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BULLETIN

OF THE

ESSEX INSTITUTE,

VOLUME IV,

1872.

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UNIVERSITY OF TORONTO

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BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 4. SALEM, MASS., JANUARY, 1872. No. 1.

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REGULAR MEETING, MONDAY, JANUARY 1st, 1872.

THE PRESIDENT in the chair. Records of preceding meeting read.

The President mentioned a few of the associations that cluster around this day; a day when the mind naturally reverts to the past, recalls the incidents of the year now closed, and indulges in reveries upon their probable influence in the distant future. No one can foretell the results; some of the most seemingly important will soon pass away and be forgotten, whereas the most apparently trivial, scarcely known beyond the threshold of the humble cot of the occurrence, will, as years roll on, become the centre of great interest and attraction, as the birthplace and home of some of nature's noblemen. He briefly alluded to the holidays that occur near the close of the old and the beginning of the new year, and called upon Mr. A. C. GOODELL, JR., who spoke of the estimation in which these days were held in the early period

of our colonial history, and the great change in the mode of observance within the past few years.

PURITAN HOLY DAYS.

Our forefathers, the Puritans, observed but three classes of holy days; namely, Sabbaths, Fasts and Thanksgivings. In the observance of the first they differed from the Catholic church and from most of the Reformed churches by devoting them exclusively to religious exercises after the Mosaic model. It was on account of this difference between them and their neighboring Protestants in Holland, that the Pilgrims left that country for America. Here they enforced, by law, the strictest observance of the Lord's day, and established periodical fasts and days of thanksgiving.

The first thanksgiving in Massachusetts was observed at Salem, July 8, 1630. Winthrop and his immigrants had arrived about a month before, bringing provisions of which the settlers under Endicott stood greatly in need. Two days before the thanksgiving, Gov. Winthrop's son Henry was drowned in attempting to swim across the North river, after a canoe; so that the occasion was mixed with sadness.

The next thanksgiving was observed at Boston, February 22, 1631. This was on account of the arrival of the ship Lyon, with provisions, which came the day before a fast which had been appointed on account of a threatened famine. The fast was immediately changed to a thanksgiving.

The next and first general thanksgiving was kept by the seven plantations then established, Oct. 16, 1633, and was ordered "in regard of the many and extraordinary mercies which the Lord hath been pleased to vouchsafe of late to this plantation; namely, a plentiful har-

vest, ships safely arrived with persons of special use and quality," etc.

After the arrival of the Province charter, only one instance occurs of a day of thanksgiving set apart by act of the General Court. This was passed Nov. 13, 1693, and the day appointed was Dec. 21, O. S., corresponding to Jan. 2, of our present calendar. Since that time all thanksgiving days have been fixed by executive proclamation, and not by act of the legislature.

CHRISTMAS.

The next subject discussed was Christmas; which was at first a movable feast, celebrated, usually, in April or May. It was probably instituted in the second century, but was not fixed by the Catholic Church, upon Dec. 25, until the pontificate of Julius I., in the fourth century.

The tradition of the church is that the birth of Jesus occurred at midnight, whence the custom in England and some other countries of ringing the church bells at midnight, early dawn, and again in the morning.

The different methods of celebrating the day in different countries and ages were then explained. The revels of the Lord of Misrule commenced at All Hallow Eve (Oct. 31), and continued to Candlemas (Feb. 2). Every day after Christmas was a holiday until twelfth night (Jan. 6). The season was always considered propitious in England, a tradition made memorable by the words of Marcellus to Horatio in the first scene in Hamlet:—

“Some say that ever 'gainst that season comes
Wherein our Saviour's birth is celebrated,
The bird of dawning singeth all night long;
And then, they say, no spirit stirs abroad;
The nights are wholesome; then no planets strike,
No fairy takes, nor witch hath power to charm,
So hallowed and so gracious is the time.”

The Puritans were greatly opposed to the observance

of the day, and in 1659 the following law was passed by the Colonial legislature of Massachusetts:—

“For preventing disorders arising in several places within this jurisdiction by reason of some still observing such festivals as were superstitiously kept in other countries, to the great dishonor of God and offence of others, it is therefore ordered by this Court and the authority thereof that whosoever shall be found observing any such day as Christmas or the like, either by forbearing of labour, feasting or any other way, upon any such accounts as aforesaid, every such person so offending shall pay for every such offence five shillings, as a fine to the county.”

This ordinance was objected to by the Royal Commissioners in 1665; but was not repealed until May 27, 1681.

In three years less than two centuries after the passage of this ordinance, the Legislature [1856, chap. 113], made this day a legal holiday on which even the sovereign legislature is not permitted to sit, and all government offices are closed.

NEW YEAR'S DAY.

New Year's day was then considered. The beginning of the year was very various in different ages and countries. Until the middle of the eighteenth century there were no less than seven days reckoned as this period; viz.,—Jan. 1 (as now); Jan. 1 (one year in advance); Dec. 25; Easter; March 1; March 25 (nine months sooner than the present time) and March 25 (three months later than the present time). This last, called the Florentine style or calendar, was the one in use in England and this colony until 1752, when it was changed to Jan. 1, and the Gregorian calendar adopted instead of the Julian which had been previously in use. The necessity of this change was then explained.

The Romans from whom we get the names of our months began the year with March, hence September, as its name implies, was really the seventh month, October the eighth, and so on.

An account was then given of the different ways in which New Year's day (Jan. 1) has been celebrated from the time of the Romans, when it was kept in honor of Janus, until the present time.

What the Romans had observed as a feast in honor of the double-faced deity, celebrating it by kindly salutations and the exchange of presents—each taking care during the continuance of the celebration, that all his words and acts should be pure and blameless—was turned by the church into a fast; and New Year's gifts were repeatedly forbidden under severe penalties. In England, however, the heathen practice of exchanging presents was never overcome by the Church; so strong a hold does it seem to have had in the popular sentiment. Indeed the custom seems to have been older, in Britain, than the time of the Roman invasion. About the only public celebration of New Year's in England at this day is the ringing in of the new year and ringing out of the old.

The present year is memorable as the first year in which the heads of departments at Washington, and many other prominent men following their example, have resolved to furnish no intoxicating drinks to those who, in observance of the time honored custom of New York, celebrate the day by making calls upon the ladies of their households.

INJURIOUS INSECTS IN ESSEX COUNTY.

Dr. A. S. PACKARD spoke of several species of insects injurious to vegetation noticed during the past season in this vicinity—specifying among others

THE ONION THRIPS.

About the middle of August my attention was called by Mr. B. P. Ware of Swampscott to serious losses of his onions from the attacks of a minute insect. The leaves were observed to turn suddenly yellow and to wilt, and the plant die. In this way large patches became infested and turned yellow, until in two or three days these prolific insects spread over the whole field. They seemed to increase most rapidly during the unusually dry hot weather that we experienced about the middle of last August. On the 11th of August a whole acre was thus cut off. Mr. Ware informed me that onion plants have been more or less infested in this way for some fifteen years, but the damage done this year was greater than ever before. This evil seems wide spread in Essex County, as not in Swampscott alone, but in Lynn, Salem and parts of Danvers, the onion crop had been similarly infested. About \$100,000 worth of onions are raised in Essex County alone, and Mr. Ware judged that at least a tenth part was destroyed by this new pest, so that in one county alone and from one kind of injurious insect we have in one season lost \$10,000. The onion crop is next to the hay crop in value, as it is sold for cash.

Fig. 1.

*Limothrips tritici* (fem.).

On examining the specimens brought into the Museum of the Peabody Academy of Science, the leaves were found to be covered with hundreds of a minute thrips which by gnawing the surface of the leaves had caused them to turn white in spots, and subsequently yellow; where they were most numerous the outer skin of the fleshy leaves was entirely eaten off, and though it was difficult to imagine that so minute an insect could have

caused the death of so stout and thick-leaved a plant, yet here were hundreds of the culprits in all stages of growth plying their jaws before our eyes in proof.

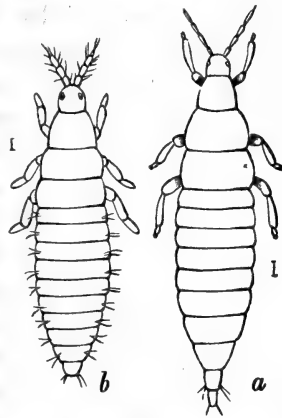
This insect, which occurred in both sexes and in all stages of growth from larvæ of minute size proved to be the wheat thrips (*Limothrips tritici*) of Fitch who gives an account of its appearance and habits in his "Second Report on the Noxious Insects of New York," p. 304.

Through the kindness of C. L. Flint, Esq., of the Mass. State Board of Agriculture, we are enabled to present figures of these insects taken from Dr. Packard's Report to the Board as State Entomologist. The females alone are winged, the males being wingless and closely resembling the larvæ. The body of the female (Fig. 1) is smooth and shining, uniformly greenish yellow with no other markings; the legs are a little paler towards articulations. The larva

(Fig. 2, *b*) is entirely greenish-yellow, the head and prothorax of

the same color as the rest of the body. The male (Fig. 2, *a*) differs from the larva in having 2-jointed feet (tarsi) and 7-jointed antennæ, those of the larva being 4-jointed. The small line at the side of each figure indicates the natural size of the insect.

Fig. 2.

Larva and male of *Limothrips tritici*.

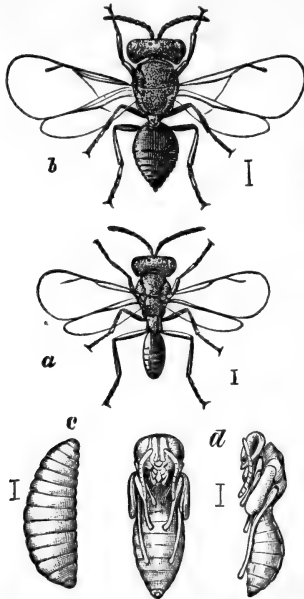
End of antennæ of male.

THE ONION FLY.

which in its larval condition attacks the roots of the

onion, was briefly alluded to. It appears about the middle of May and continues its ravages until nearly the third week in August, when it changes into the pupa or chrysalis state.

Fig. 3.



Parasite of the Imported Cabbage Butterfly.

IMPORTED CABBAGE CATERPILLAR
AND ITS PARASITE.

was next mentioned. This caterpillar during the past summer has been fearfully abundant in gardens in this vicinity, and would have done still greater injury to the growing crops were it not for the presence of the parasite which had been found to prey upon it very extensively.

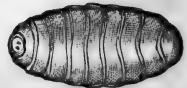
The figures annexed illustrate the several stages (Fig. 3, *a*, male; *b*, female; *c*, larva; *d*, pupa) of this invaluable ichneumon parasite which is one of the Chalcid family, and is the *Pteropis puparum* of Linnæus.

Dr. Packard had supposed that this parasite had perhaps been imported with its host, but it is now found to be a native of this country as well as of Europe, and cited authorities confirmatory of this assertion.

LARVA OF TACHINA.

Another parasite which he mentioned was the larva of a parasitic fly, *Tachina* (Fig. 4, enlarged three times), the adult form of which closely resembles the common house fly. It is a flattened,

Fig. 4.



Larva of *Tachina*.

cylindrical maggot, both ends of the body rounded much alike.

Mr. PUTNAM remarked that he had collected several hundred of the caterpillars and pupæ of the cabbage butterfly during the month of September, the caterpillars having crawled up the side of his house from an adjoining field where a large number of cabbages had been entirely destroyed by them. He had noticed that a very large number of the pupæ were infested by parasites, many of which came out during the month of September and in October. The butterfly will be out early in the spring.

Discussion followed on these and kindred subjects, participated in by Messrs. Packard, Putnam, Bolles, Goodell and the chair.

William Gardner Barton of Salem and Beaman Gates of Beverly were elected members.

The LIBRARIAN reported the following additions :—

By Donation.

GREEN S. A., of Boston. Miscellaneous pamphlets, 24.

HINGHAM AGRICULTURAL AND HORTICULTURAL SOCIETY. Transactions for 1871. 8vo pamph. 1872.

HOLDEN, N. J. Wells' English Grammar, 1 vol. 12mo. The Commonwealth, 245 nos. The Liberator, 171 nos. National Anti-slavery Standard, 256 nos. Lynn News, 25 nos. Saturday Night Press, 10 nos. Miscellaneous pamphlets, 50. Miscellaneous serials, 10.

HOLMES, JOHN C., of Detroit, Mich. Michigan School Report for 1870. 1 vol. 8vo. Lansing, 1870.

LEE, GEO. C. New York City Directories, 1858, 1865, 1866, 1867, 1869, 1870. 6 vols. 8vo. Boston Directories, 1858, 1860, 1861, 1862, 1863, 1866, 1867, 1868, 1869, 1870. 10 vols. 8vo. Bankers' Magazine, Vols. II, III, 1847-8, 1848-9. 2 vols. 8vo. Boston Board of Trade, 1865, 1868. 2 vols. 8vo. Water Power of Maine. 1 vol. 8vo. Report of the Commissioners of Patents for 1851. 1 vol. 8vo. Commercial Relations of U. S., Vols. I, II. 2 vols. 4to. Washington, 1856-1857.

LEE, JOHN C. Commercial Bulletin for Dec., 1871.

VINTON, JOHN A. Giles' Memorial. 1 vol. 8vo. Boston. 1864.

WILDER, MARSHALL P., of Boston. Historical Address before the Massachusetts Agricultural College, July 19, 1871. 8vo pamph.

WILLIAMS, HENRY L. The National Eagle, 1870. 8 nos. Miscellaneous pamphlets, 6.

By Exchange.

ACADÉMIE IMPÉRIALE DES SCIENCES BELLES LETTRES ET ARTS IN BORDEAUX. Actes. 3e Série. 31e Année. 1869. 8vo. Paris. 1869.

KONIGLICH BAYERISCHEN AKADEMIE DER WISSENSCHAFTER ZU MÜNCHEN. Sitzungsberichte der philosophisch-philologischen und historischen Classe, 1871. Heft I, II, III. 8vo pamphlets. München, 1871. Sitzungsberichte der mathematisch-physikalischen Classe, 1871. Heft I, II, III. 8vo pamph. München, 1871. Die Aufgabe des chemischen Unterrichts gegenüber der Anforderungen der Wissenschaft und Technik. Rede gehalten in der öffentlichen Sitzung der k. Akademie der Wissenschaften am 25. Juli, 1871, von Dr. Emil Erlenmeyer. 4to pamph. München, 1871.

MASSACHUSETTS HISTORICAL SOCIETY. Collections, Vol. x. Fourth Series. 1 vol. 8vo. Boston, 1871.

SOCIEDAD DE NATURALISTAS NES-GRANADINOS. Exploracion entre San José De lúcuta I el Rio Magdalena, 8vo pamph. Bogota, 1871. Informe de los Exploradores del Territorio De San Martin. 8vo pamph. Bogota, 1871. Catálogo del Estado S. De Antisquia, 8vo. pamph. Bogota, 1871.

SOCIÉTÉ IMPÉRIALE DES SCIENCES NATURELLES DE CHERBOURG. Memoires, Tome xv, 1870. 8vo pamph. Cherbourg, 1870. Catalogue de la Bibliothèque, 8vo pamph. Cherbourg, 1871.

PUBLISHERS. American Naturalist. Christian World. Gloucester Telegraph. Haverhill Gazette. Land and Water. Lawrence American. Little Giant. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Salem Observer. Shoe and Leather Journal. Silliman's Journal.



REGULAR MEETING, MONDAY, JANUARY 15th, 1872.

THE President in the chair. Records of preceding meeting read.

A TRIP TO CALIFORNIA BY RAIL.

J. J. H. GREGORY, ESQ., of Marblehead gave a familiar talk upon California, and the things to be seen along the route of the Pacific railroad, beginning at Omaha. His descriptions were plain, graphic and interesting. Speaking of agriculture in Utah, he said the process of irrigation as carried on there was far less costly than he had supposed, as it consisted of the making of mere furrows with the plough. He spoke of the elements of dissolu-

tion in the Mormon system of polygamy, the principal one of which was the great influx of gentiles, though dissension in the church itself was doing much to undermine the system. Rents in Salt Lake City he described as "terrific," and the term was not too strong, judging from a single instance which he named, where the keeper of a rum shop paid seven thousand, two hundred dollars in rent and liquor tax for his room of thirty feet by eleven—about half the amount being for rent.

The Rocky Mountain slopes, the general scenery, the many miles of grain fields, and the agriculture of California, were described.

Oleanders were seen eighteen feet in height, Century plants thirty and forty feet. In Sacramento these bloom when fifteen years old. He also described the fruits, strawberries being sold at twenty-five cents for three quarts. Of the California wines he had a poor opinion so far as his observation extended, and judging by his own standard of taste.

Mr. Gregory will continue his remarks at the next meeting.

The LIBRARIAN mentioned the following additions:—

By Donation.

BOLLES, E. C. Miscellaneous pamphlets, 19.

COLE, Mrs. N. D. Salem Gazette for 1871.

FOOTE, CALEB. Files of several county papers for Oct., Nov., Dec., 1871.

NATIONAL ASSOCIATION OF WOOL MANUFACTURERS. Bulletin for Oct., 1871.

PALFREY, C. W. Miscellaneous pamphlets, 33.

POORE, BENJ. P., of Washington, D. C. Washington and Georgetown Directories for 1865, 6, 7, 8. 4 vols. 8vo.

U. S. A. CHIEF OF ENGINEERS. Report on Geological Exploration of the 40th Parallel, Vol. V, Botany. 1 vol. 4to. Washington, 1871.

By Exchange.

ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA. Proceedings of. Part II. April-Sept., 1871. 8vo pamph.

BOSTON NUMISMATIC SOCIETY. American Journal of Numismatics for Jan. 1872. 8vo pamph.

HISTORICAL SOCIETY OF DELAWARE. Catalogue of, with its History, Constitution and By-laws. 8vo. pamph.

NEW ENGLAND HISTORIC-GENEALOGICAL SOCIETY. Register and Antiquarian Journal of Jan., 1872. 8vo pamph.

PUBLISHERS. American Literary Gazette. Gloucester Telegraph. Haverhill Gazette. Lawrence American. Little Giant. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Quarritch's Catalogue. Sailors' Magazine and Seamen's Friend. Salem Observer. Shoe and Leather Journal.



DEFICIENCIES IN THE LIBRARY.

It is intended from time to time to publish lists of deficiencies in the Library hoping that the friends of the Institute, who may notice the same, will be induced to aid in completing the sets. Any number or volume, not designated (within brackets) under any title, will be acceptable.

DEFICIENCIES IN DIRECTORIES.

[Continued from volume iii, page 96.]

WASHINGTON, D. C., by E. A. Cohen [1834]; by A. Reintrel [1843]; by Gaither & Addison [1846]; by E. Waite [1850]; by A. Hunter [1853]; by I. Teu Eyck [1855]; by W. H. Boyd [1858, 1860]; by T. Hutchinson & Bro. [1863]; by A. Boyd [1864, 1865, 1866]; by W. H. Boyd [1867, 1868, 1869, 1870].

SOUTHERN CITIES, by John P. Campbell [1854]; by W. R. Dunkley [1866-67].

VIRGINIA Directory and Business Register, by Elliott & Nye [1852].

RICHMOND, VA., by John Maddox [1819]; by E. Fuslew [1860]; by Mills & Starke [1866].

WHEELING, WEST VA., by Williams & Co. [1867-8, 1868-9].

CHARLESTON, S. C., by J. H. Bagget [1852].

AUGUSTA, GA., by E. H. Paghe [1867].

SAVANNAH, GA., by Purse & Son [1866].

MOBILE, ALA., by Fawn & Dennett [1861, 1866].

JACKSON, MISS., by J. L. Power [1860].

NEW ORLEANS, LA., by Cohen [1849]; by R. C. Kerr [1856]; by C. Gardner [1859].

TENNESSEE STATE Gazetteer and Directory, by J. L. Mitchell [1860].

MEMPHIS, TENN., by Tanner, Halpin & Co. [1859]; by Williams [1860].

NASHVILLE, TENN., by J. P. Campbell [1853, 1855-6, 1857, 1859]; by E. D. King, [1865, 1866, 1867, 1868, 1869].

LOUISVILLE, KY., by G. Collins [1836].

LAKE SHORE Gazetteer and Business Directory [1861-62].

C. C. C. & I. R. R. Gazetteer by Hynes Bro. [1870-1].

AKRON, ALLIANCE, CUYAHOGA FALLS, MIDDLEBURY, KENT, CANTON, RAVENNA, MASSILLON, SALEM, WOOSTER, OHIO, by Wiggins & Weaver [1870-1].

CHILLICOTHE OHIO, by J. B. Doyle [1855-6]; by Williams & Co. [1869-70].

COLUMBUS, OHIO, by J. R. Armstrong [1843-4, 1855]; by Williams & Co. [1867-8, 1869-70].

CINCINNATI, OHIO, by C. S. Williams [1848-9, 1850, 1852]; by Robinson & Jones [1846]; by D. F. Shaffer [1849]; by C. S. Williams [1849-50, 1850-1, 1851-2, 1853, 1855, 1856, 1861, 1859, 1867, 1858, 1866].

DAYTON, OHIO, by C. S. Williams [1860-1].

SANDUSKY, OHIO, by W. D. Root [1855].

SPRINGFIELD, OHIO, by Williams & Co. [1868-9].

STEBENVILLE, WELLSVILLE, EAST LIVERPOOL, and WELLSBURGH, OHIO, by Wiggins & Weaver [1870-1].

STEBENVILLE, OHIO, by C. S. Williams [1856].

TOLEDO, OHIO, by C. S. Williams [1860]; by Scott [1836, 1857].

XENIA, OHIO, by Williams & Co. [1870-1].

ZANESVILLE, OHIO, by C. S. Williams [1860-1].

WESTERN RESERVE Register, by Sawyer, Ingersoll & Co. [1852].

DETROIT, MICH., by Duncklee, Wales & Co. [1850]; by C. F. Clark [1865-6].

INDIANA, STATE. State Gazetteer and Business Directory by G. W. Hawes & Co. [1892-3]. State Gazetteer and Shipper's Guide, by M. V. B. Cowen [1866-7].

INDIANAPOLIS, Ind., by R. Edwards [1865-6, 1867]; by Logan [1867-8]; by H. N. McEvoy [1858-9]; by Hawes & Co. [1865] by R. Edwards [1866]; by Logan [1868]; by R. Edwards [1869]; by Hutchinson [1870].

ILLINOIS STATE Business Directory, by Smith & Du Moulin [1860]; Northern Counties, by E. H. Hall [1855-6]; State Gazetteer and Business Directory, by G. W. Hawes [1858-9].

ILLINOIS AND MISSOURI State Directory by W. L. Montague [1854-5]. Central Directory by James P. Crawford [1869].

CHICAGO, ILLINOIS, by O. P. Hatheway & J. H. Taylor [1849-50]; by E. H. Hall [1855-6]; by John Gager [1857]; by Tanner, Halpin & Co. [1858]; by R. V. Kennedy [1859-60]; by T. M. Halpin & Co. [1860-1]; by Smith & Du Moulin [1860]; by T. M. Halpin [1861-2, 1862-3, 1863-4, 1864-5, 1865-6] by J. T. Hair [1865-6]; by R. Edwards [1867]; by Smith & Du Moulin [1859]; by W. S. Spencer [1864-5]; by W. F. Bartlett [1857-8]; by R. Edwards [1869].

GALESBURG, ILLINOIS, by O. E. Root [1861].

WILL COUNTY, ILLINOIS, by J. C. W. Bailey [1859].

PUBLICATIONS OF THE ESSEX INSTITUTE. 1872.

JOURNAL OF THE ESSEX COUNTY NATURAL HISTORY SOCIETY. 1 vol.	
Svo. 1836-1852. pp. 135. In paper,	\$0 50
Bound,	1 00
PROCEEDINGS AND COMMUNICATIONS. Svo. 6 vols. 1848-1868. [The Proceedings close with the sixth volume.] The series, in numbers,	
Bound in cloth,	25 00
Vol. I. 1848-1856. pp. 275,	2 00
“ II. 1856-1858. pp. 438, 1 plate,	2 00
“ III. 1858-1863. pp. 301,	2 00
“ IV. 1864-1865. pp. 448, 15 plates,	6 00
“ V. 1866-1867. pp. 569, 4 “ and <i>Naturalists' Directory</i> ,	6 00
“ VI. 1868-1871. pp. 259, 2 plates and 31 cuts,	3 00

[These volumes contain a large number of descriptions and figures of new species, especially of Corals, Insects and Polyzoa; and many valuable papers on Natural History. The first three volumes also contain many important Historical papers. In addition to the papers on special subjects, the volumes contain the proceedings of the meetings of the Institute, the records of additions to the library and museum, and many important verbal communications made at the meetings, etc. The *Naturalists' Directory* is also issued under the same cover with vols. IV. and V. Vol. VI. closes the series.]

BULLETIN. Svo. Issued in monthly parts of about 16 pages each.

Subscription per annum,	1 00
Single numbers,	10
Vol. I. 1869. pp. 164,	1 00
“ II. 1870. pp. 178,	1 00
“ III. 1871. pp. 178,	1 00
“ IV. 1872. Subscription,	1 00

[The *Bulletin* takes the place of the *Proceedings of the Institute* which close at the date of the commencement of the *Bulletin*. This publication will contain all the short communications of “general interest, both of an Historical and Scientific character, made at the meetings of the Institute, and the record of the meetings and business of the Institute. Occasional lists of the deficiencies in the library of the Institute, and of the duplicate books offered for sale or exchange will be given.]

NATURALISTS' DIRECTORY. Issued with Proceedings, Vol. V, 1867. . . .

[This work contains the addresses and departments of study of the Naturalists, Collectors and Taxidermists, in North America at the date of publication.]

Separate from Proceedings, paper covers,	\$1 00
“ “ “ bound and interleaved,	2 00

HISTORICAL COLLECTIONS. First series, Vols. 1-8, small 4to,
 “ “ Second series in 8vo, commencing with Vol. 9,

The 10 vols. in paper covers,	20 00
“ 10 “ “ cloth binding,	30 00
Vol. I. 1859. pp. 206. Steel plate,	3 00
“ II. 1860. pp. 310,	3 00
“ III. 1861. pp. 298,	3 00
“ IV. 1862. pp. 289,	3 00
“ V. 1863. pp. 289, Steel plate,	3 00
“ VI. 1864. pp. 274,	3 00
“ VII. 1865. pp. 287,	3 00
“ VIII. 1866. pp. 267,	3 00
“ IX. 1868-9. (Vol 1 of 2d series. 8vo.) pp. 374,	3 00
“ X. 1869-70. pp. 319. Steel plate,	3 00
“ XI. 1871. Subscription,	3 00

The *Historical Collections* contain papers wholly of an Historical and Genealogical nature, and are most valuable to the student of early American History. Many important manuscripts and public and private early records are printed in these volumes for the first time, as well as papers specially prepared on topics relating to the early history of Massachusetts. Several Genealogies of leading families connected with the early settlement of the country are also contained in the volumes.]

THE WEAL-REAF. Published for Institute fair in 1860. Small 4to. pp. 56,	30
TO-DAY. Published for the Institute and Oratorio fair, 1870. pp. 38, . . .	50

Besides the above publications, the following works are offered for sale :

ALLEN, J. F. Victoria Regia, or the Great Water Lily of America. Royal folio, six colored plates, 1854,	10 00
ALLEN, J. A. Foray of a colony of Formica Sanguinea upon a colony of Black Ants. 1868,*	10
BALCH, D. M. On the <i>Sodalite</i> at Salem. 1864,*	10
BALCH, D. M. Analysis of Grapes. 1865,*	10
BRIGGS, G. W. Memoir of D. A. White. Pamphlet, 8vo, 1864,*	30
COUES, ELLIOTT. List of the Birds of New England, with critical notes. Pamphlet, 8vo, 1868,*	75

DERBY, PERLEY. Hutchinson Family. 1 vol., 8vo. 1870,*	\$2 00
ENDICOTT, C. M. Account of Leslie's Retreat. Pamphlet, 8vo. 1856,	25
ENDICOTT, C. M. Account of the Piracy of the ship Friendship of Salem in 1831. Pamphlet, 8vo, 1858,*	15
ESSEX INSTITUTE. Historical notice of, with the Constitution, By-laws, and lists of the Officers and Members. Pamphlet, 8vo, 1866,	25
FOWLER, S. P. Account of the Life, Character, etc., of Rev. Samuel Parris, and of his connection with the Witchcraft Delusion of 1692. Pamphlet, 8vo, 1837,*	15
GILL, T. Prodrome of a Monograph of the Pinnipedes (seals). 1856,*	25
HYATT, A. Observations on Fresh-water Polyzoa. 103 pages, 9 Plates and 25 Cuts, 8vo, 1868,*	2 50
KIMBALL'S Journey to the West in 1817. Pamphlet, 8vo,*	15
LORD, O. P. Memoir of A. Huntington. Pamphlet, 8vo, 1871,*	35
MCLWRAITH, T. List of Birds of Hamilton, Canada West. Pamphlet, 8vo, 1836,*	15
PLUMMER HALL, Dedication of. Pamphlet, 8vo, 1857,	30
PREBLE, GEORGE HENRY. The First Cruise of the United States Frigate Essex. Pamphlet, 8vo,*	1 00
PUTNAM'S and PACKARD'S Notes on Humble Bees, etc. Wild Bees of New England, their Parasites, etc., with a plate. Pamphlet, 8vo, 1865,*	75
SALEM, Town Records of. 1634 to 1659. 8vo, 1868,*	2 50
SHURTLIFF, C. A. Report on the Army Worm. 1862,*	10
STREETER, G. L. Account of the Newspapers and other Periodicals pub- lished in Salem. Pamphlet, 8vo, 1856,*	15
UPHAM, C. W. Memoir of Francis Peabody. Pamphlet, 8vo, 1869,*	50
UPHAM, C. W. Memoir of D. P. King. Pamphlet, 8vo, 1869,*	30
UPHAM, W. P. Memoir of Gen. John Glover of Marblehead. Pamphlet, 8vo, 1833,*	50
WEINLAND, D. F. Egg Tooth of Snakes and Lizards. Pamphlet, 8vo, with a plate, 1857,*	15
WHEATLAND, H. Notice of the Pope Family. Pamphlet, 8vo, 1867,*	25
WHITE, D. A. Covenant of the First Church. Pamphlet, 8vo, 1856,*	10
WHITE, D. A. New England Congregationalism. 1 vol. 8vo, 1861,	1 00
WILDER, B. G. Researches and Experiments on Spider's silk. 1866. Cuts,*	50
WOOD, HORATIO C. Phalangeæ of United states. 1868. Cuts of most of the species,*	1 50

* Those marked with a star are extra copies from the Proceedings and Historical Collections.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 4. SALEM, MASS., FEBRUARY, 1872. No. 2.

