIELD MEETING AT IPSWICH, WEDNESDAY, JUNE 3, 1874.

THE first field meeting, the present season, took place this day in the town of Ipswich, most of the party going in the first, and others taking some of the later trains. It is now several years since a field meeting has been held in this old shire town, formerly the place where several of the courts held their regular sessions each year. The county buildings are now confined to the house of correction and the county insane institution, on the banks of the Ipswich river—the old court house having been taken down, and the old probate court house having since been given over to Odd Fellowship and the public postal service. Some forty years since, when the old stage coach was the only public conveyance, the town had two public houses, with one or two of lesser note, which is more than can be summed up at the present day. Ipswich has a public library, the gift of the late Mr. Augustine Heard. Though this one is a comparatively modern institution, semi-public libraries are not altogether new to

the town, which possessed a "social library" as early as 1791, and later a few others of less importance. The Ipswich Female Seminary,* for thirty years under the care of Rev. and Mrs. J. P. Cowles, has been long a celebrated and well known educational institution. One of the most substantial public works in the town is the Choate Bridge across Ipswich river, which was built of stone in 1764, and cost one thousand pounds, one-half paid by the town, the other by the county; named for Hon. John Choate, who was on the committee and superintended the erection. It is strong and neat, having two arches, with one solid pier in the bed of the river.

Among the churches in the main part of the town are two Orthodox Congregational, one Methodist, and an Episcopalian. The woollen and hosiery business is the leading industry of the town (at least of a mechanical nature) and all appear to be prosecuted with success.

*The Ipswich academy commenced in 1826. A company of gentlemen erected the building, who became incorporated in February, 1828. The first teacher was Rev. Hervey Wilbur, who continued about one year, and was succeeded by Mr. James W. Ward, who was the instructor from May, 1827, to March, 1828. During the above period the school was open to children of both sexes.

Miss Zilpah P. Grant, assisted by Miss Mary Lyon, previously in charge of an academy in Derry, N. H., took the school and by their joint and indefatigable labors soon built up one of the most flourishing and popular female seminaries in New England. Miss Lyon left Ipswich in 1834 to found a permanent academy for females, with buildings, library, apparatus and endowments. After three years of unsurpassed effort she succeeded in establishing the school at South Hadley, now known as the Mount Holyoke Female Seminary, which was opened Nov. 8, 1837, and Miss Lyon was in charge until her death, which occurred March 5, 1849.

Miss Grant retired in April, 1839, and two and a half years later was married to William B. Banister, a lawyer in Newburyport. She is still living at Newburyport, a widow, aged 80, in good health.

Miss Mary E. Ellison, a teacher in Prof. Abbot's school in Boston, and for some time previous principal of a seminary at Plymouth, N. H., was appointed to succeed Miss Grant. She afterwards married Rev. Dr. Dinmick, of Newburyport, and is still living, a widow, at Newburyport. Miss Little at first was substitute and afterwards Miss Yeaton succeeded Miss Grant in the direction of the school, the three together were there only three years. The school was then closed until May, 1841, when the present principals, Rev. John P. and Mrs. Cowles, entered upon their duties. Mr. Cowles, Jan. 29, 1849, purchased the land and buildings, and the corporation was soon after dissolved. The school is a private institution under the corporate name.

The party found something to interest them in the general characteristics here mentioned, and various groups wandered forth in different directions, some in rambling over the hills in search of flowers, in visiting the library and the old burying ground; a few went down the river in boats to explore the shell heaps near the light-house and in the marshes adjoining.

Lunch was served in the town hall at half-past one, at which the young ladies of the seminary kindly and gracefully volunteered their services.

At 3 P. M. a meeting was held in the First Church. PRESIDENT in the chair.

In the absence of the SECRETARY, Mr. F. W. PUTNAM was requested to act. Records read.

The acting SECRETARY announced the following correspondence:—

From F. E. Abbot, Boston, May 9, 15; William P. Andrews, May 16; George L. Balcom, Claremont, N. H., May 21; N. Cleaveland, Westport, Conn., March 24; Henry B. Dawson, Morrisiana, N. Y., Feb. 23; Samuel E. Dawson, Montreal, May 6; D. C. Gilman, Oakland, Cal., May 21; Frank E. Hotchkiss, New Haven, Conn., May 4, 18; Rufus King, New York, May 26; Thomas Morong, Ipswich, May 27; William Neilson, May 15; William Northey, May 14; Ogden & Brooks, New York, May 26.

The LIBRARIAN reported the following additions:—

By Donation.

- ABBOT, FRANCIS E., Boston. The Index for 1870, 1871, 1872, 1873. 4 vols. folio.
- APPLETON, W. S., Boston. Genealogy of the Appleton Family. 8vo pamphlet. Boston, 1874.
- BROOKS, W. G., Boston. Miscellaneous pamphlets, 14.
- GILMAN, D. C., Oakland, Cal. Biennial Report of the Regents of the University of California, 1872-73. Proceedings of the Agassiz Memorial Meeting, Dec. 22, 1873, at Mercantile Library Hall. Remarks of Prof. D. C. Gilman on Louis Agassiz as a Teacher of Science in America.
- GREENE, SAM'L A., Boston. Miscellaneous pamphlets, 23.
- HUNT, T. F. Christian Family Casket, 1846. 1 vol. 8vo. Family Circle, 1849. 1 vol. 8vo. Miscellaneous volumes, 4. Overland Monthly, 47 numbers. Miscellaneous pamphlets, 11.
- JOHNSON, SAMUEL. A Discourse delivered at the Parker Memorial Meeting House, March 15, 1871, by donor.
- MASS. SOCIETY OF THE CINCINNATI. Memorials of the. 1783-1873. By Francis S. Drake. 1 vol. 8vo. Boston, 1873.

- MORSE, E. S. Miscellaneous pamphlets, 6.
 PICKERING, CHARLES, of Boston. U. S. Exploring Expedition for 1838, 1839, 1840, 1841, 1842. 1 vol. 4to. Boston, 1833.
 U. S. SURGEON GENERAL'S OFFICE. Catalogue of the Library of the Surgeon General's Office. 3 vols. 4to. Washington, 1874.
 WATERS, J. LINTON. Miscellaneous pamphlets, 6.
 U. S. PATENT OFFICE. Official Gazette, Apr. 14, 21, 28, May 5, 12, 1874.

By Exchange.

- BOSTON PUBLIC LIBRARY. Superintendent's Monthly Report for April, 1874.
 BOWDOIN COLLEGE. Seventy-second Annual Catalogue for 1873-74.
 MINNESOTA HISTORICAL SOCIETY. Collections of. Vol. iii, Pt. ii, 1874.
 N. E. HISTORIC-GENEALOGICAL SOCIETY. Memoir of Hon. Edmund P. Tilton. By E. Holden. Boston, 1874.
 PHILADELPHIA ACADEMY OF NATURAL SCIENCES. Journal of. New Series. Vol. viii, pt. I. April, 1874.
 PHYSIKALISCH-MEDICINISCHE GESELLSCHAFT IN WÜRZBURG. Verhandlungen, Neue Folge, v Bd. 4 Heft. 1874.
 SOCIÉTÉ MALACOLOGIQUE DE BELGIQUE. Annals, Tome vi, vii. 1871-72. 2 vols. 8vo. Procès-Verbaux Des Séances de la. Tome ii. 1873. 1 vol. 8vo.
 SOMERSETSHIRE ARCHÆOLOGICAL AND NATURAL HISTORY SOCIETY. Proceedings for the year 1872. Vol. xviii. 1 vol. 8vo. Taunton, 1874.
 PUBLISHERS. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Hardwicke's Science Gossip. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Salem City Post. Salem Observer.

The PRESIDENT, in alluding to the pleasant rambles about this ancient town and the several places of interest, some to the student of nature and others to the local historian and antiquarian, said that many Salem people had sprung from Ipswich, and consequently were always gratified in revisiting the old homesteads where their ancestors had resided years long since, and whose remains are in the old cemeteries. He mentioned several donations to the museum, specifying a fine specimen of *Pecten magellanicus* taken at Beverly Bar a few days since by Laban S. Osborne, of Salem, and called upon

Prof. E. S. MORSE, of Salem, who gave an account of this pecten, a rare species on the shores of Essex county, describing the anatomical structure and comparing the same with other mollusks. The special subject of Mr. Morse's remarks was

THE FERTILIZATION OF FLOWERS,

particularly upon the aid afforded by insects to the process. The bee seeks the flower for honey, which it is commonly supposed is placed there merely to afford him his food. On the contrary, the honey, or rather nectar—for honey, correctly speaking, is the nectar of the flower taken into the stomach of the bee, where it undergoes a change and is then regurgitated—is a sort of reward for the help the bee has rendered the plant. Many, indeed recent investigations show that most flowers could not be fertilized, hence could produce no seeds, and consequently the species would cease to exist without the help of insects. The floral organs and their functions were shown and illustrated by drawings upon the blackboard. The stigma, or top of the central organ, the pistil, must receive the fine fertilizing dust, the pollen, from the stamens, or the fruit or seed at the bottom of the flower cannot be perfected. This dust fertilizes the ovaries in which the seeds form. In some flowers the stamens and pistils are quite near together, in others the pollen placed in such a position that it could never reach the pistil without the help of insects. The bee or insect is attracted by the odor of the nectar, and in searching for it, brushes rudely against the stamens and carries the pollen away upon its body, and going to another flower chances to touch the stigma, and so leaves it where it will fertilize the seed. In the laurel the stamens are pressed within the petals and only dislodged by force, when they spring out with a snap and touch the pistil in the centre of the flower. Insects supply this force. In some flowers the pistil, or fruit-bearing organ, makes its appearance one day, and withers away, and the pollen does not come until the day following, quite too late to be of any use in fertilizing. If all the plants of this species flowered on the same day

it would speedily become extinct, but they blossom upon different days, and insects convey the pollen of one to the pistil of another. In some plants the relative size of the organs varies in different individuals so much that they almost seem to belong to different species, and this facilitates the work of the insects. An example of an orchid was given, which has a nectary like a tube five or six inches long, with a drop of nectar at the bottom; at the top, upon a broad petal, are two small button-like projections, which are the pistils, but the stamens are nowhere visible. The pollen is found in little pockets on the opposite side of the petal, connected with the button by a thread running through. This flower could never be fertilized without the action of insects. The nectary is long and narrow and it is only a certain large and brilliant species of moth, which uncoils its long tongue and in reaching the nectar strikes with its head the little buttons at the top of the tube, and as they are covered with a sticky substance, bears them away upon its head, with the thread and packet of pollen attached. As these threads dry they bend forward, and are just in position to touch the stigmatic surface upon the next flower he visits. The help of insects is necessary even where the organs are near each other in the same flower, for Darwin has found by investigation that in many flowers self-fertilization is impossible; the pollen to be efficient must be carried to the pistil of another flower. All flowers having a bright colored corolla, or fragrance, are fertilized by insects. Others, and those like the pine, having staminate and pistillate flowers on different trees, are fertilized by the action of the wind. The insects visit only the most brightly colored and perfect flowers of a species, hence these only bear seed and so the principle of natural selection is constantly operating.

Prof. Morse gave some facts concerning what might be called carnivorous plants, those which absorb and assimilate the juices of insects, and even of pieces of meat. The leaf of the fly-trap has a row of spines on the edge, and some fine hairs at the centre, with a substance attractive to insects upon them. As soon as an insect touches these hairs the leaf closes, the spines interlock and hold him a prisoner. The same action is observed on touching the hairs with a piece of meat. Other plants present similar phenomena. This was a new field of investigation and might lead to important results.

For the above facts he gave full credit to Darwin and Gray, referring also to the observations of Mrs. Treat.

Vice President F. W. PUTNAM was next introduced, and gave an account of the shell heaps at the light-house and at Eagle Hill, and alluded to the remains of the various animals that had been found in these deposits. He appealed to the residents of Ipswich who perhaps may explore the heaps, to be watchful for human bones, as the late discoveries by Prof. Wyman in the shell heaps in Florida had proved that cannibalism existed there, and perhaps it may be found that our New England Indians also were given to feasting on human flesh, though, as yet, it had not been proved that they were guilty of that practice.

Mr. Putnam then gave an account of a singular fish that had recently been presented by the Proctor Brothers of Gloucester. This fish, which had been named by Bloch, *Chauliodus Sloani*, heretofore had been found only in the Mediterranean. The present specimen was taken from the stomach of a cod caught on George's Banks, and was a most interesting addition to our fauna.

By this timely endowment the means are supplied for the indefinite increase of the library, or the establishment of a natural history collection or for any other literary or scientific object which may be advantageous to the intellectual growth of the town.

Already the benefits of the library are beginning to be manifested, as on the average eight thousand volumes are yearly drawn out and read by the inhabitants.

Historical documents, and books connected with family and town records, are finding their way into the library; and it is hoped that deposits of this kind will multiply until all those invaluable treasures, which are in the possession of old families and liable to perish, will be placed where they will not only be safe, but accessible to future historians.

Mr. Morong in the course of his remarks alluded to other funds held in trust for educational purposes, the availability of which is much lessened in consequence of the terms and conditions of the same.

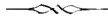
Dr. WHEATLAND followed Mr. Morong and spoke of the importance of inserting a clause in instruments of trust created either by bequest or otherwise, for public uses, prescribing the terms for modifying the conditions so as to meet the wants of those to whose uses the same may have been established, and cited several instances corroborative of the statement of the previous speaker, on the impaired usefulness of several trust funds for educational purposes.

The following vote of thanks was offered by Mr. Putnam, and after being seconded by Mr. Kimball, was unanimously adopted:—

Voted, That the thanks of the Essex Institute be ten-

dered to the proprietors of the First Congregational Church for the use of their building, in which to hold this meeting, to the selectmen of the town of Ipswich for the use of the town hall, to the Rev. Mr. Morong, the young ladies of Mrs. Cowles' school, and to other friends for their kind attentions and courtesies shown to the Institute this day.

Remarks were then made by Mr. Morong, after which the meeting adjourned to meet on the next day at noon, in the rooms of the Institute.



REGULAR MEETING, MONDAY, JUNE 15, 1874.

MEETING this evening at 8 o'clock. The PRESIDENT in the chair.

The propriety of taking suitable notice of the centennial anniversary of the meeting of the legislature of Massachusetts in Salem, Oct. 7, 1774, and resolving themselves into a provincial congress was brought to the notice of the meeting, and, after some discussion, on motion of Mr. James Kimball it was

Voted, That a committee of three be appointed to consider the subject and to report at the meeting on Monday, July 6.

MESSRS. JAMES KIMBALL, A. C. GOODELL, JR., and W. P. UPHAM were appointed. The PRESIDENT was afterwards added.

James W. Lyon, of Salem, was elected a resident member.

Adjourned.

FIELD MEETING AT TOPSFIELD, THURSDAY,

JUNE 18, 1874.

THE second field meeting of the season was held this day. The shower of the early morning induced many to infer that the meeting would be postponed, and for this reason the number in attendance was not so large as usual; but in that respect only was it inferior to the customary gatherings on such occasions. An extra train was courteously furnished by the Eastern railroad to take the party to Danvers, at which place a connection was made with the Danvers and Georgetown (under the management of the Boston and Maine) railroad, and upon arrival at Topsfield a cordial welcome was extended by the citizens. Several carriages were in waiting to convey parties to the various points of interest, and guides were in readiness to direct attention to such localities as would be attractive to visitors. The village is situated upon a level plain, entirely surrounded by hills, and the views from any one of them are beautifully picturesque and charming. There are many ancient buildings in the town that were the homes of historical characters, or were the scenes of prominent events of more or less historical importance. Hood's pond is a lovely sheet of water, and its shores attracted considerable attention. Ipswich river, which passes through the town, is a beautiful stream, and upon its waters or borders one small party spent all the time devoted to the rambles. The old Capen House was an object of interest, and its old style of arrangement and finish was examined as a curiosity. Also the old Gould house (now a barn) owned by Frederick Elliott, which is probably more than two hundred years old, older, even, than the one previously named. Its huge

oak timbers (13 by 16 and 8 by 15 inches), the brick lined walls and the old-fashioned lathing were well preserved. A passing call upon Mr. Francis Curtis, whose store of skulls, skeletons, skins and Indian relics was interesting; and a visit to the old copper mine, worked experimentally but not successfully, were among the attractions noticed by the party, who made a circuit through the edges of Boxford and Danvers. The old cemetery was visited by many; in this enclosure lie the remains of a large number of men who are distinguished in our annals. The grave of Hon. Asahel Huntington, ex-president of the Essex Institute (1861-1865) is in this cemetery, and the members felt a deep interest in it on that account. The new town hall, when completed, will be a most convenient municipal building, and a great ornament to the town.

The several parties, returning by noon, partook of their collation in Union Hall, where an abundant supply of tea and coffee was furnished by the good people of the town.

The afternoon session for the reports and addresses was held in the Methodist church, and the citizens attended in goodly numbers. The President, H. WHEATLAND, in the chair. In the absence of the Secretary, Mr. Robinson, Mr. N. A. HORTON was elected secretary *pro tem*. Records read.

The SECRETARY announced the following correspondence:—

From Charles H. Baker, Annapolis, Md., June 15; C. J. P. Floyd, Topsfield, June 15; Rufus King, New York, July 10; H. W. Lowry, Cincinnati, Ohio, June 9; Ogden & Brooks, New York, June 9; D. Perkins, Cleveland, Ohio, June 1; Charles W. Richardson, June 10; George Russell, Boston, June 12 and 13; Jacob H. Studer, Columbus, Ohio, June 5; Aug-burg, Naturhistorischer Verein, Feb. 20; Buffalo Historical Society, June 10; Boston Athenaeum, June 6; Danzig, Die Naturforschende Gesellschaft, Jan. 19; Darmstadt, Verein pers Erdkunde, April 1; Hague, The Entomological Society of the Netherlands, Sept. 26, 1873; New Jersey Historical Society, June 5, 9; New York Historical Society, June 10; New York State Library, Albany, June 15; Ohio Historical and Philosophical Society, June 8, 11; Rhode Island Historical Society, June 6; Rega, Der Naturforscher, Verein, Oct.

31, 1873; U. S. Department of Agriculture, June 11; Washington Smithsonian Institution, April 18, May 2; Worcester Lyceum and Natural History Association, June 6.

The LIBRARIAN reported the following additions :—

Columbus, Ohio, its History, Resources and Progress. By J. H. Studer. 1 vol. 8vo.

The Symmes Memorial. By John A. Vinton. 1 vol. 8vo.

By Donation.

BOSTON ATHENÆUM. Catalogue of the. 1807-1871. Pt. I. 1 vol. 4to. Boston, 1874.

KIMBALL, JAMES. Columbian Centinel for 1793, 1794, 1794-5, 1795-6, 1796-7, 1797-8, 1798-9. 7 vols. folio.

OFFICE OF THE CHIEF OF ENGINEERS. Report of the Sea-Water and Exposure upon the Iron Pile Shafts of the Brandywine Shoal Light House. By John D. Kurtz and M. R. Brown.

PALFRAY, C. W. The Phila. Inquirer, 1871, 72, 73. The Knickerbocker Magazine, 52 numbers. New England Magazine, 37 numbers. U. S. Service Magazine, 16 numbers. Miscellaneous Serials, 12.

SMALL, A. D. Boston Journal of Chemistry. Vols. 3, 4, 5. 1868-71. Annual Reports of the Redwood Library and Athenæum. 1870, 1871, 1872.

U. S. NAVAL OBSERVATORY. Instructions for Observing the Transit of Venus, Dec. 8-9, 1874.

U. S. PATENT OFFICE. Official Gazette for May 26, 1874.

WILDER, M. P., Boston. Proceedings of the Fourteenth Session and Quarterly Centennial Celebration of the American Pomological Society held in Boston, Sept. 10, 11, 12, 1873.

WILLIAMS, Mrs. C. F. U. S. Coast Survey, 1852, 1854. 2 vols. 4to. Subscribers to the Life of Geo. Washington. 1 vol. 4to. Remarks on the Navigation to the China Sea. 1 vol. 4to. Grammar of the Malay Tongue. 1 vol. 4to. London, 1800. Columbian Centinel, 1797, 1801, 1802, 1803, 1804, 1805, 1806, 1807. Christian Register for 1821. 1 vol. folio. American Pilot. 1 vol. folio. Maps, 3 vols. folio. Mariner's Guide. 1 vol. 12mo. London, 1765. The Sepoy Revolt. 1 vol. 8vo. The Shipowners' and Shipmasters' Directory. 1 vol. 8vo. London, 1817. Directory to the Port Charges of Great Britain and Ireland. 1 vol. 8vo. Weston's Complete Merchant's Clerk. 1 vol. 8vo. London, 1762.

By Exchange.

AMERICAN ACADEMY OF ARTS AND SCIENCES, Boston. Proceedings of the New Series. Vol. i. May, 1873-May, 1874. 1 vol. 8vo.

HISTORICAL SOCIETY OF PENNSYLVANIA. History of New Sweden. By Israel Acrelius. Translated from the Swedish by Wm. M. Reynolds, D.D. 1 vol. 8vo. Phila., 1874.

PUBLISHERS. American Journal of Science. American Naturalist. European Mail. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Hardwicke's Science Gossip. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Sailors' Magazine and Seamen's Friend. Salem City Post.

The PRESIDENT, in his opening remarks, alluded to previous visits to this place, the first in April, 1834. The meeting was held in the Topsfield hotel, which stood on the Newburyport turnpike and was of considerable importance in the days of the old stage coach. On this occasion the organization of the Natural History Society, the parent society of the Institute, was completed, and may thus date the commencement of its active duties. The second in June, 1856, in the Topsfield Academy, and this suggests the propriety of having an historical account of this institution prepared and printed in the publications of the Institute. Is there not some one who will undertake this work? The third in 1860 and the fourth in 1868 in the church in which we are now assembled. In coming to Topsfield we therefore come under peculiar relations, somewhat as a graduate from one of our educational institutions returns to his *alma mater*.

In mentioning the recent donations to the museum, several having an historic interest, he also suggested the importance of collecting all relics which illustrate the characteristics of earlier times, and particularly pamphlets and manuscripts.

Rev. JAMES H. FITTS, of Topsfield, was then called upon, and read some extracts from a paper which he had prepared, and which will be presented to the Institute, giving an account of "Robert B. Thomas, the maker of the Farmer's Almanac."