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

REGULAR MEETING, MONDAY, FEBRUARY 5TH, 1872.

THE President in the chair. Records of preceding meeting read.

CONTINUATION OF MR. GREGORY'S REMARKS ON CALIFORNIA.

J. J. H. GREGORY of Marblehead continued his remarks on his journey to California. He commenced with his visit among the Mormons at Salt Lake City, and described them as a temperate, industrious, thriving and religious community. Their leader appeared to be a man of rare sense and judgment. He briefly commented on the nature of the country lying between the Mormon community and San Francisco, and gave a very interesting account of his visit to the latter city and of what he saw therein. The Sabbath, by a large portion of the business people, was observed as other days. No paper money is used. Gold and silver only are circulated, and nothing less than ten cents is known.

He referred to the Chinese as a neat and orderly class of people, and more susceptible to moral and religious

influences than many supposed. They are first met at Ogden, and at San Francisco occupy exclusively one or more streets. They have their own amusements, including theatre, etc.; a visit in their midst, gives one, for a time, the impression that he is in China.

He noticed the mining towns many of which are nearly forsaken; the mining regions, and showed how by the process of mining, the soil was forever rendered useless for tillage; and the parks of big trees, of the latter many figures were given to show their size. Some of these trees are covered with bark thirty-two inches in thickness, while others, of enormous proportions otherwise, run up one hundred and twenty-four feet without losing more than a single foot in diameter. In his estimation most of the trees were not less than ten, eleven, or twelve hundred years old.

The beautiful and romantic scenery of the Yo-semite valley, which was also visited, he described in a very graphic and interesting manner.

FLORIDA INDIANS.

The following extract of a letter from Mary R. Kimball, of Salem, a teacher among the freedmen, dated Apalachicola, Fla., Dec. 25th, 1871, was read:—

APALACHICOLA, December 25, 1871.

I have been trying to get some information as to the Indian Mounds in this vicinity. One of the oldest of the "freed people" came in to see me, and said, "I am the oldest man in this place."

"Well" said I, "you are just the man I want to talk with. What do you know about those Indian mounds? Did they live there, or did they bury in those heaps?" "No" he said, "I have talked with some of the chiefs, and they told me that they were thrown up for defence; you will find them about every mile for a long distance. If you could find their graves, you would find buried with them a bowl of something to eat, with a spoon at their head, and a rifle at their side, as they were going to better hunting-grounds than we had here." "Why"

I asked, "are there so many conch shells around these places?" "They ate them as we do oysters; why, out in the woods there was a pile twenty feet high, but they have hauled many of them away to build up the roads. The different tribes and the Spanish would fight, and if you will go down to where the Flint and Chattahooche rivers fork and enter the woods, you will discover these mounds thrown up and will find skulls perforated by bullets; I have found them myself."

One of the colored men found an earthen jar last fall. He thought there was money in it, but finding none he left it in disgust. He said it would hold about two gallons.

I am going to get some one to direct me to these places when I can leave, and I will do all that I can to examine them.

The SECRETARY announced the following correspondence:—

From the Buffalo Historical Society, Jan. 22; a circular of the Chicago Academy of Sciences, an account of the loss of its building, collections, library, etc., in the great fire of Oct. 9, 1871; Maine Historical Society, Jan.; New England Historical-Genealogical Society, Jan. 22; New York Historical Society, Jan. 22; F. D. W. French, Boston, Feb. 3; Charles B. Moore, New York, Jan. 30; Feb. 1; S. A. Nelson, Georgetown, Jan. 16, 23; James Riker, Waverly, N. Y., Jan. 16.

The LIBRARIAN reported the following additions:—

By Donation.

- BOLLES, E. C. Portland Directory for 1869. 1 vol. 8vo.
 BROOKS, Mrs. H. M. Woman's Journal for 1871.
 BUTLER, B. F., M. C. Conkling's Speech in U. S. Senate, Jan. 11, 1872. Report of the Department of Agriculture for Jan., 1872.
 FREKE HENRY. The Dependence of Life on Decomposition, by H. Freke. 8vo pamph. Dublin, 1871.
 GREEN, S. A., of Boston. Miscellaneous pamphlets, 4.
 LANGWORTHY, I. P. Catalogues of Mt. Holyoke Female Seminary for 1838-9, 1850-1, 1856-7.
 PERKINS, JONATHAN C. Catalogue of Amherst College, 1871-2. Exercises at the Semi-centennial of Amherst College, July 12, 1871.
 RHODE ISLAND SOCIETY FOR THE ENCOURAGEMENT OF DOMESTIC INDUSTRY. Transactions of 1855, 6, 7, 8, 9, 60, 1, 2, 3, 4, 5, 6, 7, 8, 9, 70. 16 pamphlets. 8vo.
 ROBINSON, JOHN. Railway Times. 150 nos. Miscellaneous pamphlets, 50.
 ROPES, WM. L., of Andover. Catalogue of Andover Theological Seminary, 1871-72.
 ST. JOHN & COFFIN of New York. The Cabin Book; or National Characteristics by Chas. Sealsfield. 1 vol. 12mo.
 SUMNER, CHAS., U. S. Sen. Land Office Report for 1869. 1 vol. 8vo. Washington, 1870.

By Exchange.

- BIBLIOTHÈQUE UNIVERSELLE ET REVUE SUISSE. Archives des Sciences physiques et naturelles, Dec. 15, 1871. No. 168. 8vo. pamph. Genève. 1871.

HARVARD COLLEGE LIBRARY. Report of the President and Treasurer of Harvard College, 1870-71.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY. Seventh Annual Catalogue of the Officers and Students, 1871-2. Boston, 1872.

NEW ENGLAND HISTORIC-GENEALOGICAL SOCIETY. Proceedings of, at the Annual Meeting, Jan. 3, 1872.

PUBLISHERS. American Chemist. American Journal of Science. American Literary Gazette. American Naturalist. Christian Register. Christian World. Essex County Mercury. Fireside Favorite. Gloucester Telegraph. Haverhill Gazette. Land and Water. Lawrence American. Little Giant. Lynn Reporter. Lynn Transcript. Nation. Nature. Peabody Press. Salem Observer. Shoe and Leather Journal.

Horatio C. Merriam of Salem, elected a resident member.



REGULAR MEETING, MONDAY, FEBRUARY 19, 1872.

President in the chair. Records of preceding meeting read.

PASSION PLAY AT OBER-AMMERGAU.

JUDGE JOHN P. PUTNAM of the Superior Court read a very interesting paper descriptive of the performance of the "Passion Play" at Ober-ammergau, which he witnessed in 1871. The audience listened with marked attention, and the Judge's description was exceedingly graphic and curious.

Ober-ammergau is a secluded village in the highlands of Bavaria, and presents, as it is gradually approached, a very picturesque appearance, nestled in a plain of green fields, with snow-capped mountains in the background, a cluster of quaint looking cottages, built of stone covered with plaster, having the low broad Swiss roof, and each with its little garden of vegetables and rose trees. In the centre is the church, an object of veneration, love and tender care, as the exquisite neatness of the interior, and

of the exterior with its surroundings, amply testify. The inhabitants, numbering some twelve hundred, are peasants and with few exceptions, carvers in wood, an occupation which tends to raise them above the ordinary farmer.

Many of their carvings are really art works and bear marks of careful study. An atmosphere of general peace and good will seems to pervade the place, the villagers pursue the even tenor of their ways, making their faith their life, and cultivating those traits of character so essential to the performance of this duty in fulfilment of a vow made during a terrible pestilence in 1633.

When the pestilence was at its height, the poor peasants vowed to God, that, if He would stay the plague, they would perform every ten years, in token of their deep gratitude, this sacred drama representing the character of Christ from His entrance into Jerusalem to His ascension; this has religiously been continued with scarcely an omission every ten years to the present time.

The Judge then gave a brief outline of the history of the sacred drama; a history which exhibits very clearly the gradual development of Christianity out of the forms and customs of Paganism, in the early period of the Church. Under the papacy of Gregory the Great the germs of the true mystery plays are found; the Church then began to commemorate by processions with choruses, chants and dialogues, scenes of the passions and of the resurrection of the Saviour, and the various events of His life. He spoke of the popularity of these plays, in England, in the middle of the fourteenth century, and their continuance to a later period in Germany, Spain and Italy and to their final interdiction, generally, at the close of the last century.

The performance of these plays has been several times prohibited; the villagers of Ober-ammergau have however

always succeeded in obtaining a dispensation in their favor. The time for its last performance was 1870, but the breaking out of the war between France and Prussia compelled its postponement to the next year. To illustrate its hold on the hearts of the people, Judge Putnam stated that the villager who personated Christ was drafted into the army, but he was permitted to wear his long hair, and so careful were the authorities and soldiers for his safety, that he was never placed in an exposed position, but was confined to garrison duty.

The account of the performance was minute and impressive. The stage occupies about twenty thousand square feet, with a fine opportunity for grand scenic effects. The performers number in all about six hundred; and although the services commenced at 8 A. M., and lasted eight or nine hours, there was nothing from beginning to end calculated to excite anything but feelings of profound emotion and reverence. Some of the spectacles were of exceeding beauty. The music was solemn and inspiring. It is not allowed to be written and no one is permitted to commit a note to pencil and paper. Two years previous to the performance the principal characters are selected, and the individual representing Christ must allow his hair to grow that length of time, also those who represent Joseph of Arimathea and many of the disciples. On the January preceding, the rehearsals commence and continue several times a week.

The theatre is capable of seating some five or six thousand people, and entirely uncovered excepting the first and second row of boxes. The play is given on every Sunday and festival day from May to September inclusive, upwards of twenty times in all, so that during the course of the summer one hundred thousand persons can see it. Everybody seems to be inspired with the occasion — the peasants

of the neighboring villages, the great and fashionable world, and the ordinary tourist, were all there, as well as the Catholic Priest, the Anglican minister, and the Protestant dissenting minister, thus showing sympathy and favor.

We shall not attempt a report of Judge Putnam's description; it must be listened to in order to be properly appreciated. He described the opening chorus, the tableaux which precede and illustrate each act, the great taste and discipline which pervade the performance, and each of the eighteen or twenty acts in detail, beginning with the triumphal entrance of our Lord into Jerusalem at the rising of the curtain, and continuing through the High Priests in council; the departure of Jesus from Bethany, and the taking leave of his mother; the last supper; the betrayal and the kiss; Jesus before Caiaphas; despair of Judas; Christ before Pilate; the scourging and crowning with thorns; the sentence; Christ bearing the cross; the crucifixion; and the resurrection and the ascension.

There was nothing, the lecturer said, in all this to offend the most delicate taste, or that was inconsistent with devotional emotions or religious instincts. Men and women go up to the performance, once in ten years, as if it were the Mecca of their spiritual pilgrimage; and the entire representation, when once beheld, is a scene never to be forgotten.

At the close of the lecture several photographs of the scenes described were exhibited, which added much to the permanent impressiveness of his remarks, and terminated an evening of singular and profound interest and suggestiveness.

The SECRETARY announced the following correspondence:—

From C. C. Beaman, Cambridge, Feb. 7, 15; E. S. Joslin, Media, Penn., Feb. 9; Lucy Larcom, Boston, Feb. 17; S. A. Nelson, Georgetown, Feb. 6; William S.

Perry, Geneva, N. Y., Feb. 3; J. P. Putnam, Boston, Feb. 14, 4; W. Hudson Stephens, Lowville, N. Y., Feb. 10; Bruxelles, Academie Royale des Sciences, des Lettres et des Beaux-arts, Jul. 15, 25, Aout 30; Buffalo Historical Society, Feb. 14; Dresden, Verein für Erdkunde, Oct. 15; Genève Société de Physique et d'Histoire Naturelle, Oct. 1, Gorlitz, Die Naturforschende Gesellschaft, Nov. 18; Hague, Entomological Society of the Netherlands, Dec. 12; London, Linnæan Society, Aug. 2; Lugduno-Batavæ, Bibliotheca Universitatis, July 26; St. Petersburg, La Société Entomologique Russie, Oct. 21; Upsal, Société Royale des Sciences, Nov. 1; Washington, Smithsonian Institution, Jan. 20; Wien, Verein zur Verbreitung naturw. Kenntnisse.

The LIBRARIAN reported the following additions:—

By Donation.

BUTLER, BENJ. F., of Washington, D. C. Speech of Hon. G. F. Hoar of Mass. in U. S. House of Reps., Jan. 25, 1872. 8vo pamph. Remarks of Hon. Ellis H. Roberts of New York in U. S. House of Reps., Jan. 31, 1872. 8vo pamph. Speech of Hon. Geo. C. McKee of Mississippi in U. S. House of Reps., Feb., 1872. 8vo pamph.

GARRISON, W. P., of New York. Constitution and By-laws of New England Society of Orange, New Jersey, 1871. 16mo pamph.

HAVEN, HENRY P. Reports concerning the Public Schools of New London, 1871. 8vo pamph.

KIMBALL, JAMES. Massachusetts Register for 1869. 1 vol. 8vo.

LEE, JOHN C. Commercial Bulletin for Jan., Feb., 1872.

NATIONAL ASSOCIATION OF WOOL MANUFACTURES. Bulletin. Vol. III. No. 1. Jan.-March, 1872. 8vo pamph.

SUMNER, CHAS., of Washington, D. C. Laws of the United States. 3d Session, 41st Congress, 1st Session, 42d Congress. 1870-71. 8vo pamph.

UNKNOWN. Worcester Directory for 1871. 1 vol. 8vo.

By Exchange.

ACADÉMIE IMPÉRIALE DES SCIENCES, BELLES-LETTRES ET ARTS DE BORDEAUX. Actes, 3e Série, 32e Année. 1870. 1er et 2e Trimestres. 8vo pamph.

ACADEMIE ROYALE DES SCIENCES ARTS ET BELLES-LETTRES IN CAEN. Mémoires, 1868, 1869, 1870, 1871. 4 vols. 8vo.

ACADEMIE ROYALE DES SCIENCES, DES LETTRES ET DES BEAUX-ARTS DE BELGIQUE. Annuaire, 1871. 16mo pamph. Bulletins, 2me. Ser. T. 29, 30, 31. 1870-71. 3 pamph. 8vo. Observations des Phénomènes Périodiques pendant l'Année, 1867, 8, 9. 2 pamphlets, 4to.

AMERICAN PHILOSOPHICAL SOCIETY, Proceedings of. Vol. xii, No. 87. July-Dec., 1871. 8vo pamph.

BOORE, A. P. Notice sur un nouveau genre de Ténébrionides appartenant au Groupe des Adelliides par A. P. De Boore. 8vo pamph. Miscellaneous pamphlets, 4.

BOSTON PUBLIC LIBRARY. Bulletin for Jan., 1872.

DIE PHYSIKALISCH-MEDICINISCHE SOCIÉTAT IN ERLANGEN. Sitzungsberichte. 3 Heft. Mai 1870 bis Aug. 1871. 8vo pamph.

PUBLISHERS. Gardener's Monthly. Gloucester Telegraph. Half Yearly Compendium of Medical Sciences. Hardwicke's Science Gossip. Haverhill Gazette. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Quarritch's Catalogue. Sailors' Magazine and Seamen's Friend. Salem Observer. Shoe and Leather Journal.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 4. SALEM, MASS., MARCH, 1872. No. 3.

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

REGULAR MEETING, MONDAY, MARCH 4TH, 1872.

THE President in the chair. Records of preceding meeting read.

THE OLD CARVED CHAIR.

From a letter of E. W. Farley, Esq., of Newcastle, Me., recently received, we learn that the curious old carved oaken chair, which was given to the Historical Society, June 27, 1821, by Robert Brookhouse, of Salem, is a complete counterpart of the one in his possession, and as far as antiquity and style are concerned, these two chairs are perhaps unequalled by any to be found in New England. Mr. Brookhouse received this chair from the family of Major John Farley, of Newcastle, Me., a native of Ipswich, Mass. Mr. Brookhouse's first wife was a daughter of said Farley, and Mr. Farley's wife was Sarah Dennis of Ipswich. This chair was one of four pieces of furniture of similar wood and carvings belonging to said Sarah Dennis, and was taken to Newcastle on her removal there in 1772 or 1773 — consisting of two

arm chairs, alike in pattern, a tape loom and a chest now in the possession of Mrs. E. G. Perkins, of Salem, having upon it the date "1634;" and there is reliable traditional evidence of the age of said furniture corresponding with the year 1634, and that these articles were brought over from England by the first emigrant of the Dennis family of Ipswich.

A RELIC OF "YE OLDEN TIME,"—A STONE MILL.

In form the mill is mortar like, about as large as a peck measure, with the furred stone fitting so as to make an effectual grinder. It is similar to the stone mills spoken of in the Bible, which the Jewish women used. It was presented by Mr. D. L. D. Balch, of Amesbury, accompanied by the following letter:—

AMESBURY, FEBRUARY 7, 1872.

To the Officers of the Essex Institute:—

GENTLEMEN:—In accordance with a purpose long entertained by me, I hereby offer for your acceptance the "Stone Mill" which was brought to this country by "Lieut. Francis Peabody," in the year 1635.

This "mill" has been preserved in the Peabody family from that date to the present time, mostly at Topsfield. It was finally presented to my father, the late Israel Balch, M. D., some sixty years ago, by Jacob Peabody, and by him kept till his death in 1858.

It was my father's special request that this relic of "ye olden time" should be presented to your Institute, and it is not only a duty but a pleasure to comply with the same.

Trusting that this ancient memento of the ancestor of that honored benefactor, the late George Peabody, may be accepted and preserved through all coming time, I am

Your obedient servant, D. L. D. BALCH.

HOWARD STREET CHURCH.

Mr. GEORGE D. PHIPPEN presented a communication from Rev. C. C. Beaman, formerly of this city, on "The Closing History of the Branch or Howard Street Church in Salem." Referred to the committee on publications

for insertion in the "Historical Collections." At a meeting of the Institute, Monday evening, Jan. 20th, 1862, Rev. Mr. Beaman read an interesting historical sketch of this church, with brief notices of the several ministers who have successively officiated in that place. This paper was printed in the "Historical Collections of the Essex Institute," Vol. iii, page 272.

CLEAVELAND'S JOURNALS.

Mr. A. C. Goodell, Jr., read a letter from Nehemiah Cleaveland, of Westport, Conn., tendering to the Institute some journals written by his grandfather, Rev. John Cleaveland, of Chebacco parish, in Ipswich. The thanks of the Institute were tendered to Mr. Cleaveland for his generous offer, and Mr. Goodell was requested to communicate the same.

The SECRETARY announced the following additional correspondence :—

From L. D. Gould, Boston Highlands, Feb. 23; S. A. Green, Boston, Feb. 28; B. H. Hall, Troy, N. Y., Feb. 27, Mch. 1; Francis Harrington, Boston, Feb. 23; John F. McCoy, New York, Feb. 17, 21; S. A. Nelson, Georgetown, Feb. 19, 29; John H. Sage, Hartford, Conn., March 1; W. Hudson Stephens, Lowville, N. Y., Feb. 20; A. Woodward, Franklin, Conn., Feb. 20.

The LIBRARIAN reported the following additions :—

By Donation.

BUTLER, HON. B. F., of Washington, D. C. Speech of Hon. Roscoe Conkling in U. S. Senate, Feb. 19, 1872. 8vo pamph.

KIMBALL, JAMES. Proceedings of the Right Worthy Grand Lodge, I. O. O. F. of Mass. 1867, '8, '9, '70, '71. 9 nos. The World Almanac, 1868, '9, '70, '71, '72. Miscellaneous pamphlets, 10.

MANCHESTER PUBLIC LIBRARY. Eighteenth Annual Report of the Trustees. Dec. 31, 1870. 12mo pamph.

MANNING, ROBERT. Journal de l'Agriculture, Tome iv, 1869, 5 nos. Tome i, ii, iii, 1870. 17 nos. Der Farmers Freund, 1871.

PALFRAY, C. W. Miscellaneous pamphlets, 8.

PERLEY, EDWARD. Directory of St. Paul for 1863. 1 vol. 8vo.

STEPHENS, W. H. of Lowville, N. Y. Directory of Harrisburg for 1839. 1 vol.

STONE, EDWIN M. Thirtieth Annual Report of the Ministry at Large. Jan. 2, 1872. 8vo pamph.

SUMNER, HON. CHAS., of Washington, D. C. Department of Agriculture for 1870. 1 vol, 8vo. Washington, 1871.

By Exchange.

ENTOMOLOGICAL SOCIETY OF THE NETHERLANDS IN 'S GRAENHAGUE. Tijdschrift voor Entomologie. Tweede Serie Vijfde. Deel 1-6. Aferering, 1869-70. Zesde Deel 1, Aferering, 1871. 7 pamphlets. 8vo.

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Mr. S. A. NELSON of Georgetown read the following communication on

THE METEOROLOGY OF MOUNT WASHINGTON.

The mountainous region of New Hampshire north of Lake Winnipiseogee, known as the White Mountains has a north and south extension of about sixty miles, and on a cross line is not far from thirty miles wide.

The several ranges are naturally divided into groups, as the Moosilauke group in the southwest, the Franconia region westerly, to the south the Pemigewasset Mountains, centrally the Mount Washington group, and to the north the Stratford Peaks, together with others of less importance.

The Mount Washington group has an area of not far from thirty miles long and fifteen wide and has a north-east and southwest course. Centrally in this range is Mount Washington, in latitude $44^{\circ}, 16', 25''$ and longitude $71^{\circ}, 16', 26''$, west from Greenwich. The altitude is 6,293 feet and it is the highest peak in the group by 500 feet, and the highest east of the Mississippi with the exception of Clingman's Peak in western North Carolina.

Prof. Edward Tuckerman marks out four regions on Mount Washington: First, the *lower forest*, where are found the hard wood species of the lowlands, with the white spruce and fir, forming a dense forest. Secondly, the *upper forest*, composed of black spruce, fir, Frazer's balsam fir, a mountain ash, with rarely the canoe and yellow birch. At four thousand feet altitude these trees become dwarfed and are only found above this height in a few sheltered localities on the southern side of the mountain. The plants in the third, or *sub-Alpine region*, correspond to like localities in mountain regions generally, and from a little below the summit, upward, is the *Alpine region*,

with many plants native to Labrador and Greenland. The change of climate from the base to the summit is equivalent to that of several degrees north.

In this paper I shall confine my remarks exclusively to the meteorological phenomena of the mountain. An extended inquiry would be of greater value, but it is impossible to more than briefly touch upon the several points under consideration. I do not propose to discuss theories so much as to present facts to show the advantages mountain stations offer over those less elevated.

Some of the highest authorities have held that the study of meteorology should begin from above. Among these are Biot and Poey. And why meteorologists should have been so long content to study the aspects of the weather within the narrow limits of the lower earth currents, it is hard to decide. It is true that in Europe similar observations to those made on Mount Washington have been maintained for a limited time, but never till the past year in this country, yet nowhere have they been deemed of much value.

When we look through the rifts of a low running S. E. scud, and see, at an altitude of less than a mile, an upper current of cirro-cumulus rapidly moving towards the northeast, or in a fair day, observe it progressing at the rate of fifty miles an hour, while at the surface the wind is not above ten miles—a desire to investigate the phenomenon is aroused, and we devise ways and means to accomplish this end.

Where shall we go but to some lofty mountain peak that rises to the altitude of the atmospheric current in which that stratum of cloud is drifting?

East of the meridian of 105° west from Greenwich, over the whole continent, north of the N. E. trades, there is an atmospheric current constantly flowing in a

northerly direction. It flows in a descending plane differing but slightly from that of the limit of perpetual snow. Its descent is known to be not far from 16,000 feet at the equator to very near the surface at the poles. Over this country its range is from about 3,000 to 12,000 feet and vertically it cannot be far from 6,000 to 8,000 feet.

It varies in direction and elevation with the changing seasons—runs lower in summer than winter—and varying on different parallels, it flows near the earth when no surface wind interferes. Over New England its course is nearly W. S. W. to E. N. E., but west of the Alleghany Mountains it is more southerly. Its elevation and direction also vary in the same latitude with the variations of the weather, and probably correspond with the increase and diminution of magnetic force.

This is the *counter-trade*, and comes to us from the South Atlantic Ocean. Within it form our storms. Its ameliorating influences are seen in the southerly storms of winter, in the gentle southwest gales of April and May. Opposed to this is the dry, northwest wind which sweeps down from the Arctic regions. Many maintain that this is a surface wind. So it is when it has driven itself under the counter-trade and fills the space between that higher current and the earth. But it becomes an intermediate one whenever an easterly wind prevails at the surface, and its place is between the surface wind and the southwest-erly upper current of the counter-trade. Our records show that this frequently occurs.

It is not necessary to enlarge upon this, as it is no part of my purpose to combat theories, and I only allude to it at all, that it might be seen clearly wherein Mount Washington, or any isolated peak, is superior to stations less elevated, for the particular department of observations on aerial currents.

These advantages, at Mount Washington, we find in the elevation of more than a mile above sea-level, and that it so nearly reaches the line of perpetual snow, in the considerable height over the surrounding peaks; in the summit being usually above the lower surface winds and lower cloud stratum.

As it is, to a certain extent within the region of the higher upper currents, barometric, thermometric and hygrometric conditions obtain, which do not at lower stations, or in the same time and degree, and of value in connection with them in forecasting storms.

BAROMETRIC OBSERVATIONS.

It is well understood that changes in the velocity of the wind and amount of cloud, exercise a marked influence upon the barometer. These disturbing elements being in full force here, hence the sensitiveness of the instrument and its fluctuations, as well as its wide range. Its sensitiveness is best seen in a nearly calm day when clouds are drifting over; then the mercurial column will not rest for a moment, and yet the range for an hour may not be more than .002 to .004 of an inch. The fluctuations during a gale are very great, frequently from one half hour to another, half an inch or more. The range from December 1st, 1870, to May 14th, 1871, was 1.595 inches. The lowest reading corrected for temperature was 22.120 and the highest was 24.104. The first was during the great gale of December and the last towards the latter part of May. It has a wide range in the great gales, or hurricanes of winter, but not in the summer storms.

Almost hourly observations were taken from 11 A.M., January 22d, to 9.30 A.M. of the 23d. This was one of the three great galés. The range was 1.116. The long-

est and most severe storm of all occurred in February, commencing on the 4th. Observations from 7 A. M. of the 4th to the same hour on the 5th gave a range of 1.403. Other storms gave like results. On the 21st of May thunder showers prevailed over an extended area; but none passed over the mountain or very near. The barometer was depressed, owing more to the intensity of magnetic force than other causes as the weather was fine with us. The 22d was characteristic of the mountain. It was warm, clear and calm in the morning, with a terrific thunder storm at noon and wintry weather at night. At 11 A. M. the temperature was 66° —the highest during the summer with one or two exceptions—at 3 P. M. 26° . The barometric fluctuations were constantly going on early in the morning, falling 1.124 from 8 A. M. to noon. The oscillations of the barometer were in the same time as the discharge of electricity at the telegraph table; both in the afternoon of the 21st and on the 22d.

Humboldt has said, speaking of the horary variations of the barometer, that "no atmospheric circumstances—neither rain, nor fair weather, nor wind, nor tempest—affects the perfect regularity of these oscillations under the tropics; but they subsist alike at all times and in all seasons."

We cannot say this of Mount Washington. On the contrary, as the diurnal variation is governed by the rate of the wind and amount of cloud, it is only in calm, clear weather that it is at the usual hours, and, as it is seldom clear or calm, it may be said that here it does not conform to the general law. The tables of several stations in the New Hampshire Geological Report, compared with Mount Washington, show that on the mountain, there are times of high and low pressure which do not extend to the lower stations. These seem to be confined

to the upper atmosphere. But of the great atmospheric disturbances, covering one or more days' time, having a sweep of thousands of miles, we get, it appears from the record, the first barometric indications at lower stations. In a few instances the Mount Washington record gives earlier indications than the other stations; this is true of the December gale.

Preceding the gale of January 22d and 23d, the highest reading was on the 19th at each place, but it was some hours in advance of Mount Washington at Hanover, N. H., and Lunenburg, Vt., where the maximum obtained at 7 A. M.; at Gorham, N. H., 2 P. M., and at Mount Washington not until 4.57 P. M. At Lunenburg and Hanover, the minimum was on the 21st; at Mount Washington the 22d. The maximum after the gale abated was obtained at Hanover and Gorham the 25th; at Mount Washington and Lunenburg on the 26th at 7 A. M. Lunenburg has an elevation of 1,124 feet, and the climatic conditions more nearly correspond to those of Mount Washington than the other stations above mentioned.

THERMOMETER.

Although our observations in this department are not so complete as we could wish, yet they furnish much interesting and valuable matter, imperfect as they are. We had no spirit thermometer when we most needed it, and our mercurial instruments, though excellent, were too few in number. Dr. Kane says that "errors dependent on wind, sun and local radiation should be carefully guarded against." These remarks apply with much force to Mount Washington especially as regards radiation from clouds lying below the summit.

From partial records for the year from December, 1870, to November, 1871, inclusive, I think the mean tempera-

ture of the year may be not far from -5° Centigrade, equivalent to 23° Fahrenheit. It cannot possibly be so high as the zero isothermal line Centigrade. For the year, that of Montreal is 40° ; and the isothermal line of 45° passes a little south of Mount Washington, while the summit enjoys the climate of southern Greenland.

The highest observed temperature was 66° ; and the lowest reliable reading of the mercurial thermometer was -54° . On the 5th of February at 3 o'clock in the morning the reading was -59° . That it should read correctly at -54° may be questioned. The freezing point of mercury is not yet well established. Dr. Kane says that "thermometers correct at -40° and agreeing would show a difference of 15° or 20° at -60° ." So it was found by Sir James Ross at Leopold Harbor. Nor does Dr. Kane regard "the contraction of colored alcohol at very low temperatures, as sufficiently investigated to enable us to arrive at the cause or quantity of error." "The freezing point of mercury varied" with him "from between -38.5° and 41.5° ." Sir Edward Belcher obtained results where the mercury descended as low as -44° . Our thermometers were the Smithsonian standard in the winter, and later the standard instrument made by James Green, of New York—all excellent instruments. In the case under consideration the fall to -54° was gradual; but this is admitted to be no proof that the fall was not due to the contraction of the mercury after it became solid, as this frequently occurred in Dr. Kane's observatory. Of one thing I am fully assured; and it is, that there is much to be learned regarding the freezing point of mercury.

Nothing is more certain than the fact that the rise and fall of temperature, as a rule, is first obtained here. For instance, a low temperature, accompanying the easterly movement of the high, cold, upper wind current, is from

six to thirty-six hours earlier on Mount Washington than at lower stations. High and low temperatures are registered here, which we shall notice under winds, that do not descend to lower levels. On the other hand low temperatures are observed below when there is no change on the mountain. This we shall explain further on. So there are cold terms when the minimum is lower at some not distant stations than here.

As with the barometer so the thermometer has no fixed hours of daily maxima and minima. At Mount Washington there were seventeen days when the maximum was attained at 2 P.M., to ten at 7 A.M., and nine at 9 P.M., or when the readings were the same as at 2 P.M. At Montreal, twenty-nine at 2 P.M., to two at 7 A.M., and five at 9 P.M. At Hanover, twenty-three at 2 P.M. to four each at 7 A.M. and 9 P.M. In winter the changes are sudden and great; often in a half-hour from 5° to 25° and at any period of the twenty-four hours. The change of temperature from Sunday morning, February 5th at 3 o'clock, if we call it at that hour, -54° , to Tuesday noon following, when the thermometer indicated, in the sun, 62° , was 116° . Thirty to forty degrees difference in a day is of common occurrence.

HYGROMETRIC OBSERVATIONS

Were made with great care. During the winter we used wet and dry bulb thermometers hung side by side, and after the warm season opened the Mason Hygrometer. With all our care these froze and so were ruined. For that locality the ordinary wet and dry bulbs are most convenient at all times and in that moist climate require but little attention. Of these observations, Professor Cleveland Abbe, of the Signal Office, Washington, has said "the hygrometric observations from the mountain stations

are of the highest importance. . . . I manage daily to derive information which foretells the coming storm, and would do so far more accurately had we two other stations distant one to three hundred miles."

The hygrometer alone is a reliable instrument for determining the weather some time in advance of a change. On the mountain we could assure ourselves as to the weather for twelve to twenty-four hours; and after summer travel commenced our observations showed practical results daily; inasmuch as tourists stopping at the hotel availed themselves of the information thus gained in making their arrangements for the ensuing day.

It is the hygrometer upon which we depend more than the barometer. It is seldom that the readings of the wet and dry bulbs differ more than four or five degrees, quite rare that the difference is greater than ten. In this country as great a difference as thirty-five degrees has been recorded, and in India sixty degrees. I am led to believe that however unfavorable the climate is, in some respects, to health, the exemption from coughs and colds is due to this uniformly moist atmosphere.

THE WINDS.

The records show almost constant and exceedingly high velocities. Winds of from thirty to sixty miles an hour are the rule, light winds and calms the exception. In winter, ninety to one hundred miles is not uncommon, while in summer it seldom rises to ninety. The winter gales, which are westerly or northwest when attended by a low temperature, spend their fury in a gentle north wind bringing a moderation of temperature, quite frequently. This has been noticed by Dr. Hayes, by McClintock and Parry. I state the fact, but confess that I am unable to explain the phenomenon. Here, as in the Arctic zone,

there are high northerly winds excessively cold, and this seems to be the normal condition of things. On the mountain this gentle north wind will change suddenly, with a rising barometer, to south or southwest, which we can understand readily to be the downward movement of the southwest counter-trade descending to our level but not passing below it. A perfect calm is of the rarest occurrence in winter, for more than an hour or two. At Hanover for three months there were reported ninety-nine calms. Easterly winds are exceptional; out of two hundred and seventy observations, ten only were easterly. At Lunenburg seventy-three in the same time and Hanover forty-one. At Gorham, out of one hundred and forty-seven there were forty-one. This average holds nearly as good for the summer months. Three or four hundred feet greater elevation would place the summit above the course of the lowest surface winds. Neither do the northwest winds run much over a thousand feet higher. The altitude of 8,000 feet would undoubtedly give constant westerly winds.

From the direction and thickness of the cloud stratum, the height of the atmospheric current may be at all times determined. On the 23d of June at 7 A.M., the cloud enveloping the summit was unusually dense; the wind near the depot, southeast, in puffs, and calms, and nine miles per hour. On the roof of the hotel it was southwest and fifteen miles at least. An hour later the rain was pouring in torrents, and at the depot the wind had changed to southwest, thirteen miles an hour. These records show that gentle westerly winds may prevail on the summit, while below, at stations near and remote, the wind is easterly and tempestuous. They show, too, that the heavy gales of the winter were first felt on the mountain. The northwest wind sweeping southward, pushes up,

wedges itself under the current-trade, as it were (for atmospheric currents do not mingle, but stratify, the Huttonian theory to the contrary notwithstanding), gradually descending to the sea-level.

Of one summer high wind there is a partial report. June 8th at 5 P. M., the gale arose on the mountain reaching its height at 1 A. M., the 9th. At Bethlehem, N. H., fifteen miles west (1,800 feet above the level of the sea), there was a gentle breeze till 11 P. M., the 8th, but from that hour to 5 A. M., the 9th, the wind was high. At Bethlehem a cool, windy day followed, but on the mountain it was nearly calm and mild. Nor did it reach its highest point at Hanover till it had abated on Mount Washington.

CLOUDS.

It is obvious that the higher upper currents, especially of cirrus, which often floats at an elevation of 21,000 feet, will not present any very marked difference at the altitude of a little more than a mile. Generally it is during the transition stage into cirro-stratus or cirro-cumulus that we find this elevation advantageous. It becomes decidedly so when we would study the lower cloud-forms or observe the condensation of an approaching storm. As is well known, the higher upper current of cirrus is a westerly one, that it has a movement from west, or south of west, eastward. Passing into any sub-form the course may be from any point between S. S. W. and N. N. W. The lower currents of cumuli, which are rare in winter, and the stratus run low, seldom rising to the level of the summit. The stratus of winter is often extended over an area of several hundred square miles, and rarely has a greater average thickness, in the vicinity of the mountain, and probably not elsewhere, than 1,000 feet.

It is doubtful if, in this latitude, it ever exceeds 3,000

feet. Yet it is this thin stratum of cloud that gives the lowlands so many gloomy days in winter, while on the mountain there is no cloud from sunrise to sunset. It is on such days, when it is serene there and cloudy below, that we have a high temperature comparatively. This has been noticed in Europe. On the Brocken, in winter, under similar conditions, it is warmer than at Berlin.

In April there was the finest possible display of cumuli, an immense mass of cloud many thousand feet vertically and miles in extent. We may see the lower currents moving in different directions at the same time. Immediately around the mountains if they run low, they follow the line of the several ranges. It is not unusual at all seasons to see them on a S. E. course south of Mount Washington, and north of Mount Adams a S. W. one at the same time. Condensation may be going on at one point, in a contrary one, but a few miles distant, the cloud is re-dissolving. A distinguished French savant has said that he never saw, on the Alps, the formation of a cloud. A close observer, living on Mount Washington will have many opportunities to witness condensation over the summit. We did frequently, and Dr. Brewer of Boston has informed me that he once observed this on Mt. Washington.

[To be continued.]

BULLETIN

OF THE

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VOL. 4.

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

REGULAR MEETING, MONDAY, MARCH 4TH, 1872.

[Continued.]

STORMS.

In observations on an approaching storm the elevation of 6,000 feet is important, inasmuch as the observer is above the lower strata, the "storm-scucl." Here he may note the changes in kind and relative position of the several cloud strata from the moment the storm is seen along the western horizon, two hundred miles distant, till it shall envelop the lofty peak of Mount Washington. The elevation of a storm moving east can be seen as far distant as New York City.

When condensation advances but little faster than the storm line, it is a more interesting study than when the condensation is going on for days, and over a wide extent of country at the same time. If rapid and with the storm, we notice at an immense height the "polar bands" of cirrus, lower, cirro-stratus, or cirro-cumulus. From

the first until it breaks on us, the progressive movement is traced on a north and south line—west of that line is the storm—east, fair weather; the upper current precedes somewhat the lower stratus, or “scud.” When the line is within a hundred miles we see this more plainly. The under current of stratus—a condensation in advance of the storm—is gradually spreading out on every side. Towards night the prominent landmarks are hidden from view. We can see that the lower stratus current is running under the advancing cloud. The cloud shuts down upon the mountain, all about us an easterly storm is raging, here it is a southwesterly or westerly one.

A storm presenting its southern side to us is not so interesting, as it condenses most rapidly on this side. On the summit there are sometimes southeasterly storms, but seldom one north of east. The great storm of October 4th, 1869, was from this direction, as was one short but severe gale and heavy rain of March last.

AURORA BOREALIS.

We witnessed many fine Auroras, but no new facts regarding them are on record. It is to be regretted that we were not prepared to observe to some extent, electrical phenomena, particularly in connection with auroral storms. The only peculiar features noticed were the apparent nearness to the earth of the auroral waves, as a rule; and three times, displays when the moon was past the first quarter. Our line, or our end of the line, gave us much trouble at such times. With the insulated wire of the mountain station three miles in length, there is afforded an opportunity for the study of electric currents in the terrestrial strata as well as atmospheric currents such as is seldom offered. The mountain is a gigantic insulator, no “ground” being obtainable on the summit.

ATMOSPHERIC ELECTRICITY.

I had an opportunity of observing in our line the effects of the thunder showers of the 21st of May. Being alone, I could not pay that attention to the several phenomena which I desired. We had a very sensitive compass which we used as a galvanometer. The oscillations of the needle were followed by a report of distant thunder. As the shower was fifteen or twenty miles distant, several seconds elapsed between the deviation of the needle and the report. The instruments were not "cut out" at first so that I obtained simultaneously with the oscillation of the needle, the click of the armature. I could now time the oscillations of the barometer. These I found to correspond to the oscillations of the needle in time and amount with the intensity of the current. I did not continue these experiments long from fear of injury to the instrument, and possibly injury to myself.

The next day there was a succession of showers, with one at noon on the summit continuing an hour, during which time the depot was struck five times. Early in the morning, I had taken the precaution to connect the rails by an iron bar, and this I think saved the building from damage. It is said that, since the road was completed, scarcely a day passes, when there are not electrical discharges on the mountain, but that many of these seek the track, as the best conductor, following it to some point near the river at the terminus. In view of the terrible results attending mountain thunder storms, to those so unfortunate as to encounter them, of which we have accounts of large parties perishing together by a single discharge of electric fire, we might be surprised to learn that no harm was ever done buildings or persons on Mount Washington, although the hotel has more than once been struck. Is

not this exemption due to the fact that the summit is insulated? and that the electric current seeks a more favorable path to the earth? I have noticed repeated discharges earthward, over Raymond's Cascade, in the Great Gulf in a single shower.

AQUEOUS PHENOMENA.

It frequently rains at a temperature of 28° and at times with even a lower reading. It is not uncommon for it to snow furiously when the reading is as high as 37° . The warm waves descending to the level of the summit bring rain even in January. Owing to the violence of the wind, measurements of rain and snow are practically useless. Although the fall of snow is very great, rarely more than two or three feet lie long. The quantity held in suspension during a gale is astonishing. From November to April it is, that of all high Alpine regions, a dry impalpable powder. A snow-flake mentioned in the Press telegram of January 8th as "new," which was the cause of considerable merriment to a certain class of public journals, may be described as pyramids of six sides base depressed with the sides corresponding to the exterior. It seems that Capt. Parry saw this form of snow-flake in one of his voyages and described it in his report.

Of the frost formations, very beautiful, the highest charm of winter mountain scenery, it is only necessary to remark, that the forms are due to certain conditions of the wind, and that it is built up by aggregations of minute specilia of ice, the condensation of vapor at an extremely low temperature. Doubtless electricity plays an important part in the work, as it is only with westerly winds that it forms.

At a higher temperature than that necessary for the frost formation, ice makes on the rocks and surface of the

snow, a solid blue ice. This disappears during high north-west gales as the cold, dry N. W. wind, full of positive electricity sweeps over the mountains. Late in December a singular ice formation was discovered. I have searched meteorological works for a description, but have not yet found whether it is known or not. It is a transparent ice on the surface of rocks: cellular in structure, the cells mainly hexagonal, some triangular and a few of an indefinable form. The cells averaged about .25 inches in depth by .15 to .20 of an inch in breath.

To sum up results, we may add that mountain observatories are of the highest importance in the elucidation of climatological problems. The advantages secured are of direct, practical benefit in the daily forecasts of storms. Let the signal Office establish them, wherever practicable, throughout the country, and meteorology will be advanced shortly to the dignity of a science, a claim hardly compatible with the facts at the present time.

After Mr. Nelson had concluded the reading of his interesting communication, the following votes were unanimously adopted:—

Voted, That the Secretary be requested to tender to Hon. Judge Putnam of the Superior Court, the thanks of the Essex Institute for his interesting and instructive lecture delivered at our last meeting, giving a very vivid and graphic account of his visit to Ober-ammergau during the performance of the Passion Play in the summer of 1871.

Voted, That the Secretary be requested to transmit to Mr. S. A. Nelson of Georgetown the thanks of the Essex Institute for his interesting communication, giving a clear and succinct account of the results of the meteorological observations made during a residence on the top of Mount Washington in the winter of 1870-71.

Adjourned.

REGULAR MEETING, MONDAY, MARCH 18th, 1872.

THE PRESIDENT in the chair. Records of preceding meeting read.

The SECRETARY announced the following correspondence:—

From Pennsylvania Historical Society, Mch. 7; Charles C. Abbott, Trenton, N. J., Mch. 15; J. M. Caller, Salem, Mch. 14; Henry Cook, Boston, March 11; Robert Howell, Nichols, Tioga Co., N. Y., Feb. 7; E. M. Stone, Providence, R. I., Mch. 12; William H. Yeomans, Columbia, Conn., March 4.

The LIBRARIAN announced the following additions:—

By Donation.

ABBOTT, C. C., of Trenton, N. J. The Works of Thomas Chalkley. 1 vol. 8vo. Phila. 1749. Printed by B. Franklin & D. Hall.

AMERICAN PHILOLOGICAL ASSOCIATION. Proceedings of the Third Annual Session held at New Haven, Conn., July, 1871. 8vo pamph.

BOLLES, E. C. Address by Rob't B. Fairburn in Hartford, Conn., July 12, 1871. 8vo pamph. Assay of Gold and Silver by Thomas M. Blossom. 12mo pamph.

BUTLER, B. F., M. C. Frelinghuysen's Speech in U. S. Sen., Feb. 26, 1872.

FOOTE, CALEB. Files of several County papers for Jan., Feb., Mch., 1872.

GREEN, S. A., of Boston. Miscellaneous pamphlets, 11.

IVES, MRS. BENJ. H. True Christian Religion. 1 vol. 8vo. Boston. 1833. New Jerusalem Magazine. 2 vols. 8vo. Boston. 1833-4. Liberal Preacher. 1 vol. 8vo.

Sermons by Rev. A. Bancroft. 1 vol. 8vo. Worcester. 1822. American Journal of Geology and Natural Science. 1831. 1 vol. 8vo. Analogy of Religion. 1 vol. 8vo. Hartford. 1819. Bible News. 1 vol. 8vo. Boston. 1812. Worship and Love of God. 1 vol. 12mo. Naturalists' Pocket Book. 1 vol. 12mo. Unitarian Miscellany. 1 vol. 12mo. Insect Architecture. 1 vol. 16mo. Insect Transformation. 1 vol. 16mo. Formation of the Christian Character. 1 vol. 18mo. Times of the Saviour. 1 vol. 16mo. Christian Monitor. 1 vol. 18mo. Alphabet of Insects. 1 vol. 18mo. History of Insects. 1 vol. 16mo. New Church Doctrine. 1 vol. 12mo.

The Pursuit of Knowledge. 1 vol. 12mo.

PACKARD, A. S., JR. The Development of *Limulus Polyphemus* by donor.

RICHES, W. S., of Columbus, Ohio. Cincinnati Directories for 1857-8. 2 vols. 8vo. Ohio State Register. 1857. 1 vol. 8vo. C. C. C. and I. R. R. Gazetteer. 1870-1. 1 vol. 8vo. Columbus Directories, 1855, 1857-8, 1859-70.

STATE BOARD OF HEALTH OF MASSACHUSETTS. Third Annual Report. Jan. 1872. 8vo pamph.

SUMNER, CHARLES, of U. S. Senate. Speech of, in U. S. Senate. Feb. 28, 1872.

U. S. LIBRARY OF CONGRESS. Catalogue of Books added to the Library of Congress in 1870. 1 vol. 4to. Congressional Directory, 42d Congress, 2d Session. 8vo pamph.

YEOMANS, WM. H., of Columbia, Conn. Public and Private Acts and Resolutions of Conn. for 1842-1864. Miscellaneous pamphlets, 48.

By Exchange.

AMERICAN ANTIQUARIAN SOCIETY, Worcester. Proceedings of, Oct. 21, 1871. No. 57. 8vo pamph.

NEW JERSEY HISTORICAL SOCIETY. Proceedings of, Vol. II. No. 4. 1871.

NEW YORK LYCEUM OF NATURAL HISTORY. Annals of. Vol. X., Nos. 4-5.

PUBLISHERS. American Naturalist. Christian World. Gardner's Monthly: Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Essex County Mercury. Lawrence American. Little Giant. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Sailors' Magazine and Seamen's Friend. Salem Observer. Shoe and Leather Journal. Sotherran's Catalogue. Western Lancet.

ESSEX COUNTY SPIDERS.

J. H. EMERTON exhibited his collection of spiders from the neighborhood of Salem and gave a general account of the classification of spiders, illustrated by sketches of some of our common species. The collection contained some eight hundred specimens, representing one hundred and sixty species of the following suborders:—

Orbitelariæ (round web spiders)	29	species.
Retitelariæ (net spiders)	33	“
Tubitelariæ (tube spiders)	43	“
Citigradæ (wolf spiders)	19	“
Saltigradæ (jumping spiders)	20	“
Laterigradæ (crab spiders)	16	“

The Orbitelariæ were represented by the large black and yellow *Epeira riparia* Hentz, one of our most conspicuous spiders which can hardly escape the notice of any one who goes into the country in August, by *Epeira vulgaris*, the brown and gray spider, which spins round webs everywhere about our yards and barns, *Epeira trifolium*, one of our largest *Epeiras*, with round purple abdomen marked with white spots, and the less familiar species with thorny and odd shaped abdomens, *Epeira stellata* and *spinea*.

Among the Retitelariæ were *Theridion vulgare* Hentz, perhaps the most common of all our house spiders whose webs occupy the corners of our rooms at all seasons, and

our common *Linyphia marmarata*, *L. communis*, and *L. costata*, conspicuous by their bright colors and curious and complicated webs.

Of the Tubitelariæ perhaps the most familiar was the common *Agelena nævia* Hentz, whose webs are seen on dewy mornings almost covering the grass in our fields, each web sloping toward a tube in which the spider waits.

Among the Citigradæ were some specimens of *Lycosa Carolinensis* Hentz, the largest of the group, whose feet extend over three inches. One of these was caught in Saugus and another in Andover.

The Saltigradæ were represented by our little gray jumping spider, *Epiblemum faustum* Hentz, which is seen on walls in the sunshine running with equal facility backward, forward or sideways, and our large gray *Attus* which may be found at almost any season, in thick white cocoons under stones.

The Laterigradæ included the large white *Thomisus fartus* Hentz, which lives on flowers in gardens and is often brought into the house upon them, and the dingy gray *Thomisus vulgaris* Hentz, so common on fences, where it can hardly be distinguished from unpainted wood.

The collection was arranged in tube bottles which were pinned by the corks in trays.



REGULAR MEETING, MONDAY, APRIL 1ST, 1872.

THE President in the chair. Records of preceding meeting read.

THE SECRETARY announced the following additional correspondence:—

From Henry A. Breed, Lynn, Mch. 20; J. J. H. Gregory, Marblehead, Mch. 20; J. C. Holmes, Detroit, Mich., March 18; Yeomans, William H., Columbia, Conn., March 22; Augsburg Naturhistorischer Verein, Dec. 4; Bern, Die Naturforschende Gesellschaft, Dec.; Boston Public Library, March 18, 22; Cincinnati Public Library, Mch. 20, 27; Königsberg, Physikalisch oeconomiche Gesellschaft, Dec. 10; Lisbonne, Academie Royale des Sciences, Oct. 5; Mans, Société d'Agriculture Sciences et Arts, Nov. 20; Neuchatel, Société des Sciences Naturelles, Nov. 24; Wien, Kaiserliche Akademie, des Wissenschaften, Jan'y 7; Zurich, Naturforschende Gesellschaft, Aug. 18.

The LIBRARIAN reported the following additions:—

By Donation.

BOLLES, E. C. Address of J. A. Bolles, L.L.D., delivered at the fiftieth Annual Commencement of the National Medical College, Mch. 7, 1872.

BROOKS, HENRY M. Tristram Shandy, 3 vols. 16mo. Vicar of Wakefield, 1 vol. 16mo. Management of the Tongue, 1 vol. 16mo. Poetical Works of Oliver Goldsmith, 1 vol. 16mo. Histoire de Charles XII, 1 vol. 16mo. Federal Calculator, 1 vol. 12mo. Triumphs of Temper, 1 vol. 16mo. Trials of a School Girl, 1 vol. 16mo. Handbook i Takling, 1 vol. 12mo. Prophecy of Dante, 1 vol. 16mo. Lara, 1 vol. 16mo. Miscellaneous pamphlets, 12.

BUTLER, B. F., of U. S. H. R. Carpenter's Speech in U. S. Sen., Feb. 29, 1872. Report of the Department of Agriculture for Feb., 1872. Harlan's Speech in U. S. Sen., Feb. 28, 1872.

CABOT, JOSEPH S. American Turf Register, 9 vols. 8vo. Scriptorum Romani, 21 vols. 12mo. Southern Review, 5 vols. 8vo. New York Review, 8 vols. 8vo. Mass. Register & U. S. Calendar, 1808-1838, 35 vols. 16mo. Universal Magazine, 3 vols. 8vo. Henry's Chemistry, 2 vols. 12mo. Stewart on the Mind, 1 vol. 8vo. Southern Review, 5 nos. New York Review, 4 nos.

DEPARTMENT OF THE INTERIOR, Washington, D. C. Statistics of Population. Ninth Census, 1870. Tables I-VIII. 1 vol. 4to.

HOLMES, JOHN C., of Detroit, Mich. Twentieth Annual Report of the Board of Water Commissioners of Detroit for 1871.

LEVETTE, G. M., of Indianapolis, Ind. Geological Survey of Indiana by E. T. Cox, 1 vol. 8vo.

LITTLE, BROWN & CO., of Boston. Divinity of Christ, 1 vol. 16mo. Boston, 1872.

NEAL, THEO. A. Fleet's Almanack, 1792. 1 vol. 16mo. Postes de France, 1785. 1 vol. 16mo.

SECRETARY OF STATE OF MASS. Mass. Public Documents for 1870, 4 vols. 8vo. Acts and Resolves of Mass. passed in 1871, 1 vol. 8vo.

UNKNOWN. Annual Report of the Selectmen of Wenham. Year ending Feb. 16, 1872. Annual Report of the School Committee of Wenham. Year ending Mch., 1872.

WOODMAN, CYRUS, of Cambridge. Records of the Proprietors of Narraganset Township, No. I (now the Town of Buxton), 1733-1811. 1 vol. 8vo. Privately printed.

By Exchange.

ARCHIV DER ANTHROPOLOGIE (Hrsg v. A. Ecker, L. Lindenschmit) in BRAUNSCHWEIG. Band V, Heft 1. 4to pamph. 1871.

CROSSE ET FISCHER. Journal de Conchyliologie. 3e Série. Tome xi. No. 4.

INSTITUT NATIONAL GENEVOIS IN GENÈVE. Bulletin, No. 35, Vol. xvi, pp. 225-385. 1870.

KONIGLICH PHYSIKALISCH-ÖKONOMISCHE GESELLSCHAFT IN KÖNIGSBERG. Schriften, 1860-1870, inc. 16 pamphlets. 4to.

MASS. AGRICULTURAL COLLEGE, Amherst. Ninth Annual Report of the Trustees of. Jan., 1872.

MINNESOTA HISTORICAL SOCIETY. Annual Report of, 1871.

NATURFORSCHENDE GESELLSCHAFT IN BERN. Mittheilungen, No. 711-744, 1871.

NATURFORSCHENDE GESELLSCHAFT IN FREIBURG. Fortschritt herausgegeben zur Feier des fünfzig jährigen Jubiläums.

NATURFORSCHENDE GESELLSCHAFT IN ZURICH. Vierteljahrsschrift, Jahrg. xv. 1870. 4 pamphlets, 12mo.

NATURHISTORISCHER VEREIN IN AUGSBURG. Bericht, 1871.

PHYSIKALISCH-MEDICINISCHE GESELLSCHAFT IN WÜRZBURG. Verhandlungen Neue Folge. ii Band. 3 Heft.

SOCIÉTÉ D'ACCLIMATION. Bulletin Mensuel, Tome viii, 2me. Série Jan.-Nov., 1871. 6 pamphlets, 8vo. La Production Animale et Vegetale, 8vo pamph.

SOCIÉTÉ DES SCIENCES NATURELLES IN NEUCHATEL. Bulletin, Tome ix, 1er Cahier.

PUBLISHERS. American Chemist. Essex County Mercury. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Little Giant. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Salem Observer.

Mr. JAMES KIMBALL read a copy of a contract, which he had found among the county records, between an inhabitant of Salem and the town of Saybrook, Conn., the former to furnish the latter with a pair of colors for the military company of the town in 1675.

Thes presents witness y^t I, Samuel Crampton of Salem, doe ingage to furnish y^e towne of Saybrook, in y^e county of New London, with a pr of collures fitt for y^e company ; of dubble sarsnet, red, with a white field to shew the red cross ; a flag staf and tassells sutable. To be sent the first opportunity after the first of May next, & upon y^e receipt whereof wee, whose names are underwritten, doe ingage to pay unto y^e sd Samuel Crampton, or his order, the sum of five pounds in pease & rye at three shillings per bushel, provided y^t y^e sd collures be of y^e sd kind, one & three quarters on y^e staff, two yds. & one quarter florish, with a blew ball in y^e sd collures, which sd payment is to be made at or before the first day of Oct. next insuing y^e date hearof, as witness our hands this 30th March, 1675.

WILLIAM PRATT,
ABRAHAM POST.

I underwritten doe bind myselfe & heires to pay or cause to be paid to Samuel Crampton of Salem or his assigns the just sum of four pounds & Six pence in pailles at 10s. a dozen, & half bushels at 20s. per dozen, to be delivered at Middleton at y^e landing place by Goodman Seaseage at or before the last of Sept. after y^e date herof.
March 27, 1675.

JOHN WILLOCK.

I underwritten bind myselfe & heires to pay Samuel Crampton of Salem six bushels & one half of indian corne to be delivered at Wethersfield landing place at or before, &c. March 24, 1675.

SAMUEL BUTLER.

Nathaniel Graye also binds himself to pay the same as Samuel Butler.

Entered as a memorandum or caution per me Hillard Veren, Recorder, this 23 d. 8 mo., :76.

Reg. Deeds, Book 4, Leaf 414.

The red cross with which this banner was to be provided called up the story of Endicott and the red cross as graphically related by Hawthorne in his "Twice Told Tales,"—the act of Endicott, in tearing the cross from the banner, showing his republican instinct was bold and defiant. The Massachusetts Records were also quoted, showing the action of the General Court then held at "New Towne," censuring Endicott for his act, and prohibiting him from holding office for a year. He protested against the action, and it was then voted that he be committed for contempt in protesting; but, upon an acknowledgment of his offence, he was dismissed. These records constitute the foundation of Hawthorne's graphic story. It was that spirit of liberty which was abroad in Massachusetts and which, from time to time, thus cropped out,

that caused, at the hands of the mother country, the imposition of those oaths of allegiance required of all judicial officers, sheriffs and other officials in the provincial period of our history. The following were read, as illustrations of the same:—

OATHS APPOINTED TO BE TAKEN INSTEAD OF THE OATHS OF ALLEGIANCE AND SUPREMACY: AND DECLARATION.

I *A. B.* Do sincerely Promise and Swear, That I will be faithful and bear true Allegiance to His Majesty *KING GEORGE*.

So Help me GOD.

I *A. B.* Do Swear, That I do from my Heart, abhor, detest and abjure as Impious and Heretical, that damnable Doctrine and Position, that Princes Excommunicated, or deprived by the *Pope* or any Authority of the *See of Rome*, may be Deposed or Murdered by their Subjects, or any other whatsoever; And I do declare that no Foreign Prince, Person, Prelate, State or Potentate, hath or ought to have any Jurisdiction, Power, Superiority, Pre-eminence or Authority, Ecclesiastical or Spiritual, within the Realm of GREAT BRITAIN.

So Help me GOD.

I *A. B.* Do solemnly and sincerely in the presence of GOD, Profess, Testify and Declare, That I do believe that in the Sacrament of the LORDS SUPPER, there is not any Transubstantiation of the Elements of *Bread* and *Wine* into the *Body* and *Blood* of CHRIST, at or after the Consecration thereof by any Person whatsoever: And that the Invocation or Adoration of the Virgin *Mary*, or any other Saint, and the Sacrifice of the *Mass*, as they are now used in the Church of *Rome*, are Superstitious and Idolatrous. And I do solemnly in the Presence of GOD, Profess, Testify and Declare, That I do make this Declaration and every part thereof, in the plain and ordinary sense of the Words Read unto me, as they are com-

monly understood by *English Protestants*, without any Evasion, Equivocation or mental Reservation whatsoever; and without any Dispensation already granted me for this purpose by the *Pope* or any Authority or Person whatsoever; or without any Hope of any such Dispensation from any Authority or Person whatsoever, or without Thinking that I am or can be acquitted before GOD or Man, or absolved of this Declaration or any Part thereof, although the *Pope* or any other Person or Persons or Power whatsoever, should dispense with or annul the same, or declare that it was null and void from the beginning.

JOS. WOLCOT.

SALEM, y^e 26th of March, 1722.

Josiah Wolcot, Esq., personally appearing, took the several Oaths of Allegiance & Supremacy & subscribed the above Declaration with the Oath of Abjuration. And also was sworn to the due performance of his office of one of the Justices of his Majtys Peise & Court of Comon Pleas for the County of Essex. Taken before us,

BENJ. LYNDE, } of his Majesty's Council.
JOHN TURNER, }

THEOPHILUS BURRILL.

Jurat the 21st day of May, 1722.

Before us, BENJ. LYNDE, } of his Majesty's Council.
JOHN TURNER, }

WM. GEDNEY.

SALEM, Essex, ss.

Jurat the 19th day of July, 1722.

COR. BENJ. LYNDE, } of his Majesty's Council.
JOHN TURNER, }

• JOHN WILLIAMS.

ESSEX, ss, Salem, the 7th of Aug't, 1722.