Mr. Fitts was formerly a resident of West Boylston, the home of Mr. Thomas, and the paper gave many interesting incidents of the Thomas family and of the profession of almanac making. He alluded to the competition existing between the publishers of Isaiah Thomas's New England Almanac and R. B. Thomas's Old Farmer's,

showing that the publishers in the last century were not impervious to personal claims to popular favor.

“How sad to think that now as then,
The printers quarrel just like men!”

Mr. Fitts exhibited a complete file of the almanac from 1793 to the present year, remarking that several of the earlier numbers are exceedingly rare, and that of the year 1793 commands as high a price as ten dollars per copy. Isaiah's last number is dated 1803, although the series was continued by successors until 1822. Robert B. had been a school teacher and a book-binder previous to 1793, but from the commencement of his almanac he devoted almost exclusive attention to that. He died May 19, 1846, aged eighty years, and the work he had carried on for half a century is still continued in his name, Messrs. Brewer & Tileston being the present publishers. Mr. Thomas was a man of generous impulses; a hall erected by his bounty bears his name, and West Boylston people are proud of inviting strangers to visit Thomas Hall as one of the local “lions” of their town.

Mr. N. A. HORTON was reminded of a little story, and related the incident. During a long period of drought one season, people complained that the weather predictions of the Old Farmer's Almanack were not reliable, when one of the advocates of the old favorite explained that Mr. Thomas merely said, “Rain *may be expected* about this time,” and he claimed that that was the fact, thus flooring the impudent detractor.

Dr. JEREMIAH SPOFFORD, of Groveland, gave some curious personal recollections of the Old Farmer's Almanack, dating back to his childhood, fourscore years ago.

MR. SAMUEL TODD, of Topsfield, was called upon, and he described a neighboring high ridge of red gravel, bowlders and clay, bringing forward additional proofs (besides what he had advanced on a previous occasion) to the effect that this was a deposit brought hither on drifts of ice, and not a deposit in place.

Vice President F. W. PUTNAM described the fishes taken from Ipswich river, all representing one great group, including the pickerel, the sucker, the shiner, and the chub, and pointed out the characteristic differences of the several forms. He also described the wasp, and its habits in building nests and propagating and feeding the young, illustrating his remarks by nests collected.

Several Indian implements were placed upon the table, and Mr. Putnam also spoke upon that subject. A fine Indian mortar made of stone and found in Topsfield was presented by Mr. Samuel Todd.

MR. B. P. ADAMS, of Topsfield, presented a curiously wrought specimen of stone, recently discovered at the town farm, remarking that it differed materially from the more common specimens in this vicinity, and requested Mr. Putnam's opinion of its origin.

Mr. Putnam said it seemed probable that this was an ornament or insignia of official position among the aboriginal dwellers of our continent, but this peculiar form is more frequent at the west, among the relics of the Mound-builders, than here at the east.

MR. CHARLES J. PEABODY gave a brief history of Topsfield, whose Territory was once in possession of the Agawam Indians. He narrated incidents from the early settlement here by whites in 1639, down to modern times, alluding to the organization of the town under its present

name, copied from the Topsfield of England. Several disputes had arisen relative to the boundary lines by which Topsfield was divided from Boxford, Wenham and Ipswich, with curious incidents growing out of those disputes. In one instance the boundary passed directly through a house whose owner refused to pay his rates in either Topsfield or Ipswich, but when dunned by either town, would claim that he belonged in the other; Topsfield finally got rid of him by a change of the line so that the house was all in Ipswich. Mr. Peabody alluded to the spirit of liberty which had always been cherished by the people of Topsfield, whether in the days of the revolution, "when all the fighting men of the place were off to Charlestown," during the war of 1812-15, or in the dark days of the recent conflict.

After further remarks by Messrs. PHILLIPS, TODD, HOLMES and others, the following resolution, offered by Mr. E. N. WALTON, was unanimously adopted:—

Resolved, That the thanks of the Essex Institute be tendered to Messrs. Richard Phillips, C. T. P. Floyd, Thomas W. Pierce, Capt. Morgan, Charles Herriek, B. P. Adams, Benj. Poole, C. J. Peabody and other citizens of Topsfield for kind attentions during this visit, and also to the proprietors of the Methodist Church for the use of the meeting house.

Adjourned to meet at the rooms to-morrow (Friday) at noon.



ADJOURNED MEETING, FRIDAY, JUNE 19, 1874.

Was held this day at noon.

J. A. Allen of Cambridge, and James Coolidge of Salem were elected resident members.

BULLETIN

OF THE

ESSEX INSTITUTE.

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REGULAR MEETING, MONDAY, JULY 6, 1874.

MEETING this evening at 8 o'clock. The PRESIDENT in the chair. Records read.

The committee appointed to consider the propriety of commemorating the centennial anniversary of the meeting of the Provincial Congress in Salem, Oct. 5, 1774, reported:—

That they deem it proper and advisable to notice the event by an historical address, to be delivered on that day before the society.

Voted, That ABNER C. GOODELL, Jr., Esq., be invited to prepare and deliver the address.

After a discussion on this subject participated in by Messrs. E. B. Willson, C. Cooke, F. W. Putnam, W. P. Upham and others, it was

Voted, That the President be requested to appoint a committee of arrangements on the celebration.

Philip G. Skinner was elected a member.

NOTES ON AN EXAMINATION OF FOUR SPECIES OF
CHITONS, WITH REFERENCE TO POSTERIOR ORIFICES.

BY WILLIAM H. DALL.

1. *Stimpsoniella Emersonii* (two specimens).

The large and fine specimen from the Gulf of St. Lawrence presented a posterior and terminal anus of large size, but with the edges not elevated into a papilla. The head of an ordinary pin could be inserted into it without violence.

The orifices of the ovaries, bilaterally symmetrical, were situated just behind, and, as it were, under the shadow of, the last branchia on each side. There were two fenestræ on each side of the anterior, a little further towards the girdle, and a little larger than the posterior.

This species resembles in most particulars the *Symmetrogephyrus Pallasii* of Middendorf, and it would seem as if his ungainly subgeneric or generic name should be adopted. The hairs are precisely similar in both species, as are the branchiæ. The insertion plates also agree, according to Dr. Carpenter, who examined a series from a specimen obtained by me in the Aleutian Islands. The principal differences, beside the larger size of *Pallasii*, are as follows: In the latter the hairs are more closely set, the texture of the epidermis is thicker and harder, the points of the valves are more nearly covered, and the skin is smoothly rounded over the back, not showing anything of the form of the valves, as is the case in *Emersonii*. I think also the valves are smaller, in proportion to the size of the animal, in *Pallasii* than in *Emersonii*.

2. *Tonicella marmorca* Fabr.

This species showed a clearly defined posterior and terminal vent. The fenestræ of the ovaries were symmetrical on each side, but the branchiæ pass behind them and conceal them. They are very small, and I could not detect more than one on each side, though fresh specimens, not hardened and contracted by alcohol, might show more.

3. *Trachydermon albus* Lin.

The same remarks apply to this species. The vent was terminal, and on a papilla.

4. *Trachydermon ruber* Lin. Three specimens examined.

These specimens were much hardened by alcohol. Removing the plates from above and then the inner lining membrane, beneath the large and well filled ovaries the intestinal canal is seen, terminating in the median line posteriorly. From the outside the anus was not

perceptible in the smaller specimens. By carefully turning back the outer edge of the girdle in the largest specimen, after removing the posterior plates, but without touching the animal with the dissecting knife, the anus was perceptible, with a pellet of faeces impacted in the opening. It is exactly in the median line behind as in the annexed sketch, very small, and not on a papilla. It is also a little higher up than in the other species. The "cancellated space" noticed by Mr. Emerton (as per notice in *Ann. Mag. Nat. Hist.*, Mar., 1874) on each side behind the branchiæ is a fold or groove containing the ovarian fenestræ. There were in this specimen three fenestræ on each side, but according to Dr. Carpenter the number is variable, Prof. Verrill having counted from four to six in some specimens. These fenestræ in this species are more complicated than in most chitons which I have examined. I have never been able to satisfy myself that there is a true oviduct, and it may be that the ova are dehiscant in the perivisceral cavity and may be expelled through the fenestræ, as they are through the analogous "oviducts or segmental organs" of brachiopods.



a, a, fenestræ; *b*, anus; *c*, branchiæ; *f*, foot; *g*, girdle.

The fact that the ovarian openings are not simple apertures, was noticed by me in dissecting chitons in 1869, but I am not aware that attention had been previously called to this fact *in print*. Their position had been previously known, but it is not uniform in all chitons. In some the fenestræ are close to the anus and single on each side, and it has been stated that the ovary of one side is sometimes abortive. This last I have not yet observed in any species which I have dissected.



FIELD MEETING AT WEST NEWBURY, THURSDAY, JULY 16, 1874.

THE meeting this day was very pleasant, and in many of its features different from the usual routine adopted on similar occasions. The forenoon rambles were not extensive, and the excursion on the river proved an acceptable substitute.

The 8.13 morning train from Salem took a goodly number of excursionists to Newburyport, who there embarked on board the barge "Queen of the Merrimack," which was towed by the powerful steam tug "Mattie Sargent" up the river to West Newbury, the place of meeting. The freshet had made a strong current, and the wind was ahead, hence the passage was not rapid; this seeming disadvantage was rendered acceptable, however, by affording an opportunity to get better views of the picturesque scenery on either hand. The banks of the river and the surrounding hills and slopes are characterized by symmetry and beauty. The river is navigable as far as Haverhill, which is about eighteen miles from Newburyport; and very attractive scenery is between these points. The Eastern Railroad bridge; the Amesbury chain bridge; the fine residence of Mrs. Huse, built and improved at great cost by Rev. Mr. Fletcher, the lecturer and writer on Brazil; the castle-like mansion on the eastern bank owned by Henry W. Moulton; the village at Salisbury Point, famous for hats and dory boats; the laurel grounds, which have furnished so much annual enjoyment to people of a philanthropic and progressive turn; the village at South Amesbury, and the Rock's Bridge, connecting East Haverhill with West Newbury, were among the more prominent objects which engaged attention, and elicited numerous inquiries.

West Newbury, as seen from the river, presents the appearance of a clean and thrifty farming town. It contains some good farms, and has always furnished an intelligent representation in the Essex Agricultural Society. The shoe business is carried on to some extent in the town, but the principal manufacturing element is in comb making.

In literature this town has sent forth one shining light,

second to few in this or any other country, Professor *Cornelius Conway Felton*,* who was so long an ornament to Harvard College. He was born in West Newbury, and the old house in which he first saw the light is yet in existence, on the left of the road to Newburyport, not, as "Appleton's Cyclopaedia" erroneously says, "now Newbury." Old Newbury has honors enough of its own, without borrowing anything from neighboring towns. Prof. Felton achieved much in the department of Greek literature, and prepared both text books for preparatory schools and editions of classic Greek for colleges. Many of our readers owe much to him in the acquiring of a knowledge of the beautiful tongue of the Greeks. He was a man of wide literary culture, publishing a history of Greece; Poets and Poetry of Europe (with the aid of Prof. Longfellow); a translation of Prof. Guyot's work on Physical Geography, and an edition of the Birds of Aristophanes. He also wrote numerous articles for the "North American Review," and edited several articles for "Appleton's Cyclopaedia." Indeed, the world owes something to this town for such a man.

In theology, Harvard College owes much to the Second Parish of West Newbury, who gave up their pastor from 1774 to 1792, Rev. David Tappan, D. D., † to fill the chair of Divinity in that institution. Andover Theological Seminary also came to this Second Parish of West Newbury to find its first Professor of Theology, Rev. Leonard

*Pres. Felton, son of Cornelius Conway and Anna (Morse) Felton, was born Nov. 6, 1807. He entered Harvard College in 1823, having studied at the Academy at Bradford, with Joshua Coffin, the historian of Old Newbury, and at the Academy in North Andover under Simeon Putnam. Graduated in 1827, was connected with the Livingston County High School, Geneseo, N. Y., two years, appointed tutor in Harvard in 1829; Professor of Greek in 1831 and President in 1860. He died Feb. 26, 1892.

†Prof. Tappan was son of Rev. Benjamin Tappan, of Manchester, gr. Harvard College 1771, ord. at West Newbury, April, 1774, and inaug. Hollis Professor of Divinity in Harvard, Dec. 26, 1792; d. at Cambridge, Aug 27, 1801, aged 51.

Woods, D. D.,* who was its pastor from 1798 to 1808. Whatever soundness in the faith that Seminary has preserved may be truthfully said to be largely due to the pioneer toil of Dr. Woods. He was also a layer of foundations in several of the great benevolent societies, organized in his day, having been a member of the Prudential Committee of the American Board for about twenty-five years. What this town has given to the world in the other departments of medicine, law and civil affairs, further research might be able to show something. Let it suffice to name Major Ben. Perley Poore, a journalist of some fame and the genial Washington correspondent of the "Boston Journal." During the intervals of leisure from his duties in Washington he resides on his farm in West Newbury, which is one of the most celebrated in the county.

The homestead comprises a collection of buildings arranged in a somewhat crescent form, with the ends flanked with stone circular buildings, one of which contains a portion of his unique and valuable library, the other devoted to the culinary department of the establishment; in the centre a rustic porch, surmounted by a noble pair of antlers and gracefully covered by creeping vines—the whole presenting a very pleasing and unique appearance. The large hall bespeaks the character of the establishment, being ornamented with paintings and curious old armor. There are also a series of rooms furnished in the revolutionary period; one a parlor, with its buffet filled with curious old crockery, the ancient chairs, tables, fireplace, etc. Another, the old kitchen, with the large fireplace, pot hooks and trammels, andirons and spit,

* Leonard Woods, son of Samuel and Abigail Woods, of Princeton, Mass., b. 19th June, 1774, gr. Harvard College, 1796, ord. at West Newbury, Nov. 1798. Professor of Theology in the Theological Seminary at Andover, 1808-1816; d. at Andover, Aug. 21, 1851.

pots, tinder box, etc., a variety of chairs; the dressers with the pewter plates, mugs, etc.; the chamber with the bedstead, and its linen actually woven in the house, the chest of drawers filled with the clothing of the olden times, the cocked hat, breeches, waistcoat, brocade dresses, etc. Other rooms contain a large quantity of ancient implements, as spinning wheels, loom, flax breaker and comb, etc.; a plough of the last century, and other tools, not only those used on the farm but by the mechanics of that period; an old printing press with the stands, cases and types used by a brother of Dr. Franklin. In fact, the result only of a rapid glance at the collection of antique and historical materials in this old museum could not be enumerated short of a large volume.

There is also a very large collection of autographs, engravings, specimens of newspapers and newspaper clippings and other historical materials gathered here in rich profusion.

The garden contains many fine flowers, and there are also groves of oaks, pines and other forest trees planted years since by the present proprietor; from the hill an extensive view is obtained for miles in every direction; the Isles of Shoals and towns of the Merrimac Valley and others far and near.

At the landing we found Mr. Hayden Brown, one of the leading citizens, ready to give us a cordial welcome and escort us to the Second Congregational Church, which had been tendered for the use of the Institute for the day.

This church was gathered by Rev. John Tufts, of Newbury, and organized Sept. 1, 1731, under the name of the Fourth Church in Newbury. Under date of Feb. 12, 1821, it assumed the name of the West Church, of

West Newbury, and soon after the Second Church in West Newbury, the last being its present corporate name.

It has therefore existed one hundred and forty-three years, and has had nine pastors, of whom all save one were ordained here, beginning their ministry with this church. The following have been the pastors: 1, William Johnson, ord. Sept. 15, 1731, died Feb. 22, 1772; 2. David Tappan, ord. Apr. 18, 1774, dis. Sept. 6, 1792; 3. Leonard Woods, ord. Dec. 1798, dis. Sept. 28, 1808; 4. John Kirby, ord. June 12, 1816, drowned Dec. 5, 1818; 5. Elijah Demond, ord. Mar. 7, 1821, dis. Sept. 3, 1826; 6. Paul Couch, ord. Mar. 27, 1827; 7. J. Q. A. Edgell, ord. Sept. 17, 1832, dis. Oct. 27, 1853; 8. Davis Foster, ord. Nov. 4, 1855, dis. Sept. 24, 1867; 9. Seneca M. Keeler, installed June 13, 1872.

The first meeting house was erected on Silloway Hill, and the first meeting of the parish was held June 5, 1731. The second house was built in what was then known as Woodman's Lane, in 1815, and was dedicated Jan. 5, 1816. The third house (the one in which the church now worships) was removed to its present site, remodelled and enlarged into its present form in 1856 and 1857; corner stone laid Sept. 24, 1856, dedicated March 12, 1857.

The sun was pouring down its hottest rays as we walked up the hill from the shore to the church, and we felt the heat in striking contrast to the refreshing breeze on the river. At the northwest the black storm clouds were rising rapidly, the lightnings were flashing with scarce an interval, and the thunders were incessantly reverberating among the lofty hills and valleys. Soon the rain poured down in torrents for a short time, the party having in the meantime obtained shelter in the vestry of the church.

Rev. Seneca M. Keeler, the present pastor of the church, was present with several others who were active in rendering all possible attention to the visitors, and the refreshments brought by the party were augmented by a bountiful supply of tea, coffee and ice water. The collation was served in the commodious vestry, and at its close the rain had ceased. The air was greatly relieved of its oppressiveness and the weather was delightful.

The rain prevented any extensive rambles, and the only excursion upon land at West Newbury was between the landing and the church, and a short visit to the extensive comb manufactory of Messrs. S. C. Noyes & Co., but a few rods from the church. While the combs from this establishment are known almost everywhere in the country, there were many of the visitors who had never before seen the manufacture, and their ideas of the process required to transform a cow's horn into the beautiful and useful utensil so necessary to the comfort and happiness of every civilized being, were about as crude as some of the burlesques on agriculture would suggest about farming. Thousands of finished combs are produced weekly at these works, but it is a long time before the material gets through the various stages of preparation, which were explained by those in attendance.

At the hour for the afternoon session the company reassembled in the church. The President, HENRY WHEATLAND, occupied the chair. The records of the last meeting were read by the secretary.

The SECRETARY announced the following correspondence:—

From J. A. Allen, Cambridge, June 21; E. P. Boon, New York, June 16, 26, July 13; J. W. Brown, West Newbury, July 11; P. Carpenter, Montreal, June 6; James Coolidge, July 2; W. C. Folger, Boston, June 29; Edward Herrick, Athens, Penn., June 25, 29; G. B. Loring, July 2; Thomas Morong, Ipswich, July 9; Alfred

Osgood, Newburyport, June 19, July 3, 11, 15; George H. Peirson, June 26; Charles C. Perkins, Newport, R. I., July 10; Charles B. Rice, Danvers Centre, June 18; Jacob H. Studer, Columbus, Ohio, June 15; Grosvenor Library, Buffalo, N. Y., July 14; Buffalo Historical Society, June 16; Liverpool Literary and Philosophical Society, June 18; Corporation of Yale College, New Haven, July 13; New Jersey Historical Society, June 20, 26; Virginia State Library, Richmond, June 25.

The LIBRARIAN reported the following additions:—

By Donation.

- ALLEN, J. A., Boston. Miscellaneous pamphlets, 4.
- AMERICAN SWEDENBORG PRINTING AND PUBLISHING SOCIETY. *Arcana Celestia*, 10 vols. 8vo. *Heaven and Hell*, 1 vol. 8vo. *Four Leading Doctrines*, 1 vol. 8vo. *True Christian Religion*, 1 vol. 8vo. *Divine Love and Wisdom*, 1 vol. 8vo. *Apocalypse Revealed*, 2 vols. 8vo. *Conjugal Love*, 1 vol. 8vo. *Divine Providence*, 1 vol. 8vo. *Miscellaneous Theological Works*, 1 vol. 8vo.
- BROWN, HENRY A. *Proceedings of the National Board of Trade*, 5 vols. 8vo. 1868-1873.
- CABOT, J. S. *The Horticulturist*, 1846-1866. 20 vols. 8vo. *Gardener's Monthly*, 1826-1843. 19 vols. 8vo. *Pomological Magazine*, 1828, '29, '30. 3 vols. 8vo. *Florist's Guide*, 1827-32. *Journal D' Horticulture Pratique*, 1857, '58, '59. 3 vols. 8vo. *Annales De Pomologie*, 8 vols. 4to. *Album De Pomologie*, 1850. 2 vols. 4to. *Gardener's Monthly*, 22 numbers. *Magazine of Horticulture*, 39 numbers. *Tilton's Journal of Horticulture*, 22 numbers. *The Horticulturist*, 106 numbers.
- CONANT, W. P., St. Louis, Mo. *Reports of the St. Louis Public Schools for 1860-61-62, 1863-4, 1864-5, 1865-6, 1866-7, 1867-8, 1872-3*. 7 vols. 8vo. *Catalogue of the University of St. Louis, 1872-73*. 8vo pamph. *Catalogue of the Washington University, 1872-3*. 8vo. pamph.
- DORR, EBEN P. *Sketch of the First Monitor, and its Inventor*. 8vo pamph. 1874.
- FOLGER, W. C., of Hingham, Mass. *Miscellaneous Town Reports*, 7.
- GREEN, S. A., Boston. *Miscellaneous pamphlets*, 7.
- GRIFFIN, L. F., Andover. *Catalogue of Phillips Academy, Andover, 1873-4*.
- KIMBALL, JAMES. *Boston Weekly Magazine, 1804-5*. 1 vol. 4to. *Proceedings of the Supreme Council for the Northern Masonic Jurisdiction*, 11 numbers.
- LEE, HARRIET P. *Documents relating to the Sanitary Commission*, 112. *Dwight's Journal of Music*, 45 numbers. *The Saturday Review*, 15 numbers. *The Spectator*, 13 numbers.
- LORING, GEO. B. *Report on the Statistics of Labor in Mass.*, 1874. 1 vol. 8vo.
- MASSACHUSETTS MEDICAL SOCIETY. *Medical Communications of the*. Vol. vii, pt. viii. 1874.
- MORSE, E. S. *Portland and East Portland Directory for 1873*. 1 vol. 8vo. *Nevada Directory for 1868-9*. 1 vol. 8vo. *San Jose Directory for 1870*. 1 vol. 8vo. *Portland Directory, 1873*. 1 vol. 8vo. *Sacramento Directory, 1870*. 1 vol. 8vo. *Salt Lake City Directory, 1869*. 1 vol. 8vo. *Oakland and Brooklyn Directory, 1873*. 1 vol. 8vo.
- OSGOOD, CHAS. S. *Public Documents of Mass., 1871*. 1 vol. 8vo. *Acts and Resolves of Mass., 1871, 1872*. 2 vols. 8vo. *Registration Reports, 1865, 1868, 1869, 1870, 1871, 1872*. 6 vols. 8vo. *Reports of the State Board of Charities, 1869-70, 1870-71, 1872-73*. 3 vols. 8vo. *Mass. Life Insurance Reports, 1871, 1872, 1873*. 3 vols. 8vo. *Fire and Marine Insurance Reports, 1869, 1872, 1873, 1874*. 4 vols. 8vo. *Railroad Commissioners Reports, 1872-73*. 2 vols. 8vo. *Railroad Returns, 1866, 1868, 1869*.