Mr. John Williams personally appearing took the several Oaths & Declarations above, with the Oath of Abju-

ration & was also Sworn to his Office of Deputy Sheriff of the County of Essex.

Before us, BENJ. LYNDE, } of his Majesty's Council.
JOHN TURNER, }

I *A. B.* Do truly and sincerely Acknowledge, Profess, Testifie and Declare in my Conscience, before GOD and the World, That Our Sovereign Lord KING *GEORGE* is Lawful and Rightful KING of the Realm of *Great Britain* and of all other His Majesties Dominions and Countries thereunto belonging; (And I do solemnly and sincerely Declare, That I do believe in my Conscience, that the Person pretended to be Prince of *Wales* during the Life of the Late King *James*, and since his decease pretending to be, and taking upon himself the Stile and Title of King of *England*, by the name of *James the Third*, hath not any Right or Title whatsoever to the Crown of the Realm of *Great Britain*, or any other the Dominions there-to belonging; And I do Renounce, Refuse and Abjure any Allegiance or Obedience to him.) And I do Swear, That I will bear Faith and true Allegiance to KING *GEORGE*, and Him will Defend to the utmost of my Power, against all Traiterous Conspiracies and Attempts whatsoever against His Person, Crown, or Dignity; And I will do my utmost endeavor to disclose or make known to His Majesty and His Successors, all Treasons and Traiterous Conspiracies which I shall know to be against Him or any of them; And I do faithfully promise to the utmost of my Power, to Support, Maintain and Defend the Limitation and Succession of the Crown (against him the said *James*, and all other Persons whatsoever) as the same (by an Act, Intituled. *An Act for the further Limitation of the Crown, and better Securing the Rights and Liberties of the Subject*) is and stands limited to the Princess *Sophia*, Electress and Dutchess-Dowager of *Hanover*, and the Heirs of Her Body, being Protestants. And all these Things I do plainly and sincerely Acknowledge and Swear, according to these express words by me Spoken, and according to the Plain and Common Sense and Understanding of the

same Words, without any Equivocation, Mental Evasion, or Secret Reservation whatsoever. And I do make this Recognition, Acknowledgment, Abjuration, Renunciation and Promise, Heartily, Willingly and Truly, upon the true Faith of a Christian.

So Help me G O D.

JOS. WOLCOT.

Capt. the 26 : of March, 1722.

COR. BENJ. LYNDE, } of his Majesty's Council.
JOHN TURNER, }

THEOPHILUS BURRILL.

Jurat the 21th day of May, 1722.

Before us, BENJ. LYNDE, } of his Majesty's Council.
JOHN TURNER, }

WM. GEDNEY.

ESSEX, ss, Salem, 19th of July, 1722.

Jurat, Cor.

BENJ. LYNDE, } of his Majesty's Council.
JOHN TURNER, }

JOHN WILLIAMS.

ESSEX, ss, Salem, the 7th of Aug't, 1722.

Mr. John Williams took the above Oath before us,

BENJ. LYNDE, } of his Majesty's Council.
JOHN TURNER, }

Mr. F. W. PUTNAM read a communication from Commodore B. F. Sands of the United States Naval Observatory requesting the several scientific societies to memorialize congress for an appropriation to defray the expenses for a due observation of the Transit of Venus in December, 1874.

Referred to a committee consisting of Messrs. Kimball, Upham, and the chair to report at the next meeting.

Adj.

REGULAR MEETING, MONDAY, APRIL 15, 1872.

PRESIDENT in the chair. Records read.

The SECRETARY announced the following correspondence:—

From George Derby, Boston, April 3; J. Munsell, Albany, April 6; D. Van Nostrand, New York, April 8; Baltimore, Peabody Institute, April 4; Boston Public Library, April 2; Buffalo Historical Society, April 3; Cincinnati Public Library, April 3, 4; Minnesota Historical Society, April 9; New Jersey Historical Society, Mch. 30; New York Lyceum of Natural History, April 8; Ohio Historical and Philosophical Society, April 5.

The LIBRARIAN reported the following additions:—

By Donation.

BOARD OF PUBLIC CHARITIES, Phila., Penn. Second Annual Report, 1871. 1 vol. 8vo.

DEPARTMENT OF THE INTERIOR, Washington, D. C. Statistics of Wealth, Taxation and Public Indebtedness. 4to pamph. 1871.

FOSTER, JOHN, Boston. History of the Foster Family, of Ipswich. 1 vol. 8vo.

GARFIELD, J. A., M. C. Smithsonian Report, 1870. 1 vol. 8vo.

MUNSELL, JOEL, of Albany, N. Y. Chips for the Chimney Corner. 1 vol. 16mo. Miscellaneous pamphlets, 28.

OFFICE OF THE CHIEF OF ENGINEERS, U. S. A. Report of the Chief of Engineers, 1871. 1 vol. 8vo.

PARKER, WM. B. A Golden Chaine, or the Description of Theologie. 1 vol. 4to London. 1635.

PEABODY LIBRARY, of Georgetown, Mass. Report of the Trustees, 1872.

PERRY, Rev. W. S., of Geneva, N. Y. Papers relating to the History of the Church of Pennsylvania, 1680-1778. 1 vol. 4to. Privately printed.

SHEPPARD, JOHN H., Boston. Sketch of Commodore Sam'l Tucker and Description of the New Masonic Temple in Boston. 8vo pamph. 1872.

By Exchange.

ALBANY INSTITUTE. Proceedings of the. Vol. i, Pt. II. 1871.

BOSTON SOCIETY OF NATURAL HISTORY. Proceedings. Vol. xiv, sigs. 8-14.

HISTORICAL AND PHILOSOPHICAL SOCIETY OF OHIO. Journal. Vol. i, Pt. I. 1872.

NEW ENGLAND HISTORICAL AND GENEALOGICAL SOCIETY. Register and Journal for April, 1872.

NEW JERSEY HISTORICAL SOCIETY. Collections of. Vol. 7. 1 vol. 8vo. 1872.

NEW YORK GENEALOGICAL AND BIOGRAPHICAL SOCIETY. Genealogical and Biographical Record for Apr., 1872.

VERMONT STATE LIBRARY. Transactions of the Vermont Dairymen's Association, 1870-1.

PUBLISHERS. American Naturalist. Christian World. Gardener's Monthly. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Land and Water. Lawrence American. Little Giant. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Salem Observer.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 4.

SALEM, MASS., MAY, 1872.

No. 5.

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

REGULAR MEETING, MONDAY, APRIL 15, 1872.

[Continued.]

ON THE TRANSIT OF VENUS.

THE committee to whom was referred the resolution offered by Mr. F. W. Putnam at the last meeting of the Institute to memorialize Congress for an appropriation to defray the necessary expenses of observations of the approaching Transit of Venus

REPORT

That this subject has received the favorable consideration of several of the European governments, and preparations are being made by them for a thorough observation of the coming Transit of Venus, which will occur on December 8, 1874. In Russia, whose territory presents many favorable points for observation of the phenomenon, a committee, organized by Prof. Strüve, has had under consideration, during the past two years, the establishment of a chain of observers at positions one hundred miles apart along the region between Kamtschatka and

the Black Sea. The principal astronomers of Germany have held two conferences, each of several days' duration, which have resulted in a decision to furnish four stations for heliometric observation of the planet during its transit; one of these will be in Japan or China, and the others probably at Mauritius, Kerguelen's and Auckland Islands, and some of these will also be equipped for photographic observations. A French commission on the subject sat before the war, and reported to the Bureau des Longitudes that it was desirable for their government to provide for observing stations at Saint Paul's Islands and Amsterdam, Yokohama, Tahiti, Noumea, Mascate and Suez. Lately the Academy of Sciences has applied to the Government for the requisite funds. The British preparations are probably more advanced than those of any other country. The astronomer royal first called attention to the transit in 1857, and again in 1864. In 1868 he began to shape definite plans, selected the observing stations, and opened communications with the Government upon the financial requirements of the undertaking.

In view of these facts it is desirable that the United States Congress, though having appointed a commission at its last session, should at an early day make provision that will enable this commission to place a corps of observers in the field, provided with suitable apparatus and abundant means to conduct in a proper manner the observations of this approaching transit of Venus.

It will require time to arrange the apparatus, some of which will undoubtedly have to be made for the occasion—conferences will be essential with the observers of other countries, so that the plans of observation may be in strict harmony with each other, and, before the positions are finally decided upon, the intentions of the other nations should be fully known.

The *personnel* of the various observing expeditions should be agreed upon and commence practice with the time and position instruments. At Woolwich a temporary observatory has been fitted up, with the object of forming a more accessible school of observation. At the

several positions the erection of temporary observatories will be required, and a residence of the observers for three or four months to ascertain the absolute local time of the phenomenon and the exact longitude. This accordingly increases the extent of preparation.

Your committee would recommend the adoption of the following memorial and resolves:—

To the Honorable Senate and House of Representatives in Congress assembled:

The Essex Institute, an organization located at Salem, in the State of Massachusetts, for the promotion of Science, Literature and the Arts, respectfully memorialize your Honorable Bodies to take into consideration the propriety of granting a suitable appropriation to enable the scientific corps connected with the Executive Branch of the Government, and such others as may be associated with them, to make a thorough and accurate observation of the approaching transit of Venus.

Resolved, That the President and Secretary be authorized to sign the above memorial in behalf of the Essex Institute and that the Secretary transmit the same, with a certified copy of the doings of the Institute in relation thereto, to the Hon. B. F. Butler, the Representative in Congress from this district, with a request to present the same and to use all proper means to secure a favorable consideration of this measure.

H. WHEATLAND, }
 JAMES KIMBALL, } Committee.
 W. P. UPHAM, }

ANCIENT TOPOGRAPHY OF SALEM.

JAMES KIMBALL, Esq., exhibited a map showing the old topography of Salem and presented the results of a careful examination of the early records of the county of Essex, for the purpose of gleanings a class of historical

facts hitherto neglected, and tending to give us a clearer insight into the early history of the first settlement at Salem, more especially in reference to the ancient topography of its territory, its development and adaptation to the wants and uses of civilized life.

Mr. Kimball has devoted considerable time in gathering up and placing upon record these fragmentary portions of our history, which, as each generation passes away, will become more and more obscure and difficult to be determined, unless they are rendered more enduring than the imperfect and decaying records of those early days, or the failing memories of those aged persons who are fast passing from our midst. These efforts to preserve a valuable department of our local history will undoubtedly induce others to continue the examination, so that, in the future, we may be able to present to the historian materials for a full and perfect history of Salem, that shall be a worthy tribute to the memories of the early settlers of *Naumkeke*.

This communication, one of a series which Mr. Kimball has in preparation, elucidating portions of our local history, was referred to the committee on Publications to be printed in the "Historical Collections."

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

Edward Dean of Salem was elected a resident member.

REGULAR MEETING, MONDAY, MAY 6TH, 1872.

THE PRESIDENT in the chair. Records of the preceding meeting read.

The SECRETARY announced the following correspondence:—

From B. F. Butler, Washington, April 28; R. Manning Chipman, Lisbon, Conn., April 9; C. H. Goss, Salem, April 18; J. D. W. French, Boston, April 26; J. Munsell, Albany, N. Y., April 23, 30; The Nation, New York, April 18; L. R. Stone, Newton, April; American Geographical Society, April 9, 19; Cincinnati Public Library, April 19, 24; St. Petersburg, Société Entomologie de Russie, Feb. 23; Washington, Smithsonian Institution, April 24, 29.

The LIBRARIAN reported the following additions:—

By Donation.

- BOLLES, E. C. Miscellaneous pamphlets, 10.
 BUTLER, B. F., M. C. Moore's Speech in U. S. H. R., April 6, 1872. Sawyer's Speech in U. S. Sen., April 17, 1872. Sargent's Speech in U. S. H. R., April 18, 1872.
 FOLGER, WM. C., of Hingham, Mass. Miscellaneous Town Reports, 6.
 FOOTE, CALEB. Files of several County papers for Feb., Mch., Apr., 1872.
 GOULD, JOHN H., of Topsfield. Crusii Moral, 1 vol. 12mo. Leipsic, 1744. Tribune Almanacs. 8 nos. American Almanacs. 4 nos. Les Comédies de Terence. 1 vol. 16mo. Halle. 1720.
 HAYDEN, DR. F. V. List of Elevations and Distances west of the Mississippi River. 12mo pamph.
 KNIGHT, B. Locke's Essays. 1 vol. 8vo. Campbell on Rhetoric. 2 vols. 8vo. Cousins' Psychology. 1 vol. 12 mo. Macy's Exploration of the Red River. 1 vol. 8vo. Insects Injurious to Vegetation. 1 vol. 8vo. Report of the President and Directors of the Pittsburgh & Boston Mining Company. Jan., 1849. 1 vol. 12mo. Report of the Superintendent of the U. S. Coast Survey for 1853. 1 vol. 4to.
 LEE, JOHN C. Commercial Bulletin, Mch. 30, April 13, 20, May 4, 1872.
 MANNING, ROBERT. Missionary Herald. 128 nos. Home Missionary Journal. 41 nos. New England Farmers and Gardeners' Journal. 208 nos.
 PALFRAY, C. W. Miscellaneous pamphlets, 10.
 PEABODY, MRS. FRANCIS. Journal of the American Unitarian Association. 37 nos. Every Saturday, 18 nos. Miscellaneous pamphlets, 27.
 PERRY, REV. W. S. of Geneva, N. Y. Miscellaneous pamphlets, 6.
 STONE, HENRY, Washington, D. C. Laws of Philadelphia. 1 vol. 8vo. Phila. 1860. Laws and Ordinances of Boston, 1856, 1 vol. 8vo. Ordinances of Baltimore, 1858, 1 vol. 8vo. Corporation Ordinances of New York, 1859, 1 vol. 8vo. Statute Laws of Louisville, 1857, 1 vol. 8vo. Revised Charter of Buffalo, 1856, 1 vol. 8vo. Laws and Ordinances of Cincinnati, 1859, 1 vol. 8vo. Acts of Tennessee, 1865, 1865-6, 1867-8, 1868-9, 4 vols. 8vo. Senate Journal of Tennessee, 1865-6, 1868-9, 2 vols., 8vo. House Journal, 1865, 1868-9, 2 vols., 8vo. Journal of the Assembly of Newfoundland, 1868, 1 vol. 4to. Laws of North Carolina and Tennessee, 1850, 1 vol. 12mo. Laws of Nashville, 1860, 1865, 2 vols. 12mo. Ordinances of Richmond, 1859

1 vol. 12mo. Nashville Directories 1855-6, 1857, 1859, 3 vols. 12mo. 1865, 1866, 1867, 1868, 1869, 5 vols. 8vo. Political Text Book, 1860, 1 vol. 8vo. American Museum, 1 vol. 8vo. Directory of New York, 1866. 1 vol. 8vo. Memoir of H. L. White, 1 vol. 8vo. Pitkin on Commerce. 1 vol. 12mo. Directories of Cities in the West and South, 1867-8. 1 vol. 4to. History of England. 1 vol. 8vo. Biography of Sam'l Lewis. 1 vol. 12mo. The Heavenly Pathway. 1 vol. 12mo. How to get a Farm. 1 vol. 12mo. Ten Acres Enough. 1 vol. 12mo. Bayonet Exercises for the Army. 1 vol. 12mo. Genealogy of the Mudge Family, 1638-1868. 1 vol. 8vo. Constitutional Convention. 1 vol. 8vo. Bankers' Magazine, 1851-2, 1 vol. 8vo. Smithsonian Reports, 1865, 1866. 2 vols. 8vo. Patent Office Reports, 1851-2, 1865. 2 vols. 8vo. Department of Agriculture, 1867. 1 vol. 8vo. Memphis Riots, 1866. 1 vol. 8vo. Miscellaneous pamphlets, 50.

SUMNER CHAS., of U. S. S. Two Protests of C. Sumner. Mch. 26, 27, 1872. 8vo.

By Exchange.

CINCINNATI PUBLIC LIBRARY. Geological Survey of Ohio for 1870. 1 vol. 8vo. HISTORICAL SOCIETY OF PENNSYLVANIA. Discourse on the Inauguration of the New Hall, Mch. 11, 1872, by John W. Wallace. 8vo pamph.

PUBLISHERS. American Naturalist. Canadian Naturalist. Essex County Mercury. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Land & Water. Lawrence American. Little Giant. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Pavilion. Peabody Press. Quarritch's Catalogue. Salem Observer. Western Lancet.

ANCESTRY OF SUSANNAH INGERSOLL.

The PRESIDENT read extracts from a manuscript sermon of the Rev. Dr. William Bentley of the East Church, Salem, which was delivered in December, 1811, on the occasion of the death of Mrs. Susannah Ingersoll, presenting a very graphic yet brief notice of the ancestry of the deceased in the line of descent from Richard Hollingsworth, one of the primitive settlers,—son William Hollingsworth, daughter Mary, the wife of Philip English, daughter Susannah, who married John Touzell, daughter Susannah, the wife of John Hathorne and mother of the subject of this notice. For a more extended account see "Hist. Coll. of Essex Institute," Vol. xi, page 228.

• THE FAIRFAX AND HATHORNE HOUSE.

Reference was made by the President to the old house on the corner of Essex and Cambridge streets, in process of being taken down to erect on its site a more elegant structure. The original part of this house was built about

1685 by Benjamin Marston, the land having been purchased, some five years previous, of Jonathan Neale, who received it by inheritance, being an heir to the estate of Francis Lawes.*

Mr. Marston sold the estate, Feb. 24, 1701-2, to James Menzies, † formerly of Boston, then of Salem, who afterwards conveyed it to Philip English, and Philip English, July 25, 1724, to his daughter Susannah, the wife of John Touzell; ‡ and from her it passed to her daughter Mary, the wife of William Hathorne, and for many years it was in the possession of that family, and known as the Hathorne House. The original part is about fifteen feet from the street. Additions have been made from time to time, — first, a two story store on the western part of the front, and afterwards, within the remembrance of several now living, that on the eastern part, three stories in height; at the same time the first addition was made of the same height. In the taking down of this interesting relic of the olden times, the various alterations and additions were traced from the original with its projecting second story, and lean-to in the rear, to the building as we last beheld it. With this, as with many of our old houses, interesting associations are connected. In this house § lived William Fairfax, during his residence in

* See Essex Reg. Deeds, Book 42, fol. 256.

† See Essex Reg. Deeds, Book 15, fol. 51.

‡ See Bulletin of Essex Institute, Vol. 1, page 75. Essex Reg. Deeds, Book 5, fol. 283.

§ The following deposition from the manuscripts on file in the Library of the Institute confirms this tradition :—

“The Deposition of Christian Swasey, formerly Christian Legroe who Saith That about five years ago she Lived with Capt. John Touzell and Susanna his wife in the House Mr. Fairfax now dwells in in Salem, and that Mr. Phillip English, the Father of the said Susannah Then dwelt with Them in said House, and That She Then & There att Diverse Times heard the said Phillip English Say to his Daughter Susannah Touzell I give you all my Household goods and att Several Times when he said So He also bid Her fetch it up Every Thing from his House to Her House, To which She Replied She had not House Room Enough to Hold it and

Salem as collector of the port. William Fairfax, son of Henry Fairfax and grandson of Henry, the fourth Lord Fairfax, was born in 1691. He served in the British army, and was stationed for a time at St. Helena, and subsequently at the Bahamas, where he married Sarah, daughter of Major Walker, and was appointed Chief Justice of the Island. About the year 1725, on account of the unhealthiness of the climate, he removed to New England, having received the appointment of collector of customs of this port. In 1731 his wife died, leaving him four children, one of whom, Anne, born in Salem, married Lawrence Washington and afterwards George Lee. William Fairfax subsequently married Deborah Clark, daughter of Francis and Deborah (Gedney) Clark, of Salem. In 1734 he accepted the offer, to be the superintendent of the estates, of his cousin Thomas, the sixth Lord Fairfax, who had become the proprietor of the northern neck of Virginia, through his mother, who was Catherine, daughter of Lord Culpepper. He soon after removed from Salem, and at first took up his residence in Westmoreland County, but subsequently removed to a plantation called Belvoir, fourteen miles below Alexandria. He was collector of his majesty's customs for the South Potomac, and for some time President of the Council of Virginia. He died Sept. 3, 1757, aged sixty-

That about four years Since They all removed Down to the House where They now Live, and That she often Times since has heard the said English Say He had Given all his Household Goods to his Daughter Touzell for her and her Children.

The Mark.

CHRISTIAN X SWASEY.

Essex, ss. Salem, Aug. 2, 1732.

Then Christian Swasey made oath to the truth of the foregoing Deposition (Phillip English, jun., and Wm. Browne being present at the Caption who objected that their Father Mr. Phillip English Sen. hath not for these several years past been of a sound and Disposing mind) and this evidence is Taken to be in Perpetuam rei memoriam.

BENJ. LYNDE.
BENJ. LYNDE, Jun. } Justice of Quorum unus."

five years. Of several children by the second marriage, Bryan became afterwards the eighth Lord Fairfax; William died at Quebec in 1759, a lieutenant in the British army; and Hannah married Warner Washington, a nephew of General Washington.

THE RATTLE OF THE RATTLESNAKE.

Mr. F. W. PUTNAM gave a description of the structure of the horny appendage to the tail of many snakes, especially developed in the genus of Rattlesnakes, and controverted the idea of natural selection having anything to do with its peculiar development. He also thought that the supposition that the rattle was a benefit to the snake, as a means of enticing birds, by its sound imitating that made by the Cicada, as suggested by a writer in a late number of the "Naturalist," could not be accepted. The Cicada was not a ground insect, and was comparatively rare, even among the trees, in such localities as were most frequented by the rattlesnake. Secondly, the sound made by the snake was very slight under ordinary circumstances, and the rattle was not sounded to any extent unless the snake was disturbed by some cause. His own observations on these snakes, in their natural habitat, led him to believe that it was not at all their nature to set up a rattling for the sake of enticing birds to them, but that they would slowly and cautiously approach their victim, or else lie in wait ready to give the fatal spring upon anything that came near. He believed that the rattle was in reality a detriment to the snake, except in so far as it served to call the sexes together which, from the unsocial habits of the species, he thought was most likely its true function.

ANNUAL MEETING, WEDNESDAY, MAY 8TH, 1872.

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 FOR THE YEAR,

exhibiting a satisfactory condition of affairs and a gradual development of the plans and objects of the Institute, has been compiled.

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

W. H. A. Putnam, son of Eben and Elizabeth (Appleton) Putnam, died at Salem, Aug. 30th, 1871, in the thirty-ninth year of his age. From the age of fourteen until the year preceding his death he had led a sailor's life, making many voyages to the East Indies, Europe, Australia, and the Pacific coast of America, as master or factor. During these voyages he collected, very extensively, specimens in all departments of zoology, which have greatly enriched the museums at Salem and Cambridge.

J. Willard Peele, son of Willard and Margaret (Appleton) Peele, died at his seaside residence in Beverly, Sept. 29th, 1871, aged sixty-seven years. In early life he went to Manila and established the house of Peele, Hubbell & Co., where he resided many years. He returned to this country about 1845, and has since resided in Salem, except during the last three or four years in Boston.

Benjamin Cox, son of Benjamin and Sarah (Smith) Cox, born in Salem, Jan. 9th, 1806, graduated at Harvard College in 1826, studied medicine with Dr. A. L. Peirson and after receiving the degree of M. D., established himself in his native city, where he obtained a large practice, winning the attachment of those to whom he ministered by his suavity of manners, genial disposition, and skill in his profession. Though always interested in passing events, he never mingled much in public life outside the duties of his profession. He died Nov. 30th, 1871.

The meetings have been continued as usual. Three FIELD MEETINGS have been held, at Beverly, East Gloucester, and Rockville in Peabody. At the meeting in Beverly, the Wenham Pond and City Water Works were visited and many kind attentions were extended by the Superintendent and his assistants. The *cyclone* or *tornado*, which passed over the pond and extended through a part of Wenham on the Sunday preceding, was the subject of remarks from Mr. A. W. Dodge, and the results of his observations, with the statement of Mr. D. H. Johnson, have been printed in the BULLETIN.

At the meeting in East Gloucester the citizens of the place were very attentive, especially the Rev. Mr. Gannett, the pastor of the church in which the meeting was held; who kindly, at our suggestion, prepared a very interesting history of the Baptist society in that place, which has been printed in the BULLETIN. Messrs. Bolles, Johnson, Phippen, Emerton and others made extended remarks suggested by the various specimens collected during the forenoon rambles.

It was deemed proper that meetings should occasionally be held in the vicinity of Ship Rock, Peabody, so that the members of the Institute might have an opportunity

to visit this remarkable boulder, which, with an acre of land adjacent, is the property of the Institute; accordingly, one was held on Wednesday, August 2d.

A cordial invitation was received to hold a meeting at Rowley during the month of September, but owing to peculiar and unusual circumstances it was deemed advisable to postpone to another season.

A special meeting was held on the evening of Sept. 5th to listen to the reading, by Judge Lord, of his memoir on the life and character of Mr. Huntington, ex-President of the Institute. This paper has been printed in the eleventh volume of the "Historical Collections" and copies have been also struck off in a separate form. The address was listened to with intense interest and was a faithful and correct delineation of Mr. Huntington's character.

Evening meetings have been held on the first and third Monday evenings, except during the months of June, July, August and September. The meeting on Monday, Oct. 16th, was devoted principally to remarks upon the great loss which our sister institutions, the Chicago Historical Society and the Chicago Academy of Sciences, had sustained by the great conflagration that had devastated so large a portion of Chicago on the 8th, 9th and 10th of October, and in the destruction of their entire libraries and collections. Resolutions of sympathy and proffers of aid were passed. A brief history of these Institutions was presented, with some account of their condition when visited by several members of the Institute in the month of August preceding.

Papers or lectures have been communicated, by Dr. A. H. Johnson, on some Mementos from the Franco-German War; W. H. Foster, on Reminiscences of the Salem and Boston Stage Company; Mr. F. W. Putnam, on the

Ancient Fortifications on the Wabash River, Indiana, and on the Mammoth Cave of Kentucky and its Inhabitants; A. C. Goodell, Jr., a sketch of the Legislation of Mass., the Provincial Period, and an account of the Puritan Holidays; Rev. E. S. Atwood, on the Beginnings and Growth of Language; Dr. A. S. Packard, on Insects Injurious to Vegetation noticed in this vicinity the past season; J. J. H. Gregory, Esq., of Marblehead, two lectures on the Result of his Observations during a trip by rail to California, his visit to Salt Lake City, Yosemite Valley, the Great Trees, etc.; Hon. J. P. Putnam of the Superior Court, a very interesting and graphic account of the "Passion Play" at Ober-ammergau, which he witnessed in the summer of 1871; Mr. S. A. Nelson, of Georgetown, on the Meteorology of the White Mountains; James Kimball, Esq., some account of the Judicial Oaths in the Colonial Days in the interest of loyalty; also, an interesting sketch of the Ancient Topography of Salem. Mr. James H. Emerton exhibited his Collection of Spiders and explained the system of classification and other interesting facts in their natural history. From others, many short communications and brief remarks were presented. The attendance on some of these occasions was very large, and the subjects under discussion elicited a great degree of interest and attention.

It may be deemed appropriate in this connection to allude to the lecture on Mt. Washington illustrated by the camera, delivered at the rooms by Mr. S. A. Nelson, and also a series of five lectures, on the Microscope and what it shows us, by our associate, Rev. E. C. Bolles; these lectures were also illustrated by the lantern with the calcium light, which were very successfully manipulated with the assistance of Mr. E. Bicknell. It is to be hoped that lectures with illustrations of this character will be

given during the next season. This plan has thus far succeeded admirably in rendering the study of the sciences attractive.

The library has received by donation and exchanges 1,046 bound volumes and 8,543 pamphlets, besides newspapers, manuscripts, etc., the donations from one hundred and ten individuals and twenty-six societies, the exchanges from ninety-six societies and incorporated bodies, of which sixty-four are foreign. From the editors of the "American Naturalist" one hundred and eighty-seven serial publications.

It is only requisite at this time to present these statistics, the particulars having been reported at the regular meetings and printed in the BULLETIN.

Museum. Many valuable additions have been made to the department of Natural History, which have been deposited with the Trustees of the Peabody Academy of Science, and have been acknowledged, duly cared for and properly arranged by the officers of that Institution. The specimens of an historical interest and works of art are placed in Plummer Hall under the immediate superintendence of the officers of the Institute. Those of an historical interest consist of a large collection of antiquarian and historical relics; paintings and engravings of many of the old houses, and of the persons who have in years past been prominent in our annals; medals; coins; paper currency, etc., etc. Additions continue to be made to this department, the collection is becoming one of great value, and more extended accommodations are required in order to have it properly arranged and classified. The few specimens of works of art, possessing no special interest, are not arranged systematically, and may be regarded only as a nucleus, around which it is desirable that, at an early

day, an art museum may be formed. The recent introduction of drawing into our public schools, the increased attention given to artistic studies, and a growing appreciation of skilled labor, and the large remuneration it commands, require that some efforts by the Institute should be given in this direction. To meet these increasing demands of the public upon our resources, may we not reasonably expect a liberal response from members and friends?

Horticultural exhibitions have been very successfully conducted during the past season. The old zeal that, years long since, actuated our movements in this direction, seems to have been renewed in a younger generation and to burn with an undiminished lustre. A series of twelve exhibitions have been held, commencing on Monday, May 29th, and closing on Wednesday, November 8th, including two, opened only during the evening, for the display of the night blooming cereus, and the annual in September, opened to the public from Tuesday, the 19th, to Friday, the 22d. On this latter occasion, the hall was very tastefully decorated with festoons and wreaths of evergreens, stands and baskets of flowers; many choice pot plants and a goodly collection of fruits and vegetables were placed upon the tables. Contributions were received not only from those having extensive grounds, but from many whose gardens were of limited dimensions. The aggregate made fine exhibitions, and varied with the successive appearance of those showy and attractive objects that adorn the garden, coming and going at regular intervals, marking with great exactness the progress of the seasons in their annual course. The attendance was large and the general interest manifested by the visitors seemed to indicate that our humble efforts in

this direction may lead to the promotion of a taste for the cultivation of beautiful flowers, fine fruit and choice vegetables in this community.

Financial. The Treasurer's report shows an increase in the annual income, yet additional means are requisite to enable the Institute to perform in a fitting manner the various duties which the community may reasonably expect.

DEBITS.

Athenæum, for rent and Librarian,	\$350.00
Salaries, 781.00; Coal, 147.25,	928.25
Postages, 20.44; Sundries, 55.51,	75.95
Social meetings and Excursions,	772.00
Publications, 1238.50; Bank Tax, 11.93,	1250.43
Gas, 70.20; Express, 30.40; Insurance, 30.00,	130.60
Collections, 6.15; Balance of last year, 335.77,	341.92
Balance in Treasury,	2.48

Historical.