3 vols. 8vo. Journal of the Mass. House of Representatives, 1872, 1873, 1874. 3 vols. 8vo. Journal of the Mass. Senate, 1872, 1873, 1874. 3 vols. 8vo. Report on the Board of Education, 1869, 1872-73. 2 vols. 8vo. Manual for the General Court of Mass., 1865, 1868, 1869, 1870, 1872, 1873, 1874. 7 vols. 12mo. Miscellaneous pamphlets, 94.

U. S. PATENT OFFICE. Official Gazette, June 2, 9, 16, 23. 1874.

By Exchange.

- ARCHIV FÜR ANTHROPOLOGIE. Band vi, Heft iv, 1874.
- BUFFALO SOCIETY OF NATURAL SCIENCES. Bulletin of. Vol. ii, No. I, 1874.
- CROSSE ET FISCHER. Journal de Conchyliologie, Tome xiv. 3e Série. No. i, ii, 1874.
- GEOLOGICAL SURVEY OF CANADA. Report on the Fossil Plants of Canada, by J. W. Dawson, LL. D., F. R. S., F. G. S. Montreal, 1873.
- GESELLSCHAFT NATURFORSCHENDER FREUNDE IN BERLIN. Sitzungs-berichte, jahrg, 1873. 1 vol. 8vo.
- INSTITUT HISTORIQUE IN PARIS. L' Investigateur, 40s Année. No. ii. Feb., Mar. 1874.
- K. K. ZOOLOGISCH BOTANISCHE GESELLSCHAFT IN WIEN. Verhandlungen, Band, xxiii, jahrg. 1873. 1 vol. 8vo.
- KÖNIGLICHE GESELLSCHAFT IN REGENSBURG. Flora, 1873. 1 vol. 8vo.
- NATURFORSCHENDEN GESELLSCHAFT IN DANZIG. Schriften, Band iii, Heft ii, 1873.
- NATURFORSCHENDEN GESELLSCHAFT IN ZÜRICH. Vierteljahrsschrift, jahrg, xvii, 1872.
- NATURHISTORISCHER VEREINS IN AUGSBURG. Bericht, 1873. 1 vol. 8vo.
- NATURWISSENSCHAFTLICHE GESELLSCHAFT "ISIS" IN DRESDEN. Sitzungs-berichte, jahrg, 1872. Oct., Nov., Dec. Jahrg, 1873. Jan.-Dec. Dresden. 1873-4.
- NATURWISSENSCHAFTLICHEN VEREINE ZU BREMEN. Abhandlungen, Band iii, iv (Schluss). Heft. Band iv, Heft i. 1873-4. Beilage, No. iii, zu den Abhandlungen des. 4to pamph.
- PEABODY INSTITUTE OF BALTIMORE. Seventh Annual Report of the Provost to the Trustees of, June 4, 1874.
- PHILA. ACADEMY OF NATURAL SCIENCES. Proceedings of. Part I. Jan., Feb. Mch., 1874.
- PHYSIKALISCH-MEDICINISCHE GESELLSCHAFT IN WÜRZBURG. Verhandlungen, vi Band iii and iv (Schluss) Heft.
- ROYAL ASIATIC SOCIETY. Journal of the North China Branch of the. New Series, No. viii, 1871.
- ROYAL SOCIETY OF LONDON. Proceedings of the. Vol. xxi, Nos. 146, 147. Vol. xxii, Nos. 148, 149, 150.
- ROYAL SOCIETY OF TASMANIA. Monthly Notices of Papers and Proceedings of the, for 1872.
- SOCIÉTÉ D' ACCLIMATATION IN PARIS. Bulletin Mensuel De La. 3me Série, Tome i, No. 2, 1874.
- SOCIÉTÉ D' ANTHROPOLOGIE DE PARIS. Bulletins de La. Tome viii, 11e Série, Mai, Juillet, 1873.
- SOCIÉTÉ VAUDOISE DES SCIENCES NATURELLES IN LAUSANNE. Bulletin. 2e Série. Vol. xii, No. 71. Feb., 1874.
- VEREIN DER FREUNDE DER NATURGESCHICHTE IN MEKLENBURG. Archiv. 27 Jahrg, 1873. 1 vol. 8vo. Neubrandenburg, 1873.
- VEREINS FÜR ERDKUNDE IN DARMSTADT. Notizblatt, iii Folge, xii Heft, Nos. 133-144.

VEREINES ZUR BEFÖRDERUNG DES GARTENBANES IN BERLIN. Monatschrift des. 16 Jahrg. Jan.-Dec. 1873.

YALE COLLEGE. Catalogue of, 1874. 8vo pamph. Obituary Record of the Graduates of, 1874. Yale College in 1874.

ZEITSCHRIFT FÜR DIE GESAMMTEN NATURWISSENSCHAFTEN IN BERLIN. Band vii, viii, 1873. 2 vols. 8vo.

ZOOLOGISCHE GESELLSCHAFT IN FRANKFURT, A-M. Zoologische Garten, Jahrg. xiv. No. 7-12. Juli-Dec., 1873.

PUBLISHERS. American Naturalist. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Sailors' Magazine and Seamen's Friend. Salem City Post. Salem Observer. Silliman's Journal.

The President made a few remarks, in which he mentioned that this was the first meeting of the Institute at West Newbury, and that now every municipality in Essex County had been visited except Lawrence, and in accordance with the custom observed at the meetings at new places, he gave a brief statement of the history and objects of the society. Some of the facts stated are as follows:—As early as 1832-3, several young men discussed the propriety of organizing a society to promote the study of natural history. In the December following such an organization was partially effected, and at Topsfield, in April, 1834, it was perfected. The Natural History Society and the Essex Historical Society were united in 1848, and incorporated under the name of Essex Institute, and the sphere of its labors has from time to time been enlarged, until now it embraces history, natural history, horticulture, and the fine arts. The first field meeting of the society was held in 1849. At that time only a few persons attended, and the meetings were held in the farm houses or other convenient places, but they did not assume the present character until the summer of 1856. Since then meetings have been held in thirty-two towns or cities in Essex County, and four beyond the limits, and in fifty-eight different parishes or districts, from one to five in the same townships.

MR. GEORGE D. PHIPPEN, of Salem, gave an interesting discourse on the few plants that had been gathered, and also on the familiar plants of the field and the garden, particularly on that unwelcome class known as weeds. For convenience he divided them into three classes, wild, cultivated, and intrusive. Among the many referred to he spoke of "woodwax," the seed of which was first sent to this country in 1629, to Gov. Endicott, and it was described as eminently useful for coloring purposes. The "white weed," with its traditional fame, is a common plant with our early history. "Chickweed" is referred to by the earliest botanists as suitable food for birds, has been long known, and is wonderfully diffused throughout the globe. The "nettle plant," from which good linen can be made, was first introduced into England by the Romans, and it is said, with more humor than truth, was used for the purpose of thrashing each other to keep themselves warm in cold weather, to which they were unused. Purslain, charlock, ambrosia and others were referred to. He also spoke of milkweed, the fibre of which has been used for textiles; and of the raising of hybrids and the success that has attended the efforts in this direction in the great variety of beautiful flowers and fine fruits, the result largely of human agency, ensuring hopes of never ending novelty and satisfaction.

MR. JOHN ROBINSON praised the arrangement of ferns which were placed in front of the pulpit, and spoke of the kindness of the people in furnishing them.

Prof. D. B. HAGAR, of the State Normal School in Salem, spoke of the pleasure which he experienced when he saw men who, like a previous speaker, had some intellectual pursuit in addition to his ordinary business life.

The work of the Essex Institute in the way of cultivating a taste for scientific pursuits, is an excellent one ; and one of the best things we can do for young people is to encourage them to select some one branch of science and make it their study in their leisure time. Such pursuits are especially valuable in lifting men above the low life which regards dollars and cents as the chief object to strive for.

Mr. ABNER G. PHIPPS, agent of the State Board of Education, whose present visit to the town was the first since he had taught school there, before he entered College, spoke in support of the sentiments uttered by the previous speaker.

Dr. JEREMIAH SPOFFORD referred to the medicinal qualities of the milkweed spoken of by Mr. Phippen, and also to a theory entertained by him in regard to the ancient course of the river in the vicinity of Newbury, which he thought must have been some distance south of the present stream, and fifteen or twenty feet higher.

Mr. HAYDEN BROWN, of West Newbury, talked of the various matters relating to the history of the town, and the work of the Institute. He spoke of the people of the town as an honest, hard-working class, without a beer-saloon, a bowling alley, or a place where rowdies can congregate.

Hon. STEPHEN M. ALLEN, of Boston, made some interesting statements relating to the construction of dams and reservoirs.

Rev. W. H. H. MARSH, of Salem, in response to a call from the chair, said he regretted he had not the opportunity of attending more frequently the meetings of the Institute, the several objects of which are of such great practical importance. The age is marked by scientific investigation, and as science has so vastly enlarged her domain, and has thus disclosed the interdependence of the several branches of scientific investigation, the successful prosecution of any single department of science requires a knowledge of several of the others. The true scientific spirit aims at the largest comprehension possible of facts, and receives hypotheses with caution, if not with distrust. For this reason the correct interpretation of nature and the true interpretation of revelation at those points where it touches science, will certainly harmonize. Science interrogates nature and nature reveals God, and so scientific study should be promotive of virtue, morality, high-toned character, reverence and faith.

On motion of Mr. N. A. HORTON

Voted That the sincere thanks of the Institute are due to the proprietors of the Second Church in West Newbury for the use of their building to hold this meeting; also to Mr. Hayden Brown, Mr. Gilman W. Brown, Rev. S. M. Keeler, and other citizens of West Newbury, for courtesies extended during this pleasant excursion.

An adjournment was had at about four o'clock, and it became necessary for the company soon to take their departure on the homeward trip.

The people of West Newbury had given the visitors a very favorable impression of the town and its inhabitants, and it is hoped the acquaintances formed under such pleasant auspices will be long continued.

Personally we desire to express our grateful appreciation of attentions from Rev. Mr. Keeler, a gentleman of high attainments and culture ; Mr. Hayden Brown, of the firm of S. C. Noyes & Co., and his son, Mr. Gilman W. Brown, to whom we were indebted for valuable information in collecting material for this sketch. The elder Mr. Brown seems to be ready to every good word and work tending to benefit the community in which he resides. He has furnished a fine room for the Library Association, just organized on a plan of individual membership under a law of the State for such purposes, and we hope at our next visit to find its shelves groaning with their weight of wisdom. The nucleus is already inaugurated, and it will not be allowed to remain undeveloped.

The passage down the river was quite rapid, as wind and tide were now in our favor. Vocal music did its part in aiding the general enjoyment, and it was with a feeling of regret that we parted company with the Merrimac and its beautiful "Queen." The 6.23 train soon transported us to the good old City of Peace, after a day of rare pleasure and much profit.



REGULAR MEETING, MONDAY, AUGUST 3, 1874.

MEETING this evening at 8 o'clock. The PRESIDENT in the chair.

Richard Harrington, of Salem, and Gilman W. Brown, of West Newbury, were elected resident members.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 6. SALEM, MASS., SEPTEMBER, 1874. No. 9.

One Dollar a Year in Advance. 10 Cents a Single Copy.

FIELD MEETING AT ROCKPORT, THURSDAY, AUGUST 6, 1874.

THE fourth field meeting the present season was held this day. The weather was very propitious for an excursion, the temperature cool and refreshing. The party, numbering about two hundred and fifty, was made up of delegations from Lynn, Salem, Beverly, Manchester and other towns in Essex County, a large proportion being, however, from Salem. The railroad ride was pleasant, affording a passing view of interesting sections of Beverly, Manchester and Gloucester, with occasional glimpses of the ocean and of some of the beautiful sea-side villas that have within the past few years been erected on this shore. The striking characteristics of the scenery on entering the precincts of Cape Ann are the many bowlders to be seen upon the hills on every side.

On arrival at the place of destination a committee of the Rockport Agricultural Association met the party and proceeded to the Town Hall, which was the rendezvous for the day, and where a cordial reception was extended.

Then the party separated into groups, each wending their way to visit the various objects of interest, as inclination dictated.

Some went to Pigeon Cove, which always offers many attractions; some visited the quarries, where the process of getting out huge blocks of beautiful granite was watched with interest; and some took general rambles along the shore and noticed the artificial harbors constructed by the erection of solid granite breakwaters built at great cost; some went to Long Beach, which is in view of Thatcher's Island, where, Aug. 19, 1635, twenty-one persons were cast away and only Mr. Thatcher and his wife were saved; while others visited the extensive and fine cabinets of Dr. Barden and Mr. Knowlton, which contain many choice mineralogical and geological specimens. Bears' Skin Neck and the delightful woods claimed a fair share of attention. There are a number of fine residences in the town proper and at the Cove. Among those that attracted notice was that of John D. Sanborn, Esq., which is most pleasantly situated and commands a charming view.

At 2.30 P. M., after all had lunched in the dining room at the hall, or in little knots on the rocks or in the woods, the company gathered in the large audience room, where the afternoon session was held. The meeting was called to order by the President, HENRY WHEATLAND.

In the absence of the Secretary, Mr. N. A. HORTON was requested to act. Records of preceding meeting read.

The SECRETARY announced the following correspondence:—

From M. M. Carpenter, Montreal, Canada, Aug. 3; I. W. Fielder, Everett, July 16; F. E. Hotchkiss, New Haven, Conn., July 27; F. I. Hsley, Newark, N. J., July 18; S. M. Keeler, West Newbury, July 17; W. J. Knowlton, Boston, July 25; T. Morong, Ipswich, July 18; Stuart Rogers, Providence, R. I., July 18; George Russell, Boston, July 29; K. T. Woods, Aug. 1; Iowa State Historical Society, July 15; Leeds Philosophical and Literary Society, July 25; New York State Library, Aug. 1.

The LIBRARIAN announced the following additions:—

By Donation.

- BROOKS, HENRY M. Reed's Apology. 1 vol. 12mo. Essex County Directory, 1839-70. 1 vol. 8vo. Conversations on Infant Baptism. 1 vol. 16mo.
- BUTLER, B. F., of U. S. Cong. Speech in U. S. H. R., June 19, 1874.
- CORNELL UNIVERSITY. Bulletin of. Vol. i, Nos. 1, 2, 1874.
- HOTCHKISS, F. E., of New Haven, Conn. New Haven Directories for 1870, 1871, 1872, 1873. 4 vols. 8vo. Miscellaneous pamphlets, 16.
- HSLEY, F. L., of Newark, New Jersey. Newark City and Business Directory, 1873-74. 1 vol. 8vo. Miscellaneous almanacs, 54.
- KIMBALL, JAMES. Freemason's Monthly Magazine for 1873.
- KINGSLEY, MRS. —. Federal Republican and Commercial Gazette for 1873. 1 vol. folio.
- LORING, GEO. B. Agriculture of Mass., 2d Series, 1873-74. 1 vol. 8vo. Thirty-fifth Registration Report, 1872-73. 1 vol. 8vo. Report of the Insurance Commissioner of Mass., 1874. 1 vol. 8vo. Miscellaneous pamphlets, 17.
- MAINE BOARD OF AGRICULTURE. Report of the Secretary of the, for 1873-74. 1 vol. 8vo.
- MASON, ALBERT, New York, N. Y. History of Burmah, by Rev. F. Mason. 1 vol. 8vo. 1850. The Story of a Working Man's Life, by F. Mason. 1 vol. 8vo. 1870.
- MERRITT, L. F. The Shanghai Budget, *Mc*. 26, Apr. 2, 9, 18, 25, May 2, 9, 16, 23, 30, June 6, 13, 1874. Essex County Mercury, May 27, June 17, 24, July 1, 15, 23, 1874.
- OFFICE OF THE CHIEF OF ENGINEERS. Report of a Reconnaissance in the Ute Country made in 1873, by Lieut. E. H. Buffner. 8vo pamph. Washington, 1874.
- PERKINS, ALBERT C., of Exeter, N. H. Catalogues of Phillips Exeter Academy, 1783-1839, 1873-4.
- QUINT, A. H., of New Bedford, Mass. Minutes of the Seventy-Second Annual Meeting, Lynn, June 16-18, 1874, with the Reports and Statistics. Boston, 1874.
- SWALLOW, GEO. C. Report of the Curators of the University of the State of Missouri. Catalogue, etc., for the year ending June 24, 1874.
- U. S. PATENT OFFICE. Official Gazette, July 14, 1874.
- WORCESTER LYCEUM AND NATURAL HISTORY ASSOCIATION. Officers of the, for 1874-5. Worcester, 1874.
- YOUNG MEN'S CHRISTIAN ASSOCIATION OF WORCESTER. Report for 1874.

By Exchange.

- BERWICKSHIRE NATURALIST CLUB, Alwick. Proceedings. Vol. vii, No. 1, 1873.
- BOSTON PUBLIC LIBRARY. Bulletin of. July, 1874.
- BOTANISK TIDSSKRIFT I KJØBENHAVN. Tidsskrift. Vol. ii, pts. 2, 3. Journal De Botanique, 1872-3. 2 pamphlets, 8vo. 1874.
- IMPÉRIALE ACADÉMIE DES SCIENCES DE ST. PETERSBOURG. Mémoires, Tome xix, Nos. viii, ix, x, 1873. Tome xx, Nos. i, ii, iii, iv, v, 1873. Tome xxi, Nos. i, ii, iii, iv, v, 1873. 13 pamphlets, 4to. Bulletin, Tome xviii, Nos. iii, iv, v, 1873. Tome xix, Nos. i, ii, iii, 1873-4. 6 pamphlets, 4to.
- IOWA STATE HISTORICAL SOCIETY. The Annals of Iowa. April, 1874.
- KONGELIGE DANSKE VIDENSKABERNES SELSKABS I KJØBENHAVN. Oversigt, 1873. No. ii.
- MANCHESTER SCIENTIFIC STUDENTS' ASSOCIATION. Annual Report for 1873.
- NATURAL HISTORY SOCIETY OF MONTREAL. Canadian Naturalist and Quarterly Journal of Science. Vol. vii. No. 5. 1874.
- NEW JERSEY HISTORICAL SOCIETY. Proceedings. Vol. iii, 2d Series, No. 4, 1874.

NEW YORK GENEALOGICAL AND BIOGRAPHICAL SOCIETY. Record of, Vol. v, No. 3. July, 1874.

PUBLISHERS. American Journal of Science and Arts. American Naturalist. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Hardwicke's Science Gossip. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Salem City Post. Salem Observer.

The PRESIDENT, in introducing the exercises, took occasion to refer to the memory of the late Rev. Stillman Barden,* who, on previous visits to Rockport had been unremitting in his attentions. Mr. Barden had been the minister of the Universalist Society of this place for several years, and during his residence here had, by his indefatigable labors, contributed largely to our knowledge of the mineralogical treasures found occasionally during the excavations in the extensive quarries.

Mr. ALFRED OSGOOD, of Newburyport, read the following notes concerning the

“LEAD MINE” AT ROCKY HILL, WEST NEWBURY.

In the early part of last year a farmer of Newbury, at or near a place called “Rocky Hill,” discovered a piece of lead ore on the surface of the earth, and, incited by records or traditions of former discoveries of the metal in the same region, he purchased the lot of land, containing twelve acres, and commenced digging, finding pieces of the size of one pound and upwards to some of two or three hundred pounds in weight, distributed among the drift, which in this region consists largely of angular fragments not much worn, and a loamy soil. The amount of ore realized up to date being about three tons. The dimensions of his pit are thirty feet by five and six feet in depth; the deposit of ore, however, was not more than

* For a biographical and obituary sketch of Rev. Mr. Barden, by Rev. Mrs. P. A. Hanaford, see Historical Collections of Essex Institute, Vol. vii, page 213.

twelve feet in length and lying on the northwest side of a boulder, containing small veins of lead, antimony, and sulphuret of iron. (The ledges in that region are what Professor Hyatt calls Diorites.)

Other prospective diggings disclosed only boulders much worn and rounded by glacial action, and of the same character as the large one.

All of the pieces of lead ore were much worn, and the iron in contact decomposed.

Mr. F. W. PUTNAM made some further observations, not only on this mine, but in explanation of the process by which the boulders seen standing alone on the high hills are brought hither on the ancient icefields from the North.

He also gave a very interesting account of

THE ANDERSON SCHOOL OF NATURAL HISTORY ON

Penikese Island, where he, with others, had spent several weeks past as an instructor. This island, situated some twelve miles south from New Bedford, one mile in length by a half a mile in width, was donated by Mr. Anderson, of New York, a year or two since, to Prof. Agassiz, as a location for a scientific school during the summer months.

Mr. Anderson also gave the sum of fifty thousand dollars to be expended for the necessary buildings, etc. The school was in operation for the first time last season, under the direct superintendence of Prof. Agassiz, who gave to it his accustomed zeal and vigor to establish it upon a firm and enduring basis. Mr. Alexander Agassiz, son of the late Prof. Agassiz, is the present director, and the pupils, who come from all parts of the country, are composed of Normal teachers and professors, principally from the western colleges. There are over fifty pupils and from

ten to twelve instructors, each instructor having charge of a special department. He described the several buildings and the method of instruction pursued. Text books are abolished and the studies are directly from the specimens by dissection and from life. A tug boat visits the island from New Bedford three times a week. The expenses of the students are about eight dollars per week. He anticipated the best results from this school in the dissemination of scientific knowledge, and certainly hardly greater facilities could be offered.

Hon. A. W. DODGE followed Mr. Putnam and quoted Agassiz to the effect that a great error in our mode of teaching is that we rely too much upon text books; yet he thought there was danger that those who made a specialty of certain studies would attach too much value to their particular study in comparison with others. He then made some very important remarks upon horticultural pursuits, and described the process of growth by which certain common fruits are developed.