J. Perley, for binding,	75.00
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Natural History and Horticulture.

Exhibition season, 1870, 26.87; do. 1871, 159.78,	186.65
	<u>\$4,113.28</u>

CREDITS.

Dividends of Webster Bank, 20; Social meetings and Excursions, 1,206.45,	\$1,226.45
Hall, 123.00; Sundries, 10.25; on acc't of note, 21.15,	154.40
Athenæum, proportion of coal, janitor, etc.,	148.62
Publications, 428.28; Assessments, 1,278.00,	1,706.28

Historical.

Dividend Naumkeag Bank, 24.00; Michigan Central R. R. dividends, 60.00,	84.00
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Natural History and Horticulture.

Dividends Lowell Bleachery, 160.00; P. S. & P. R. R., 19.50,	179.50
Horticultural Exhibitions, 1871,	238.78

Davis Fund.

Coupons Burlington and Missouri River Railroad Bonds,	138.25
Coupons Dixon, Peoria and Hannibal R. R. Bonds,	237.00
	<u>\$4,113.28</u>

BULLETIN
OF THE
ESSEX INSTITUTE.

VOL. 4.

SALEM, MASS., JUNE, 1872.

No. 6.

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

ANNUAL MEETING, WEDNESDAY, MAY 8TH, 1872.

RETROSPECT FOR THE YEAR.

[Continued.]

Publications. The BULLETIN has been continued in monthly numbers, giving full reports of the doings of the Institute, and abstracts of papers read at the meetings; this makes an annual volume of some one hundred and sixty pages and a copy of each issue is sent gratuitously to the members. Vol. xi, No. 1, of the "Historical Collections" has been printed, and another part is nearly ready for distribution.

A fund, securely invested, the income of which to be expended in printing the proceedings of the Institute, and papers on scientific and historical subjects presented at its meetings, also records, diaries, letters and other material that will tend to elucidate our local history, is a great desideratum, and would tend to rescue from oblivion many interesting and valuable memorials of the olden times.

The importance of multiplying copies of all valuable documents, for which purpose the press is the great agent, cannot be overestimated, and numerous citations can be adduced in confirmation of the statement. The incidents connected with the late great conflagration at Chicago may suffice in this case. The Historical Society of that city lost much that is irrecoverable; as manuscript documents and correspondence relative to the early history of Illinois. In the Academy of Sciences of Chicago were lost also the valuable manuscripts containing the results of the Scientific work of Dr. William Stimpson for nearly twenty years; these were ready for the press, awaiting the action of government to have them printed.

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* — WM. SUTTON.
Of the Arts — GEO. PEABODY. *Of Natural History* — F. W. PUTNAM.

Recording and Home Secretary.

AMOS H. JOHNSON.

Foreign Secretary.

A. S. PACKARD, JR.

Treasurer.

HENRY WHEATLAND.

Librarian.

W. P. UPHAM.

Superintendent of the Museum.

JOHN ROBINSON.

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 Department of Horticulture.

R. Manning, A. F. Bosson, Wm. A. Ireland.

Curators of Department of the Arts.

James A. Gillis, F. H. Lee, H. F. G. Waters.

Lecture Committee.

Jas. Kimball, Geo. Perkins, Wm. Northey, Wm. Neilson, E. C. Bolles.

Finance Committee.

J. C. Lee, R. S. Rogers, James Upton.

Field Meeting Committee.

A. W. Dodge, C. M. Tracy, E. N. Walton, Caleb Cooke, A. B. Hervey.

Library Committee.

J. G. Waters, Alpheus Crosby, H. M. Brooks.

*Publication Committee.*A. C. Goodell, Jr., F. W. Putnam, R. S. Rantoul, H. M. Brooks,
G. D. Phippen.

MEMBERS ELECTED.

Samuel Chamberlain, James E. Trask, Sidney Winslow and Elbridge Baker, all of Salem, were elected members.



REGULAR MEETING, MONDAY, MAY 20th, 1872.

THE PRESIDENT in the chair. Records of preceding meeting read.

The SECRETARY announced the following correspondence:—

From E. W. Buswell, Boston, May; J. J. H. Gregory, Marblehead, May 10; Augustus Mudge, Danvers Centre, May 4; W. Neilson, May 10; Wm. Northey, May 13; George Peabody, May 11; M. A. Stickney, May 14; John A. Vinton, Winchester, May 9.

The LIBRARIAN reported the following additions:—

By Donation.

BUTLER, B. F., M. C. Ellis's Speech in U. S. H. R., Apr. 30, 1872. Butler's Speech in U. S. H. R., Apr. 18, 1872. Report of the Department of Agriculture for March and April, 1872. Dawes' Speech in U. S. H. R., May 3, 1872.

CLOGSTON, W., of Springfield, Mass. London Directory, 1857, 1 vol. 12mo. Ithaca and Oswego Directory, 1867-8. 1 vol. 12mo. Utica Directories, 1842-3, 1853-4, 1858-9, 1861-2, 1867-8. 5 vols. 12mo. Oneida County Directory, 1866-7. 1 vol. 12mo.

DEPARTMENT OF THE INTERIOR. Mortality of the U. S. for 1850, 1860, 1870. 4to pamph.

KIMBALL, JAMES. Miscellaneous pamphlets, 7.

LEE, JOHN C. Commercial Bulletin for May 11, 1872.

MANNING, ROBERT. Amateur Cultivator's Guide. 2 vols. 8vo. 1869-70.

WHEATLAND, STEPHEN G. Neill & Smith's Compendium of Medica. 1 vol. 8vo. Hooper's Physicians' Vade Mecum. 1 vol. 12mo. Darwin's Origin of Species. 1 vol. 8vo. Digestion and its Derangements. 1 vol. 8vo. Watson's Practice of Physic. 1 vol. 8vo. Bowman's Medical Chemistry. 1 vol. 12mo. Wilde on Diseases of the Ear. 1 vol. 8vo. Paget's Surgical Pathology. 1 vol. 8vo. Wood's Practice of Medicine. 2 vols. 8vo. London Lancet. 1 vol. 8vo. Hunter. 1 vol. 8vo. Carpenter's Principles of Human Physiology. 1 vol. 8vo. Dictionnaire de Médecine. 1 vol. 8vo. Dwight's Modern Surgery. 1 vol. 8vo. Book of Prescriptions. 1 vol. 12mo. The Prescriber's Complete Handbook. 1 vol. 12mo. Taylor's Medical Jurisprudence. 1 vol. 8vo. Sargent's Minor Surgery. 1 vol. 12mo. Copland's Medical Dictionary. 1 vol. 8vo. Beck's Materia Medica. 1 vol. 8vo. Wilson's Diseases of the Skin. 1 vol. 8vo. Mille's Practice of Surgery. 1 vol. 8vo. U. S. Dispensatory. 1 vol. 8vo.

WILLIAMS, HENRY L. Salem Gazette, 76 nos. Boston Shipping List, 1844. 1 vol. folio.

By Exchange.

PUBLISHERS. Gloucester Telegraph. Hardwicke's Science Gossip. Haverhill Gazette. Land and Water. Lawrence American. Little Giant. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Salem Observer.

Mr. JOHN ROBINSON exhibited an interesting collection of native plants in flower which he had gathered in this vicinity during the past few days, and made some remarks upon the same, indicating the localities, and time of blooming, which was several weeks later the present season than that of the average periods for some ten or twelve previous years. The following may be specified: *Sanguinaria Canadensis*, *Erythronium Americanum*, *Epigæa repens*, *Thalictrum anemonoides*, *Anemone nemorosa*, *Thalictrum dioicum*, *Viola pedata*, *Viola pubescens*, *Viola sagittata*, *Viola blanda*, *Houstonia cærulea*, *Ariscæ-*

TABLE CONTAINING THE DATES OF THE FIRST FINDING IN FLOWER OF SOME OF OUR NATIVE VERNAL PLANTS.

	1856	1857	1858	1860	1861	1862	1864	1865	1866	1867	1868	1869	1870	1871
<i>Anemone nemorosa</i> , Wind Flower,.....	Apr. 30	Apr. 22	Apr. 12	Apr. 19	Apr. 27	.....	Apr. 27	Apr. 14	Apr. 23	Apr. 25	Apr. 24	Apr. 23	Apr. 25	Apr. 23
<i>Aquilegia Canadensis</i> , Wild Columbine,.....	May 15	May 11	May 7.	May 12	May 10	.....	May 5.	.....	.....	.....	.....	.....	.....	.....
<i>Aralia trifolia</i> , Dwarf Ginseng,.....	May 18	.....	May 21	May 20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Arethusa bulbosa</i>,.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Cornus Canadensis</i> , Dwarf Cornel,.....	.....	June 1.	June 1.	May 20	May 28	.....	May 30	.....	June 9.	June 5.	June 12	May 31	June 2.	May 28
<i>Cypripedium acaule</i> , Ladies' Slipper,.....	May 25	June 1.	May 29	May 20	May 28	.....	June 1.	May 21	May 30	June 1.	June 3.	June 6.	May 26	May 26
<i>Epigaea repens</i> , Trailing Arbutus,.....	.....	.....	.....	.....	.....	.....	.....	May 21	May 30	May 28	June 3.	May 30	May 28	May 26
<i>Erythronium Americanum</i> , Dog's Tooth Violet,.....	.....	Apr. 22	Apr. 15	Apr. 15	Apr. 21	Apr. 20	Apr. 24	Apr. 8.	Apr. 23	Apr. 16	Apr. 24	Apr. 25	Apr. 25	Apr. 23
<i>Hepatica triloba</i> , Round-leaved Hepatica,.....	Apr. 10	Apr. 3.	Mch. 28	Mch. 19	Mch 16*	Apr. 6.	Mch. 20	Mch. 19	Mch. 21	Apr. 4.	Mch 29†	Mch. 28	Jan. 27	Mch. 11
<i>Kalmia latifolia</i> , Laurel,.....	June 20	.....	June 20	.....	.....	.....	June 18	June 10	June 12	June 10	June 28	June 27	June 20	June 13
<i>Nymphæa odorata</i> , Water Lily,.....	July 17	July 7.	July 4.	.....	.....	.....	.....	.....	June 28	July 1.	July 13.	July 19.	July 7.	June 24
<i>Oldenlandia purpurea</i> , Blueets, Honstonia,.....	Apr. 30	Apr. 20	Apr. 17	Apr. 19	Apr. 27	Apr. 26	Apr. 19	Apr. 2.	Apr. 25	Apr. 21	.....	.....	.....	.....
<i>Sanguinaria Canadensis</i> , Bloodroot,.....	.....	Apr. 12	Apr. 7.	Mch. 31	Apr. 18	Apr. 24	Apr. 15	Apr. 2.	Apr. 20	Apr. 16	Apr. 19	Apr. 10	Apr. 10	Apr. 6.
<i>Sarracenia purpurea</i> , Side Saddle Flower,.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Smitacina bifolia</i> , Two-leaved Solomon's Seal,.....	May 25	June 1.	June 4.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Tridentatis Americana</i> , Star Flower,.....	May 22	June 1.	May 29	May 20	May 24	.....	May 31	May 21	May 28	May 28	June 6.	May 25	May 22	May 21
<i>Uvularia sessilifolia</i> , Sessile-leaved Bellwort,.....	.....	May 9.	May 8.	May 4.	May 5.	.....	May 5.	.....	.....	.....	.....	.....	.....	.....

* Mch. 24, snow two feet deep.

† Two flowers. Snowstorm. 19 plants.

‡ Found two yellow ones.

ma triphyllum. He presented the accompanying table — containing the date of the first finding in flower, the several species enumerated therein — compiled by one of our enthusiastic collectors, the results of his observations for the past fifteen years.

Mr. GEORGE D. PHIPPEN spoke of some of the localities which he was wont to frequent, in years long past, in search of our native plants, and which are now occupied by dwellings or manufacturing industries. He alluded briefly to the great change that had taken place in the immediate suburbs of the city.

Rev. E. C. BOLLES remarked, that a day or two before, he had listened to a lecture by Prof. Asa Gray on the Fertilization of Plants by the Agency of Insects, and that several of the wild-flowers on the table had served as illustrations. Among these was the *Houstonia*, of which there had long been known to be two kinds of flowers. The first had stamens projecting above the dwarfed pistil, while in the second the stigmas were carried up far beyond the anthers. The members of the Institute would see both kinds pretty equally represented in the tufts of flowers before them, distinguishing these by observing that in some flowers they would see only the two stigmas, in others only the four anthers projecting from the throat of the corolla. So the *Houstonia* had been said to have *dimorphous* flowers, but the reason for this variation had not been understood till an explanation had been sought in the possibility of an artificial fertilization. It was now seen that the pollen of any *Houstonia* blossom did not fertilize the ovules of the same flower. In the case of the flowers with extruded stigmas, this could not occur unaided, because the stamens were deeply sunk in the

corolla—while in the other kind the pollen would not be found to exert a fertilizing effect upon its own stigma. But the two kinds of flowers were exquisitely arranged to produce cross-fertilization. An insect, exploring a corolla where the anthers were at the bottom, would cover its proboscis with pollen, which would be carried to the depressed stigma of the other kind of flower, and while visiting that second flower, the insect's head would remove some of the pollen, which again it would leave on the exerted stigma of a third flower of the kind first plundered. The structure of these flowers is to be explained in Prof. Gray's book, just passing through the press, entitled "How Plants Behave."

Mr. J. H. EMERTON mentioned that in November last he dug a root of *Batrychium dissectum* from an open pasture, and in January set it down with other ferns in a glass case. In about two months it produced a new frond with the usual triangular outline, but nearly twice as large as the old ones, and with the divisions of the pinnae almost entire. The next frond, which grew in another month, was of the ordinary kind. It afterward produced in succession three fronds five or six inches long, with pinnae in pairs over an inch apart toward the base, and with their divisions almost entire, looking very much like small sterile fronds of *Osmurida Claytoniana*.

Mr. F. W. PUTNAM gave an account of the explorations of several members of the Institute at Jeffries' Neck, in Ipswich, on Friday last.

The researches were undertaken for the purpose of ascertaining if a large number of depressions, in two groups, about a mile apart, were graves of Indians, as had been supposed. After carefully digging into several

of the places and getting to the original bottoms of the holes, it was evident to all present that they were not graves, and though a few stone implements and pieces of Indian pottery were found in the course of the excavations, there was nothing by which the original makers of the holes could be determined beyond doubt as Indians, though unquestionably the holes had been dug years ago by some race of men, and perhaps by the Indians for some temporary purpose. During the digging an old clay pipe bowl, of the pattern used by the first settlers, was found, indicating that perhaps the depressions were of a comparatively recent date, though the pipe might have been lost at a time following the original working, as it was found only a few inches below the sod.

One of the most interesting results of the explorations was the finding by Mr. Goodell of a well marked piece of Indian pottery in the gravel bank about three feet below the surface. This piece of pottery was seen, and the spot from which it was taken carefully examined, by several of the party, and it was unquestionably carried into the bank of gravel at the same time the bank was formed, and not buried there, as the gravel was undisturbed and the fragment of pottery by itself. The only question is as to the age of the gravel deposit, whether original river drift, or wash from the hills above at a more recent time, though even if of the later date it would prove of great antiquity.

Mr. Putnam exhibited a plan, made by Mr. J. H. Emerton, of one of the groups of depressions, showing their relative positions, and also a section of one of those opened. A sketch, showing the clearing which had been made by taking away all the large stones from the vicinity, and the relation of the depressions to the surrounding country, was made by Mr. C. A. Walker.

Mr. Putnam was followed by remarks from Messrs.

Goodell, Kimball, and others. After an interesting discussion on these and other subjects suggested by the above topics the meeting was adjourned.



REGULAR MEETING, MONDAY, JUNE 3, 1872.

PRESIDENT in the chair.

Samuel Calley of Salem and George E. Lewis of Peabody were elected resident members.



FIELD MEETING AT MIDDLETON, WEDNESDAY,
JUNE 12TH, 1872.

THE RAMBLE.

THE Institute, in arranging the series of Field Meetings, the present season, decided to commence at Middleton and to accept the kind invitation of Mr. Simon F. Esty to use his grounds as the place of rendezvous for the day. Thither the party, on alighting from the cars of the Lawrence Branch of the Eastern Railroad, at the Middleton station, about two hours before noon, wended their way, and found a beautiful walnut grove well adapted for the purpose of rural excursions, situated on the borders of a large pond formerly known as "the Great Pond," but now designated "Forest Lake."

From this place the several parties, after depositing their baskets, etc., went in different directions as inclinations dictated; some upon the pond, boats being in readiness for the purpose, others rambled through the grove

and adjoining woods, or betook themselves to some of the pleasant by-paths that here abound, and are more or less skirted with shrubbery and the flowering plants that appear and disappear, in succession, with the advance of the season. Many of these by-paths were undoubtedly the primitive roads constructed by the early settlers, from house to house, without any definite plan, merely for their own personal convenience. When the villages and towns sprung up requiring better and more direct means of communication, other roads were constructed and these were soon abandoned; the people accordingly changed their places of residence and built other houses; the old ones being neglected soon fell into decay. One occasionally meets in rambling through the woods and following the devious windings of some of these old by-paths or cross-roads the remains of an old cellar, the gnarled apple tree near by, a few plants that always linger in the footsteps of man, and perhaps the old well in the midst of dense woods and forests. Nature soon usurps her sway and clothes with rich verdure the places that man ceases to cultivate.

This diversity of the surface into hills and dales, with the various brooks and ponds interspersed, adds to the beauty of the scenery and greatly contributes to the pleasures of rural walks. Through the kindness of Mr. David Stiles, several of those interested in antiquarian lore were enabled to see specimens of the old houses, two stories front with a lean-to in the rear, that have braved the blasts of some two hundred winters, also the burial places where the forefathers of the hamlet sleep with their names inscribed upon the simple stone that marks the spot of interment. Mr Stiles directed attention to other objects of historical interest; some of these will be alluded to in the afternoon session. Middleton has two railroads located within its territory, one from Salem to Lowell in the extreme

western part at the paper mill, the other from Salem to Lawrence through the central part near the village. The occupation of the inhabitants is largely agricultural; though the manufacture of shoes and paper is carried on to considerable extent.

After partaking of the repast at the grove the party proceeded to the church, where the afternoon session was held, commencing at 3 P. M. The **PRESIDENT** in the chair:

AFTERNOON SESSION.

Records of preceding meeting read.

The **SECRETARY** announced the following correspondence:—

From F. S. Drake, Boston, May 11; Simon F. Esty, Middleton, May 28; H. Hagen, Cambridge, May 6; A. Lackey, Haverhill, June 4; James Niven, Saugus Centre, May 22; W. S. Perry, Geneva, N. Y., May 20; A. A. Scott, Saugus Centre, May 24; W. P. Upham, May 14; Durkheim, Naturwissenschaftlicher Verein der Rheinpfalz, Feb. 7; Gottingen, Die K. Gesellschaft der Wissenschaften, Jan. 10; Saint Petersburg, Academie Imperiale des Sciences, Ap. 29; Throndhjem, Société Royale des Sciences et des Lettres, Aug. 16, Dec. 12; U. S. Dep. of Interior, May 14.

The **LIBRARIAN** reported the following additions:—

By Donation.

BROOKS, HENRY M. Corry's Life of Washington. 1 vol. 12mo. Juvenile Lyre. 1 vol. 8vo. Life of Marion. 1 vol. 12mo. Bibliotheca Historica. 1 vol. 8vo.

BRYANT, JAMES S., of Hartford, Conn. Register for the State of Conn. for 1790-16mo. Flint's Discourse on Washington. 8vo. Proudfit's Sermon. 8vo.

BUFFUM, JAMES N., of Lynn, Mass. Lynn City Documents for 1871. 1 vol. 8vo.

BUTLER, B. F., M. C. Kelly's Speech in U. S. H. R. May 1, 1872. Butler's Speech in U. S. H. R., May 21, 1872.

CHAMBER OF COMMERCE, New York. Fourteenth Annual Report of, 1871-72. 1 vol. 8vo.

CROSBY, ALPHEUS. Dartmouth Centennial. 1869. 8vo pamph. Catalogues of Dartmouth College, 1864-5, 1870-1, 1871-2. 3 pamphlets, 8vo.

DABNEY, M. P. Works of Mrs. Barbauld. 2 vols. 8vo. Domestic Memoirs. 2 vols. 12mo. Thoughts on Education. 1 vol. 12mo. Sketches of Foreign Manners. 1 vol. 12mo. Works of Dr. Franklin, 1 vol. 16mo. Memoirs of the Life of M. L. Ramsay. 1 vol. 16mo. Hamilton's Letters. 1 vol. 12mo. Journal of the American Unitarian Association. 40 nos. Fac-simile of the Original Manuscript of Burns' Jolly Beggars. 4to pamph.

U. S. DEPARTMENT OF THE INTERIOR. U. S. Geological Report of Nebraska. Final Report. 1 vol. 8vo. Ninth Census of the U. S. 4to pamph.

EXECUTIVE COMMITTEE OF THE FRENCH RELIEF FUND, Boston. Reports of, 2 pamphlets, 8vo.

- PEABODY INSTITUTE, Peabody, Mass. Peabody Press and Danvers Monitor. 1870, 1871. 2 vols. folio.
- LANGWORTHY, I. P., of Boston. Miscellaneous pamphlets, 39.
- LEE, JOHN C. Commercial Bulletin, May 18, 1872.
- PALFRAY, C. W. Directory of Hannibal, 1871-2. 1 vol. 8vo.
- PEABODY, Mrs. FRANCIS. Every Night Book. 1 vol. 12mo. Every Saturday 21 nos. Miscellaneous pamphlets, 12.
- PERRY, W. S., of Geneva, N. Y. Digest of the Canons. 8vo pamph. 1872.
- PHILLIPS, W. P. Agriculture of Mass., 1871-2. 1 vol. 8vo. Thirty-Fifth Annual Report of the Board of Education. 1 vol. 8vo. Boston, 1872. Miscellaneous pamphlets, 12.
- PREBLE, G. H., of Charlestown. Notes on Ship-building in Mass. 8vo pamph. 1872.
- SHEPARD, HENRY F. American Naturalist. 15 nos. Miscellaneous pamphlets, 6.
- STORY, ELIZA. East Indies Directories. 2 vols. 4to. Geographical Grammar. 1 vol. 8vo. Requisite Tables. 2 vols. 8vo. Geometrical Problems. 1 vol. 8vo. Blunt's Coast Pilot. 1 vol. 8vo. Clarrissa. 8 vols. 12mo. Salmon's Gazetteer. 1 vol. 12mo. Volney's Ruins. 1 vol. 16mo. Willich's Lectures. 2 vols. 8vo. Miscellaneous pamphlets, 50.
- SUMNER, CHAS., U. S. Senate. Sumner's Speech in U. S. Sen. May 31, 1872.
- ROBINSON, W. S., Clerk Mass. House of Reps. Journal of the House of Reps. of Mass. 1865, 1866, 1867, 1868, 1869, 1870, 1871. 7 vols. 8vo. Report of the Committee on Claims on the Alterations and Repairs upon the State House. 1869. 1 vol. 8vo. Miscellaneous pamphlets, 65.
- WHITING, WILLIAM, of Boston. Memoir of Rev. Saml. Whiting, D. D., by the donor. 1 vol. 8vo. Boston, 1872.
- WINTHROP, ROBT C., of Brookline, Mass. Life and Letters of John Winthrop. 1588-1649. 2 vols. 8vo. Boston. 1869.

By Exchange.

- CROSSE ET FISCHER. Journal de Conchyliologie, Tome xii. 3e Série. No. 1. 1872.
- ENTOMOLOGISCHEN VEREIN IN STETTIN. Entomologische Zeitung. 32 Jahrg. 1871. 8vo. Stettin. 1871.
- K. GESELLSCHAFT DER WISSENSCHAFTEN IN GOTTINGEN, HANOVER. Nachrichten, 1871. 16mo pamph.
- KÖNIGLICHE NORSKE VIDENSKABERS-SELSKAB, THRONDHJEM. Skrifter, i det 19de Aarhundrede, Bind femte, Heft. I, II. 1865-68. Bindsjette, 1870. 3 pamphlets, 8vo.
- KÖNIGLICHE BAYERISCHE BOTANISCHE GESELLSCHAFT IN REGENSBURG. Flora, Neve, Reihe. 29 Jahrg. 1871. 8vo pamph. 1871.
- OBERLAUSITZISCHE GESELLSCHAFT DER WISSENSCHAFTEN IN GÖRLITZ. Neues Lausitzisches Magazin. Im Auftrage der Oberlausitzischen Gesellschaft der Wissenschaften. Bd. xiviii. 1871. 8vo pamph.
- SOCIÉTÉ D'ACCLIMATION, IN PARIS. Bulletin Mensuel, 2me Série. Tome viii. Dec., 1871. 8vo pamph.
- SOCIÉTÉ D'ANTHROPOLOGIE IN PARIS. Bulletins, Tomes v, vi. 11e Serie. 1870-71. 8vo pamphlets.
- SOCIÉTÉ VANDOISE DES SCIENCES NATURELLES. Lausanne, Bulletin, Vol. x, No. 65, 1870. 8vo pamph.
- ZOOLOGISCHE GESELLSCHAFT, FRANKFURT A M. Zoologische Garten. Nos. 7-12. Juli-Dec. 1871. 6 pamphlets. 8vo.
- PUBLISHERS. American Naturalist. Christian World. Gardener's Monthly.

Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Land and Water. Lawrence American. Little Giant. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Salem Observer. The Brunonian.

The SUPERINTENDENT of the Museum reported :—

From Miss J. R. COLBY, a Fire Set, taken from the ruins of the house of Mrs. Mulliken, burned by the British at the Battle of Lexington, April 19, 1775.

FIRST FIELD MEETINGS—DR. WILLIAM STIMPSON.

THE PRESIDENT in his opening remarks alluded to the coincidence of this day being the twenty-third anniversary of the first Field Meeting, which was held in the neighboring town of Danvers, on June 12, 1849. Some twelve or fifteen members in private carriages assembled at the Plains, and under the guidance of our old friend, Dr. Andrew Nichols, visited the locality of the *Vaccinium vitis-idea* first discovered by William Oakes in 1820—this plant is seldom found growing elsewhere within the limits of Massachusetts. The sphagnous borders of Cedar Pond in Wenham were also visited and there was detected the *Andromeda polifolia* just passing out of bloom. Thence repairing to Berry's Tavern at the Plains, the afternoon was devoted to explaining and illustrating by the microscope (a constant accompaniment at these meetings) the structure and economy of the lower algæ, fungi, lichens, etc. The second meeting, a few weeks later, was held at the residence of A. T. Newhall in Lynnfield. There were present with us on this occasion, Messrs. F. Alger and C. T. Jackson of Boston, and Seaman of Germany. Ship Rock and the serpentine ledges in Lynnfield were visited, and at the afternoon session furnished topics for discussion. The third, on the 28th of August following, was at the seashore on Burley Smith's farm in Manchester. Some visited the woods of Essex and Manchester where Cutler and Oakes, in years long past, were

went to herbarize; a few spent the time in dredging along the adjacent shores, a boat having been sent from Salem for this purpose. The visitors on this occasion were Mr. C. Girard, an assistant of Prof. Agassiz, and a young man named Stimpson, hailing from Cambridge, and not then out of his teens. Acquaintance had been made with Mr. Stimpson, a week or two previous, during a trip in the steamer R. B. Forbes from Boston to Salem, with members of the American Association for the Advancement of Science, who were visiting Salem, on the day after the adjournment of the session at Cambridge. Dredges having been put on board, at the suggestion of Professor Agassiz, were used occasionally during the trip.

Let us consider in this connection the subsequent career of this young man, the notice of whose death at Ilchester, near Baltimore, on the 26th ult., has been so recently announced. That trip from Boston to Salem was his first experience in dredging, a novelty to him, and he was much interested in this pursuit. He visited Salem several times during that autumn, and accompanied me on dredging excursions in the harbor. The results of his gleanings on these occasions formed the basis of a series of observations which were embodied in a work on the New England Shells, published in 1851—his first introduction to the scientific world as an author. This was soon followed by a paper on the Marine Invertebrates of Grand Menan, published in 1853, under the auspices of the Smithsonian Institution, and has since been considered as the first authority in the marine zoology of that region. He then spent several years in the North Pacific, Japan, etc., as naturalist to Government Expeditions and made vast collections, principally the results of dredging in those seas. He then resided for some years at Washington, in the quiet prosecution of his investigations, and the publica-

tion of their results. When the late Robert Kennicott went to Alaska, in 1865, in the employment of the Russian Telegraphic Expedition, Dr. Stimpson removed to Chicago to assume the duties of Secretary of the Chicago Academy of Natural Sciences, and maintained that connection until his death. During that interval he visited Florida on several occasions, and always obtained numerous interesting collections for the Academy.

Dr. Stimpson ranked high as a scientific investigator, his researches were thorough and his descriptions clear and accurate. He has added a large number of new species to the list of marine animals, the detailed account of which, forming many zoological monographs with illustrations nearly ready for the press, were destroyed by the Chicago fire as were also the types of his species. This great loss, the result of his labors for twenty years, affected him severely and influenced very much the state of his health.

The past winter Dr. Stimpson was engaged on board the U. S. C. S. steamer *Bache* in superintending dredging between Cape San Antonio, Cuba, and the coast of Yucatan and thence to Key West—but his increasing infirmities prevented him from fully carrying out his plans—returning not long since to the residence of his father-in-law near Baltimore he became gradually worse and died, as before noticed, on the 26th of May.

It seems appropriate, at this time and on this occasion, to allude to the decease of Dr. Stimpson, especially from the fact that he received his first experiences in the uses and results of dredging at one of these outdoor meetings, and that after the lapse of more than a score of years a life, then at its commencement, closes so full in the performance of scientific work and having done so much for the promotion and diffusion of science in this country.

Mr. F. W. PUTNAM alluded to the high position which Dr. Stimpson had taken in the ranks of science, and to the esteem in which he had always been held by those associated with him, and closed by proposing that a committee be appointed by the Institute to draw up a series of resolutions expressive of the loss which it had sustained. The committee, consisting of Messrs. Putnam, Bolles, Johnson and Wheatland, afterwards reported the following resolutions, which were unanimously adopted, and it was voted that a copy be sent to the family of Dr. Stimpson, and to the Chicago Academy of Sciences.

Resolved: That the Essex Institute has learned with profound regret of the recent death of Dr. William Stimpson, who has for so long a time been distinguished as the foremost American student in Marine Zoology, and whose loss to science is the greater since it has occurred in the midst of his successful labors to restore the fortunes of that Institution which has owed so much to his eminent attainments.