Prof. ALBERT H. TUTTLE, of the Ohio Agricultural and Mechanical College, Columbus, who has been visiting in Salem for some weeks for the purpose of dredging on the coast and collecting the marine fauna and flora, among other remarks spoke of the great variety of marine plants and animals found along the coast, and the opportunities thus afforded to students in zoology and botany for investigation and research.

Rev. A. B. HERVEY, formerly of Peabody, now of Troy, N. Y., who is spending his summer vacation near the Clifton House, in Marblehead, gave a description of some of the curiosities seen during his trip to the shore, with a humorous narrative of his conveyance thither.

Mr. F. W. PUTNAM then described certain specimens which were placed upon the table, consisting of the egg case of a species of *Buccinum*; a stone bored by a *Pholas*; a sponge found on the shore; and a mass of clay in the form of a tube, which was probably the case of a large marine worm.

Hon. JAMES KIMBALL read the following communication from Mr. J. B. Wardwell, of Methuen, Mass., giving

A DESCRIPTION OF AN INDIAN RELIC

Recently found on the farm of Mr. Wm. Hutchins, in Methuen, and near the New Hampshire line. A rock of gray, compact sandstone, with a broad, flat surface, and estimated to weigh nearly half a ton, was dug up in rising ground bordering meadow land, where, no doubt, once existed a small pond. Mr. Hutchins was digging large stones from this pasture for building purposes, which led to its discovery. The rock was bottom up, and so bedded that but a small portion of it was visible above ground, and this part was covered with a close, filmy, gray moss. It was hauled to the road (an eighth of a mile) where it was to be used in a cellar wall, and on removal of the dirt from the flat side, about three-fifths of a circle was discovered. To the eye this appears to be a perfect circle. It measures twenty inches in diameter, and from a half inch to three-quarters of an inch in depth. It was accomplished by drilling holes as near together as possible, and then removing the intervening portions. The instrument, or drill, appears to have been between a quarter and three-eighths of an inch in diameter, and the markings number one hundred and twenty, and are suggestive of the use of the *bow*, as a means of moving the drill. These markings bear the impress of great age.

The missing part of the relic will be sought after, from time to time, though I think with but little prospect of success, as the fracture has also the appearance of age, and the fragment may have been destroyed or carted off years ago. A small portion of the surface within the circle and near the line of fracture has been removed, and suggests the idea of its having been broken and abandoned, when it had reached its present stage of completion. The relic is now in my possession, and I regret to add, that in splitting it off from the main body, it was broken into several pieces, although fourteen holes were drilled for its accomplishment. The fragments are now joined, and the whole embedded in plaster.

A reasonable conclusion is, that it was intended for a large mortar, but ruined in the process. It is particularly interesting as a relic, on account of showing plainly the method adopted in hollowing out these vessels, as also, its remarkable size and correctness of outline. The surface in which this circle is wrought was originally coated with a silicious film, a large portion of which still remains.

Moulds will immediately be prepared, for furnishing casts of this relic at reasonable prices.

Mr. PUTNAM remarked on the importance of this relic as showing how the large stone vessels, or "mortars," as they are generally called, were made.

Mr. CALEB COOKE announced the donation of several interesting historical relics to the cabinets, including a pair of antique andirons and a chafing dish from Mr. William Russell, of Salem.

Mr. Cooke also mentioned that Mr. Charles H. Foster, of Salem, during his recent visit to Australia, had, with much care and attention, made a very valuable collection

of the animals illustrative of the peculiar fauna of that country, comprising the skins of twenty mammals and one hundred and twenty-one birds, besides several reptiles, fishes, etc. These he has kindly presented to the Institute, and they have been accordingly deposited in the museum.

A vote of thanks to Mr. Foster for this very acceptable addition to the museum, and for the interest he has thus expressed in the promotion of the objects of the Institute; also to the other friends whose liberal contributions have been announced at this meeting, was unanimously adopted.

On motion of Mr. Kimball it was

Voted, That the thanks of the Institute are due to the Selectmen of Rockport for the use of the town hall to hold this meeting; and to the members of the Rockport Agricultural Association for courtesies extended to the members and their friends during this pleasant visit to Rockport.

Adjourned.



REGULAR MEETING, MONDAY, AUGUST 17, 1874.

MEETING this evening at 8 o'clock. Vice President A. C. GOODELL in the chair.

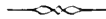
Mrs. E. S. Metcalf, Charles T. Jenkins, Frederick Porter and George G. Putnam, all of Salem, were duly elected resident members.

Mr. C. H. HIGBEE presented specimens of the *Anthrenus varius*, and made some interesting remarks upon

the history and habits of this insect, so injurious to woollen fabrics.

The chair presented to the Institute an old cartridge box, the gift of Hon. William Fabens, of Marblehead. This old box, with its belt and covers, was found in the walls of an ancient farmhouse, recently taken down, upon the Neck, in Marblehead. As it bore the monogram of George the Second it may have been secreted previous to 1760 by some deserter from one of the many ships of war that sailed to our shores before the revolution. Remarks suggested by this subject were made by Messrs. W. P. Upham, Henry Hale, and others.

Adjourned.



REGULAR MEETING, MONDAY, SEPTEMBER 7, 1874.

MEETING this evening at 8 o'clock. The PRESIDENT in the chair. Records of last meeting read.

The SECRETARY announced the following correspondence:—

From M. Anagnos, Boston, Aug. 27, Sept. 7; Gilman W. Brown, West Newbury, Aug. 12; C. C. Carpenter, Andover, Sept. 3; John D. Champlin, Jr., New York, Aug. 27; Joseph Cummings, Middletown, Conn., Sept. 11; Samuel Hart, Hartford, Conn., Aug. 17; A. Laekey, Haverhill, Aug. 31; R. Ridgway, Washington, D. C., Aug. 12; W. Hudson Stephens, Denver, Col., Aug. 27; Charles A. Walker, Boston, Aug. 25; Yale College, Aug. 24.

The LIBRARIAN reported the following additions:—

By Donation.

BRIGGS, DANIEL B., of Lansing, Mich. Report of the Superintendent of Public Instruction of the State of Michigan, 1873. 1 vol. 8vo.

BUREAU OF EDUCATION, WASHINGTON, D. C. Circulars of Information of the No. I, 1874.

BUTLER, B. F., M. C. Memorial Addresses on Charles Sumner, Apr. 27, 1874. 1 vol. 8vo. U. S. Coast Survey for 1870. 1 vol. 4to. Report of Explorations and Surveys for a Ship-Canal, Isthmus of Darien. 1 vol. 4to.

CABOT, J. S. The Life of John Phillips. 1 vol. 42mo. Tariff of Duties, by P. P. DeGrand. 1 vol. 12mo. Grammar of the Greek Language. 1 vol. 12mo. Adam's Latin and English Grammar. 1 vol. 12mo. Poetical works of Lord Byron. 1 vol. 12mo. Patriotic Addresses. 1 vol. 12mo. Butler's Analogy. 1 vol. 12mo. Watt's Logic. 1 vol. 12mo. Anecdotes. 1 vol. 12mo. The Tatler. 1 vol. 12mo. History of Bonaparte. 1 vol. 8vo. Lecture on Astronomy. 1 vol. 8vo. Burlamaqui on Laws. 2 vols. 8vo. Martin's Gazetteer of Virginia. 1 vol. 8vo. Moore's Universal Geography. 1 vol. 8vo. Millot's General History. 5 vols. 8vo. Duncan's Cicero. 1 vol. 8vo. Guthrie's Grammar. 1 vol. 8vo. Conquest of Mexico. 2 vols. 8vo. Duffie's Nature Displayed. 2 vols. 8vo. Treatise on the Vine. 1 vol. 8vo. The American Gardener. 1 vol. 12mo. Hewey's Meditation. 1 vol. 12mo. The Female Spectator. 1 vol. 12mo. Poetical Works by T. Pindar. 1 vol. 12mo. Jackson's Messages. 1 vol. 12mo. Essays by John Locke. 2 vols. 8vo. Siamese Tales. 1 vol. 16mo. The Death of Abel. 1 vol. 16mo. The Works of Horace. 1 vol. 16mo. Rural Sports. 1 vol. 12mo. History of Rasselas. 1 vol. 12mo. Young's Dictionary. 1 vol. 8vo. History of the Heathen Gods. 1 vol. 16mo. Saville's Miscellanies. 1 vol. 12mo. Practical Grammar of the English Tongue. 2 vols. 12mo. Vicar of Wakefield. 1 vol. 12mo. Homer's Iliad. 1 vol. 16mo. Evenings at Home. 3 vols. 12mo. Method of Teaching and Studying Belles-Lettres. 4 vols. 12mo. Milot's History of England. 4 vols. 12mo. Florist's Guide. 2 vols. 8vo. Pomological Magazine. 3 vols. 8vo. Greek Testament. 1 vol. 12mo. Miscellaneous pamphlets, 40.

CUMMINGS, Rev. JOSEPH, Pres. of Wesleyan University, of Middletown, Conn. Annual Catalogues of the Wesleyan University. 15 pamphlets. 8vo. The Wesleyan Olla Podrida. 3 pamphlets. 8vo. Ceremonies and Speeches at the Laying of the Corner Stone and Dedication of Orange Judd Hall of Natural Sciences, May 5, 1870.

DEPARTMENT OF THE INTERIOR. U. S. Coast Survey, 1868-69. 1 vol. 4to. Diseases of Cattle in U. S., 1839-70. 1 vol. 4to. Compendium of the Ninth Census of U. S., 1870-71. 1 vol. 8vo. Commercial Relations, 1871-72. 2 vols. 8vo. Senate Miscellany, 2d Sess., 42d Cong., 1871-72. 1 vol. 8vo. Report of the Department of Agriculture, 1872. 1 vol. 8vo. Affairs in the Late Insurrectionary States, 1872. 13 vols. 8vo. House Miscellaneous, 2d Sess., 42d Cong., 1871-72. 4 vols. 8vo. Foreign Relations of the United States, 1872-73. 6 vols. 8vo. Report of the Secretary of War, 1872-73. 2 vols. 8vo. Report of the Secretary of the Interior, 1872-73. 2 vols. 8vo. Annual Reports, 3d Sess., 42d Cong., 1872-73. 1 vol. 8vo. Executive Documents, 3d Sess., 42d Cong., 1872-73. 4 vols. 8vo. Estimates of Appropriations, 1873-74, 1872-73. 1 vol. 8vo. List of Private Claims from 32-41 Cong. 1 vol. 4to, 1872-73. Reports of Explorations and Survey for a Ship-Canal, Isthmus of Darien, 1872-73. 1 vol. 4to. House Journal, 3d Sess., 42d Cong., 1872-73. 1 vol. 8vo. House Miscellaneous, 3d Sess., 42d Cong., 1872-73. 3 vols. 8vo. Senate Miscellaneous, 3d Sess., 42d Cong., 1872-73. 1 vol. 8vo. Senate Documents, 3d Sess., 42d Cong., 1872-73. 1 vol. 8vo. Senate Reports, 3d Sess., 42d Cong., 1872-73. 3 vols. 8vo. Senate Journal, 3d Sess., 42d Cong., 1872-73. 1 vol. 8vo. Report of Committees, 3d Sess., 42d Cong., 1872-73. 3 vols. 8vo.

PEABODY, Mrs. F. Horticultural Register, 27 numbers. Annals of Electricity, 31 numbers. Putnam's Monthly, 11 numbers. European Agriculture and Rural Economy, 10 numbers. The Monthly Miscellany, 12 numbers. Western Quarterly Review, 25 numbers. American Repertory, 21 numbers. Christian Examiner, 93 numbers. American Journal of Science, 25 numbers. Gardener's Monthly, 66 numbers. Journal of Science and the Arts, 17 numbers. The Horticulturist, 54

numbers. The Farmer's Cabinet, 45 numbers. Monthly Religious Magazine, 71 numbers. American Quarterly Review, 33 numbers. The Chemist, 42 numbers. Magazine of Horticulture, 135 numbers. Magazine of Domestic Economy, 25 numbers. Hunt's Merchant's Magazine, 33 numbers. The Mechanic's Magazine, 27 numbers. Library of Useful Knowledge, 173 numbers. New England Magazine, 8 numbers. The Knickerbocker Magazine, 7 numbers. London Journal, 17 numbers. Edinburgh Journal of Science, 12 numbers. Salem Directories, 1855, 1857, 1859, 1871, 1884, 1886. Mass. Register, 1823, 1825. English Exercises. 1 vol. 12mo. Beleke's German Grammar. 1 vol. 8vo. Burns' Poems. 1 vol. 16mo. Ad-dick's French Elements. 1 vol. 8vo. Live and Learn. 1 vol. 12mo. Miscellaneous pamphlets, 900.

TAFT, S. H., of Humboldt, Iowa. Catalogue of the Officers and Students of Humboldt College for 1873-74.

U. S. PATENT OFFICE. Official Gazette, July 21, 28, Aug. 4, 11, 1874.

WATERS, J. G. Boston Almanacs, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1859. Salem Directories, 1850, 1855, 1859.

WILLIAMS, H. L. The International Railway Guide, 11 numbers. Miscellaneous pamphlets, 37. Miscellaneous almanacs, 7.

WILLSON, E. B. Record of the Unitarian Worthies, Aug., 1874.

By Exchange.

BOSTON PUBLIC LIBRARY. Twenty-second Annual Report, 1874.

GEOLOGICAL SURVEY OF CANADA. Palaeozoic Fossils. Vol. ii, pt. 1, Aug., 1874.

INSTITUT HISTORIQUE IN PARIS. L' Investigateur, 40e Année, No. iii. Avril-Mai, 1874.

LITERARY AND PHILOSOPHICAL SOCIETY OF MANCHESTER. Memoirs of, 3d Series, Vol. iv, 1871. 1 vol. 8vo. Proceedings of, Vols. viii, ix, x, xi, xii. 1873-73. 6 vols. 8vo.

NATURFORSCHENDER VEREIN IN RIGA. Correspondenzblatt, xx Jahrg.

SENCKENBERGISCHE NATURFORSCHENDE GESELLSCHAFT IN FRANKFURT. Ab-handlungen, Bd. ix, No. 1-2, 1873.

SOCIÉTÉ D' ACCLIMATATION IN PARIS. Bulletin Mensuel, 3me Série, Tome i, Avril, 1874.

PUBLISHERS. American Journal of Science. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Sailors' Magazine and Seamen's Friend. Salem Observer. Salem Post.

Mr. CALEB COOKE mentioned that among the recent additions to the cabinets may be specified the donation from Samuel Emery, of Salem,—a Franklin medal. This medal was adjudged as a reward of merit, by the Boston school committee, to Stephen Emery, 1799. Also a longitude and azimuth compass made by R. Walker.

Rev. E. C. BOLLES presented some interesting relics, collected by him, from Chester, in England, consisting in

part of pieces of pottery, human bones, etc., of the Roman period; also stereoscopic views of the Salisbury cathedral and other sites of historic interest in that vicinity, including Old Sarum and Stonehenge, the supposed ruins of an old Druidical temple. He described the Blackmore Museum in Salisbury, and exhibited a stone implement from one of the mysterious "barrows" or burial mounds on the plain about Stonehenge. These mounds are of different forms, and probably different ages, and are the most conspicuous objects in the melancholy scenery of Salisbury Plain. The soil is chalk, overlaid by a thin, crispy turf. Some of the barrows have been opened; and by searching in the half-filled excavation in one of these diggings, Mr. Bolles found this spearhead, roughly chipped from flint, and exhibiting in its weathered surface the marks of great antiquity. It is about five inches long and two wide. Mr. Putnam, to whom it was submitted, was uncertain whether to consider it a complete implement of the rudest stone age, or an unfinished one of a later period. Mr. Bolles made these relics the subject of some unpremeditated remarks of great interest, and we hope that he may be induced at some future meeting of the Institute to give a more extended account of his recent researches amid the ancient haunts of the Druids and the Romans in England.

The PRESIDENT alluded to the recent donation from a few friends of a valuable cast of the "Rosetta Stone." The stone of which this is a cast was discovered near Rosetta, in lower Egypt, in August, 1799, and is now deposited in the British Museum. The inscription is in three languages, Hieroglyphic, Demotic, or the language of the country, and Greek. Being counterparts, or repetitions of each other, they give the main key and help in

deciphering the hieroglyphics of ancient Egypt. The event recorded by the Rosetta stone, the decree issued at the coronation of Ptolemy Epiphanes, took place at Memphis in March, 193 B. C. This cast is one of Ward's series, and was made at Rochester, N. Y.

The PRESIDENT called the attention of the meeting to the decease of Prof. JEFFRIES WYMAN, of Cambridge, a valued corresponding member, which occurred at Bethlehem, N. H., on the 4th inst., in his sixty-first year. He spoke of the great loss which the Institute and science had sustained in his death, and alluded to the very prominent positions which he had held, and his worth both as a man and a scientist.

Vice President F. W. PUTNAM gave an account of the scientific work of Prof. Wyman, alluding especially to the great care with which he conducted all his researches; his extreme cautiousness; the remarkable thoroughness of his work and the extraordinary modesty, but at the same time amazing force, with which he advanced his views. As an anatomist and physiologist he was without a superior, and he was a most careful and profound investigator in archaeology, to which science he had devoted the later years of his life. His work upon the ancient shell heaps of Florida, which is now being printed by the Peabody Academy of Science, will be a lasting monument to him as an archaeologist, and will exhibit the care with which he performed his investigations and deduced his results.

Mr. PUTNAM then offered the following resolutions, which were unanimously adopted:—

Whereas, the ESSEX INSTITUTE has learned with deep

regret of the death of its distinguished corresponding member, Professor JEFFRIES WYMAN, therefore,

Resolved, That in the death of JEFFRIES WYMAN, the Institute acknowledges the loss of a most honored member, and laments that science is deprived of the continued labors of one of the most upright and conscientious of men, most cautious of investigators, and most concise of expounders in his chosen departments of physiology, comparative anatomy, embryology and anthropology.

Resolved, That a copy of these resolutions be sent to the bereaved family of our late member, as the expression of our condolence with them in their great affliction.

Adjourned.



REGULAR MEETING, MONDAY, SEPTEMBER 21, 1874.

MEETING this evening at 7.20 o'clock. PRESIDENT in the chair. Records read.

The SECRETARY announced the following correspondence :—

From James S. Bryant, Hartford, Conn., Sept. 12; Joseph Cummings, Middletown, Conn., Sept. 15; J. W. Fielder, Everett, Sept. 10; Samuel Hart, Hartford, Conn., Sept. 16; C. H. Higbee, Boston, Sept. 21; Alfred M. Mayer, South Orange, N. J., Sept. 19; S. M. Watson, Portland, Me., Sept. 12.

The LIBRARIAN announced the following additions :—

By Donation.

HART, SAMUEL, of Trinity College, Hartford. Address before the House of Convocation of Trinity College, July 1, 1874, by Rev. Wm. Payne, D.D.

HOADLEY, C. J., of Hartford, Conn. Legislative Documents of Conn., 1834, 1855, 1856, 1857, 1868, 1869, 1870, 1871, 1872, 1873, 1874. 20 vols. 8vo. Catalogue of Conn. Volunteer Organizations, 1861-65. 1 vol. 8vo. History of Conn. during the Recent War, 1861-1865. 1 vol. 8vo. New Haven Colonial Records, 1638-1743. 7 vols. 8vo. Genealogical Notes by N. Goodwin. 1 vol. 8vo.

U. S. PATENT OFFICE. Official Gazette, Aug. 15, 1874.

WOLCOTT, J. W., of Boston, Mass. Report on the Statistics of Labor, 1873. 1 vol. 8vo. Annual Report of the Board of State Charities, 1-9. 9 vols. 8vo. Thirtieth Registration Report of Mass., 1871. 1 vol. 8vo. Miscellaneous pamphlets, 12.
 WATERS, J. G. Chicago Directory, 1863-64. 1 vol. 8vo. The Christian Inquirer, 60 numbers. Almanacs, 13. Miscellaneous pamphlets, 31.

By Exchange.

AMERICAN ANTIQUARIAN SOCIETY. Proceedings of the Semi-Annual Meeting, held in Boston, Apr. 29, 1874.

CANADIAN INSTITUTE. The Canadian Journal of Science, Literature and History. Vol. xiv, No. 3., Aug., 1874. 8vo. Toronto, 1874.

PUBLISHERS. Forest and Stream. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Salem Observer. Salem Post.

Among the donations announced to the cabinets may be specified several articles illustrative of the costumes of central Turkey, presented through the Rev. E. S. Atwood, from Miss E. M. Pierce, of the Mission Station at Aintab, Central Turkey, formerly a resident of Salem, and a teacher in one of the public schools. These consisted of a pair of native boots, a pair of native shoes, also of cobcob; ink and penholder, knife, comb, and specimens of native cloth; and a Turkish telegram.

Mr. ROBINSON states that a new fern has been received from Dr. C. C. Parry, collected by him in Southern Utah. It is named by Prof. Eaton "*Notholena Parryi*."

Caroline A. Watson, of Salem, was elected a resident member.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 6. SALEM, MASS., OCTOBER, 1874. No. 10.

One Dollar a Year in Advance. 10 Cents a Single Copy.

FIELD MEETING AT MANCHESTER, FRIDAY, OCTOBER 2, 1874.

THE closing field meeting of the season was held this day, at Manchester, by the kind invitation of Mr. Lewis N. Tappan and other citizens of that town. Manchester is one of the most attractive places in this county to hold a meeting. It is a locality exceedingly rich in the various objects which contribute to the enjoyment of the lovers of natural history. The proximity to the woods, on the one side, which abound with floral treasures, varying with the different seasons of the year, and the diversified soil and aspect; the rocky and craggy hills, the meadows and the lowlands, each having its distinct flora; on the other side the seashore, with its bold, rocky cliffs, and the intervening beaches, cooled during the heated months by the invigorating breezes from the ocean, offer to the students of the marine flora and fauna much to study and investigate.

The day was unpropitious, and the attendance was accordingly smaller than usual. The party was welcomed

at the station by Messrs. Tappan, Merrill, Price and others, and were conveyed to various points of attraction in carriages provided for the occasion. Some went to the seashore, where "Eagle Rock" and the several fine beaches offered great attractions, more especially "the musical sands" which are situated on part of what is known as the "Old Neck Beach," and are alluded to in the notice of the meeting on Thursday, Aug. 2, 1866;* some to the woods, noticing especially the famous bowlder named "Agassiz Rock;" also large and fine specimens of the tupelo tree (*Nyssa multiflora*) and of the sassafras tree (*Sassafras officinale*); others went in different directions, as inclination dictated.

Lunch was had at the Town Hall at about one o'clock, tea and coffee being provided by citizens of the town, and the afternoon session was held at the same place at two and one-half o'clock.

In the absence of the President, Vice President F. W. PUTNAM took the chair and made the opening address.

He stated that a field meeting was held at Manchester, Aug. 28, 1849, the first year of holding these meetings, being the third of this series. The place of rendezvous was at the point, on Burley Smith's farm. The adjacent shore was dredged to procure the mollusca and other marine animals; the late Mr. William Stimpson was present and made his first dredging; the forerunner of his extensive and valuable services in sea dredging, which has so indelibly associated his name with the marine zoology of New England.

In July, 1856, through arrangements made by Mr. Jonathan French, jr., principal of the public high school, another field meeting was held in the high school house,

* See Proceedings of Essex Institute, Vol. v. page 57.

a building placed upon the brow of an elevation, a short distance from the thickest settlement of the town, and from which is a most beautiful landscape and water view. This meeting was memorable as the first of the meetings attended by ladies, the excursions having previously been confined to small parties of gentlemen, travelling in private conveyances.

A meeting was also held in the town in the following summer of 1857, and again on Thursday, August 2, 1866, soon after the completion of the laying of the Atlantic cable, and resolutions were passed on the successful result of that undertaking. At this meeting the late Chief Justice Chase and other distinguished persons were present.

The chairman then called on Prof. E. S. MORSE, of Salem, who spoke at some length upon the cause of the glacier scratches found on our pasture bowlders, illustrating his remarks by explanatory diagrams on the black-board. The proofs of the glacial theory, the action of the glaciers, the origin of moraines, the formation of icebergs and incidental questions connected with the topic, were ably presented. In the course of his remarks he made a statement not generally known, that the American Indians were acquainted with the fact that the glacial scratches on ledges and bowlders run north and south, and that they used them as a guide. The fact is not referred to in any work of science, or aboriginal history, but Mr. Morse received it from an old gentleman, at Portland, whose grandfather remembered that the Indians sometimes found their way through the forests by scratching away the earth over the rock in order to note the direction of the smooth scratches.

The speaker also alluded to the somewhat current impression that water will wear away a rock, and showed

that instead of this the softer portions of rock are worn away by the action of sand and gravel washing over it.

In reply to a call for an account of the large bowlder in the Manchester woods which had been visited by the party, the Secretary, Mr. JOHN ROBINSON, stated that he had taken great pleasure, during the morning, in visiting the curious bowlder in the woods on the road to Essex. After a pleasant but difficult walk through woods and clearings, and finally by a scramble to the summit of the hill upon which many bowlders rest they came to the rock designated. It is about half the size of Ship Rock, so justly celebrated, and in shape almost a cube, of perhaps twenty feet on a side, one end resting upon the ledge which forms the hill, and the other propped up about two feet by a wedge-shaped rock, the sharp end downwards; the base of the thus inverted wedge is against the under side of the bowlder. Beneath is room for two persons to crawl, and the glacial scratches upon the ledge, being so well protected, are nearly perfect, while a sidelong glance shows the surface of the ledge to be quite smoothly polished. Mr. Robinson, after speaking of the importance of such characteristic bowlders in demonstrating the glacial theory, and of the interest expressed by the late Prof. Agassiz while visiting this rock some years since, made, at the suggestion of some residents of Manchester, the following motion, which was unanimously accepted, after being seconded by Mr. Lewis N. Tappan, who offered some remarks on the subject, including reminiscences of Prof. Agassiz' visit to the spot:—

Voted, that the bowlder visited during the morning by a party from the Essex Institute Field Meeting, held at Manchester, Oct. 2, 1874, be named and hereafter known as "Agassiz Rock."

Mr. PUTNAM on announcing the acceptance of the vote alluded to the marked propriety of attaching the name of Agassiz to so interesting a bowlder, and stated that hereafter, in all the publications of the Essex Institute, this bowlder would be known by the name now bestowed, and that in due time the name would be incorporated in works upon the subject of glacial action in New England.

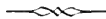
Rev. Dr. BOLLES, of Salem, was the next speaker, and took as his theme the reason why leaves change their color in the autumn, and why it is when the time has come that they fall from the trees. He explained that these things were not occasioned by frost, as so many suppose. Frost congeals foliage, rendering it flaccid, and it takes on the color of decay. Nor is it any process that comes from outside the leaf, but the result of certain changes that take place in the leaf itself. The leaf is a living thing, the workman of the plant, from which it gets its growth, blossom, and fruit. Dr. Bolles then entered into a minute description of a leaf, its framework and covering, the vegetable cells, from which it receives its color, and showed how, from some change in these cells the leaf ripened and took on the glowing colors of autumn foliage. He spoke of the assistance received in the study of this subject from the spectroscope, an instrument so powerful that it reaches and penetrates the mysteries of the planets, yet so delicate as to take cognizance of the chemistry of a tiny leaf-cell, unknown save as we analyze it through this wonder-working glass. The doctor also explained how, at the ripening of the leaf, a cork-like substance is formed at the junction of the stem with the twig, until the leaf is ready to fall at the slightest breath, without the bleeding and loss which would ensue from the violent disruption of the foliage from the tree.

The CHAIRMAN gave a description of a salamander which had been left by some one upon the stand. In answer to questions he explained that it was not poisonous, and indeed could not be made to bite. He then traced the distinctions between the salamander and the toad and frog, and between various varieties of salamanders common to this vicinity, giving an account of their development and habits.

Dr. BOLLES called attention to a new work undertaken by the Institute, in the forming of a museum representing the history of various manufactures, and said the Institute would be glad to receive contributions. The intention is to make a collection of pottery, types of different kinds of stone, china and earthenware; articles for kindling fire,—antique specimens of matches, tinder boxes, etc.; old paper,—writing and printing. Articles which possessors might deem worthless would perhaps be of service in making a link of great value.

On motion of Dr. BOLLES it was

Voted, That the thanks of the Essex Institute be tendered to Messrs. John Price, Lewis N. Tappan, J. W. Merrill, and Cheever, and the ladies of the town who had so kindly aided in the arrangements of the day. Also to the town authorities for the use of this hall.



REGULAR MEETING, MONDAY, OCTOBER 5, 1874.

THIS evening was appropriated to the commemoration of the first centennial of the revolution—the one hundredth anniversary of the meeting, in Salem, of that

memorable body, which here formally and finally resolved itself into a Provincial Congress, and thereby established in Massachusetts "a government of the people, by the people, and for the people."

The hall was well filled. Henry Wheatland presided, and a fine double quartette choir, under the direction of M. Fenollosa, Esq., who played a piano-forte accompaniment, sang some patriotic pieces in excellent style, which received warm applause. The exercises were opened with the singing of the following words, adapted for the occasion to the tune of "Scots wha hae wi' Wallace bled :"

Men that dare with wrong to fight;
 Men that battle for the right;
 Gird ye on your armor bright;
 Hark the Toesin's call!
 Tyranny with latest breath,
 Struggling onward to its death,
 Still with frantic madness saith,
 Liberty shall fall!

Right and wrong in desperate strife;
 Front to front, and life for life,
 Reckless of the ruin rife;
 Meet in conflict dire!
 Lighting up our western sky;
 Harbinger of vict'ry nigh;
 See! the flames are mounting high;
 Kindles Freedom's fire!

What though King's strong arm assail;
 This the light makes tyrants pale;
 God and Justice will prevail,
 Now and evermore.
 Every form of wrong shall die!
 Perish every vaunted lie;—
 Lo! the radiance from on high
 Lights Columbia's shore.

Men that dare with wrong to fight;
 Men that battle for the right;

Now is past Oppression's night ;
 Breaks the coming morn !
 Look, behold the morning star
 Freedom's pathway gilds afar ;
 While behind her conquering car,
 See a Nation born !

Dr. Wheatland then introduced ABNER C. GOODELL, Jr., Esq., Vice President of the Historical Department, who proceeded to deliver an elaborate and most admirable oration on the subject of the commemoration, which was attentively listened to, and at various points emphatically applauded. This valuable contribution to our historical literature, in which was given a minute history of the occurrences which led to the meeting whose one hundredth anniversary the society had met to celebrate, will soon be published in the "Historical Collections" of the Institute, and be accessible to all who take an interest in the great events here transacted and commemorated.

Mr. Goodell first drew from the Greek mythology a parallel between the story of the Greek founder of Athens and the genius of independence in creating the harmonious confederation of States. He followed this with a review of the relations existing between Great Britain and the American colonies one hundred years ago, especially what took place in Salem at that time—the removal of the General Court, etc. Speaking of this court, he said, When the whole Assembly met here in June, the upper room was the hall of the representatives. The council chamber may have been below, or more likely in the old tavern opposite, on the site now covered by the Stearns Building ; while the governor, doubtless, had rooms not far distant, or possibly he may have remained at his headquarters in Danvers. On this occasion ; viz., in October, the whole body of legislators, consisting of the assembled

ninety, found ample space in the court room, which was fifty feet long and thirty feet wide. The Assembly organized; John Hancock was chosen chairman and Benjamin Lincoln, clerk. A committee was then appointed to consider the governor's proclamation, and to consult on measures to be adopted, and the Assembly again adjourned. On Friday, the 7th of October, the committee reported four resolutions, concluding with the declaration that the grievances which they set forth were such as "in all good governments," had "been considered among the greatest reasons for convening a Parliament or Assembly," and that the proclamation was further proof of the necessity of "most vigorous and immediate exertions for preserving the freedom and constitution" of the province. The resolutions were immediately adopted. Having thus solemnly renounced the authority of Parliament, and affirmed the fundamental right of the people to institute a government, when, in their judgment the regular administration had overstepped the limits of the constitution, they adjourned to more comfortable quarters at Concord, to meet on the following Tuesday. Here they continued their sittings, with a few weeks' intermission, until the 10th of December. At Concord they organized the Congress by raising Hancock to the presidency, and made Lincoln their secretary. Their progress toward practical independence was now sure and speedy. Before the end of October, all constables and collectors of taxes had submitted to their order to withhold payment from Harrison Gray, the province treasurer, and to return their collections to Henry Gardner, who soon after was appointed receiver general; and with closed doors and under a solemn pledge of secrecy, they had resolved upon the momentous subject of "the most proper time" to procure arms and ammunition by unanimously adopt-

ing a report that "now is the time!" By midsummer three sessions had been held, had transacted business, and finally dissolved. On the day of their dissolution they again assembled, by the recommendation of the Continental Congress, as an independent government under the charter. Before this reorganization, the established tribunals of justice, which had either ceased to hold sessions or were disregarded by the people, had been replaced by a Court of Inquiry, to insure the preservation of order; the establishment of a navy had been favorably reported upon, and the great work of raising and equipping an army had been accomplished. Under the new style of government, the council and representatives removed the judges who had been appointed by royal governors, and issued commissions to new magistrates of their own selection. Thus, in less than ten months from the taking of their first bold step at Salem, the new régime was in the full exercise of the three great functions of government—legislative, judicial and executive. While the Legislature was thus employed, the people were busy arming and organizing the militia. Through the fall and winter, colonels of regiments and other military officers, who were not in known sympathy with the popular movement, were either forced to resign, or the men under their command voluntarily disbanded and reorganized under other leaders. New companies were started, beginning with an artillery company in Marblehead, for which subscriptions were opened early in November. The expedition of Colonel Leslie, on the 26th of February, 1775, and the affair at the North Bridge in Salem, when the first bloodshed of the revolution occurred, present a theme inviting discussion, when the anniversary of that day arrives. Mr. Goodell recapitulated the events of these nine months as follows:—

Here, we have seen, were convened the last Provincial Assembly and first Provincial Congress ; here were chosen the first delegates to the Continental Congress ; here the assembled province first formally renounced allegiance to the Imperial Legislature ; here was made the first attempt to enforce the last oppressive acts of Parliament, and here that attempt was resisted ; here, though no mortal wound was given, was shed the first blood of the American Revolution ; here was first organized the nucleus of an army ; and here the banner of independence first spoke defiance, as it flapped and rustled in the wind.

The choir next sang a German National Hymn, from Mendelssohn's four part songs, commencing,

“Thro' deepest gloom the night wind cold,” etc.

In conclusion the choir sang Julius Eichberg's National Hymn,

“To thee, O country.”

The President then invited the company to partake of a basket collation which had been provided in the ante-rooms, and a pleasant season of social enjoyment terminated this interesting commemoration.

Otis P. Lord of Salem, Lewis N. Tappan of Manchester and J. W. Merrill of Cambridge were elected resident members.



REGULAR MEETING, MONDAY, OCTOBER 19, 1874.

MEETING this evening at 7.30 o'clock. The PRESIDENT in the chair. Records of preceding meeting read.

The SECRETARY announced the following correspondence :—

From E. P. Bohn, New York, Oct. 15; James S. Bryant, Hartford, Sept. 21; C. H. Dall, Boston, Sept. 21, 24; C. C. Dawson, New York, Oct. 15; Charles H. Higbee, Boston, Oct. 13; F. E. Hotchkiss, New Haven, Conn., Oct. 3; G. M. Levette, Indianapolis, Ind., Sept. 26; Alfred M. Mayer, Hoboken, N. J., Oct. 3; Daniel A. Rogers, Chicago, Ind., Sept. 24; T. W. Silloway, Boston, Oct. 3, 7; Mary W. Towne, Sept. 30; Bordeaux, Société Linnéenne, Sept. 14; Kjøbenhavn, det Kongelige Danske Videnskabernes Selskab, Sept. 7; New York Lyceum of Natural History, Oct. 12; New York State Library, Sept. 25; Somersetshire Archaeological and Natural History Society, Taunton, Sept. 14; Trinity College Library, Oct. 6; Worcester Public Library, Oct. 2, 7.

The LIBRARIAN reported the following additions :—

By Donation.

ANAGNOS, M., Boston. Reports of Blind Institutions, 46.

BOLLES, E. C. Principles of Masonic Law, by Mackey. 1 vol. 8vo. Hymns for the Sanctuary. 1 vol. 8vo. Putnam's Phalanx. 1 vol. 8vo. Gloria Patri. 1 vol. 8vo. Portland Reference Book, 1852-53. 1 vol. 12mo. Autobiography of L. Norton. 1 vol. 12mo. Life of Wm. Penn, by T. Clarkson. 1 vol. 8vo. Mrs. Marsh's Novels. 2 vols. 8vo. The Widower. 1 vol. 8vo. Miscellaneous pamphlets, 76.

BRYANT, JAMES S., Hartford. Mining Statistics west of the Rocky Mountains, 1870. 1 vol. 8vo. American Sunday School Magazine, 1821. 1 vol. 8vo. Burgh's Dignity. 1 vol. 8vo. Bellamy's True Religion. 1 vol. 12mo. Willison's Meditations. 1 vol. 12mo. Murray's English Grammar. 1 vol. 12mo. Butler's General History. 1 vol. 16mo. An Autobiography by John B. Gough. 1 vol. 12mo. Adam's Latin Grammar. 1 vol. 16mo. Memoir of Rev. M. Henry. 1 vol. 12mo. Blair's Lectures. 1 vol. 16mo. English Reader. 1 vol. 12mo. Beauties of Creation. 1 vol. 12mo. Zion's Pilgrim. 1 vol. 16mo. Solymán and Alméná. 1 vol. 16mo. William's Sermon. 1 vol. 8vo. Farewell Letters by W. Ward. 1 vol. 12mo. Webster's American Selection. 1 vol. 12mo. History of Animals. 1 vol. 12mo. Dwight's Geography. 1 vol. 12mo. The Battle of Bunker Hill; a Poem by R. Emmons. 1 vol. 12mo. Filkington's Historical Beauties for Young Ladies. 1 vol. 12mo. Thoughts on Divine Goodness. 1 vol. 12mo. Flint's Dictionary. 1 vol. 12mo. Dwight's Psalms. 1 vol. 16mo. The Widow of the Village. 1 vol. 16mo. Nettleton's Village Poems. 1 vol. 16mo. Hartford Directories, 1857, 1868, 1869, 1870, 1871, 1872, 1873. Hartford City Guide, 1871. 1 vol. 12mo. Macgowan's Life of Joseph. 1 vol. 12mo. Miscellaneous pamphlets, 86.

COOKE, C. Rockford City Directory for 1869. 1 vol. 8vo.

DAWSON, CHAS. C., New York. Dawson Family Records, by donor. 1 vol. 8vo. Albany, 1871. Guide Books, 27. Miscellaneous pamphlets, 38.

ELLIOTT, E. B., Washington, D. C. Report on the Commerce and Navigation of the United States, 1873. 1 vol. 8vo. Report on Immigration, by E. Young, 1871. 1 vol. 8vo. Monthly Reports of the Chief of the Bureau of Statistics, Treasury Department, July-Dec., 1873, Jan.-May, 1874. 11 pamphlets.

GREEN, Dr. S. A., of Boston, Mass. Forty-Sixth Annual Report of the Controller of Public Schools of Penn., 1864. 1 vol. 8vo. Annual Report of the Boston City Hospital, 1873-74. 1 vol. 8vo. Miscellaneous pamphlets, 26.

HOTCHKISS, FRANK E., of New Haven, Conn. Year Book of the City of New Haven, 1873. 1 vol. 8vo. Report of the Board of Education of Conn., 1874. 1 vol. 8vo. Report of the Board of Education of the New Haven City School District, 1874.

LEE, F. H. Dexter Smith's Paper, 8 numbers. Folio, 15 numbers. Musical Bulletin, 9 numbers. Brainard's Bulletin, 17 numbers. Miscellaneous pamphlets, 15.

- LEE, JOHN C. Commercial Bulletin, Sept. 5, 12, 19, 1874.
- LEVETTE, G. M., Indianapolis, Ind. Geological Survey of Indiana, 1873. 1 vol. 8vo. Indiana Agricultural Reports, 1873. 1 vol. 8vo.
- MILES, W. A., New York. New York Directories, 1871, 1872, 1873. 3 vols. 8vo.
- MERRITT, L. F. Shanghai Budget, June 20, 27, July 1, 11, 18, 1874. Essex County Mercury, several numbers.
- PALFRAY, C. W. Miscellaneous pamphlets, 27.
- POTNAM, F. W. Annual Report of the Indianapolis Board of Trade, Jan., 1874. Mineral, Manufacturing and Agricultural Resources of Indiana, by E. T. Cox, 1873.
- POTNAM, GEO. G. Democratic Review, 12 vols. 8vo.
- ROBINSON, JOHN. Miscellaneous pamphlets, 360.
- SMITH, Prof. J. L., Louisville, Ky. Scientific Researches, 1 vol. 8vo. 1873.
- SCENCE, F. H. Catalogus Universitatis Brnnensis, 1873. 8vo pamph.
- STICKNEY, M. A. Miscellaneous pamphlets, 150.
- U. S. PATENT OFFICE. Official Gazette, Sept. 1, 8, 15, 22, 29, 1874.
- WATERS, J. G. Speeches on the Indian Bill, 1830. 1 vol. 8vo. Youth's Instructor, 1 vol. 12mo. Sermons by J. Flint, 1 vol. 8vo. The Seaman's Daily Assistant, 1 vol. 8vo. Mass. Register, 1816. 1 vol. 12mo. Moore's Strictures, 1 vol. 12mo. Bowditch's Practical Navigator, 1 vol. 8vo. American Coast Pilot, 1 vol. 8vo. Moore's Navigation, 1 vol. 8vo. Coaster's Companion, 1 vol. 8vo. Miscellaneous pamphlets, 150.

By Exchange.

- AMERICAN PHILOSOPHICAL SOCIETY OF PHILA. Proceedings of, Vol. xiv, No. 92. Jan.-June, 1874. 8vo pamph.
- BUFFALO SOCIETY OF NATURAL SCIENCES. Bulletin of, Vol. ii, No. 2, 1874. 8vo pamph.
- NEW YORK STATE LIBRARY. Eighty-sixth Annual Report of the Regents of the University, 1 vol. 8vo. 1873. Twenty-third Annual Report of the New York State Cabinet of Natural History, 1869. 1 vol. 8vo. Miscellaneous Reports, 3.
- SOMERSETSHIRE ARCHEOLOGICAL AND NATURAL HISTORY SOCIETY. Proceedings for 1873. 1 vol. 8vo.
- PUBLISHERS. American Naturalist, American Journal of Science, Forest and Stream, Gardener's Monthly, Gloucester Telegraph, Hardwicke's Science Gossip, Haverhill Gazette, Ipswich Chronicle, Lawrence American, Lynn Reporter, Lynn Transcript, Medical and Surgical Reporter, Nation, Nature, Peabody Press, Salem Post, Salem Observer.

George H. Woods, of Salem, was duly elected a resident member.

Prof. E. S. MORSE, being called upon, gave a very interesting account of the theory of evolution, basing his remarks principally upon the structural development of birds and its relations to that of reptiles and other great natural families, both geological and extant. It was difficult to decide which most to admire, the fluency and

earnestness of his utterance, or the wonderful facility and rapidity of his illustrations with the pencil.

On motion of Rev. E. S. ATWOOD, it was unanimously voted that an invitation be extended to the Massachusetts Universalist Convention, now in session in Salem, to visit the rooms of the Institute and examine the various collections of the Association.

Rev. E. C. BOLLES then gave a very interesting and eloquent account of his observations among the various scientific collections of London, during his recent European tour. He spoke particularly of the immense library of the British Museum, the South Kensington and Bethnal Green Museums, the National Gallery of Paintings, the Jermyn Street Museum with which Huxley is connected, the East India Museum and the Kew Botanic Gardens, describing their collections, explaining their arrangement and purposes, and expatiating eloquently on their influence upon the useful education of the public. The sums spent for these collections by the government, the men of wealth and the friends of science, seem almost fabulous, and their perfection in the several departments is wonderful.

Mr. Bolles concluded by moving that a new department be added to the Institute, or put in charge of a curatorship already established, viz. : a museum of Technology, or Applied Science. Such a collection had been commenced on a small scale and arranged in the ante-room in such a manner as to make the plan intelligible, and the audience were invited to examine it after the adjournment. The specimens illustrated the different processes in the manufacture of porcelain and pottery, from the crude clay to the highly ornamented and finished

article ; also the several processes in chromo lithography. Mr. Bolles likewise brought from Europe for this department about a thousand specimens of fibres, including those on which the British government has expended so much experiment in India, which will be an important and valuable nucleus for the new department.