Resolved: That even in the grief which this severe affliction causes, the Essex Institute cannot but remember with pride that Dr. Stimpson's first acquaintance with the department of investigation which he afterwards pursued to such results, was made under its own auspices, and that the records of its Field Meetings for 1849 will preserve the honorable memorials of this beginning of his fame.

Resolved: That the Secretary of the Institute be instructed to convey, by these Resolutions, to the family of Dr. Stimpson and to the Chicago Academy of Sciences, not only the assurances of the high appreciation in which its members hold the scientific acquirements and labors of their lamented friend, but also their earnest sympathy with his relatives in the sorrow of their bereavement.

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FIELD MEETING AT MIDDLETON, WEDNESDAY, JUNE 12TH, 1872.

[Continued.]

THE EARLY MEETINGS OF THE SOCIETY.

MR. S. P. FOWLER, of Danvers, one of the original members of the Society, gave an interesting retrospect of its early history, and narrated many incidents of its first meetings, alluding especially to the one held in Topsfield on Wednesday, the 16th of April, 1834, in furtherance of the object and to complete the organization by the appointment of committees, etc. Specimens in the various branches of Natural History, with apparatus for collecting, were exhibited and illustrated, and the modes of preservation of the same, with a view to the formation of a Museum were discussed by William Oakes of Ipswich, Dr. Andrew Nichols of Danvers, and others. These two gentlemen may be justly regarded among the pioneers of science in this community, and the present generation are now reaping the fruits of their labors and their example in this direction;

they have long since been gathered to their fathers. Mr. Oakes died on the 31st of July, 1848, a noted and enthusiastic botanist; Dr. Nichols, a valued physician, and one particularly conversant with our local geology and botany, March 31, 1853, just as the little *Draba verna*, a plant of which he always delighted to make mention and collect specimens, was expanding its tiny petals to another vernal season. He also spoke of the field meetings in Danvers and Lynnfield during the summer of 1849 and the great interest which Dr. A. Nichols, Mr. Thomas Cole of Salem, Dr. George Osgood of Danvers and others took in this movement for the promotion of science.

HISTORICAL NOTICES OF MIDDLETON.

DAVID STILES of Middleton being called up, said he proposed to say something about the beautiful pond (on the shores of which the society had this day taken their repast), and two of the earliest settlers. Boston was settled in 1630 and four years subsequently Newton people under the care of Richard Bellingham, Esq., of Boston (afterwards Gov. of the Colony), moved to Cochichewick (Andover) and settled on the fish brook leading from the Great Pond to the Merrimac River. This small colony was exempt from tax and had the direct care of an agent, a compensation for the privations and dangers of an unprotected company in the midst of savages and in the wilderness. Bellingham must have passed to and fro within a mile of this pond in Middleton. None of the towns west of this were then settled and the roads at that time were through Danvers, Topsfield and Boxford, to old Rowley then called Salem Newmeadows, and Rowley Village. Bellingham's keen eye found this pond, and in 1639 obtained a grant for about twelve hundred acres which contained the pond and at that time an Indian plantation (relics and

skeletons of the Indians are still found in this locality). In 1659 Bellingham sold this claim to Bray Wilkins whose descendants (some of them) are before me to-day. Wilkins was from Wales, came over in one of Gov. Endicott's vessels and tended a ferry in Lynn fifteen years before settling in Middleton. This was in 1660, one year after purchasing these lands. His dwelling was on the southeast side of the pond and protected from the cold winds by Wills Hill on the north. His family consisted mostly of boys who took up a large portion of this claim and erected dwellings thereon for themselves, and this accounts for this name being more numerous in our early history than any other. Wilkins attended church at Salem Village, of which this town was a part, under the pastorate of Rev. Samuel Parris, in 1692, at the time of the witchcraft, and one of his grandsons was a victim.

In 1663 Thomas Fuller from Woburn bought a claim of Maj. General Dennison, lying east of Bellingham and parallel with it, and erected his dwelling just south of this church on the site now occupied by the house of Mr. Abijah Fuller. Thomas Fuller was a blacksmith by trade. He had quite a number of sons who also settled on his lands and for some years these two families must have been the principal ones in this part of the town.

In 1728 these people obtained a charter from the Great and General Court for a town. It enjoined upon the inhabitants the settling a minister and hiring a schoolmaster to teach "ye young to read and write." Consequently they settled Andrew Peters, and hired Daniel Towne as schoolmaster. Peters was from Andover, son of Samuel Peters and a graduate of Harvard College, in the class of 1723. The charter was presented to the town by Lieut. Thomas Fuller, designated as one of the principal inhabitants, who, at that period, must have been between ninety

and one hundred years old, and we are assured of this fact by his excellent, though very tremulous, handwriting.

The spot where the town met to receive their charter was at the house of Dr. Daniel Felch, a few rods east of the present church and the dividing line between Salem and Rowley. The meeting-house, though raised at that time, was not covered; it seems, therefore, that the town had been some time preparing for an existence (the population at that time was about four hundred). About thirty years ago I bought and took down this old meeting-house of massive timbers, all oak, most of which squared ten by thirteen while underneath I found oak stumps hewn away to receive the floor timbers which measured over four feet in diameter.

In conclusion, I thank this Society for the interest they have awakened in this county in searching for these hidden treasures, which to the antiquarian, and indeed to all coming posterity, are of so much value.

Mr. A. C. GOODELL, Jr., of Salem, spoke of his pleasant visit during the forenoon to several places of historical interest in the town, especially to the spot alluded to by Mr. Stiles, where the act of incorporation of the town in 1728 was first openly proclaimed, being read by the Sheriff. He then read a copy of the act.

INDIAN RELIC.

Mr. D. J. TAPLEY, of Danvers, described a curious and interesting sculptured stone which was discovered recently at Meredith Village, N. H. The stone was found embedded in clay and deposited in the sandy soil at the head of Lake Winnipiseogee, at a depth of two feet. On carefully removing the coating of clay, an egg-shaped "gorget" was found, having a tapering hole through its longest

diameter and measuring three and seven-eighths inches in length by two and five-eighths in thickness. The material is a silicious sandstone, of a drab color and fine grain, and the sculptures are of a much higher grade of art than any of a similar class extant. The surface of the stone is smooth, and as perfect in contour as if turned in a lathe. The carvings are in bas-relief, on a ground sunk in this surface.

On one side of the stone is a face in relief, similar in its general features to the Mexican and Indian "Masks." On the opposite side is a representation of arrows in various positions, a new moon, and a convolute, or coil, which may represent a serpent. On the third side is a wigwam and a circle supposed to represent the full moon, and on the fourth an ear of corn and a depressed circle containing pictures of the head(?) of some animal, a deer's leg, and a crown(?).

The stone was found by Mr. Seneca Ladd of Meredith Village at the bottom of a post hole which some of his workmen were excavating. As Mr. L. is quite a naturalist, the discovery was hailed by him with enthusiasm, and the relic will be preserved with the greatest care. The discovery is regarded as one of great importance in its archæological bearings.

Mr. F. W. PUTNAM remarked that the description of the carved stone given by Mr. Tapley had greatly interested him, especially as the carving was shown by Mr. Tapley's drawings to be far more elaborate than anything he had known as the work of the earlier inhabitants of New England. The Mound Builders of the South and West were good workers in stone, and often made quite elaborate carvings, but the later race of Indians were not much skilled in the art, and but few relics of their work

had been found. On this stone, however, we had the characteristic Indian face, similar to the few others that had been found in New England, with an attempt at an artistic result in the finish of the stone and the other figures carved upon it, that would certainly lead us to infer that its maker, if an Indian, was of a far higher caste as an artist than the distorted and childlike outlines of animals and men ordinarily cut or painted by them have heretofore impressed us as possible, and were it not for the fact that the face is so similar to undoubted Indian representations of the human face, which we have from New England, he would be inclined to think that it might have been the work of some other race. The position in which the stone was found marked it as quite an ancient piece of workmanship, and from its shape and the fact of its having a hole through its centre, he believed it would be classed with the singular perforated stones called gorgets, found throughout the country, and always more or less elaborately finished, which were supposed to have been worn on the breast as an ornament or badge of office.

Mr. JAMES H. EMERTON of Salem in speaking of the

SPIDERS AT MIDDLETON

said that while going about the shallow parts of the pond in a boat we saw a large number of spiders, most of them of the genus *Tetragnatha*, on the sedges entirely surrounded by water. They were standing head down with their feet stretched out up and down the leaves and could hardly be distinguished from their withered tips. One of these spiders found on an alder bush overhanging the pond was disturbed. It dropped and ran along on the water without wetting its body until it reached a water plant. These spiders are usually found near water but he had

not before seen them run on the surface although it is a common habit with several other species.

MICROSCOPIC FUNGI.

Rev. E. C. BOLLES of Salem said that if there have been but few flowering plants collected for consideration, almost every one must have remarked, perhaps without knowing what they were, two curious vegetable growths which were largely represented among the specimens upon the table. The roads about Middleton are bordered with a great abundance of Berberry bushes and Blackberry vines; and all of the former and many of the latter exhibit vegetable parasites in profusion upon their young foliage. These parasites are microscopic fungi only visible to the naked eye in the mass. The specimens before the meeting represent two divisions of the great family of the fungi, named *Coniomycetes* or *Dust-fungi*, because the most evident character about them is their powdery spores.

The Berberry bushes have a large proportion of their leaves spotted with numerous yellow discolorations. These are found to proceed from clusters of points which roughen the under surface. Microscopic examination shows each point to be a short cylinder thrust up through the cuticle of the leaf, and having its upper edge cut into teeth or segments, which are turned over the outside very evenly. Each cup contains many rounded translucent grains, and as the cup with its frill is white and the grains a rich yellow, the whole makes a very beautiful object for the microscope. The cells are clustered together—hence the common name, Berberry Cluster-cups (*Æcidium Berberidis*). The yellow grains are the spores and with the cups form the fructification of the plant. The rest of its structure as in all fungi is represented by the *mycelium*, or mat of white fibres, which pervades the tissue of the leaf.

In the case of the Blackberry vines, the leaves seem thickly and completely coated on the under side with a powdery orange-colored material. So brilliant is it that a plant so infected is a very striking object by the roadside. On looking more closely, we see that the color is in patches, which, in their tendency to become confluent, have spread over nearly the whole surface of the leaves. The orange material seems to have burst from under the cuticle, as the cluster-cups did. But there are no cups nor cells, only a mass of naked, rounded spores. This is a *Rust*, the *Uredo Potentillarum*; and is found on many plants of the Rose family. The mycelium of the fungus is hidden in this plant as in the other.

Both of these fungi are very common species here. Two features of interest may be noted. First, the immense number of spores, showing the resources of these minute plants. By the dispersion of these germs, widespread injury to the farmers' crops is often done by other species of Rusts, etc. Then again, these Berberry and Blackberry leaves are in many cases hardly unfolded, and yet almost immediately covered with the fungi. This shows that the plant itself is so infected, that year after year, in renewing its own foliage, it renews the parasitic growth as well.

Dr. A. H. JOHNSON of Salem and Rev. L. H. Frary of Middleton being called upon made some interesting remarks upon the object of these meetings and the beneficial influences that may arise therefrom in the promotion of science and general culture in the community.

SCIENTIFIC LECTURES.

The Committee on Lectures reported, that arrangements had been made (subject to the confirmation of the Institute) with Rev. E. C. Bolles of Salem, and Mr. E. Bicknell

of Salem as assistant, to deliver forty lectures "on the microscope and what it shows us" illustrated by the calcium light, in such places in Essex County as may be agreed upon during the year commencing July 1, 1872, eight of them to be given in Mechanic Hall, Salem, on successive Wednesday evenings commencing on the third Wednesday in October.

Voted, To accept the report of the committee, and confirm the doings.

David Weston of Salem was elected a resident member.

Voted, That the Essex Institute hereby tenders its hearty thanks to Mr. Simon F. Esty of Middleton for the use of his beautiful and commodious grove, to the Proprietors of the Congregational Church in which this session has been held and to Messrs. David Stiles, Henry White, Merriam, Tyler and others of Middleton who have extended courtesies on this occasion.

Adjourned.



FIELD MEETING AT GROVELAND, TUESDAY,
JULY 16, 1872.

Soon after nine o'clock on the morning of Tuesday, 16th of July, a goodly number of persons began to assemble in the Eastern Railroad Station, Salem, for an excursion to Groveland, taking the 9.25 train for Danvers on the Essex Road, thence a special train on the Danvers and Georgetown, now leased and operated by the Boston and Maine Railroad corporation, the remainder of the route.

The additions to the party from other towns at the several stations considerably augmented the number in attendance. On arrival at Groveland the party was met

by several of the citizens, and proceeded to the new building recently erected through the efforts of the venerable Dr. Jeremiah Spofford, on the site of the Merrimac Academy which was destroyed by fire some two or three years since, where a preliminary meeting was organized. The President, after briefly alluding to the nature of the gathering, and expressing the hope that the day's excursion might be pleasant and instructive to every participant, introduced Dr. Spofford who extended a cordial welcome and described the location of the groves, streams, paths, hills and other objects of interest that were accessible during the forenoon's ramble; when he closed, the party adjourned and went in groups to the various localities pointed out, as inclination dictated.

This building is arranged for a lecture room on the second floor, and on the first, several smaller rooms for a public library, reading room, and other purposes. May the praiseworthy efforts of this venerated friend be fully and speedily carried out, and may he long live to witness the benefits of a good educational institution, ably sustained by the liberality of the friends of true progress and tending largely to promote the culture of the citizens of his native town.

THE NEW IRON BRIDGE.

The great bend in the Merrimac river between Groveland and Haverhill has made the crossing, at this place, from the early days of the settlement highly desirable. Before the construction of the bridges, the ferry at this point received always its fair proportion of travel. It is only recently that the residents in this section of the county have been favored with this great accommodation. This bridge was an object of great interest; it was built by authority of the Legislature (Acts 1870 chap. 219), and

under the direction of the county commissioners, over the Merrimac River near the site of the "Chain Ferry" in Groveland and connecting that town with Haverhill.

It was commenced March 29, 1871, under the superintendence of Col. Coffin of Newburyport. The stone piers, which are the handsomest on the river, were designed by Mr. C. A. Putnam of Salem, and built by Messrs Blaisdell and Parker, the former of New Hampshire and the latter of Rockport. The superstructure was built by the King Iron Bridge Co., of Cleveland, Ohio, and is an iron tubular bridge, light appearing and graceful in construction, but capable of sustaining a great weight. It has 804 feet of flooring, and is 25 feet in clear width. There are six spans, each 126 feet, and a draw of 68 feet, designed by Mr. C. G. Force, engineer of the King Company. The bridge is warranted to sustain a weight of 3,000 pounds to the lineal foot. It was tested and formally inaugurated on Wednesday, April 10, 1872, when one of the spans was subjected to a test of thirty tons, placed as nearly in the centre as possible, and the deflection was only thirteen-sixteenths of an inch. About 14 tons were put upon the draw with no further deflection than would be caused by the straightening of the chains.

The cost of the bridge may be summed up as follows :

For foundation, piers, etc.,.....	\$48,898.35
“ superstructure,.....	33,056.67
“ interest account,.....	3,007.68
	<u>\$84,962.70</u>

and was divided between the county and the adjoining towns in the following proportions :

County of Essex paid twenty-seven-sixtieths.....	\$38,233.22
City of Haverhill paid nineteen-sixtieths,.....	26,904.85
Town of Groveland paid eight-sixtieths,.....	11,328.36
Town of West Newbury paid six-sixtieths,.....	8,496.27
	<u>\$84,962.70</u>

The day of inauguration may be considered one of the important events in the town's life; a good proportion of the people were out, a collation was provided, and speeches ranging from grave to gay were warm in the approval of this object which has been a cherished one for many years to obtain.

In 1834, 1835 and 1836 petitions were forwarded to the Legislature for a charter to build a bridge at this locality, but the opposition of Haverhill, and more actively that of the Proprietors of Haverhill Bridge, prevented a favorable consideration. This source of objection is now removed, the several bridges over the Merrimac, hitherto controlled by private interests, have been laid out as highways by legislative action (see Acts 1867, chap. 296, and 1868, chap. 309), and the expenses incident thereto and of maintaining the same have been assessed by the county commissioners on the county and towns or cities most benefited.

HISTORICAL NOTICES.

The first bridge over the Merrimac at Haverhill was completed in the autumn of 1794; its erection was considered a marvel of mechanical skill and ingenuity. In 1795 the Merrimac Bridge at the Rocks connecting Haverhill with West Newbury was built, and was the longest over this river; there being but little travel, the proprietors suffered it to fall to decay and in 1818 it was swept away by the ice. It was rebuilt in 1828.

These bridges have superseded the old ferries, the primitive mode adopted by our ancestors to maintain communication with those living on the opposite banks of the large rivers and to facilitate general travel.

An historical sketch of these old ferries with brief allusions to the many incidents connected therewith would embody many valuable facts and be a great contribution to

our local history. The records of the county and of several of our towns contain a mass of material on the subject that would amply repay a careful examination.

The ferries on the Merrimac near Haverhill have varied at different periods in number and location. The first on record was in 1647, Thomas Hale authorized to keep a ferry. In 1711, a ferry was established at Holt's Rocks between Haverhill and Newbury, and was kept for many years by John Swett, father and son, hence the name of "Swett's Ferry." In 1745, there were no less than five ferries between the village of Haverhill and Holt's Rocks: Swett's, at Holt's Rock; Cottle's, at the mouth of East Meadow River (Cottle's Creek); Pattee's near the House where David Nichols now or recently lived; Milliken's at the "Chain Ferry"; and Griffen's nearly opposite the central part of the city.

A ferry has been kept at the location of the New Bridge from 1738 to 1872, or 134 years, as a public landing; for more than one hundred years it had been a regularly attended ferry. About thirty years after the opening of Haverhill bridge, regular attendance was suspended; boats, however, have been kept by individuals for the conveyance of foot passengers.

Some of the party, who were interested in genealogical investigations, repaired to the old records; others, among whom was the author of a valuable memoir of one of the old families of the place, visited the location of several of the original grants of land to settlers from Rowley who first came hither in 1649. This territory at that time was known as "the Merrimac lands" and was within the township of Rowley. The first grants were bounded on the river (the river before the building of roads was the most convenient mode of communication), and extended back a considerable distance, some as far as the present

dividing line between Georgetown and Groveland. These were of different widths; the boundaries of most of them can now be easily ascertained, and any one acquainted in town can designate with sufficient accuracy the place where the first people lived, and the land they occupied. Although meetings of the settlers were probably held from the beginning, yet the first on record was on the 20th Feb., 1668-9. The name then given was Merrimac, afterwards called Rowley village on the Merrimac; Jan. 7, 1672-3, they voted to take the name of Bradford and incorporated under that appellation about 1675.

The first congregational church was constituted Dec. 27, 1682. Zachariah Symmes, a native of Charlestown and a graduate of Harvard in the class of 1657, was the first pastor, and was succeeded by his son, Thomas Symmes.

On the seventeenth of June, 1726, the town was divided into town parishes and this portion was set off as the East Precinct, and incorporated as a distinct municipality, March 8, 1750, under the name of Groveland.

The first parish meeting was held July 4, 1726; on the 8th of November following, Rev. William Balch was unanimously invited to preach with them; he was born at Beverly in 1704, graduated at Harvard College in 1724, ordained in 1728, and died January 12, 1792, aged 88—a descendant of John Balch, one of the old planters of Salem. He was succeeded by Rev. Ebenezer Dutch, a native of Ipswich, a graduate of Brown in 1776, ordained Nov. 17, 1779, died Aug. 4, 1813, aged 62. Rev. Gardner B. Perry was the third pastor, born at Norton, Aug. 9, 1783, graduated at Union in 1804, settled Sept. 28, 1814, and after a long and useful ministry died Dec. 16, 1859.

Balch's woods, extending along the banks of the Merri-

mac, is a delightful place in which to ramble, especially on a hot day, and to enjoy the beautiful scenery of the river and the opposite shore, with its undulating hills covered largely with wood in some localities, and in others with the city of Haverhill, thriving villages and cultivated fields; here also the naturalist can find much to study in his especial line of investigation. Several eminences nearly in the centre of the village were visited, and presented extensive views and cool and refreshing breezes.

At 1 P. M. the several parties repaired to the lower hall of the new building which was the place of gathering for the day, where the collation was partaken, the citizens furnishing delicious tea and coffee. The divine blessing was invoked by Rev. J. C. Paine of Groveland.

THE AFTERNOON SESSION

was called to order at 2 P. M. in the hall on the second floor. The PRESIDENT in the chair. Records of preceding meeting read:—

The SECRETARY announced the following correspondence:—

Boston Public Library, June 17; Geological Survey of India, Jan. 2; Maryland Historical Society, June 19; New York State Library, June 22; Rhode Island Historical Society, June 28; U. S. Dept. of Interior, June 18; Department of Agriculture, June 17, 20; Vermont Historical Society, July 9; Worcester Free Public Library, June 29; Mrs. W. B. Bannister, Newburyport, July 10; J. W. Foster, Chicago, Ill., June 25; John H. Gould, Topsfield, July 12; L. D. Gould, Boston Highlands, July 11, 13; S. C. Gregory, New York, June 13; C. J. Maynard, Ipswich, July 4; J. Spofford, Groveland, June 21, July 5, 8.

THE LIBRARIAN reported the following additions:—

By Donation.

BANNISTER, Mrs. WM. B., of Newburyport. Christian World, 60 numbers. Jewish Chronicle, 10 numbers. The Israelite Indeed, 43 numbers. Panoplist, 19 numbers. Miscellaneous pamphlets, 112.

BUTLER, BENJ. F., M. C. Carpenter's Speech in U. S. Sen., June 3, 1872. Logan's Speech in U. S. Sen., June 3, 1872. Flanagan's Speech in U. S. Sen., June 1, 1872.

DEPARTMENT OF THE INTERIOR, WASHINGTON, D. C. Reports of Commissioners to Paris Exposition, 2nd Sess., 40th Cong., 1867-8, 6 vols. 8vo. Senate Documents,

2nd Sess., 40th Cong., 1867-8, 1 vol. 8vo. Reports of the Committees of the House of Reps., 3d Sess., 40th Cong., 1868-9, 1 vol. 8vo., 2nd Sess., 41st Cong., 1869-70, 3 vols. 8vo. Patent Office Reports, 3d Sess., 40th Cong., 4 vols. 8vo. Senate Reports, 2nd Sess., 41st Cong., 1869-70, 1 vol. 8vo. Senate Journal, 2nd Sess., 41st Cong., 1869-70, 3 vols. 8vo. Commerce and Navigation, 1869-70, 1 vol. 8vo. Report of the Department of Agriculture, 1869-70, 1 vol. 8vo. Executive Documents, 2nd Sess., 41st Cong., 1869-70, 1 vol. 8vo. Mines and Mining, 1869-70, 1 vol. 8vo. Report of the Finance Committee, 1869-70, 1 vol. 8vo. Report of the Secretary of the Interior, 1869-70, 1 vol. 8vo. House Journal, 1869-70, 1 vol. 8vo. Report of the Secretary of the Navy, 1869-70, 1 vol. 8vo. Senate Journal, 1869, 1 vol. 8vo. Senate Documents, 1869, 1 vol. 8vo. Report of the Secretary of War, 1869-70, 1 vol. 8vo. Senate Reports, 1839, 1 vol. 8vo. House Miscellaneous 1869, 1 vol. 8vo. Claims of U. S. against Great Britain, 1869, 5 vols. 8vo.

FOLGER, WM. C., of Nantucket. Report of the Town of Scituate, Mch. 1871-Feb. 1872. Report of the Selectmen of the Town of Marshfield, 1872.

HOTCHKISS, SUSAN V., of New Haven, Conn. Fifteenth Annual Catalogue of the Officers and Students of the University of Rochester, 1864-5.

MUDGE, ALFRED, of Boston. Genealogy of the Mudge Family in America from 1638-1868 by donor, 1 vol. 8vo. Boston, 1868.

WESTON, DAVID. Miscellaneous pamphlets, 14.

WILDER, M. P., of Boston. Proceedings of the 30th Sess. of the American Pomological Society held in Richmond, Sept. 6, 7, 8, 1871, 4to pamph.

By Exchange.

GEOLOGICAL SURVEY OF INDIA. Observations on the Geology and Zoology of Abyssinia, 1 vol. 8vo. Records of the Geological Survey of India, Vol. iv, Pts. iii, iv, 2 pamphlets. 8vo. Memoirs of Geological Survey of India, Ser. vi, vii, 1871, 2 pamphlets, 4to.

NEW YORK GENEALOGICAL AND BIOGRAPHICAL SOCIETY. Record of, for July, 1872.

PHILADELPHIA ACADEMY OF NATURAL SCIENCES. Proceedings of, Part iii, Oct., Nov., Dec., 1871.

PUBLISHERS. American Naturalist. Essex County Mercury. Hardwicke's Science Gossip. Haverhill Gazette. Ipswich Chronicle. Land and Water. Lawrence American. Little Giant. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Sailors' Magazine and Seaman's Friend. Salem Observer. Silliman's Journal. Western Lancet.

The SUPERINTENDENT of *Museum* reported the following additions to the Historical Collection:—

CRAIG, MRS. SAML. A bottle with "C. B. 1715" stamped on it.

LITTLE, WM., of Newburyport. A old fashioned Mirror.

MUDGE, ALFRED, & SON, of Boston. A complete set of the Jubilee programmes, 1872.

U. S. OFFICE OF THE CHIEF SIGNAL OFFICER. Washington, D. C. Three copies of the daily weather Maps.

JAMES B. STONE. A pair of overshoes worn about the period of the Revolution.

L. H. Frary of Middleton, W. F. Southard, W. W. Kelman, Jr., and George K. Proctor, all of Salem, were elected resident members.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 4.

SALEM, MASS., AUGUST, 1872.

No. 8.

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

FIELD MEETING AT GROVELAND, TUESDAY,
JULY 16, 1872.

[Continued.]

THE PRESIDENT in his opening remarks alluded briefly to his first visit to Groveland, then the East Parish of Bradford, on Thursday, the 21st of September, 1837, a beautiful autumnal day, in company with a few friends, to attend a horticultural exhibition in the hall of the Merrimack Academy, and a meeting of the Essex County Natural History Society.

The collection of flowers was very fine and tastefully arranged, contributions were received from the gardens of the village and also from those of Salem, Newburyport, Haverhill and other towns. The attendance from the vicinity was large, the agricultural and other occupations being fully represented. A pleasing feature of the occasion was the appearance of the grounds* of the Academy

*The ground in front of the Academy was then a flower garden, wholly managed by Mr. Morse and his pupils, which, though entirely open and exposed, knew not the loss of fruit or flower!

laid out as a beautiful garden under the superintendence of Mr. Sylvanus Morse,* the Principal, for the amusement and gratification of the scholars, who not only culled from its gayly attired borders many choice flowers, but also gathered from the fields and woods, gerardias, asters, fringed gentians and many other attractive and showy flowers that add so much to the beauty of autumnal scenery. There was a goodly display of fruit and vegetables arranged on the tables. The exhibition indicated the great zeal in horticultural pursuits which was fostered by Mr. S. Morse, and Rev. G. B. Perry, † the pastor of the parish church. Both have passed away, but their memories survive and will long be cherished, the one as the faithful and beloved teacher, the other for the great interest which he always took in the various movements for the promotion of education, temperance, horticulture and other objects that tend to the general culture of the people, in addition to his usual professional duties which were always cheerfully and very acceptably performed.

In the afternoon a meeting of the Natural History Society, since incorporated as the Essex Institute, was held, Rev. G. B. Perry, one of the Vice Presidents, in the chair. The objects of the Society being fully stated called

* SYLVANUS MORSE, son of Joseph and Sophia [Bigelow] Morse of West Boylston, Mass.; born June 30, 1798; graduated at Brown University; married Harriet N., daughter of Dr. Jenks, of North Brookfield. He commenced teaching in Groveland in 1828 and continued for fifteen years, thence went to West Boylston and afterwards to Middleboro, Mass., where he died in 1871. His wife died in 1872 and both were buried in the cemetery at Groveland.

† Rev. GARDNER BRAMAN PERRY, D. D., son of Nathan and Phebe [Braman] Perry, was born at Norton, Mass., Aug. 9, 1783. In June, 1800, entered Brown University, continued there two years, and then went to Union College, where he graduated in 1804. For several years principal of Kingston Academy. Sept. 28, 1814, ordained at Bradford [Groveland] and was the sole pastor until 1851, when a colleague was appointed; he sustained the pastoral relation to the church until his death, which occurred December 2, 1859. He married, first, Maria P. Chamberlain of Exeter, N. H.; second, Eunice Tuttle of Acton; third, Sarah Brown of Groton, who survived him.

forth remarks from the presiding officer, the Secretary and others.

In the evening an instructive lecture was delivered in the church by the President of the Society, Dr. Andrew Nichols of Danvers,* "On the Advantages of the Study of Nature," which closed this interesting day.

After mentioning the meetings of the Institute held in this place in September, 1859, and June, 1860, and the cordial receptions extended on these occasions, he called upon Mr. E. S. Morse to give some account of his observations during the forenoon's ramble.

Mr. E. S. MORSE of Salem, after a few remarks on the findings of the day, gave a description of the insect which is the cause of the froth found on grass. This froth goes by the name of frog spit, and is supposed by many to be made by frogs, while others are aware that the substance in question is made by insects, but suppose the insects to be young grasshoppers. They are quite different from the grasshopper, belonging to an entirely different order. The creature causing this froth matures into a little wedge-shaped bug called leaf hopper, an hemipterous insect, the *Ptyelus lineatus* of Fitch. The eggs are deposited in the autumn, and are hatched in the following summer. In their larval or immature condition only are they surrounded by this frothy substance. It has been stated that these insects excrete their frothy covering, whereas they excrete a clear liquid, and blow it up afterward. This they accomplish by reaching out of the fluid their posterior segments and clutching, as it were, a drop of air, which they drag within the fluid holding it for a while against the under surface of the

* See page 89 of this volume; also Proceed. Essex Inst., Vol. i, page 49 and Vol. ii, page 26.

body, and then allowing it to escape in the fluid. This, repeated many times, converts the fluid into froth.

Dr. JEREMIAH SPOFFORD* was the next speaker. He retains his vigor in a remarkable degree for one who has reached fourscore and four years, and in his remarks gave an interesting account of the academy of which he was one of the founders, as follows:—

MERRIMACK ACADEMY.

Merrimack Academy originated in repeated conversations between the Rev. Dr. Perry, then pastor of this church, and myself, who now, after the lapse of half a century have devoted much of my time and care during the last year to rebuilding its ruined walls, destroyed by fire in September, 1870.