The plan excited much interest and was regarded with high favor. Several gentlemen announced that they already had, or could easily procure, suites of specimens in various arts, which they would be glad to add to the Institute treasures.

The subject was referred to the Directors, and there is a fine prospect of commencing the new department with valuable contributions, and under the most favorable auspices for constant and large additions.



LISTS OF BIRDS OBSERVED AT VARIOUS LOCALITIES CONTIGUOUS
TO THE CENTRAL PACIFIC RAILROAD, FROM SACRAMENTO
CITY, CALIFORNIA. TO SALT LAKE CITY, UTAH.

BY ROBERT RIDGWAY.

THE observations upon which the following notes are based were made in connection with the field work of the U. S. Geological Exploration of the Fortieth Parallel, in charge of Mr. Clarence King, U. S. Geologist, during portions of the years 1867, 1868 and 1869.

The present paper is a mere abstract of that portion of the zoölogical report* of the Survey relating to the character and distribution of the local avifaunæ encountered along the route of exploration, and is published in its present form in order to acquaint ornithologists, as soon as possible, with the results of ornithological investigations made by the Expedition.

The country traversed by the Survey in the course of its field work is embraced chiefly between the parallels of 39° and 42° North latitude,

*In press.

and the meridians of 111° and 122° West longitude. The localities at which observations were made upon the fauna are classified as follows:—

I. THE SACRAMENTO VALLEY.

- a. Outskirts of Sacramento City.
- b. Across the plains from Sacramento to the Sierra Nevada.

II. THE SIERRA NEVADA.

- a. The western foot-hills.
- b. The pine region.
- c. The summit of Donner Pass.
- d. The eastern slope.

III. WESTERN NEVADA (*area of the eastern drainage of the Sierra Nevada, or western Basin drainage*).

- a. Eagle Valley.
- b. Carson Valley.
- d. Washoe Valley.
- e. Truckee Meadows (above the Virginia Mountains).
- f. Truckee Valley (below “ “ “
- g. Adjacent plateaux.
- h. Islands of Pyramid Lake.

IV. EASTERN NEVADA, SOUTHERN IDAHO AND NORTHWESTERN UTAH (*interior Basin drainage*).

- a. West Humboldt Mountains.
- b. Toyabe Mountains.
- c. Ruby Mountains.
- d. East Humboldt Mountains.
- e. Upper Humboldt Valley.
- f. Lower Humboldt Valley, “Sink” of the Humboldt.
- g. Soda Lake, Carson Desert.
- h. Ruby and Franklin Lakes.
- i. Thousand Spring Valley.
- j. “City of Rocks,” Southern Idaho.
- k. Deep Creek, Northwestern Utah.

V. EASTERN UTAH (*Wasatch and Uintah drainage, or eastern Basin drainage*).

- a. Salt Lake valley.
- b. Islands in the Great Salt Lake.
- c. Parley’s Park (Wasatch Mountains).
- d. Paek’s Cañon (western spur of Uintah Mountains).
- e. Kamas Prairie.
- f. Provo Cañon (pass of the Provo River).

I. SACRAMENTO VALLEY.

- a. Catalogue of birds breeding in the immediate vicinity of Sacramento City in June, 1867.

1. *Thryomanes Bewicki spilurus*. Common?
2. *Dendroica aestiva*. Abundant.
3. *Geothlypis trichas*. Abundant.

4. *Icteria virens longicauda*. Abundant.
5. *Iirundo horreorum*. Abundant.
6. *Progne subis*. Abundant.
7. *Petrochelidon lunifrons*. Abundant.
8. *Vireo gilvus Swainsoni*. Common.
9. *V. pusillus*. Common.
10. *Collurio Ludovicianus (exenbitoroides ?)*. Common.
11. *Carpodacus frontalis*. Abundant.
12. *Chrysonitris tristis*. Abundant.
13. *Coturniculus passerinus perpallidus*. Common.
14. *Chondestes grammaca*. Abundant.
15. *Melospiza melodia Heermanni*. Common.
16. *Spizella Breweri*. Common.
17. *S. socialis*. Common.
18. *Hedymeles melanocephalus*. Common.
19. *Guiraca carulea*. Common.
20. *Cyanospiza amœna*. Common.
21. *Pipilo erythrophthalmus Oregonus*. Common.
22. *Agelaius phœniceus gubernator*. Very abundant.
23. *A. tricolor*. Very abundant.
24. *Xanthocephalus ieterocephalus*. Very abundant.
25. *Sturnella neglecta*. Common.
26. *Icterus Bullocki*. Very abundant.
27. *Tyrannus verticalis*. Abundant.
28. *Sayornis nigricans*. Common?
29. *Contopus Richardsoni*. Abundant.
30. *Empidonax pusillus*. Abundant.
31. *Coccyzus Americanus*. Rare.
32. *Calypte annæ*. Common.
33. *Trochilus Alexandri*. Common.
34. *Colaptes auratus Mexicanus*. Rare.
35. *Otus vulgaris Wilsonianus*. Common.
36. *Speotyto cunicularia hypugæa*. Abundant.
37. *Falco sparverius*. Abundant.
38. *Zenaidura Carolinensis*. Abundant.
39. *Ægialitis vociferus*. Abundant.
40. *Ardea herodias*. Common.
41. *Herodias alba egretta*. Rare.
42. *Butorides virescens*. Abundant.
43. *Nyctiardea grisea nævia*. Common.
44. *Gallinula chloropus galeata*. Abundant.
45. *Fulica Americana*. Abundant.
46. *Anas boschas*. Abundant.

47. *Chaulelasmus streperus*. Abundant.
48. *Querquedula cyanoptera*. Abundant.
49. *Aythya* ——— sp? Abundant.
50. *Larus* ——— sp? Abundant.
51. *Sterna Forsteri*? Abundant.
52. *Hydrochelidon fissipes*. Very abundant.

b. List of species observed among the oaks of the plains
between Sacramento City and the foot-hills of the
Sierra Nevada, June and July, 1867.

1. *Parus atricapillus occidentalis*? Common.
2. *Troglodytes ædon Parkmanni*. Common.
3. *Eremophila alpestris chrysolæma*. Abundant.
4. *Pica melanoleuca Nuttalli*. Very abundant.
5. *Corvus Americanus*. Very abundant.
6. *Myiarchus crinitus cinerascens*. Common.
7. *Picus Nuttalli*. Common.
8. *Melanerpes formicivorus*. Abundant.
9. *M. torquatus*. Abundant.
10. *Strix flammea pratincola*. Common.
11. *Scops asio*. Common.
12. *Buteo lineatus elegans*. Common.
13. *Rhinogryphus aura*. Rare.

II. SIERRA NEVADA.

a. Species seen among the western foot-hills, July, 1867.

1. *Polioptila cærulea*? Abundant.
2. *Psaltriparus minimus*. Abundant.
3. *Certhia familiaris fusca*. Common.
4. *Troglodytes ædon Parkmanni*. Common.
5. *Dendroica æstiva*. Abundant.
6. *Chrysomitris Lawrencei*. Common.
7. *Pipilo fusca crissalis*. Common.
8. *Cyanocitta Floridana Californica*. Common.
9. *Lophortyx Californicus*. Common.

b. Species found in the pine forests of the western slope of the
Sierra Nevada, at an altitude of 5,000 feet, in July, 1867.

1. *Turdus migratorius*. Common.
2. *T. Swainsoni ustulatus*. Abundant.
3. *Sialia Mexicana*. Common.

4. *Cinclus Mexicanus*. Common.
5. *Myiadestes Townsendi*. Common.
6. *Dendroica Auduboni*. Common.
7. *Pyrranga Ludoviciana*. Common.
8. *Junco hyemalis Oregonus*. Common.
9. *Picicorvus Columbianus*. Abundant.
10. *Cyanura Stelleri frontalis*. Abundant.
11. *Picus albolarvatus*. Common.
12. *Sphyrapicus varius ruber*. Rare.
13. *Aquila chrysaetus Canadensis*. Common.

c. Species breeding at an altitude of about 7,000 feet on
the Sierra Nevada, July, 1867.

1. *Zonotrichia leucophrys intermedia*. Very abundant.
2. *Junco hyemalis Oregonus*. Abundant.
3. *Sialia Mexicana*. Abundant.
4. *Turdus migratorius*. Abundant.

d. Species breeding on the eastern slope of the Sierra Nevada
(July, 1867, and April and May, 1868).

1. *Turdus migratorius*. Abundant.
2. *T. Swainsoni ustulatus*. Common?
3. *Sialia Mexicana*. Common.
4. *Cinclus Mexicanus*. Common?
5. *Regulus calendula*. Common?
6. *Certhia familiaris fusca*. Common?
7. *Parus montanus*. Abundant.
8. *Sitta Carolinensis aculeata*. Abundant.
9. *S. pusilla pygmæa*. Abundant.
10. *Helminthophaga celata*. Common.
11. *Myiodioctes pusillus*. Common?
12. *Dendroica Auduboni*. Common.
13. *Geothlypis Macgillivrayi*. Abundant.
14. *Carpodacus Cassini*. Abundant.
15. *Chrysomitris pinus*. Abundant.
16. *Melospiza Lincolni*. Common.
17. *Junco hyemalis Oregonus*. Abundant.
18. *Zonotrichia leucophrys intermedia*. Abundant.
19. *Passerella iliaca megarhynchus*. Abundant.
20. *Pipilo erythrophthalmus Oregonus*. Abundant.
21. *Picicorvus Columbianus*. Abundant.
22. *Cyanura Stelleri frontalis*. Abundant.

23. *Cyanocitta Floridana Californica*. Common.
24. *Contopus borealis*. Rare?
25. *Empidonax Hammondi*. Common?
26. *E. obscurus*. Abundant.
27. *E. flaviventris difficilis*. Rare?
28. *Stellula calliope*. Common?
29. *Picus albolarvatus*. Common.
30. *Sphyrapicus varius ruber*. Rare?
31. *S. thyroideus*. Rare.
32. *Melanerpes torquatus*. Abundant.
33. *Canace obscura*. Common.

Of the species breeding on the eastern slope of the Sierra Nevada (table "d"), only one—*Picus albolarvatus*—is peculiar to that range, the remainder breeding on the mountains toward and beyond the eastern limit of the Great Basin. *Sialia Mexicana*, *Sitta aculeata*, *S. pygmaea*, *Empidonax difficilis* and *Sphyrapicus thyroideus*, have not yet been found anywhere in Nevada to the eastward of the Sierra, but they occur among the nearly equally dense forests of the Rocky Mountain ranges,*—most of them being abundant in the Wahsatch range of Utah. Several of these species thus repeated in the Rocky Mountain system, are represented there by different geographical races, as follows:—

SIERRA NEVADA.	ROCKY MOUNTAINS.
1. <i>Turdus Swainsoni nstulatus</i> .	<i>T. Swainsoni</i> .
2. <i>Junco hyemalis Oregonus</i> .	<i>J. hyemalis annectens</i> .
3. <i>Zonotrichia leucophrys intermedia</i> .	<i>Z. leucophrys</i> .
4. <i>Passerella iliaca megarhynchus</i> .	<i>P. iliaca schistacea</i> .
5. <i>Pipilo erythrophthalmus Oregonus</i> .	<i>P. erythrophthalmus megalonyx</i> .
6. <i>Cyanura Stelleri frontalis</i> .	<i>C. Stelleri macrolopha</i> .
7. <i>Cyanocitta Floridana Californica</i> .	<i>C. Floridana Woodhousii</i> .
8. <i>Sphyrapicus varius ruber</i> .	<i>S. varius nuchalis</i> .

* See Birds of Colorado, Bull. Essex Inst., v, Nov., 1873, p. 178.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 6. SALEM, MASS., NOVEMBER, 1874. No. 11.

One Dollar a Year in Advance. 10 Cents a Single Copy.

REGULAR MEETING, MONDAY, NOVEMBER 2, 1874.

MEETING this evening at 7.30 o'clock. PRESIDENT in the chair. Records read.

The SECRETARY announced the following correspondence:—

From A. C. Goodell, jr., Oct. 16; L. C. Herrick, Woodstock, Ohio, Oct. 28; C. H. Higbee, Boston, Oct. 27; E. W. Leavenworth, Syracuse, N. Y., Oct. 18; J. W. Manning, Reading, Oct. 26; John R. Rollins, Lawrence, Oct. 29; Buffalo Historical Society, Oct. 30; Göttingen Die Königliche Gesellschaft der Wissenschaften, Juli 6; New York Historical Society, Oct. 31; New York State Library, Oct. 28, 29; Ohio Historical and Philosophical Society, Oct. 3; Portland Institute, Oct. 20; Worcester Public Library, Oct. 23.

The LIBRARIAN reported the following additions to the library:—

By Donation.

BOLLES, E. C. Miscellaneous pamphlets, 9.

HATCH, LEMUEL B. The Descendants of Wm. Hatch, of Scituate, Mass., 1871. The Syrian Protestant College, 1871.

LEAVENWORTH, E. W., of Syracuse, N. Y. Genealogy of the Leavenworth Family in the United States, by donor. 1 vol. 8vo. Syracuse, 1873.

OFFICE OF THE CHIEF OF ENGINEERS. Report upon Ornithological Specimens collected in 1871, 1872, 1873. Catalogue of Plants collected in 1871, 1872, 1873.

SILSBEE, E. A. The White Mountain Guide Book. 2 vols. 12mo. Lunar Obser-

vations, by E. C. Ward. 1 vol. 8vo. Southern Quarterly Review, 2 numbers. The Athenaeum, 10 numbers. Allen's Victoria Regia. 1 vol. folio.

U. S. PATENT OFFICE. Official Gazette for Oct. 13, 1874.

WATERS, J. G. Palestine and the Hebrew People. 1 vol. 16mo. The Books and Characters of the New Testament. 1 vol. 16mo. Lesson on the Old Testament. 1 vol. 12mo. Miscellaneous pamphlets, 40.

WILLSON, E. B. Record of Unitarian Worthies, May, July, Oct., 1874.

WOLCOTT, Mrs. S. B. Catalogue of Harvard College Library. 4 vols. 8vo. The Mass. System of Common Schools. 1 vol. 8vo. 1819. Abstracts of Mass. School Returns, 1839-40, 1840-41, 1845-49. 3 vols. 8vo. Pitkin's Statistics. 1 vol. 8vo. Fisk's Greek Grammar. 1 vol. 12mo. Natural History of the Bible. 1 vol. 12mo. Goodrich's Greek Grammar. 1 vol. 16mo. Hamel's French Grammar. 1 vol. 12mo. Elements of Euclid. 1 vol. 8vo. Pelham's System of Notation. 1 vol. 12mo. Sheridan's Grammar of the English Language. 1 vol. 12mo. Coleman's Discourses. 1 vol. 12mo.

By Exchange.

BOSTON PUBLIC LIBRARY. Bulletin for Oct., 1874.

CROSSE ET FISCHER. Journal de Conchyliologie, 3e Série, Tome xiv, No. 3, 1874.

GEOLOGICAL SURVEY OF CANADA. Report of Progress for 1872-73. 1 vol. 8vo.

INSTITUT HISTORIQUE IN PARIS. L'Investigateur, 40 Année, Juin-Juillet, 1874.

KONGELIGE DANSKE VIDENSKABERNES SELSKAB I KJØBENHAVN. Oversigt, 1873, No. 3. 1874, No. 1.

NEW YORK STATE LIBRARY. New York Legislative Documents for 1870, 71, 72, 73, 74. Laws. 8 vols. 8vo. Senate Journals. 4 vols. 8vo. Senate Documents. 22 vols. 8vo. Assembly Journals. 8 vols. 8vo. Assembly Documents. 52 vols. 8vo. Manual for the Use of the Legislature of New York, 1871. 1 vol. 12mo.

PEABODY ACADEMY OF SCIENCE. Sixth Annual Report for 1873.

SMITHSONIAN INSTITUTION. Smithsonian Contributions to Knowledge, Vol. xix. 1 vol. 1to. Smithsonian Miscellaneous Collections, Vols. x, xi, xii. 3 vols. 8vo. Smithsonian Reports, 1871, 1872. 2 vols. 8vo.

SOCIÉTÉ D'ACCLIMATATION. Bulletin Mensuel, 3me Série, Tome i, No. 5, Mai, 1871. No. 6, Juin.

SOCIÉTÉ D'ANTHROPOLOGIE IN PARIS. Bulletin, 2e Série, Tome viii, 5e, 6e, Fascicule, 1873. Tome ix, 1er Fascicule, 1874.

VEREIN FÜR ERDKUNDE ZU DRESDEN. x Jahresbericht. 8vo pamph. 1871.

YALE COLLEGE. Catalogue of the Officers and Students in Yale College, 1874-5.

ZEITSCHRIFT FÜR DIE GESAMMTEN NATURWISSENSCHAFTEN IN BERLIN. Band ix, Neue Folge, 1871.

PUBLISHERS. American Naturalist. Forest and Stream. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Salem City Post. Salem Observer.

Hon. JAMES KIMBALL read two petitions, signed some one hundred and fifty years since, to the proper authorities, setting forth the necessity of preventing the construction of dams or other obstructions to the free passage of fish from the sea to the inland ponds, to deposit their

spawn during the appropriate season ; giving the reasons therefor, and urging the great value of the fisheries to our people. It seems that at this early period in our history there were persons cognizant of the importance of those measures which are now receiving due attention from the national and several of our State governments, commissions having been appointed to take this subject into consideration and to devise means to restock our rivers and streams with food fishes, which in the early settlement furnished an abundant supply. The preservation of fish received the earliest attention of the colonists, as they were one of the great "staples" of Massachusetts, being not only a source of supply for their own wants, but of great profit in their foreign trade ; a cargo of fish often procured for them a return cargo of wines, spices, and other luxuries. In the construction of the first mills reservations were made in the grants, "not to stop or hinder the alewives from going up to the great pond." Many of our older citizens may well remember the attention that was given to the removal of all obstructions that would prevent the free passage of the alewives and other fishes to and from the spawning places, by our town authorities, in the appointment of fish committees, whose duties were not only to remove these obstructions, but prevent the taking of fish only on certain days in each week, and also to prescribe the manner that a due proportion may be preserved.

Previous to 1760 but few changes had been effected, and it was not until the beginning of the present century that the old landmarks, once prominent in our local descriptions, began to disappear, and such has been the rapid march of progress, that during the last three-quarters of a century all of them are obliterated.

Improvements required by the progressive tendencies of the age, have contributed in effacing places once

famous in our local history. The once beautiful North and South rivers, so important to the first settlers of the town as their principal and most convenient highway, and which afforded ample accommodations to the early commerce of the town, are now reduced to sluggish streams, hardly receiving the purifying influences of the ocean tides, by reason of the obstructions required in the service of trade and manufactures.

To the Justises of the Generall Seshions of the Peace to be holden at Salem for the Comty of Essex, the last Tuesday of June, 1725.

“The Humble Petition of Thomas Rich Humbly Sheweth. That the North-River in the Town of Salem runs Southwesterly into Severall Ponds, viz. Spring Pond, long Pond & Seder Pond where abundance of Fish passes in the Spring time of the year to spawn. Nevertheless several waïres have been made across the Brook, within this few years, which have almost broke their usuall wonted Custom. I have made application to the Selectmen who inform me that it is with your Honours Consideration in that affair. I have this four years last past taken all the care I could in pulling down all the Waïres in said Brooks to the severall Ponds once. I requested by a complaint to Justice Sewall & Justice Wolcott for a warrant, hoping to finde out them that had erected s^d waïres & I took a Constable with me then we found but one Waïre. I have spent four days in the properest time of every last four years abovesaid. Sometimes I have pulled down seven Waïres between Mr. Trask^s Millpond & the Butts Bridge, this year I was but two days up the Brook but did not find any. but was informed that the fish were stopt in their Comeing down from the ponds, and if your Hon^{rs} in your Wisdom See cause to order that affair, or else their wonted custom will be broke, which will make other fish as COD & HADDOCK scarce with us, for *such fish comes in after the above small fish for bait*; and if such inconveniences could be removed, fish might be as plenty as they were formerly, which would be a great benefit to the TOWN & COUNTRY, for which your Petitioner desires your Honours Consideration for his abovesaid trouble, and your Petijoner shall ever pray.

THOMAS RICH.”

It seems that the labors of Mr. Rich were in his own opinion of some service, for another petition was presented the next year, which is here presented, verbatim.

“To the Honrball his maiesties Justses of in fear^t cort, and generall seshions of the peace to Be holden at Salem for the county of Essex the last Tuesday of June, 1726.

It was considrd By the Honrball cort holden at Salem on the last Tuesday of June 1725, that Thomas Rich shuld tack care, and use all proper meanes that the Law Be observed and fulfilld with respect to

the fish being obstructed in thare passing up the several brukes that leadeth to the several ponds. As spring pond, Long pond and seder pond. According to your honors order, I have taken All the cears I could And I hope to good effect By reason of the plenty of *coal* & *haddock* that have Byn this year. this was the fifth year that I have tacken ceare concerning sd fish passing up sd Brukes four days pr year I have Bin up sd Brukes And wherupon several weares and other in embrances one sd Brukes. I am informed that there is a brook that leadeth out of Ipswidg river to unphreys pond whar Abundans of fish used to pas formerly And if your honors In your wisdom see cas to order that afore it will Be A great Benefit not only to this town But also to the country. I haue tacken ceare five years last past the S^dlect men tooek of my rates on year But that is too small Anotes to four days waden up the Brukes to the small ponds. That if your honors in your wisdom see fit to Alow Sumthing for the managant in that mater your petitioner shall for ever pray.

Salem Jun y^e 21. 1726.

THOMAS RICHL."

"Its Considered by the Court that the petitioner be further Impowered and allowed for the year ensuing to remoue all obstructions in the Brooks as abovsaid."

(Endorsed) "partly granted."

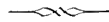
Prof. E. S. MORSE gave some account of certain species of ants which construct receptacles under ground for the storage of their food, describing the manner in which these were made; also the ingenuity and skill displayed, and the division of labor adopted by these ants in the procuring of the food and in the other arrangements in the management of their domestic affairs.

He also described the habits of a family of spiders known as the trap door spiders, who also construct their domiciles under ground, which are tubular in shape and composed of the web filled in with the earth, and other materials that are cemented together by a glutinous matter which they secrete. They have at the entrance a trap door composed of fibres of the web filled with earth, bits of leaves, lichens, etc., so as to be completely disguised. The different species vary somewhat in the style of the

construction, though all are made upon the same general principles.