Dr. Perry and myself had then numerous families, in need of better advantages than the place afforded, and others were in the same situation, and some of us not well able to incur the expense of maintaining children at distant schools. These conversations resulted in the drawing up a paper by myself, which was headed by Mr. Perry, and followed by Dr. Benjamin Parker, † Capt.

* JEREMIAH SPOFFORD, son of Jeremiah and Temperance Spofford, was born at New Rowley [Georgetown] Dec. 8, 1787; married, Oct. 14, 1813, Mary Ayer, daughter of Deacon Eleazer and Mary [Flint] Spofford, of Jaffrey, N. H. First settled in Hampstead in 1813, a physician, and removed in 1817 to East Bradford, now Groveland, where he now resides, having continued in the practice of his profession fifty-five years. Author of a Gazetteer of Massachusetts, "Reminiscences of Seventy Years," a Spofford Genealogy, etc.

† BENJAMIN PARKER, son of Bradstreet and Rebecca [Balch] Parker, was born at Bradford [Groveland], Nov. 11, 1759; graduated at Harvard College in 1782; Dartmouth in 1812 conferred upon him the honorary degree of M. D. He practised medicine in Virginia about twenty years and returned to his native town in 1809, where he resided until his death, which occurred May 12, 1845. Married Hannah Moulton of Hampstead, N. H., in 1816; three sons.

George Savary,* Moses Parker, Esq., † William Greenough ‡ and others, promising to pay certain proportions or shares, in the erection of a building for academy purposes.

The building was raised July 4, 1821, was finished and occupied for a school in November of the same year, consisting of about twenty-five scholars, male and female, mostly, but not wholly, of this place.

Mr. Stephen Morse, § a native of the town and graduate at Dartmouth, was the first teacher, with a female department during the two summer terms, first taught a few weeks by Miss Harriet Wood, || but most of the time of those and the two succeeding summer terms of the next year by Miss Mary Frothingham ¶ of Newburyport, afterwards the wife of Rev. William Withington.

The school was no sooner in operation than application was made to the legislature for an act of incorporation, which was obtained, incorporating Rev. Gardner B. Perry, Dr. Benjamin Parker, William Greenough, Esq., Dr.

* Capt. GEORGE SAVARY, son of Major Thomas and Polly [Rollins] Savary, was born January 30, 1793, at Bradford [Groveland]. A boot and shoe manufacturer and trader; representative and senator of Massachusetts legislature. Married Louisa, dau. of Benjamin Balch of Salem. Died at Groveland, March 28, 1854.

† MOSES PARKER (son of Bradstreet and Rebecca [Balch] Parker) was born April 20, 1756. Trader and ingenious mechanic; did much for the academy and town. Died July 9, 1837.

‡ WILLIAM GREENOUGH, son of William; a trader and farmer; representative of Massachusetts legislature; born at Bradford [Groveland] Oct. 25, 1763; married Abigail Parker (sister of Benjamin Parker); died Oct. 7, 1851.

§ Rev. STEPHEN MORSE, son of Deacon Thomas and Rebecca [Cole] Morse, was born at Bradford [Groveland], Feb. 24, 1794; graduated at Dartmouth College, 1821; at Andover Theological Seminary, one year; married Martha, daughter of Dr. Jona. Kittredge of Salisbury; settled in the ministry at Merrimac and Troy, N. H., Biddeford, Me. and at Post Mills, Vt. In 1847, on account of ill health, retired to Thetford, Vt., where he died May 22, 1855.

|| HARRIET WOOD, daughter of Abner Wood of Newburyport.

¶ MARY FROTHINGHAM of Newburyport; a successful teacher; married Rev. William Withington, an Episcopal minister of Dorchester; died young.

Jeremiah Spofford, Ebenezer Rollins,* Phinehas Parker, † Capt. George Savary, and Capt. Samuel Tenney. ‡ Rev. Elijah Demond § was named in the act, but declined the trust. Mr. Stephen Parker || was elected trustee in 1824. Dr. Perry was president of the board thirty-five years, till his death; Dr. Spofford was secretary about twenty years, and president after Mr. Perry. Capt. Benjamin Parker, ¶ elected trustee, was secretary and treasurer nearly thirty years.

The school did not entirely sustain itself, in its early years, but all deficiency was made up by an annual assessment upon the trustees, resident in town, and on one occasion one hundred and forty dollars were paid, at an evening session, to square accounts, by a voluntary contribution by them alone.

Rev. David L. Nichols** was preceptor about two years. His health failing, Mr. John C. March, afterwards

* EBENEZER ROLLINS, son of Eliphalet and Patty [Sargent] Rollins; merchant in Boston.

† PHINEHAS PARKER, son of William and Hannah [Hardy] Parker; born at Bradford [Groveland] Dec. 3, 1783. In early life went into business in Boston; in 1827 retired and removed to Newburyport, and died at that place Oct. 7, 1850.

‡ Capt. SAMUEL TENNEY, son of Solomon and Betsey [Savary] Tenney, born Feb. 21, 1764; died April, 1828.

§ Rev. ELIJAH DEMOND, son of Israel Howe and Hannah [Henry] Demond, born at Rutland, Mass., Nov. 1, 1790; graduated at Dartmouth College in 1816; studied at Andover Theological Seminary; settled in the ministry at West Newbury, Lincoln and Princeton; married Lucy, daughter of Aaron Brown of Groton and has resided at Westborough, Mass.

|| STEPHEN PARKER, son of Daniel and Abigail [Bailey] Parker, born Nov. 11, 1783; married Mehitable, daughter of Wm. Palmer; a boot and shoe manufacturer and trader; representative of Massachusetts legislature; died Aug., 1861.

¶ Capt. BENJAMIN PARKER, son of Stephen Parker; trader fifty years; married Anne, daughter of Barker Lapham.

** Rev. DAVID LOWELL NICHOLS, son of Stephen and Martha [Robinson] Nichols, born at Amesbury, Mass., Apr. 12, 1794; graduated at Dartmouth College in 1816; teacher at Richmond, Va., Groveland and other places; studied divinity and was ordained but never settled on account of ill health; died at Kingston, April 22, 1829.

Rev. John C. March* of Belleville, succeeded in 1825, during one year. Dr. Alonzo Chapin, † afterwards missionary at the Sandwich Islands, and now physician at Winchester, Mass., taught one year. John Tenney, Esq., ‡ afterwards an attorney at Methuen, taught one term.

Mr. Sylvanus Morse, A. B., of West Boylston, commenced his valuable service in November, 1827, and sustained the school upon its own resources till April, 1844, seventeen years. Mr. Morse's long term was a great benefit to this institution and to the town, nearly all the children of the founders of the institution, and almost a whole generation of the young people of the town passed more or less time under his tuition, and were influenced by his wise instruction and gentle manners. Nor was the time passed here less pleasant to himself—his attachments were strong. It was his misfortune to lay his first-born son in our cemetery, and by their preference and direction, the earthly remains of himself and his amiable wife have been recently brought from a distant residence to rest by his side.

Mr. Benjamin Greenleaf, § many years preceptor of

* Rev. JOHN CHARLES MARCH, born at Newburyport, Oct. 9, 1805; graduated at Yale College, 1825; settled over the Second Church in Newbury [Belleville Parish]; March, 1832, and continued as the pastor until his decease in September, 1846.

† Dr. ALONZO CHAPIN, a student of medicine; for several years a missionary at the Sandwich Islands; now physician at Winchester, Mass.

‡ JOHN TENNEY, son of Shubael and Mary [Jameson] Tenney, born at Dunstable, Sept. 12, 1799; graduated at Dartmouth College, 1824; counsellor at law in Methuen; senator in Massachusetts legislature and executive councillor; married first, Mary Augusta, daughter of Bailey Bartlett of Haverhill; second, Augusta, daughter of Joseph and Lucy [Osgood] Sprague of Salem; died April 9, 1853.

§ BENJAMIN GREENLEAF, son of Caleb and Susannah [Emerson] Greenleaf, born in the West Parish of Haverhill, Sept. 25, 1786; graduated at Dartmouth College, 1813. He resided at Bradford and was for many years a successful teacher and author of a series of arithmetics which for many years were largely introduced into the schools of New England and other states. He represented Bradford in the Massachusetts legislature in 1837, 1838 and 1839. He married Lucretia, daughter of Col. James Kimball of Bradford. He died Oct. 29, 1864.

Bradford Academy, kept one term, during the sickness of Mr. Morse, with much approbation.

Mr. Rufus C. Hardy,* a graduate of Dartmouth, sustained a useful and reputable school here from April, 1848, to 1860, upon the tuition received, which tuition was from three to five dollars a term, of three to four months, or less than twelve dollars a year, a small expense compared with the extra expense of board and travel, in supporting scholars at the distant schools, for which the public money is expended; in addition to losing the privilege of parental superintendence of children at home.

Miss Mary S. Frothingham, before named, Miss Sophia Perry, † sister of Rev. Dr. Perry, Miss Judith D. Peabody, ‡ sister of the London banker, and Miss Hannah Parish, § daughter of Rev. Dr. Parish, were successively and successfully employed in a separate female department till February, 1829, when, by vote of the trustees, a separate female department was discontinued. The town was much indebted to Mr. Hardy, and his sister, Miss Emeline Hardy, || now deceased, for sustaining a highly useful school here for more than ten years.

During the successful operation of this academy it sent forth more than one thousand pupils, and we could often

*RUFUS CHANDLER HARDY, son of Phineas and Olive [Parker] Hardy, born at Bradford [Groveland] Feb. 18, 1814; graduated at Dartmouth College, 1842. He commenced teaching in the academy in 1848, and continued with success for ten years, living at the old homestead.

† SOPHIA PERRY, sister of Rev. Dr. Perry of Groveland.

‡ JUDITH DODGE PEABODY, daughter of Thomas and Judith [Dodge] Peabody, of Haverhill and Danvers, a sister of George Peabody, the distinguished London banker; born April 5, 1799; married, first, Jeremiah Russell of Georgetown, and second, Robert S. Daniels of Danvers; resides in Georgetown.

§ Miss HANNAH PARISH, dau. of Rev. Dr. A. Parish of Newbury.

|| OLIVE EMELINE HARDY, a sister of Rufus C. Hardy, was a graduate of and an assistant in the academy two years and teacher in the town schools nearly twenty years; died in 1871, aged 51.

count ten to thirteen of its graduates, natives of the town, in business as successful teachers, in this and the neighboring towns;* with a corresponding elevation of the habits and manners of the population. Now, with an amount spent for town schools fourfold what it then cost for them and the academy, in the vain attempt to make learned gentlemen and ladies of the whole community, we hear of no teachers from our town schools, and have a deterioration in our manners and morals which I have no disposition to portray.

The academy stood, and was useful for short terms of schooling and social purposes, till September, 1870, when it was destroyed by fire.

To the speaker, who then stood and now stands alone of the original board of trustees, and who had in younger life expended his utmost energies for its erection and support, and experienced and witnessed its usefulness, this was a sad and sickening sight.

Capt. Benjamin Parker was early elected a trustee, and in 1827 secretary and treasurer, and though an octogenarian like myself, and confined by sickness, has, by his counsel and his vote, rendered essential aid in the re-occupation of this spot, so dear to the memory of a thousand of its alumni and their friends, with a building, larger than its predecessor, in which we have the pleasure of meeting you this day, for scientific purposes, instead of the solitary visit of some of you, who may remember its schools, its lectures, its exhibitions, and its

*In this connection mention may be made of the valuable services of Miss Apphia Spofford, a teacher for fourteen years, and Miss Sarah Tenney, a teacher for twenty years in the public schools of this and other towns. The first is sister of Dr. Jeremiah Spofford, born July 1, 1796; married Amos J. Tenney, Esq., of Georgetown; at that town she now resides, his widow. The second is daughter of William and Abigail [Jaques] Tenney, and is now a much respected inhabitant of this town.

flower garden, to cast a melancholy look over its dust and ruins.

Our pupils, having been largely of the class who had talents and energy to educate themselves, have given a high average, and we have known of no failure, among the large number who have gone forth to honorable stations, in all the professions; and we have yet to learn if the high schools, which are supported by taxation, in all the large towns, with a view to giving a scientific and classical education to the whole population, are furnishing us as many, or as talented teachers as flowed out spontaneously from the four thousand pupils of our seventy academies, without cost to anybody but themselves, twenty years ago. Our self-made men have always held honorable competition with the sons of affluence, or the protégés of the State; and it is yet doubtful whether academies, accessible to all who had taste and talent, to work their own way to learning and business, were not better than high schools for a whole population, upon free cost, and half a dozen schools, remote from a great part of the state, furnished with palatial buildings, and all the modern conveniences that a state's wealth can purchase!

Mr. JAMES H. EMERTON of Salem, mentioned several cases of protective colors and habits in spiders which he had seen in the grove during the morning walk.

The common *Epeira caudata* of Hentz, covers the remains of its prey and other rubbish with loose silk and arranges them in a line across the web, with room enough at the centre for the spider, who draws her feet close to her body, showing only the brown and gray abdomen, which can hardly be distinguished from the dirt around it.

A specimen of *Attus* was caught on dried oak leaves, in the woods, colored almost the same shade of brown,

mixed with black ; which, when it was still, could hardly be found among the leaves.

Another curious spider, of which three specimens were found, had the abdomen prolonged beyond the spinnerets, much as in *E. caudata*. Its color was brownish-yellow, with darker marks, like dried grass, and it hung in the web with its legs laid close together, and bent in front of the head, looking like a bit of straw accidentally dropped in the web.

Messrs. ABNER S. PHIPPS, the agent of the State Board of Education, and D. B. HAGAR, principal of the State Normal School in Salem, being invited, made short addresses upon the utility of a knowledge of the natural sciences, combining in good proportions wit and wisdom.

Rev. S. C. BEANE of Salem spoke of the system of compulsory education as sometimes not effecting its object if there were wanting in the towns a disposition to carry out the spirit of the law, and mentioned some of the advantages that accrued from the academies which were in a flourishing condition some years since, and were located in many of our rural towns.

Rev. E. C. BOLLES of Salem described the various mosses that were noticed in the rambles, illustrating the subject on the blackboard, as had also Messrs. Morse and Emerton. Mr. Bolles was quite eloquent in showing the perfection of nature in all her works, manifesting the absolute perfection of the Creator in all his attributes.

Mr. LA ROY F. GRIFFIN, principal of the Phillips Academy, Andover, spoke of the interest he had long felt in the Institute, dating back to the time when he was

at Beverly, and expressing high appreciation of the influence of the Institute in the cause of popular education. He exhibited a specimen of coral which he had picked up in Beverly. The chair suggested that it was probably found near the site of an old lime kiln, similar specimens having been found in like places in Salem. The coral was probably brought from the West Indies by the traders on the return trips and was burnt with shells and other materials containing lime collected on the beaches and elsewhere for the lime that was used for building purposes during the provincial period.

Mr. GOLDSMITH, principal of the Andover High School, followed with a few words expressive of the importance he attached to such organizations in the interests of useful knowledge.

Mr. C. H. WEBBER, after a few preliminary remarks, offered the following resolution, which was unanimously adopted.

Resolved, That the thanks of the Essex Institute are due and are hereby tendered to Dr. Jeremiah Spofford, Dr. Morris Spofford, Rev. John C. Paine, Messrs. Chas. Stickney, D. H. Stickney, Eldred S. Parker, George P. Carlton, O. B. Merrill, B. E. Merrill, Frank Savary, Charles Drew, N. Hopkinson Griffith, Jos. H. Hopkinson of the Dewhirst line of Haverhill & Groveland Omnibuses, Mrs. Martha W. Parker, Mrs. Moses P. Atwood, Miss A. T. Spofford, and all others who have been active in making our visit to-day so pleasant and profitable.

Dr. SPOFFORD and Rev. Mr. PAINE of Groveland responded, saying that they were grateful to the party for the visit, and trusting that it might serve to awaken and perpetuate in their locality a deeper love for natural history and scientific attainment.

The visitors took the return train at 5.08, entirely escaping the drenching rain which soon commenced falling, and which fortunately ceased before their arrival at Danvers. While awaiting the Lawrence train for Salem, a beautiful rainbow appeared in the eastern heavens, awakening those hopeful emotions always inspired by the bow of promise.



THE FIRST WHITE HAMBURG, AND THE FIRST MUSCAT OF ALEXANDRIA GRAPE-VINE IMPORTED INTO THE UNITED STATES.—

COMMUNICATED BY JONES VERY.

In the year 1822, Capt. Jones Very, of Salem, brought to Boston from Malaga in the Barque Aurelia, with a cargo of fruit and wine, two grape-vines; a White Hamburg, and a Muscat of Alexandria, or Royal Muscadine. These were then about two inches round, and were rooted in two large green earthen vases. It was his intention to keep them; but finding it inconvenient, he sold them to a neighbor, Mr. William Dean, living on the opposite side of the street (Essex St., opposite Buffum's Corner), who had just built a greenhouse. Under his care they grew, and have been very productive ever since. The last year 1871, the grapes were very abundant and large. The White Hamburg is now, 1872, fourteen inches round about two and a half feet from the ground, where it divides into two branches, each seven inches round. The Muscat is seven inches round about two and a half feet from the ground, where it branches. These two vines, as I have been informed by J. F. Allen, Esq., are the parent vines of all of these two kinds in this country, being the first imported into the United States. The estate of Mr. Dean is now owned by Mr. George W. Varney.

FIELD MEETING AT ANNISQUAM, THURSDAY,
AUGUST 8, 1872.

A PLEASANT, warm summer's day, so congenial and appropriate for a visit to the seashore, where can be enjoyed the cool and refreshing breezes of the ocean, induced many to accompany the Institute on this excursion to the rock-bound coast of Cape Ann. After a pleasant ride in the cars to the Gloucester station, and thence by carriage some four or five miles, the party arrived at the place of meeting in Annisquam, a parish of Gloucester on the north side of the Cape.

The latter portion of the trip was exceedingly interesting and attractive, passing over a road abounding in rich and varied scenery and in many places highly picturesque; huge masses of rock, with small patches of green verdure interspersed, were conspicuous; the little brown, weather-stained, moss-covered cottages, that thirty years ago were marked features in the landscape, are giving place to a more substantial and commodious class of structures with all the appendages of the new and improved residences; thus indicating that the inhabitants are prosperous and turning their attention to a less precarious employment. From an early period the fisheries have been carried on with varied success at several points on the Cape, around which have clustered villages of considerable extent; although in this section the business has declined, yet the increased attention in others, especially at the "Harbor," has made Gloucester the most important fishing place on the continent.

The introduction of the stone business, which commenced at Pigeon Cove in 1824, and has, in a great degree, superseded the fisheries, effected this change and has

largely contributed to the wealth and prosperity of this people. Many companies have been formed, and from Sandy Bay to Annisquam, a distance of six miles, huge derricks thickly stud the landscape, and the sharp click of the drill hammer has become a familiar sound. The attention of the summer tourist to the seashore has had a corresponding influence in this direction. Many of the retired and secluded spots on the shores of this county have been appropriated for private residences, and others are gradually being taken up for similar purposes. In this immediate neighborhood the stone mansion of Gen. B. F. Butler at Bay View is conspicuous. Many summer visitors were in this place to pass the hot term—they come literally in swarms, not only from the inland cities and towns of New England, but from New York, the West, and a few from the South. Many of the families camp out by the shore in tents, while others are beginning to have their "cottage by the sea." The natural curiosities of this place, the woodland attractions, the rides, embracing some of the grandest sea views in the world, the shores generally high and bold, with fine beaches in many places, the bracing and invigorating air—these combined make this place a very desirable resort, in the summer season, to the invalid, the tourist and the pleasure seeker; at other seasons to the sportsman for its sea fowl, gunning and fishing; and at all times to the naturalist for its marine fauna and flora, its peculiar geological formation and fine minerals found in the seams exposed during the process of quarrying.

Mechanic's Hall, at Squam Point, was the place of rendezvous for the day, where, on arrival, an informal meeting was held, a cordial welcome extended, and arrangements made for the various excursions. Some rambled over the hills and on the shore, as inclination dictated; some

enjoyed a pleasant sail in the harbor (several boats near by were made available and brought into requisition); others crossed over to Coffin's beach and farm on the West Gloucester side to visit the beach and the rocky cliffs upon which the sand had been blown and had given them, at a little distance, the appearance of sand hills, and also to look for Indian shell heaps, usually found in similar localities. In former times this opposite shore was a mass of dense woods; but they have been cleared away and these sand heaps now give a variety to what was formerly hills of grass and other vegetation. The views from the high lands were very extensive and very enjoyable; Coffin's Beach, Castle Neck and Plum Island, at the head of Ipswich Bay, were seen stretching away to the northwest, but owing to a haze in the horizon Agamenticus and the Isles of Shoals, which are usually visible from Lookout Hill, could not be seen. There is also a curious trap dyke leading from one of the camping houses and within a few minutes walk of the place of rendezvous.

A little past noon the various parties began to reassemble in the hall to partake of their lunch, the people of the village having kindly provided a bountiful supply of tea and coffee, and extended other civilities, which were gratefully received; afterwards adjourned to the Universalist Church at the head of the Cove, where the public meeting was held, commencing at 2 P. M.

(To be continued).

BULLETIN

OF THE

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FIELD MEETING AT ANNISQUAM, THURSDAY,
AUGUST 8, 1872.

[Continued.]

THE PRESIDENT in the chair. Records of preceding meeting read.

THE PRESIDENT in his opening remarks alluded briefly to the objects of the Institute, the origin of the field meetings, the opportunity offered thereby to gather information, from every part of the county, of historical and scientific value, and also to awaken an interest for these pursuits in the several places visited. He mentioned that two meetings the present season had previously been held: one at Middleton, an inland town diversified with hills and dales, with many by-paths skirted with shrubbery and flowering plants, with pleasant ponds and running streams; on the shores of one of these ponds known as Forest Lake was the rendezvous for the day; the other at Groveland, on the banks of the Merrimac, with the

beautiful grove on the river banks, hence its name, and fine views from the several eminences in the centre of the town. He said that this day they had come to the seashore, the rock-bound coast, lashed in the wintry months with the tempestuous waves, and that in the summer the calm and placid waters, the cool and refreshing breezes rendered it a most delightful retreat; that here another field was opened for their inspection, the marine fauna and flora, and the peculiar geological formation of this part of the coast.

The speaker reminded them that they had come to a new place, not newly settled but new to most of them, and in common with the members of the Institute he had found much enjoyment in visiting these new scenes and attractions.

Mr. F. W. PUTNAM of Salem was called upon and made some interesting remarks founded on two specimens which he had collected during his rambles in the forenoon.

INDIAN SHELL HEAPS.

He said that he had taken a boat and visited Coffin's beach and the sand hills adjacent, with the hope of discovering some of the Indian shell heaps which are frequently found along the New England coast, often buried beneath the sand drifts, and uncovered at other times by the shifting of the sand. He had found but one such at Coffin's farm as the excessive heat prevented him from continuing his search. From this one he had obtained a small-piece of Indian pottery, which was passed round and exhibited to the audience. He said this was a piece of an ornamented pot, as was shown by the groove across it, and from the curvature of the piece it must have been a part of a small vessel. Some of these pots were

eighteen inches in diameter, and others quite small. The Indian pottery was composed of clay and pounded clam shells, and dried in the sun at first, though afterwards, as they were used for cooking purposes, they had the appearance of having been baked. These shell heaps also contained axes, gouges, arrow-heads and other stone implements, and particularly interesting was a kind of fish spear made of bone. There was also found a kind of awl made of bone, finely pointed and used by the Indians for making holes in skins, etc. By an examination of the kitchen refuse heaps of the Indians, it could be determined pretty accurately the kinds of animal food that were used by them. Bones of the deer, moose, and the other animals once common to this part of the country, had been found; also the black bear, and in one instance a tooth of a white bear, which indicated that though this animal is an inhabitant of the arctic regions, he might have been occasionally found, in times long past, in these latitudes. In all, the bones of some ten or twelve of the different kinds of mammalia had been found in these refuse heaps. The bones of a bird now extinct, as is believed, the last known specimen having been taken in Greenland, the great auk, had been found. This bird was of a heavy build and incapable of flight. Of the fish, the Indians used all the common kinds here taken, and they also consumed large quantities of the fish known as the wolf fish, devil fish, or monk fish, which we regard as unfit for food. More than two-thirds of the fish bones found in many of these Indian refuse heaps were of this species.

EGG CASE OF THE SKATE.

Another interesting specimen obtained by him was the egg case of one species of the skate. This is found on

our beaches and is supposed by many persons to be a kind of sea plant, being black and of the texture of dried rockweed. In shape it very much resembles a hand barrow and one of its common English names is derived from this resemblance. This case is formed in the oviduct of the fish, and unlike the process in other oviparous animals, where the shell is the last part of the egg produced, this case or shell is in part formed before the egg is deposited in it. The egg, enclosed in the case, is then laid and becomes attached to various substances by means of filaments extending from the projections or tubes of the case. After a while the young skates are hatched, when the empty shell is driven on shore. Many of the skates lay eggs of this character, others are viviparous. The common dog fish, which is a species of shark, is viviparous, and produces five or six young in a perfect state at a time. Some of the larger species of sharks are oviparous, others are viviparous. Mr. Putnam's remarks were listened to with much interest, many of his facts being new to a large portion of the audience.

HISTORICAL NOTICES OF THE THIRD PARISH AT ANNISQUAM.

Rev. E. W. COFFIN, of Orange, Mass., a former pastor of the society at Annisquam for the term of five years, was next called upon to give a short sketch of the history of the society. He said that Mr. Hooper, the present pastor, having been notified that it would be desirable for him to give the meeting some information concerning the rise and progress of the Parish in whose church they were to assemble, and having made arrangements, which he could not change without great inconvenience, to be absent on his summer vacation at the time of holding the meeting, had requested him to supply the desired information. He had, when pastor of the society, prepared and

delivered two discourses on its history, but as he did not have them with him at this time, he could only avail himself of the matter contained in them, as far as his memory could serve him, and he might make some mistakes. This was originally the third Congregational Parish in Gloucester, the one in the harbor being the first, and the one in the West Parish being the second. The first minister settled over the parish was Benjamin Bradstreet, who was settled in 1728, and continued pastor till his death in 1762. He had a numerous family, and one of his daughters married James Day, a resident of this village, and some of their descendants are living in this neighborhood at the present time. From the best information he (Mr. Coffin) could obtain, he believed that the first meeting house, which probably stood near the old burying-ground at Bay View, was burned, and that on the question of building another a division arose as to the location, some of them wishing to rebuild on the old site, and some on the site of the present church, and that at a meeting of the Parish it was decided by a majority to build on the old site, and that the frame of the building was prepared and placed on the spot preparatory to raising it the next day. But when the people came to the raising the next morning they found no frame there, the friends of the present location, having, during the night, removed the whole of the timber to this site. This action settled the question as to location, and the meeting house was built on the place where this church stands, and here it stood till 1830, when it was replaced by this structure. Rev. John Wyeth was the next minister; he was settled in 1766, but remained only two years. The parish could not be called minister worshippers, as might be judged from their peculiar way of hinting to Mr. Wyeth their desire for a change: once a musket ball was fired just

over his head, and his black horse, during one night while in the pasture, changed color by a liberal application of whitewash. The pastor finally took the hint and left, stopping at the top of the hill, and shaking the dust from his feet as a testimony against them. The next minister was Rev. Obadiah Parsons, who was an eloquent man, and his pulpit services were very acceptable. Stories were circulated discreditable to his moral character, however, and he was finally dismissed. It is related that at the council called to consider his case, the principal witness against him was a colored woman, and the question arising whether the testimony of a colored person should be received, it was decided at that early day not to receive the same. The church remained without a pastor until the Rev. Ezra Leonard, who is and ever will be held in high veneration by the people of Squam, was settled in 1804, and remained pastor till his death in 1832. A remarkable change took place during his administration, he publicly embracing the doctrine of Universalism in 1811, carrying the whole society with him, with the exception of four or five families. In announcing this change of views, he preached a Universalist sermon, and told them he believed this doctrine, and must preach it if he preached at all. The parish voted to retain him until his year expired, and in the following March the record says it was voted that "he continue to preach the gospel as usual." Mr. Coffin also gave a short sketch of all the ministers of the parish since the death of Mr. Leonard, but want of space forbids our following his remarks further than giving their names, time of service and brief individual notices.

Rev. Abraham Norwood, one year; Rev. Elbridge Trull, one year; Rev. John Harriman, three years; Rev. Geo. C. Leach, four years; Rev. M. B. Newell, three

years ; Rev. J. A. Bartlett, two years ; Rev. B. H. Clark, one year ; Rev. E. W. Coffin, five years ; Rev. Nath'l Gunnison, three years ; Rev. E. Partridge, two years ; Rev. L. L. Record, three years ; Rev. J. H. Tuller, one year ; Rev. J. H. Willis, two years ; Rev. F. A. Benton, one year ; bringing us down to the present pastor, Rev. Mr. Hooper, who was settled in 1871, and whose temporary absence we regret to-day. The church, as a Universalist body, has had fifteen ministers, of whom only seven survive.

Mr. Norwood has been an able and amiable minister, residing now in Conn. Mr. Trull thought he could do better in furnishing medicine for the *body*, and so engaged in the druggist business. Mr. Harriman left the ministry and engaged in secular pursuits, and has been dead many years. Mr. Leach united with, and is now a member of, the Catholic church. Mr. Newell committed suicide about six years ago, in West Brattleboro', Vt. Mr. Bartlett died a few years ago, having previously retired from the ministry. Mr. Clark changed his views while at Annisquam and never preached afterward. Mr. Coffin has ever been, and is now a Universalist minister of the conservative type, and is now settled in Orange, Mass. Mr. Gunnison one of our most able and excellent ministers, died two years ago, in Maine, of paralysis. Mr. Partridge is yet alive, "hale and hearty," although "the almond tree flourishes" to a perfect whiteness. Mr. Record, a most excellent man and minister, left for the higher life two years ago. Mr. Tuller is yet living in one of the western states. Mr. Willis is now settled in North Orange, Mass. Mr. Benton was a young man of brilliant talents and a very good man, but too radical to suit a majority of the parish at Annisquam. He is now preaching to a radical society in the west.

ALLEN W. DODGE, Esq., of Hamilton, was the next speaker. He said he had been introduced as the County Treasurer, but he did not think that circumstance would add much to the interest of his speech. He said if any one had a draft on him in his official capacity, he would pay it at sight, but as to any scientific drafts, he should require several days' grace on them. He said the world regarded the acquisition of wealth as the only true success, but he thought that the young men of this Institute who had been sitting at the gates of the temple of nature, and knocked till they had obtained an answer, and had then given the knowledge thus obtained to the world had attained a higher success. Mr. Dodge's remarks were highly entertaining and valuable, and we regret that space will not permit a more extended abstract of the same.