Rev. E. C. BOLLES reported progress in the formation and arrangement of the collection of specimens illustrating some of the industrial arts, specifying a few of the most interesting additions.

Mr. C. H. HIGBEE, with remarks relative to the articles, presented a series of Heliotypes from J. R. Osgood & Co., Boston, and also the following donations to the collections; from E. C. Mack a fire frame and several kitchen utensils of the olden times; from J. C. Lee specimens of pottery from Torquay; from John Pickering a cast-iron fire place back with the date of 1660, and the initials I. A. P., for John and Alice Pickering, taken from the Pickering house on Broad street, which was built several years previous to the above date by John Pickering, the ancestor of the present owner of the estate. Adjourned.



REGULAR MEETING, MONDAY, NOVEMBER 16, 1874.

MEETING this evening at 7.30 o'clock. PRESIDENT in the chair. Records read.

The SECRETARY announced the following correspondence:—

From H. B. Dawson, Morrisania, N. Y., Sept. 30; G. L. Goodale, Cambridge, Nov. 9; C. H. Higbee, Nov. 9; J. C. Holmes, Detroit, Mich., Nov. 12; Stanislas Mennier, Paris, Feb. 21; Robert Ridgway, Washington, D. C., Nov. 7; George H. Woods, Nov. 2; New York Lyceum of Natural History, Nov. 2.

The LIBRARIAN reported the following additions to the library:—

By Donation.

- FLINT, GEO. F. Essays on Peace, on War. 1 vol. 12mo. 1827.
- GREEN, DR. S. A., of Boston, Mass. Sweetser on Consumption. 1 vol. 8vo. Thacher on Hydrophobia. 1 vol. 8vo. Berra's Treatise. 1 vol. 8vo. Sweetser on Digestion and Disorder. 1 vol. 8vo. Halsted's New Method of Curing Dyspepsia. 1 vol. 12mo. Jackson on Fever. 1 vol. 12mo. Constitution of the Mass. Charitable Mechanic Association. 1 vol. 12mo. Miscellaneous pamphlets, 16.
- HOLMES, J. C., of Detroit, Mich. Third Annual Report of the Secretary of the State Pomological Society of Michigan, 1873. 1 vol. 8vo.
- MACK, E. C. The National Era, 1852-1859, 415 numbers.
- MEUNIER, STANISLAS, of Paris, France. Cours de Géologie Comparée, by donor. 1 vol. 8vo. 1874.
- OFFICE OF THE CHIEF OF ENGINEERS. Report of the Board of Commissioners on the Irrigation of the San Joaquin, Tulare and Sacramento Valleys of the State of Cal. Report on the Compressive Strength, Specific Gravity, etc., by Q. A. Gillman. U. S. PATENT OFFICE. Official Gazette, Oct. 20, 27, 1874.
- WALTON, E. N. Miscellaneous pamphlets, 7.
- WATERS, H. F. Calcutta Journal, 69 numbers.

By Exchange.

- IOWA STATE HISTORICAL SOCIETY. The Annals of Iowa, July, 1874.
- N. E. HISTORIC-GENEALOGICAL SOCIETY. Historical and Genealogical Register, Oct., Dec., 1874.
- PHILA. ACADEMY OF NATURAL SCIENCES. Proceedings of the. Pt. ii. Apr.-Sept., 1874.
- SOCIETY OF NATURAL SCIENCES OF BUFFALO. Bulletin of. Vol. ii, No. 3, 1874.
- PUBLISHERS. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Salem Post. Silliman's Journal. Salem Observer.

The SECRETARY reported specimens of glass ware, illustrating glass making, from W. LIBBEY, of the New England Glass Company. Also the manuscript speech of Charles Sumner, delivered in Faneuil Hall, Nov. 5, 1860, after his return from Europe, whither he had gone in search of health. It was received from Mr. Sumner's executors, through the instrumentality of Mr. R. S. Rantoul.

M. McPherson, of Salem, was elected a resident member.

The principal interest of the meeting centred in the Indian skeletons and relics, recently discovered on the

land of Mr. Wyman, near the new cemetery in Marblehead. A portion of the bones and the articles found were placed on the table. After the subject had been introduced by the PRESIDENT,

Mr. A. C. GOODELL, JR., said that from a conversation with Isaac C. Wyman, Esq., the owner of the land where the bodies were found, he was led to visit the locality some two years ago,—in the hope of getting some further light respecting the location of the ancient Fort Darby; but upon viewing the premises he became satisfied that the curious and irregular hollows in the surface of the ground were not the marks of post holes or palisades, as had been conjectured, but were, in all probability, the work of Indians. His opinion was confirmed by a tradition in Marblehead that this spot was an Indian burying ground, and he resolved to verify it whenever he could make up a party including Mr. Putnam, the Director of the Museum, whose interest in aboriginal archaeology is well known. His illness in the summer of 1873 prevented this excursion; and no opportunity was afforded until late this autumn, when, although Mr. Putnam was absent at the west, a party was hastily got together in order that the investigation might be made before the cold season set in. The party consisted of fourteen persons, including two experienced navvies, and the work was commenced late in the forenoon.

Four holes were sunk without success; but after lunch, one of the party, in digging a fifth hole, came to what he called a decayed root. The digging was instantly stopped until an examination had been made by Mr. Goodell, who drew out a human arm bone, and carefully removing the earth, uncovered a human skull. The other holes were now abandoned, and the entire party set to work, in the

most careful manner, to remove the earth, which consisted of a sandy loam, for a considerable space, above and to the north and west of the first skeleton. The result was the discovery of four skeletons, in the condition and position shown in the photographs.* So carefully was the work performed, that not a bone or fragment was displaced. One of the skeletons was removed entire, by forcing a thin board, under it, horizontally, then placing a frame around it, and pouring in plaster of Paris until it was firmly held in place. Much credit is due to Dr. Johnson, and to Rev. Messrs. Atwood and Bolles, and especially to Mr. Cooke, for the skill and care with which the earth immediately about the skeletons was removed. The last named gentleman found, with a fifth skeleton—which is not shown in the photograph, as it was badly broken and decayed—the pieces of pottery, the broken pot or vase, a brass toy bell and two beads of European make, which were exhibited at the meeting.

Mr. WILLIAM P. UPHAM spoke of some references to Indian localities in that neighborhood, found in early deeds preserved among the records at the Court House. He called attention to a passage in Mourt's Relation, narrating the particulars of a voyage of ten men sent out from Plymouth in 1621, with Tisquantum and two other Indian interpreters, to visit the Massachusetts Indians, partly to see the country, partly to make peace with them, and partly to procure their truck. Mourt describes very minutely their passage along the coast for some miles, and then striking across the Bay and coming over to this shore, where they landed, and marched into the country. About four miles from the landing they came to where Nanepashemet, the Indian King, had lived. Not far from

* These, prepared by J. W. and J. S. Moulton, may be had at the rooms of the Essex Institute, and at the Naturalists' Agency.

thence, in a bottom, they came to a fort built by the deceased King, described thus :—

“There were poles some thirty or forty foot long, stuck in the ground as thick as they could be set one by another, and with these they enclosed a ring some forty or fifty foot over. A trench breast high was digged on each side; one way there was to go into it with a bridge; in the midst of this palisado stood the frame of an house, wherein being dead he lay buried.

About a mile from hence, we came to such another, but seated on the top of an hill; here Nanepashemet was killed none dwelling in it since the time of his death.”

Mr. Upham’s theory was, or, rather, he hazarded the conjecture, that the old expedition landed, perhaps, at Lynn; that the palisade fort was that which has long been known as the old Indian fort, on the Marblehead and Lynn road, near the junction of the road cut through from Salem a few years ago; and that the hill on which Nanepashemet was killed, was the very hill on which these remains were found. The distances agree very well with those in Mourt’s Relation, and the remains of the palisadoed fort still traceable conform to the description of the fort which Mourt’s people saw. Whether the bones of either of the bodies were those of Nanepashemet cannot, of course, be determined, but there are reasons for supposing that they may have been. The theory is certainly plausible.

Rev. E. S. Arwood gave some further particulars of the digging operations, and complimented Mr. Cooke for the exceeding care and skill which he exercised in uncovering the remains, expressing the opinion that to his patient labor the Institute was indebted for the perfect state in which the bones were reclaimed and removed.

Mr. CALEB COOKE gave an interesting account of his experience in examining Indian graves, both in this county and at the west, and stated that the place where these remains were found was on the top of a hill overlooking Salem harbor, west of the new cemetery, and known as Besson's pasture. On the surface are irregular depressions marking the site evidently of the wigwams of a considerable village of Naumkeag Indians. In the rear of the brow of the hill, at the other end of the pasture, as he was informed by Mr. J. J. H. Gregory, may be seen a ridge of earth, with a ditch in front, running in a straight line across the pasture. This probably had palisades, and formed the defence of the village. On digging into these depressions, fragments of charcoal, as well as the shells of the *Natica*, *Pecten*, *Mytilus*, *Modiola* and *Mya*, also fragments and entire bones of mammalia and fishes, were met with; in the bottom of some of them a collection of stones was found, showing the evidence of having been exposed to the action of fire; mixed with them were fragments of charcoal and traces of ashes. It was just outside of one of these cellars that the skeletons on the table were found.

No. 1 of the photographs, in reality, consists of portions of two persons, one of them of middle age, the other, judging from the size and thinness of the pieces of the skull, that of a young person. This can be seen near the pelvis of the adult, and may have been a child buried in the arms or lap of its mother. Some of the bones of the legs of the adult are in a reversed position, showing that in this case there was a reburial, or that they were not buried until the body had decayed, and at the burial of the others these were gathered up and placed with them, being laid in as nearly a natural position as possible. This body was placed in the grave with the head

pointing in a northeast direction, while the rest were towards the southwest.

No. 2 was found on its back, and had the frontal portion of the skull badly crushed in. On the breast was found a shell of *Pyrrula canaliculata*, and under one side of the jaw a small dark mass which on examination proved to have been a pouch made of bear's skin, between the folds of which two bones, of some small mammal, the species of which has not yet been determined, were found. Embedded in this mass, on the outside, were several small copper tubes, one of them showing traces of the cord by which they were fastened to the pouch. Behind the ear were found several more of these tubes, making in all, eight. These relics are evidently the remains of a pouch ornamented by these tubes, that was hanging at the neck when the body was buried. The tubes were from two inches and a half to three inches in length, and from an eighth to a quarter of an inch in diameter; they were made of very thin sheet copper, rolled up, with the edges just lapped, but not fastened.

Nos. 3 and 4 were facing each other, and with these nothing was found.

No. 5, which is not shown in the large photograph, but the position of which is seen in the stereoscopic picture, consisted of but a mere handful of bones, and was a little out of the line to the northeast of the others, its head about on a line with the pelvis of No. 4. Across the top of the head of this was found a stone pestle, six inches and three-quarters long, and at the side of the skeleton numerous pieces of pottery, consisting of a small cup nearly whole, which by careful measurement was found to contain just a gill when perfect, and the fragments of at least two other vessels, a small bell of European make, of a flattened globular form, thirteen-sixteenths of an inch

across by eight-sixteenths high, made of two pieces soldered together, two small blue glass beads, and two small polished jasper pebbles. The bell containing nothing to produce a sound, and the fact that only two beads were found, after a careful examination of the soil, lead to the supposition that these beads were once contained in the bell. With all of these bodies was found in varying quantities a dark red substance like ochre, which completely covered some of the bones.

These remains were found at a depth of from twenty to twenty-two inches, and had placed at both ends of each body a large rock upon which they were partly resting. Two of the rocks are shown in the photograph.

Prof. E. S. Morse spoke of the importance of these relics in an archaeological point of view, and the especial value of the skeleton upon the table, such carefully secured specimens being exceedingly rare. He also made some remarks upon stone and other relics, contending that the similarity of arrowheads wherever found was no indication of a community of origin, but rather of a common necessity which impelled to the fashioning of these implements in the forms which practical experience proved the simplest and most natural. He likewise complimented Mr. Cooke for the care and skill which he had displayed in the preservation of the remains.

Some conversation then took place about the custom of depositing mementos in graves. A suggestion was made that the worthless character of many of the relics found in Indian graves, such as broken pottery, etc., indicated the poverty of the Indians, but it was stated that the negro tribes in Africa, although quite as poor, were in the habit of burying really valuable articles with their

dead. Parkman says that the practice of burying treasures with the dead is not peculiar to the North American aborigines, and calls to mind the curious fact mentioned in the "London Times" of Oct. 28, 1865, in describing the funeral rites of Lord Palmerston, viz. :—

"And as the words, 'Dust to dust, ashes to ashes,' were pronounced, the chief mourner, as a last precious offering to the dead, threw into the grave several diamond and gold rings."

Dr. A. H. JOHNSON called attention to the bones upon the table, and, by means of a skeleton of the Caucasian race, pointed out the anatomical peculiarities of the Indian bones, illustrating the differences by comparing and contrasting the similar bones in the two races. The bones exhibited were preserved whole, as they lay in the grave. They were not in their natural combinations, but were laid together in a compact bundle, with some regard to symmetry, although not according to their anatomical structure.

Dr. Johnson regarded this collection of bones as a reinterment of one of the tribe or family. It was a practice among the Hurons, well known to the Jesuits, as stated by Parkman, at intervals of ten or twelve years, to collect together their dead and convey them to the common place of sepulture, where the great Feast of the Dead was celebrated with peculiar rites. From all quarters of the Confederated tribes the mourners began their march. The bodies remaining entire were borne on a kind of litter, while the disjointed bones, bundled like fagots, were wrapped in skins, and slung at the shoulders of the relatives. Thus the procession slowly defiled along the forest paths, uttering at intervals, in unison, a dreary, wailing cry, designed to imitate the voices of disembodied

souls, winging their way to the land of spirits, and believed to have an effect peculiarly soothing to the conscious relics which each man bore. In conformity with a kindred custom it is probable that this bundle of bones was disinterred from their original grave and reburied in the family or tribal lot.

Dr. Johnson made some further observations relative to the characteristics of the Indians, and expressed the opinion, founded on the statements of the most reliable historians, that the popular impression in regard to the number of aborigines in New England during the early settlements was very much exaggerated.

Rev. E. C. BOLLES gave a humorous account of the remarks of the bystanders, and the impressions prevalent among them, during the digging operations. He also said that a microscopic examination of the hair and skin found among the relics, revealed the fact that these were the remains of the paw of a bear, which was an ornament frequently worn by the red men. From the character of the relics preserved it was evident that an Indian of no little distinction was among those interred in this grave.

Before adjourning a vote of thanks was passed to Mr. Isaac C. Wyman, the owner of the ground, to Messrs. Roundey, Dolliver and other citizens of Marblehead, for the interest they had manifested and the aid they had rendered in enabling the members of the Institute to conduct the examination which had produced such important results.

SPECIAL MEETING, WEDNESDAY, NOV. 25, 1874.

MEETING this evening at 7.30 o'clock. The PRESIDENT in the chair. Records read.

The SECRETARY stated that JAMES STEELE MACKAYE delivered last evening for the benefit of the Institute his lecture on FRANCOIS DELSARTE. Mr. Mackaye is one of Delsarte's most successful pupils; and this lecture, the recital of his master's life and a fitting tribute to his memory, was listened to with marked attention and pleasure. Delsarte was born in the north of France, Nov. 11, 1811; a descendant of the Delsartos of Italy. His mother was a woman of remarkable refinement and intellectual culture, from whom he inherited his proud spirit, his love of beauty, and his devotion to truth. A very graphic account was given of the bitter struggles of his early days; the success that attended his first appearance on the stage; his subsequent brilliant career as a singer and actor, until an impaired voice compelled him to retire at the height of his fame; and of the subsequent devotion to his studies and the establishment of his "practical school of æsthetics and art" in Paris, which was very celebrated. He died July 20, 1871.

The Secretary also mentioned that Miss ANNA FINKENSTADT, of Newport, had rendered valuable assistance in the Institute course of lectures and concerts at Mechanic Hall on Monday evening, and on his motion it was

Voted, That the thanks of the Institute be presented to Mr. James Steele Mackaye, and Miss Anna Finkensadt, for their very acceptable contributions thus rendered in the promotion of the objects of the Institute.

Thomas High, of Marblehead, was elected a resident member.

[To be continued.]

BULLETIN

OF THE

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SPECIAL MEETING, WEDNESDAY, NOV. 25, 1874.

[*Continued.*]

By special request Mr. F. W. PUTNAM exhibited the collection of living fishes and crayfishes which he had brought from the Mammoth Cave, and occupied the evening by giving an account of the specimens and the formation of the cave.

Mr. Putnam stated that his investigations were made while acting as an assistant on the Geological Survey of Kentucky, of which Prof. Shaler was the chief, and therefore he was able to work with great advantage, having been aided by the proprietors of the Mammoth Cave, through their courteous agent, Mr. Miller, and his assistant, Mr. Wilcoxson.

Mr. Putnam first made an allusion to the advanced character of the Kentucky Survey, and the broad and liberal principles upon which it had been based by the legislature of the state, which, by providing for a biological survey in connection with the geological, had thus

shown a far more advanced appreciation of the value of science in all its departments, than had many an older state which had simply looked with favor on geological surveys so far as it was thought they would give immediate returns in pecuniary value. He then proceeded to give a general account of the geology of the region, embracing the great cavernous country of which the Mammoth Cave and its vicinity form only a small part. He traced the present drainage of the region, and showed how a large part of the surface of the country was cut up by sink holes, or large circular depressions, in which the rain water accumulated and was then drained off by subterranean streams, to unite with the water of the Green River and its tributaries at a lower level, forming the caves through the immense beds of subcarboniferous limestone. He then explained how the caves, which exist in immense numbers throughout this whole limestone region, had been formed by the action of the carbonic acid in the rain water, and also by the wearing away of the rock by the sand and stones carried along by the streams. He said that no one could examine the caves without being convinced that their formation was wholly due to aqueous action in this way, and that in those chambers where the water was still at its work one could hardly fail to understand the process. In this way the caves have been cut for miles in extent, and to the depth, in some instances, of nearly three hundred feet from the surface. The upper chambers, or early river beds, become dry as the subterranean streams cut their way lower and lower into the limestone, just as the outside rivers cut their way deeper and deeper into the valleys. Many of the caves near the surface have become entirely dry from this deeper drainage, while in others at a little lower level, or in situations where the water from above has percolated through the

limestone, the dripping waters have formed the beautiful stalactites by the deposit of the carbonate of lime as each drop of water was freed from its carbonic acid. In such places one beholds the beauties of the formations within the cave, and there are to be seen the innumerable shapes of stalactites, from small tubes to massive pointed forms, and from delicate translucent curtains to immense fluted pendants, while from the water that drops to the floor below arise little hills of pure lime, or the immense pedestals which, in some cases, uniting with the stalactites above, form continuous columns, often fluted and corniced like the most elaborately carved pillars. The upper and dry chambers are left to stand until they shall be worn away by gradual erosion or be destroyed by some great convulsion of nature. The water action that is slowly depositing the lime anew in the form of stalactites and stalagmites is gradually closing the chambers that had previously been formed by its more active operations which are still going on in the passages below. Here the river action is to be seen, and one soon understands the formation of the beds of sand, the pits and the potholes seen in many parts of the caverns.

The present caves are thus unquestionably traced to the action of running water and the chemical action of the carbonic acid which have been going on for thousands and thousands of years. The denudation of the surface of the rock by the same and other causes must not be forgotten, and there is every reason to believe that this denudation, or gradual wearing away of the surface of the limestone, must have been immense. With this consideration before us the suggestion that caverns may once have existed in the upper part of this limestone, made when the rock was in connection with the salt water which formerly extended over this area, may not be considered too

bold a one to make, especially as some forms of life are found in these subterranean streams which, at present, seem to indicate a marine origin, and brackish water animals of certain forms once enclosed in the cave, would be very likely to survive under the peculiar conditions in which they were placed, as we know to have been the case under other, but somewhat similar, circumstances. That many, or, with two or three exceptions, nearly all of the thirty or forty species of vertebrates, articulates, mollusks and still lower forms, including a few plants, now discovered in the caves of Kentucky, are of comparatively late introduction, is probable from the fact that they are so closely allied to forms living in the vicinity of the caves, but that the blind fishes, the *Chologaster* and a few of the lower forms of articulates, as the *Lernæan*, parasitic on the blind fish, may have been inhabitants of the subterranean streams for a much longer period is worthy of consideration on the following grounds:—

First, the blind fish family has no immediate allies existing in the interior waters,* the only species of the family, in addition to the three found in the Mammoth Cave, being known at present only from the rice ditches of the low coast of South Carolina.

Second, the *Lernæan* parasite is much more common on marine fishes than on strictly fluviatile species, and is more decidedly a marine than a fresh water form. These facts may therefore be taken as at least indicating the probability of the early origin of some part of the great cave system of the region of the Ohio valley, and while there may be nothing in the present structure of the caves to indicate their having been formed in part while in con-

* In common with others I have considered the *Heteropygii* as belonging to the same order with the *Cyprinodontes*, but I now have, from further information of their structure, doubts as to their close association with that group. This subject will be presented on another occasion.

tact with salt water, the supposed erosion of the limestone and the modification of the early formed chambers by later action should be carefully considered before it can be denied that the caves were not, in some slight part, for a time, supplied with marine life. Until a specimen of *Chologaster*, or some other member of the family, has been obtained in the external waters of the Ohio valley, it is hardly logical to regard the family to which the blind fishes belong as one originally distributed in the rivers of the Ohio valley, and afterwards becoming exterminated in the rivers and only existing in two such widely different localities as the coast of South Carolina and the subterranean streams of the southwestern states. That marine forms of life are found in our fresh water lakes and rivers is known to be the case. The specimen of a shrimp exhibited was secured in the Green River near one of the outlets of the Mammoth Cave. The fact that in some of the waters of Florida fishes once marine are now confined to the fresh water lakes of comparatively recent formation, and that in the St. John's River, and others of that state, many marine and fresh water species are found associated, are evidence of the change that may take place in the habits of some marine animals, while a recent announcement of the *Gobiosoma* found in the Ohio River* is another instance of a marine fish living in fresh waters.

Living specimens of both species of blind fishes (*Ambyloopsis speleus* and *Typhlichthys subterraneus*) were exhibited, and with them specimens of a fish never before collected in the waters of Mammoth Cave.

This last proves to be the *Chologaster Agassizii* described † from a young specimen obtained from a well in

* PUTNAM, notice of *Gobiosoma molestum* from the Ohio. Am. Nat., viii, Feb., 1874.

† See PUTNAM, Amer. Nat., vi, p. 22, figs., Jan., 1872: Report Peabody Acad. Sci., 1871. Both articles are reproduced in "Life in Mam. Cave," 1872.

Lebanon, Tennessee. This fish, which reaches a length of nearly five inches, is of a delicate brownish tint, and is provided with dark and well developed eyes. Five specimens were secured by setting the seine over night several times, and though every effort was made to capture them by ordinary methods of seining, it proved unsuccessful, so shy and quick of movement is this singular inhabitant of the dark waters of the cave.

Its habits are in marked contrast to those of the blind fishes, for it lives at the bottom of the stream, darting with the utmost rapidity, and swimming rapidly by very quick lateral motions of its whole body, seldom coming near the surface, even in the aquarium, unless disturbed.

The blind fishes on the contrary swim slowly about or remain at rest near the surface of the water, and are very readily seen and easily captured by a careful and quick movement of the scoop net, though if, by means of the peculiar tactile organs with which they are so liberally supplied, they *feel* the least disturbance near them in the water, they move off by a quick dart and then swim slowly about; occasionally they drop to the bottom for a short time, but it is seldom that they are so seen.

An interesting fact respecting the theory of the adaptability of the color of an animal to its surroundings is observable in the Chologaster; they are so near the exact color of the dark sand of the bottom of the river in the cave that it is almost impossible to distinguish them as they lie at rest, and yet this can hardly be supposed in any way to add to their security, for as utter darkness prevails they would be equally safe, in that respect, if they had all the colors of the rainbow displayed on their bodies, and then probably their principal enemy is the large species of *blind* fish.

This Chologaster also gives the most conclusive evi-

dence that light is not necessary for the existence of coloration in animals, for here in total darkness is this most beautifully tinted fish.

From the present knowledge of the fauna of our rivers it can only be assumed, without a fact in favor of such an assumption, that the *Chologaster* is a later comer into the subterranean streams than its blind and colorless cousins, and it cannot now be maintained with any reason that the supposed peculiar adaptability to surface feeding was the cause of the survival of the blind fishes of the caves, and the want of the structure adapting the fish to surface feeding the reason that other forms did not survive; for we have in *Chologaster* a fish with just the same structure of mouth as in *Amblyopsis* and *Typhlichthys*, provided with an equally large air bladder (if that can be considered as having anything to do with surface habits), and yet living always at the bottom of the water.

Yet that many species enter the cave from the outside waters is proved by the collection of the following species of fishes in the same waters with the blind fishes and the *Chologaster*:—

Two specimens of *Amiurus catus*, half grown; one specimen of *Uranidea* (sp.?), very large; one specimen each, of full size, of two species of Cyprinoids not yet determined, but, as in the case of the cat-fish and bull-head, of the same species as those collected in the Green River just outside of the cave. All five of these specimens were as highly colored and had their eyes as perfect as their kin in the Green River. They were all in good condition, and when captured were in every way apparently as well off as if in daylight.

A large number of insects, small crustaceans, etc., were obtained in the cave, and a few species of plants of the lower forms were collected. The other living specimens

exhibited were a series of crayfish of two species. Of one, the common blind species of the cave, *Cambarus pellucidus*, several specimens were exhibited; most of them were white, but three were of a light drab color. Of the other species, probably the *Cambarus Bartonii*, there was a large specimen of the ordinary color, and another quite small one that was very light colored, while several others now in alcohol were also obtained from the cave in company with the blind species.

In another cave, situated several miles down the Green River from the Mammoth Cave, and on the opposite bank, which was christened "Blind-fish Cave," a number of specimens of the blind *Typhlichthys* and several blind crayfish were collected. The peculiarity of this cave consists in the fact that from its entrance, under a shelving rock which is considerably above the bed of the Green River, issues a small stream of water which can easily be followed for a short distance, and by crawling along its bed for some few hundreds yards farther. In this cave the blind fishes and blind crayfishes were found not far from its entrance, and, at times, they have been taken by other persons quite out in daylight, yet they are identical in every way with those of the Mammoth and other caves where utter darkness prevails.

Certainly all these facts must be taken into consideration if the attempt is made to account for the origin of cave life, but until the present time many of them have been unknown, and consequently only a very few were used as furnishing proofs of the theories which have been advanced. With these new facts before us it certainly behooves us to be deliberate in drawing our conclusions.

NOTE. Having hinted on this and previous occasions that, from the apparent continuance of marine forms of life in the subterranean regions of the southwest, there may have been caves, of greater or

less extent, to which marine life may have had access at a period long past, notwithstanding the present want of geological proof on the spot by which such an idea can be substantiated, the following quotations from the most eminent writers upon limestone formations and upon the structure of caves in other parts of the world, will show that the suggestion is within the limits of the probable.

Professor DANA, in his "Corals and Coral Islands," p. 360. writes as follows: "The elevated coral limestone, although in general a hard and compact rock, abounds in caverns. They may be due in part to open spaces, or regions of loose texture, in or between the strata. But in most cases they are a result of solution and erosion by the fresh waters of the land, or the waves and currents of the ocean, subsequent to the elevation. On the island of Mesia, many caverns open outward in the coral limestone cliff* and in some were large stalactites."

In the very important work on caves by Mr. DAWKINS, recently published under the title of "Cave Hunting," the learned author, under the heading of "The Various Ages of Caves," states "It is very probable that caves were formed in calcareous rocks from the time that they were raised to the level of the sea, since they abound in Coral Islands." After quoting some facts from Dana's work, he goes on to say:

"Calcareous rocks might therefore be expected to contain fissures and caves of various ages. In the Mendip Hills they have been proved by Mr. Charles Moore to contain fossils of Rhætic age, the characteristic dog-fishes *Acrodus minimus* and *Ilyodus reticulatus*, the elegant sculptured Ganoid fish, *Gryrolepis tenuistriatus* and the tiny marsupials, *Microlestes* and its allies. This singular association of terrestrial with marine creatures is due to the fact, that while that area was being slowly depressed beneath the Rhætic and Liassic seas, the remains were mingled together on the coast line, and washed into the crevices and holes in the rock.

The older caves and fissures have very generally been blocked up by accumulations of calc-spar or other minerals, and they are arranged on a plan altogether independent of the existing systems of drainage.

It is a singular fact that no fissures or caves should, with the above exception, contain the remains of animals of a date before the Pleistocene age. There can be but little doubt that they were used as places of shelter in all ages, and they must have entombed the remains of the animals that fell into them, or were swept into them by the streams. Caves there must have been long before, and the Eocene, Palæotheres and Anoplotheres met their death in the open pitfalls,

* On p. 194 this cliff is described as "a white and solid limestone, seldom presenting any traces of its coral origin."

just as the sheep and cattle do at the present time. The Hyænodon of the Miocene had, probably, the same cave-hunting tastes as his descendant, the living hyæna, and the marsupials of the mesozoic age might be expected to be preserved in caves, like the fossil marsupials of Australia.

The chances of preservation of the remains when once cemented into a fine breccia, or sealed down with a crystalline covering of stalagmite, are very nearly the same as those under which the Pleistocene animals have been handed down to us. The only reasonable explanation of the non-discovery of such remains seems to be, that the ancient suites of caves and fissures containing them, and for the most part near the then surface of the rock, *have been completely swept away by denudation, while the present caverns were either not then excavated or inaccessible.*

Such an hypothesis will explain the fact that, the non-ossiferous caverns are older than the Pleistocene age, not merely in Europe but in North and South America, Australia and New Zealand. The effect of denudation in rendering the geological record imperfect, may be gathered from the estimate, which Mr. Prestwick has formed, of the amount of rock removed from the crests of the Mendips and the Ardennes, which is in the one case a thickness "of two miles and more;" and in the other as much as "three or four miles." Under these conditions we could not expect to find a series of bone caves reaching far back into the remote, geological past, since the caves and their contents would inevitably be destroyed."

See also a quotation from the address by Mr. Prestwick before the Geological Society, on p. 69 of Mr. Dawkins' work, in which the surface denudation by the action of atmospheric water is discussed.



REGULAR MEETING, MONDAY, DECEMBER 7, 1874.

MEETING this evening at 7.30 o'clock. The PRESIDENT in the chair. Records of preceding meeting read.

The SECRETARY announced the following correspondence:—

From N. Cleaveland, Westport, Conn., Dec. 2; S. G. Drake, Boston, Dec. 3; G. L. Goodale, Cambridge, Nov. 25; S. G. Gould, Manchester, N. H., Nov. 19, Dec. 1, Waldo Higginson, Boston, Nov. 27; E. H. Hitchcock, Amherst, Nov. 14; Charles J. Hoady, Hartford, Conn., Dec. 2; M. F. Jacob, South Hingham, Nov. 27, Dec. 2; Charles Phillips, Philadelphia, Nov. 25; Dec. 2; Willard P. Phillips, Dec. 5; R.

Ridgway, Washington, Nov. 29; M. W. Shepard, Dec. 4; T. N. Snow, Baker City, Oregon, Nov. 18; Basel, Naturforschende Gesellschaft, Aug. 29; Briinn Naturforschende Verein, Sept. 7; München, K. Bayerischen Akademie der Wissenschaften Sept. 15; New York Genealogical and Biographical Society, Nov. 16; New York Historical Society, Dec. 5; Washington, Smithsonian Institute, Aug. 14; Würzburg, Physikalisch-Medicinische, Gesellschaft, Aug. 22.

The LIBRARIAN reported the following additions to the library:—

By Donation.

AGASSIZ, A., of Cambridge, the following works by his father, Louis Agassiz. *Catalogus Systematicus Ectyporum Echinodermatum.* 4to pamph. *Natural History of the Aclephæ of North America.* 2 parts, 4to. *Monographie des Poissons Fossiles Du Vieux Grès Rouge.* 3 parts, text and 40 plates. *Monographie d' Echinodermis.* 4 Liv. and plates. *Mémoire sur les Moules de Mollusques.* 4to pamph. *Études Critiques sur les Mollusques Fossiles.* 4 Liv., 4to pamphlets. *On the Origin of Species.* 8vo pamph. *Contemplations of God in the Kosmos.* 8vo pamph. *Primitive Diversity of Animals.* 8vo pamph. *Ichthyological Fauna of the Pacific Slope.* 8vo pamph. *Classification in the Animal Kingdom.* 8vo pamph. *Buckland's Geologie und Mineralogie.* 2 vols. *Untersuchungen über die Gletscher.* 1 vol., with plates. *Histoire Naturelle des Poissons D' eau Douce de L' Europe Centrale.* 1 vol., with plates. *Nomenclatoris Zoologici Index Universalis.* 1 vol. 12mo. *Nomenclator Zoologicus, Contmens Nomina Systematica Generum Animalium Tam Viventium Quam Fossilium.* 1 vol. 4to. *Iconographie des Coquilles Tertiaires.* 4to pamph.

BOLLES, E. C. *Salem Directory for 1872.* 1 vol. 8vo. *Notes of Livermore.* 1 vol. 8vo. *Miscellaneous pamphlets.* 60.

BROOKHOUSE, ROBERT. *Patent Office Report for 1850-51.* 1 vol. 8vo. *Hunt's Merchant Magazine,* 10 numbers. *American Review,* 7 numbers. *The Cultivator,* 160 numbers. *N. E. Farmer,* 165 numbers. *Boston Patriot,* 1811, 1813, 1816. *The Yankee,* 1812.

MINER, A. A., Boston. *Catalogue of the Officers and Students of Tufts College.* 1874-5. and Triennial. 8vo pamph.

PHILLIPS, W. P. *Memorial of Chas. Sumner.* 1 vol., small 4to.

ROBINSON, JOHN. *Coin Catalogues,* 152. *Miscellaneous pamphlets,* 23.

U. S. PATENT OFFICE. *Official Gazette,* Nov. 10, 17, 1874.

WOODMAN, CYRUS, of Cambridge, Mass. *Genealogy of the Woodmans of Buxton, Me.* By C. Woodman. 1 vol. 8vo.

By Exchange.

ARCHIV FÜR ANTHROPOLOGIE. Bd vii, Heft I. 1874.

NATURAL HISTORY SOCIETY OF MONTREAL. *The Canadian Naturalist and Quarterly Journal of Science.* Vol. 7. No. 6. Nov., 1874.

NATURFORSCHENDE GESELLSCHAFT IN BASEL, Switzerland. *Verhandlungen, Sechster Theil, Erstes Heft.* 8vo.

NATURFORSCHENDE VEREIN IN BRÜNN, Verhandlungen, xi Band. 1872. 8vo.

NATURWISSENSCHAFTLICHEN GESELLSCHAFT "ISIS" IN DRESDEN. *Sitzungs-Berichte,* Jahrg. 1874. Jan-März. 8vo.

NEW YORK GENEALOGICAL AND BIOGRAPHICAL SOCIETY. *Genealogical and Biographical Record,* Vol. v. No. iv, Oct., 1874.

PHYSIKALISCH-MEDICINISCHE GESELLSCHAFT IN WÜRZBURG, Bavaria. *Verhandlungen, Neue Folge Bd., vii.* 1874. 1 vol. 8vo.

SOCIÉTÉ ENTOMOLOGIQUE DE BELGIQUE. Annales, Tome xvi, 1873. 1 vol. 8vo.
 SOCIÉTÉ VAUDOISE DES SCIENCES NATURELLES IN LAUSANNE. Bulletin, Vol. xii. No. 72. 1874.

PUBLISHERS. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Hardwicke's Science Gossip. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Salem Observer. Salem Post. Silliman's Journal.

A. Graham Bell, of Salem, was elected a resident member.

Gen. H. K. OLIVER gave a brief résumé of a recent valuable donation from the heirs of the late Gen. Benjamin F. Edmands, of Boston, of a large collection of music, both printed and in manuscript, being part of the library of the Boston Academy of Music, an organization that flourished in Boston from 1833 to 1857, and did much to promote the culture of good music in the metropolis. Gen. Oliver spoke in high terms of commendation of several of the early members, specifying more particularly the late Lowell Mason, for many years a leading spirit in musical circles, and Gen. Edmands, a gentleman well known for his zeal and interest in public affairs, more especially in those that relate to the military.

Mr. JOHN ROBINSON presented a large collection of catalogues and pamphlets on coins and coinage.

Mr. F. W. PUTNAM presented from Mr. Albert W. Edmands, of Charlestown, an interesting document containing the signatures of the Hon. Anson Burlingame, the ambassador from China, and the members of the Chinese Embassy and suite, when on a visit to this country in 1868.

To the manuscript department Mrs. J. F. WORCESTER presented the genealogical papers of the late Dr. J. F. Worcester.

Votes of thanks were passed to the several donors.

Mr. JOHN ROBINSON gave an instructive and interesting account of the processes in the manufacture of glass, in all its varieties, tracing it from its origin to the elaborate and skilful workmanship of the present day, exhibiting specimens and illustrating the methods of mixing and melting by drawings on the blackboard.

Previous to the adjournment, Gen. OLIVER alluded to the Transit of Venus, which was to occur on the 8th, and mentioned the plans that have been adopted by several of the governments of Europe and of the United States, in locating a line of observers in different places to note the particular phases of this occurrence; and the importance of these observations in determining facts in astronomical science.

Adjourned.



REGULAR MEETING, MONDAY, DECEMBER 21, 1874.

MEETING this evening at 7.30 o'clock. The PRESIDENT in the chair. Records of preceding meeting read.

The SECRETARY announced the following correspondence:—

From E. J. Attinelli, New York, Dec. 3. 10; Henry B. Dawson, Morrisania, N. Y., Dec. 10; L. C. Herrick, Woodstock, O., Dec. 1; J. Warren Merrill, Cambridgeport, Dec. 5; M. J. Peabody, Boston, Dec. 4; Charles Phillips, Germantown, Penn., Dec. 9; Robert Ridgway, Washington, Dec. 8; J. Henry Stickney, Baltimore, Md., Dec. 17; Henry White, New Haven, Conn., Dec. 7; W. C. Wood, Wenham, Dec. 12; William H. Yeomans, Columbia, Conn., Dec. 12; Boston Society of Natural History, Dec. 18; Brockton Public Library, Dec. 15; Buffalo Historical Society, Dec. 7; New Hampshire Historical Society, Dec. 14; Rhode Island Historical Society, Dec. 10.

The LIBRARIAN reported the following additions to the library:—

By Donation.

- BAKER, CHAS. H., of Annapolis, Md. Annual Register of the U. S. Naval Academy at Annapolis, Md. 1874-5.
- BOARDMAN, SAM'L L., of Augusta, Me. The Ornamental and Useful Plants of Maine, by F. L. Scribner. 8vo. pamph. Some Materials towards a History of the Cattle of Maine, by S. L. Boardman. 8vo pamph.
- COGSWELL, WM. Miscellaneous pamphlets, 340.
- GREEN, S. A., of Boston. Miscellaneous pamphlets, 14.
- KIMBALL, JAMES. Cape Ann Advertiser, Nov. 13, 20, 28, Dec. 4, 11, 1874.
- LEA, ISAAC. Philadelphia. Index to Vol. i to xiii, Observations on the Genus *Unio*. 4to pamph.
- LEE, JOHN C. Commercial Bulletin, Nov. 21, 28, Dec. 5, 1874.
- MEMORIAL HALL LIBRARY, at Andover, Mass. Catalogue of. 1 vol. 12mo.
- THOMPSON, C. O., of Worcester, Mass. Fifth Annual Catalogue of the Worcester Free Institute, 1874-5.
- U. S. PATENT OFFICE. Official Gazette for Nov. 24, Dec. 1, 1874.
- WARNER, OLIVER. Mass. Public Documents for 1873. 5 vols. 8vo.
- WATERS, J. LINTON. Miscellaneous pamphlets, 14.
- YEOMANS, W. H., of Columbia, Conn. Report of the Secretary of the Conn., Board of Agriculture. 1873-4. 1 vol. 8vo. Miscellaneous pamphlets, 30.

By Exchange.

- ACADÉMIE ROYALE DES SCIENCES, ARTS ET BELLES-LETTRES, Caen, France. Memoires, 1872. 2 vols. 8vo.
- KÖNIGLICH BAYERISCHEN AKADEMIE DER WISSENSCHAFTEN IN MÜNCHEN. Sitzungsberichte der philosophisch-philologischen und historischen Classe. Heft v, vi. Heft. i, ii. iii. 1873. Sitzungsberichte der Mathematisch-physikalischen Classe. Heft. iii. 1873. Heft. i, ii. 1874. Ueber den Einfluss des Freiherrn Justus von Liebig auf die Entwicklung der Physiologie. 4to pamph. 1874. Dr. Justus Freiherrn von Liebig zum Gedächtniss. 4to pamph. 1874. Justus Freiherr von Liebig Als Begründer der Agrikultur-Chemie. 4to pamph. 1874. Gedächtniss Rede auf König Johann von Sachsen. 4to pamph. Ueber Deutschlands Weltstellung. 8vo pamph. 1874.
- MARYLAND HISTORICAL SOCIETY. The Lords Baltimore: by J. G. Morris, D.D. 8vo pamph. 1874.
- SOCIÉTÉ D'ACCLIMATATION IN PARIS. Bulletin Mensuel, 3me Série, Tome 1. Nos. 7, 8. Juillet-Aout. 1874.
- ST. GALLISCHE GESELLSCHAFT, ST. GALLEN. Bericht. 1872-73. 1 vol. 8vo.
- PUBLISHERS. American Naturalist. Forest and Stream. Gloucester Telegraph. Hardwicke's Science Gossip. Haverhill Gazette. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Quaritch's Catalogue. Peabody Press. Salem Observer. Salem Post.

Mr. F. W. PUTNAM noticed some of the very important archaeological discoveries of the Hayden exploring expedition, and made interesting mention of the cliff dwellers of the Mancos Cañon of the great Colorado region, describing briefly their habitations, as exhibited by photographs which had been taken by the expedition and from information furnished him by Mr. Ingersol, who was

of the party that had made the examination. He then exhibited engravings of somewhat similar dwellings of an ancient race in France, and gave an account of several recent investigations in archaeology, both in this country and in Europe.

Mr. ALFRED OSGOOD of Newburyport, gave an account of the alleged lead or silver mines in the vicinity of Newburyport. He leaned to the opinion that the accounts were exaggerated; that the ore found was simply float ore, brought thither by glacial action, and that it was doubtful if there were a vein or mine in the place. He, however, thought that a scientific examination ought to be made to ascertain the fact, and suggested that a party should be detailed from the Institute to make a thorough examination.

Mr. KNOWLTON, of Rockport, differed from Mr. Osgood as to the ore being deposited by glacial action, and was inclined to believe it a genuine vein.

Mr. F. W. PUTNAM suggested that the difference of opinion on this subject indicated the importance of a thorough scientific survey of the state, and he thought that the Institute ought to take some action favoring a survey, and present its views to the Legislature, which would soon receive a report from the Board of Education in relation to the subject.

Hon. GEORGE B. LORING expressed himself in favor of such action, and presented many forcible arguments in furtherance of such a course. He spoke of the practical value of a thorough understanding of the natural resources of a state. The work of agriculture cannot be

properly conducted until the condition and quality of the soil are accurately ascertained, and that which is valuable be improved, and that which is useless avoided. In no way can we avoid a wasteful expenditure of money in exploring the mining and mineral wealth of the land, except by such an investigation into the geological formation where that wealth lies, as to reveal its exact condition. To a scientific knowledge of the mineral deposits of one section of our country, and to a scientific application of enquiry to them, do we owe the most successful mining enterprise of our day. In the early days of copper mining at Lake Superior, vast sums of money were wasted through ignorance, and large amounts of property were abandoned from insufficient exploration of their true value; but in our day scientific research guides the miners on to almost fabulous results. For the business prosperity of our state, therefore, he was in favor of the proposed survey, and doubted not that the Legislature would look with favor upon the proposition. And remembering that upon such enterprises, more than upon mere material endeavor, depends the true reputation of a state, in the eyes of all civilized people, he could not believe that Massachusetts would be backward in taking her stand among the most enlightened, as she long had among the most energetic and thriving commonwealths.

After some further discussion, a committee was appointed, consisting of Messrs. F. W. Putnam, A. S. Packard and E. S. Morse, to prepare a memorial to the Legislature, embodying the views of the Institute, and to report the same for action at the next meeting.

Hugh Elder, of Salem, Francis H. Johnson and George W. W. Dove, of Andover, were elected resident members.





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