Rev. L. J. LIVERMORE of Cambridge, at present supplying the Unitarian pulpit in Danvers, expressed his appreciation of such organizations as the Essex Institute.

Hon. JAMES DAVIS, the Trial Justice of Gloucester, claimed to be a Squamer, and as such he had a right to welcome the excursionists to-day, which he proceeded to express in most cordial language.

Hon. J. J. BABSON, of Gloucester, being called upon, gave an interesting

HISTORICAL SKETCH OF ANNISQUAM.

MR. PRESIDENT:—In response to the call upon me for some historical incidents connected with the spot upon which we are assembled, I have merely to observe that such of these incidents as are of general interest are very few. Famous Capt. John Smith, you all know, made the

first exploration of the coast of New England, from Penobscot Bay to Cape Cod, in 1614. Within these limits, according to his own account, he "sounded about twenty-five excellent, good harbors," but whether the one some of you have sailed upon to-day was included in the number or not, no one can tell. From the hills you have looked out upon "Augoam" and the great bay "north of the fair headland Tragabigzanda." We must rejoice that this name, notwithstanding the romantic interest connected with it, was soon changed for that of Ann, queen of James I. The name Squam is an Indian word, first occurring in print, so far as I know, in William Wood's map of Massachusetts, drawn in 1633, where it is spelled Wonasquam. It also occurs in Winthrop's Journal, under the year 1635; and at a little later date in Josselyn's "Account of Two Voyages to New England." He spells it Wonasquam, and calls it "a dangerous place to sail by in stormie weather, by reason of the many rocks and foaming breakers."

The scenic features of this locality are very noticeable; and, considering the rugged character of its surface, it is hardly surprising that eighty-six years elapsed after the incorporation of the town before a sufficient number of inhabitants were found on it to set up a distinct parish organization. Of this, and its ministers, Mr. Coffin, one of the number, has just given us an interesting account. He might, if time had permitted, have enlarged much upon the ministry of Rev. Ezra Leonard. I look upon the conversion of this pastor and his people from the ancient faith of the New England churches to the doctrine of universal salvation as one of the most remarkable events in the history of the town. Here is a minister, a graduate of Brown University, educated in the strictest doctrines of Calvinism, and settled over a church which

has for many years listened to him as the expounder and advocate of these doctrines, who announces to his people that a great change in his religious belief has taken place, and that he must, if not there, elsewhere, henceforth preach a doctrine he has all his life been laboring to destroy; and these people, after serious deliberation, conclude that it is better to change their religion than to change their minister. This action was a striking testimonial to the superiority of christian character over sectarian profession, and the result of it was an abundant harvest of religious harmony and joy throughout the twenty years of his continued ministry. The memories of these people are even now, forty years after his death, full of the kind words and good deeds of this honored and beloved pastor. The description of the good minister in Goldsmith's "Deserted Village" will apply to him. "E'en his failings leaned to virtue's side;" so, at least, must have thought the poor, ill-shod woman whom he met in the road as he was walking home one wintry day, and to whom he gave the pair of shoes, which, to supply an urgent need of his wife, he had been to the harbor to buy.

REV. C. E. BARNES of Salem felt a deep interest in the study of nature. He believed that the more we knew of nature, the more plainly should we perceive that the God of creation was the God of revelation.

DR. ADDISON DAVIS of Boston, a Squam boy, spoke most eloquently of the swarm of B's abounding here: beauties, beaches, berries, belles, etc. He was glad that the Institute had come here, for he knew that they would come again. Men who study do know something better in quality and quantity than those who do not, and they increase the sum of human happiness.

The LIBRARIAN announced the following additions :—

By Donation.

- ABBOTT, C. C., of Trenton, N. J. Official Register of the Officers and Men of New Jersey in the Revolutionary War. 1 vol. 8vo. Trenton, N. J. 1872.
- CATE, S. M. The Pellet, a paper at the Homœopathic Fair, Boston, April, 1872.
- FOOTE, CALEB. Files of several County papers, May, June, July, 1872.
- GREEN, S. A., of Boston. Fourth Annual Report of the Trustees of the Boston City Hospital. 1 vol. 8vo. Boston, 1868. Miscellaneous pamphlets, 47.
- GRIFFIN, LA ROY, of Andover. Catalogue of Phillips Academy, 1871-2.
- HAYDEN, F. V. U. S. Geological Survey of the Territories. Profiles, Sketches, etc. 1 vol. 4to. New York, 1872.
- PEABODY ACADEMY OF SCIENCE, Salem. Memoirs. Vol. i, No. 3.
- POORE, B. PERLEY, of Bransby, near Lincoln, Eng. U. S. Official Register, 1871. 1 vol. 8vo. Post Office Directory, 1 vol. 8vo. Washington and Georgetown Directories for 1868, 1869, 1870. 3 vols. 8vo.
- SALEM NATIONAL BANK. Boston Daily Advertiser, 1871, 1872.
- SALEM MARINE INSURANCE COMPANY. New York Commercial Advertiser, 1858, 1859, 1860, 3 vols. folio. New York Daily Advertiser, 1861, 1 vol. folio. New York Shipping List, 1857-8, 1858-9, 1860, 1861, 4 vols. folio. Boston Daily Advertiser, 1854, 1857, 1858, 1860, 1861, 5 vols. folio.
- SPENCER, THOMAS, of Bransby, near Lincoln, Eng. Doomsday Book Translation by Chas. G. Smith, 1 vol. 8vo. Battle of Agincourt, 1 vol. 8vo. London, 1833.
- SPOFFORD, DR., of Groveland. Genealogy of the Spofford Family, 1 vol. 12mo.

By Exchange.

- AMERICAN ACADEMY OF ARTS AND SCIENCES, Memoirs of. Vol. x, Pt. I, 1868. Proceedings of, sigs. 38-51 of Vol. viii. 1870.
- ARCHIV FÜR ANTHROPOLOGIE. Bd. v, Heft II, 1872. 4to pamph.
- BIBLIOTHEQUE UNIVERSELLE ET REVUE SUISSE. Archives des Sciences Physiques et Naturelles. Nos. 169-173, 1872. 5 pamphlets, 8vo.
- CANADIAN INSTITUTE, of Toronto. The Canadian Journal of Science, Literature and History, Vol. xiii, No. 4. July, 1872.
- GESELLSCHAFT NATURFORSCHENDER FREUNDE ZU BERLIN. Sitzungs-Berichte, 1871. 8vo pamph.
- IOWA STATE HISTORICAL SOCIETY. The Annals of Iowa, Apr., 1872. 8vo pamph.
- K. K. ZOOL. BOTAN. GESELLSCHAFT IN WEIN. Verhandlungen, Jahrg., 1871. Bd. xxi. 1 vol. 8vo.
- KONGLIGA SVENSKA VETENSKAPS AKADEMIÉN STOCKHOLM. Oversigt, Bd. xxvi, xxvii, 1869, 1870. Lefnadsteckningar, Bd. i, Hafte II, 1870. Handlingar, Bd. vii, viii, ix, 1868, 1869, 1870.
- L'INSTITUT ROYAL GRAND-DUCAL DE LUXEMBOURG. Publications, Tome xii, 8vo pamph. 1872.
- NATURWISSENSCHAFTLICHER GESELLSCHAFT ISIS IN DRESDEN. Sitzungs-Berichte. Oct., Nov., Dec., 1871. 8vo pamph.
- NEW ENGLAND HISTORIC-GENEALOGICAL SOCIETY. Hist. Gen. Register and Antiquarian Journal, July, 1872. 8vo pamph.
- ROYAL SOCIETY of Tasmania. Monthly Notices of Papers and Proceedings for 1870. 8vo pamph.
- SENCKENBERGISCHE NATURFORSCHENDE GESELLSCHAFT IN FRANKFURT. Abhandlungen, Bd. viii, Pt. I, II. 4to pamph. Bericht, 1870, 1871. 8vo pamph.

SOCIÉTÉ D'ACCLIMATATION. Bulletin, Mensuel, 2me Serie, Tome ix, 1872.

VEREIN ZUR BEFÖRDERUNG DES GARTENBAUES IN BERLIN. Wochenschrift, Jahrg, xiv. Numbers 1-52. 1871.

ZEITSCHRIFT FÜR DIE GESAMMTEN NATURWISSENSCHAFTEN IN BERLIN. Bd. iv, July-Dec., 1871. 6 pamphlets. 8vo.

PUBLISHERS. American Naturalist. Christian World. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Land and Water. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Sailors' Magazine and Seamen's Friend. Salem Observer.

The SECRETARY announced the following correspondence :—

J. W. Balch, Boston, July 31; J. Prescott, Boston, July 30; Boston Public Library, July 22; Bowdoin College, Trustees, Aug. 5; Buffalo Historical Society, July 22, Aug. 2; Frankfort-a-M., Die Senkenbergische Naturforschende Gesellschaft, Mar. 19; London Royal Society, July 1; Maine Historical Society, Aug. 5; Maryland Historical Society, July 23; New England Historic-Genealogical Society, Aug. 5; New York Historical Society, July 19, 22, Aug. 3; Ohio Historical and Philosophical Society, July 30; Rhode Island Historical Society, Aug. 1; Stockholm, L. Academie Royale Suedoise des Sciences, Avril, Mai 8.

The PRESIDENT read the following letters from Messrs. Thomas Spencer and E. W. Farley, which were addressed to him and had recently been received.

BRANSBY, NEAR LINCOLN, 10th 7th mo., 1872.

DEAR SIR:—I have this day forwarded, by son Franklin who sails from Liverpool in the "Spain" for New York, a partial translation of Doomsday book and hope that it may be accepted as a small contribution to the historical department of the Institute. I am prompted to do so by the fact that on one of my voyages from Salem to the old country, some Salem gentlemen requested me to hunt up a full translation of the original Doomsday. This commission I could not execute and I am not now aware that such a translation is extant. With this volume there is a map of England which exhibits a picture of the country very much as the Pilgrim fathers left it behind them.

I have forwarded by the same conveyance History of the "Battle of Agincourt" because it contains the Roll Call of the principal English gentry, the class who followed our fifth Henry in his famous expedition. I remember on one occasion hearing the Rev. Mr. Withington of Newbury quote from this Roll Call to prove from the similarity of names that the principal part of the early settlers of New England were from the same class. This little reminiscence prompted me to send the History. It is not a readable book any more than Doomsday,

but it may have an interest for the archæologist and, peradventure, a place in the historical department. It is a cherished doctrine of mine that the history of old England and New England are identical up to the great Revolution.

I beg to acknowledge the receipt of books and papers relating to the antiquities of Salem and its vicinity, together with some that exhibit a pleasant picture of the happy life of the good people of the good old town. Long may they continue to enjoy their happiness. I remember with affectionate gratitude their kindness to me and mine when we were poor and strangers among them. Believe me, dear Dr. Wheatland, thy sincere friend and humble coadjutor,

THOMAS SPENCER.

NEW CASTLE, MAINE, JULY 29, 1872.

DEAR SIR:—During my pleasant call at the rooms of the Institute, at Plummer Hall, in October last, in company with my friend, Cyrus Woodman, Esq., of Cambridge, I promised to send you a history of the oak arm-chair, which I saw there, which was presented to the Essex Historical Society, June 27, 1821, by the late Robert Brookhouse, Esq., of Salem.

This I should have done long since, had I not been waiting to make a fit disposition of another chair, the mate of yours, at that time in my possession and which has a history similar to yours, down to the time the latter went into the possession of Mr. Brookhouse.

I have given mine to Bowdoin College, for a Commencement Chair, with a plate added, suitably inscribed. As my letter to President Chamberlain, of that Institution, embraces all that is of interest connected with both chairs, including a chest and a tape loom, all of which comprised a set of four pieces of furniture, formerly belonging to the Dennis family, of Ipswich, in your county, I send you by this mail, a copy of the Brunswick Telegraph, of July 26th inst. containing the letter, and it is unnecessary for me to add any thing farther to the subject of this communication.

Yours very respectfully,

E. W. FARLEY.

The following extract from the letter of Mr. Farley to President Chamberlain was then read.

Its history is this: it was brought from England, probably in 1635, when Daniel and Thomas Dennis, the first emigrants, so far as I can discover, of the Dennis family of Ipswich, Essex County, Mass., came over. This chair, with its mate, similar in style, though a size smaller

(from which circumstance, I infer that it was for the matron of the house), an oaken chest, about 2 feet 6 inches in length, by 1 foot 6 inches in width, with legs, and a lid, its sides carved like the chair, and a small tape loom, such as the ladies of the olden time used to manufacture their garter stuff, comprised a set of four pieces of furniture, which my paternal grandmother, Sarah Dennis, wife of John Farley, both of said Ipswich, brought to this town, to which they removed in 1772 or 1773. Its mate, through Robert Brookhouse, of Salem, Mass., who married a daughter of my grandfather Farley, found its way back to Essex County, and was presented by him to the Essex Historical Society (since merged in the Essex Institute), on the day of its organization, June 27, 1821, and was occupied by the venerable Dr. Holyoke, its first President. It is now at the rooms of the Institute, at Plummer Hall, in Salem. Some years afterwards, the chest went into the possession of Mr. Brookhouse, and is now in the possession of his daughter (by a second wife), Mrs. Perkins, wife of Judge Perkins, of Salem. The tape loom has been lost, or destroyed.

That chest bears the date of 1630. David Dennis, a brother of my grandmother, Sarah Dennis, aforesaid, who died at Nobleboro', in this State, in October, 1843, aged 92, told me a few months prior to his decease, that these pieces of furniture were then more than 200 years old. His statement, taken in connection with the date upon the chest, establishes, I think, beyond reasonable cavil, the age of the chair.

Mr. R. KNOWLAND of Marblehead, after a few preliminary remarks, offered a resolution of thanks to the proprietors of the church, to Messrs. James S. Jewett, George Norwood, Josiah Friend, John D. Davis, Elias Davis, Jr., A. F. Bragdon, W. E. Dennis, John A. Going, James A. Dennison, Fred. Davis, Fred. W. Lane, James Davis, E. W. Coffin, and all others who had been active in their attentions, during this pleasant visit to Annisquam. The resolution was unanimously adopted.

The meeting closed at 4 o'clock and the party was conveyed from the church to the railroad station in carriages in waiting and departed highly pleased with their excursion, both as to the kind reception by the people of the village and the beautiful scenery and views presented on every hand.

CATALOGUE OF THE MAMMALS OF FLORIDA, WITH NOTES ON
THEIR HABITS, DISTRIBUTION, ETC.—BY C. J. MAYNARD.

INTRODUCTION.

THE following paper is the result of notes taken during three winters' travel in Florida. These journeys were undertaken mainly for the purpose of studying the habits of the birds found in this region, but considerable attention was also paid to the mammals. The first trip was made during the winter of 1868-69, when the country about the lower St. John's, Lake Harney, and the eastern coast, north of Cape Canaveral, was explored. At this time I was accompanied by Messrs. C. A. Thurston and J. F. LeBaron, who served as assistants. The second journey was accomplished during the season of 1870-71. Then the country on the western coast about Cedar Keys, and the southern portion of Florida, including the Keys and Everglades, were visited. I was assisted in my researches by Mr. H. W. Henshaw, and accompanied by my artist friend, Mr. E. L. Weeks.

The ensuing winter (1871-72) found me once more on the St. John's River. The country along this river was explored as far as South Lake; then we visited Indian River and examined the coast as far as Spruce Creek on the north, south to Jupiter Inlet. I was accompanied by an assistant, Mr. E. C. Greenwood, and Messrs. G. W. Winegar, T. P. Barnes, Jr. and F. A. Ober. I am indebted to the gentlemen named for notes and specimens. I would also tender my thanks to Capt. Douglass Dummett of East Florida, Dr. J. V. Harris of Miami, Mr. J. L. Burton, who served me well as a guide, for valuable notes and assistance, and to Prof. S. F. Baird, Dr. Harrison Allen and Mr. J. A. Allen for kindness in identifying specimens.

Besides the notes upon the habits, distribution, etc., of the species given, some of which may perhaps be new, I have been able to add one species to the fauna of the United States, one to the eastern section of the Union and one to Florida. A few other mammals than those given may occur in the state, especially the smaller species. But I trust this will prove a tolerably correct catalogue of the mammals which inhabit Florida.

FELIDÆ.

1. *Felis concolor* LINN.

Panther, Tiger, Puma.

This large cat is very common on Indian River, in the interior and more southern sections of the state, but is not found on the Keys. It is quite a formidable animal, growing sometimes to be eleven feet in length, measuring from the end of the nose to the tip of the tail, and

if its courage corresponded with its size it would be a dangerous foe to the inhabitants. It is, however, exceedingly cowardly and I never knew of any well authenticated instance of its attacking man, although some stories were related of its carrying away young children, which may have been true. The puma is capable of performing such feats, for it possesses great strength. Capt. Dummett informed me that he had shot one near his plantation in the autumn of 1871, which had killed a full grown buck and was devouring it.

Like many of this family the puma is nocturnal in its habits and remains concealed in the dense swamps and hummocks during the day, commonly reclining on the limb of a tree. It is said to drop upon its prey from such an elevation, and many old hunters warned me against passing through the thick woods in the early morning or late in the evening as they said that the tigers were usually on the alert at such times and might be tempted to spring upon one if he were alone. It is very inquisitive when its dominions are invaded during the day, and will often follow the intruder for some distance, uttering a low, moaning cry, but is always careful to keep concealed.

Besides this peculiar low note it emits a variety of harsh sounds, some of which are only given during the night, and are quite terrifying when first heard, especially one in particular which resembles the scream of a woman in extreme agony. This cry is more frequently given in March, when the males are in pursuit of the females. I think the young are dropped in the autumn. Skins of this animal which I have seen from Florida are of a decidedly rufous color without spots or bars. It may be well to remark that I have frequently heard, from hunters, of tigers which were not only of a larger size than the common species, but which were said to be spotted. I never saw a specimen, but it is not impossible that the closely allied species *Felis onca* may be found here, although I hardly think it probable.

[To be continued.]

BULLETIN

OF THE

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CATALOGUE OF THE MAMMALS OF FLORIDA, WITH NOTES ON THEIR HABITS, DISTRIBUTION, ETC.—BY C. J. MAYNARD.

[Continued.]

2. *Lynx rufus* RAFINESQUE.

Common Wild Cat.

THIS animal is abundant even on the borders of the settled districts. It is quite annoying to the planters, for it not only commits serious inroads upon hen roosts, but frequently carries off young pigs. It is a nocturnal animal, and is seldom seen abroad during the day, but conceals itself in the thick hummocks. During the season when the males are in pursuit of the females it may be occasionally met with, especially in the morning and evening. At this time its loud and varied cries are heard, sometimes during the day, but oftener during the night. This is naturally a cowardly animal, and will invariably fly from man when it has the power to do so. The wild cats are only as large as setter dogs, yet they possess great strength, and a man requires considerable determination to attack one when placed in such a situation that it cannot escape. My friend, Mr. Thurston, once seized a full grown male, that was only slightly stunned by a charge of dust shot, and strangled it, but did not escape without receiving some scratches. Although shy when faced, they will often approach quite near one when sleeping in the open air, and I have upon two

occasions been awakened by their cries to find the beasts within a few feet of me, but upon my moving they instantly sprang away.

Florida specimens of this species are fully as large as those from more northern localities. I give the dimensions of a full grown male taken at Dummett's. From nose to eye, 1.80; to ear, 4.78; to occiput, 6.00; to root of tail, 33.00; to outstretched hind leg, 48.00. Tail to end of vertebra, 7.75; to end of hair, 8.60. Length of hind leg, 7.00. Length of hand, 4.40; width, 2.00. In color Florida wild cats are much more rufous than those from the north, and are inclined to be more spotted.

CANIDÆ.

3. *Canis lupus* LINN.

Gray Wolf.

The stronghold of these wolves is at present in what is called the "Gulf Hummock" in western Florida, where they are quite numerous. According to Mr. F. A. Ober they are also found about the Kissinee River and Lake Okechobee. I saw the tracks made by a single animal near Salt Lake. It was accustomed to pass along a sandy road every night for the greater part of the time which we remained in the vicinity. My guide, Mr. Burton, who had resided near this place for some months, informed me that he had never seen it, nor had any of the settlers, although it was frequently heard to howl. I did not meet with any wolves about Miami nor do I think that they occur south of the Everglades. Individuals who have frequently taken this species describe them as being very dark colored, usually quite black.

4. *Vulpes Virginianus* RICHARDSON.

Gray Fox.

Common in the wilder districts. This little fox does not appear to do any great degree of mischief on the plantations and it is probable that it finds sufficient wild game to satisfy its appetite. I once surprised one that was cautiously making its way towards a large bevy of quails with the evident intention of capturing some. Specimens from Florida are quite gray in color, especially upon the upper parts.

MUSTELIDÆ.

5. *Putorius lutreolus* CUVIER.

Mink.

I saw but a single specimen of this animal. This was on the St. John's River above Blue Springs, where one swam across the river but a short distance in advance of our boat. I did not learn that it was at all common; indeed, nearly all the hunters seemed entirely unacquainted with it.

One feature, noticed in skins of this species taken in Maine and New Hampshire, which I have never seen mentioned, is the presence of white hairs which are more or less numerous in the dark colors of the back. This species appears inclined to albinism, but the appearance of the white hairs is not the result of this disease, for in every instance that I have seen of an approach to albinism the fur turns white first and the hair afterwards.

6. *Lutra Canadensis* SABINE.

Otter.

Very abundant throughout the greater part of the state. I found them as numerous on Indian River as in the interior, but did not meet with them at Miami, in the Everglades or among the Keys. The fur is of little value in comparison with northern skins; the best winter pelts being worth but five dollars each in Boston. The usual price paid in Jacksonville is from seventy-five cents to one dollar, consequently they are not hunted much and therefore are not shy. They are quite inquisitive and will sometimes follow a boat for some distance, or approach any one standing upon the shore. At the same time they will utter a short, continuous grunt. Otters may frequently be seen chasing each other sportively through the water, and while we were in the vicinity of South Lake, my guide, Mr. Burton, called my attention to certain smooth paths in a sandy spot, which he said were otter slides. They appear to amuse themselves by dragging their bodies over the smooth sand, just as the same species glide down snow-covered river-banks at the north. The slides in Florida were situated at some distance from the water.

The color of adult otters from this state is strongly inclined to reddish-brown, but the young which are dropped in February are very dark. I think I never saw a more beautiful animal than a young specimen of this species which was captured at the head of Indian River by Mr. Thurston. It was only about two weeks old, yet was covered with a fine coat of exceedingly glossy fur.

7. *Mephitis mephitica* BAIRD.

Common Skunk.

This species seems to be restricted to the more northern portions of the state. Specimens taken in this region present the same variation regarding the distribution of the black and white which is noticeable in this animal elsewhere. Although the amount of the above named colors is changeable, it is unusual to see the skunk of a different hue; yet Mr. F. A. Ober of Beverly has a specimen which was taken in that place, that is marked in a very singular manner, inas-

much as those portions which are usually black are in this instance pale brown or fawn.

8. *Mephitis bicolor* GRAY.

Little Striped Skunk.

This pretty little species which, previous to my discovering it in Florida, was not known to occur east of the Mississippi, is very abundant in certain sections of the state. They are confined to the narrow strip of land which lies between Indian River and Turnbull Swamp, being found as far north as New Smyrna and south to Jupiter Inlet. They appear to take the place of the common skunk, which does not occur in this section. They frequent the scrub, and traces of them may be seen at all times, for they have the habit of digging small holes in search of insects, like the preceding species. These skunks are easily domesticated and I have frequently known of their being used in the houses for the purpose of catching mice. Sometimes the animals are captured and the scent glands removed, but they are often simply decoyed about the premises by exposing food, when they will take up their abode beneath the buildings, and will soon become so tame as to enter the various apartments in search of their prey.

URSIDÆ.

9. *Procyon lotor* STORR.

Raccoon.

Very numerous both upon the mainland and among the Keys, even frequenting the low mangrove islands which are overflowed by every tide. They subsist upon fish and crabs to a great measure when upon the seashore, but in the interior they live chiefly upon the fluviatile mollusks (*Unio*, *Pomus*, etc.). They are strictly nocturnal, seldom appearing abroad during the day.

In color the Florida raccoon differs from New England specimens in being more rufous; the black markings are not as conspicuous, the dark rings on the tail being sometimes nearly obsolete; in fact, adult specimens from Florida in this respect resemble those from New England.

10. *Ursus Americanus* PALLAS.

Black Bear.

Very common, especially in the unsettled districts; giving the inhabitants considerable trouble by destroying young pigs. Although extremely abundant in certain sections, as the numerous tracks indicate, it is difficult to see one, for they chiefly move about during the night. The bears of Florida do not hibernate, but are not quite as active during the winter months as in summer. The young are

born in early spring, after which the females are said to be somewhat dangerous, especially if surprised when with their cubs; but at other times both sexes are arrant cowards. They will not even molest one when sleeping, but will always avoid the presence of man when aware of it. I have made my bed in a bear path and, in the morning, found by the tracks made by them in the night that they made a wide circuit rather than pass near me.

The food of the Florida bears is variable. During the early winter they feed on the berries of the common and the saw palmettoes; later in the season they eat the tender new growth, or buds, of the above mentioned plants; for this purpose they will climb the tallest palmetto and with their strong claws will tear out the "cabbage," as the new growth is sometimes called, and eagerly devour it. The removing of this bud is no easy task even to an experienced person provided with an axe, yet Bruin's great strength enables him to force the tough leaf-stalks asunder with the greatest of ease. Trees which have been treated in this rough manner invariably die and a large number may be seen in this condition in any cabbage swamp.

When the king or horseshoe crabs come on shore to deposit their spawn, the bears resort to the shore and, after turning the crustaceans over, scoop out their softer parts. They are also aware of the time when the sea turtle lay, and during the months of June and July walk the beaches nightly and devour the eggs. Indeed, so persistently do they hunt for them that it is almost impossible to find a nest that has been undisturbed.

The bears of this state are fully as large as those from New England, and the hair is as dark colored. I have also seen skins that were but little inferior to northern ones in woolliness, but generally they are only covered with hair. One which I procured at Dummett's in the winter of 1869 is singularly marked, for it has brownish lines starting from the point of each shoulder and extending down the legs on the inside. The other portion of the hair is black. The young for a year or two are strongly inclined to reddish-brown. The bears inhabit the entire portion of the mainland, but are seldom found on the Keys.

CERVIDÆ.

11. *Cariacus Virginianus* GRAY.

Common Deer.

Very numerous in almost all sections. The deer of Florida are not likely to be exterminated very soon, not only because of their abundance, but because the inhabitants do not kill them wantonly, knowing that they are extremely valuable to them for food, and the tourists who possess sufficient skill to capture any number of them are scarce.

When we first attempted to hunt deer we were almost always unsuccessful, even rarely being able to see one, and were informed by the hunters that we did not go out at the right time. Upon questioning them they told us that the deer were governed in their time of feeding by the moon. An hour before moonrise the animals arose from their beds or came out of the hummocks to feed upon the grass in the clearings, or in the piny woods, continuing until after the moon was up. An hour before the moon southed (*i. e.*, attained its highest altitude) they did the same thing, and also when it was directly beneath the earth, making in all eight hours feeding time. At first I laughed at this as an old hunter's notion, for although it is easy to understand why the deer should feed at those times when the moon rises near night and sets near morning, it is difficult to perceive why they should conform to the same rule through all the varying phases. But after three seasons' experience I am obliged to acknowledge that as far as my observation extends this theory is correct. The deer are certainly seen feeding much more frequently during these stated times than at others. Of course one occasionally meets a straggling animal at other hours, but I never found any number on their feet at any other time. All the hunters with whom I have conversed also confirm this. Another singular fact is that the great horned owls hoot at the feeding time of the deer, even if it be broad daylight. I have observed this fact on many occasions, and the hunters, when they hear the owls, say "now the deer are feeding."

Early in February the deer moult. The bucks then lose their horns and the does are heavy with young, which they drop in March. Before the moult the hair is of a bluish color, but after shedding they take on a sleek coat of fine reddish hue. This animal is found in all sections, even on the Keys. They inhabit small islands where they can obtain little or no fresh water, yet deer from these localities are noticeably larger than those from the mainland. Of this fact I have been assured by Lord Parker, an English gentleman who has spent several winters in Florida, and who has killed a large number of these animals in all sections of the state.

MANATIDÆ.

12. *Trichechus manatus* LINN.

Manatee.

This singular animal is found in large numbers about the inlets of Indian River, and Capt. Dummett informs me that he has captured specimens as far north as his place, which is within five miles of the head of the river. I have been informed by creditable authorities that it is remarkably abundant upon the western coast in the various rivers and creeks which abound between Tampa Bay and Cape Sable.

I have never seen it in Mosquito or Halifax Lagoons and am confident that it does not occur there. This species is said to feed upon the leaves of the mangrove during the night.

DELPHINIDÆ.

13. *Delphinus erebennus* CÔPE.

Porpoise.

A large number of porpoises which I take to be this species occur abundantly about the bays, salt water rivers and along the entire coast of Florida. It is also probable that a second species may be found.

VESPERTILIONIDÆ.

14. *Lasiurus Novboracensis* GRAY.

Red Bat.

Common in the more northern sections of the state, frequenting the woods. During the day they rest hanging head downwards upon the leaf of a tree. Specimens captured are not only smaller in size than those from the north, but are much deeper in color; the fur, however, is generally tipped with ash.

15. *Scotophilus fuscus* H. ALLEN.

Carolina Bat.

Common throughout the northern sections, but more abundant in the vicinity of settlements.

I once captured a female specimen of this species which was heavy with young, placed her in a cage and left her. After an absence of an hour or so I returned and found that she had escaped, but had left a young one clinging to the woodwork on the side. The little thing was entirely naked, but was furnished with teeth, which it showed when handled and endeavored to bite, squeaking after the manner of all these animals. I replaced it in the cage, where it remained until night, but in the morning it was gone and I supposed that its mother had carried it away.

16. *Scotophilus Georgianus* H. ALLEN.

Georgia Bat.

Two bats which I have in my collection, that were shot about ten miles south of Salt Lake, I think are of this species. The specimens were taken in the evening and were flying about near a small pond in the piny woods.

17. *Nycticejus crepuscularis* H. ALLEN.

Mr. J. A. Allen in the "Bulletin of the Museum of Comparative Zoology" (Vol. ii, No. 3, p. 174) states that there is a specimen of

this bat in the museum at Cambridge which was collected in Florida by Mr. Charles Belknap.

18. *Corynorhinus macrotis* H. ALLEN.

Big-eared Bat.

Dr. Harrison Allen in his monogram of North American Bats (p. 55) cites a specimen of this species which was collected in Micanopy, Florida, by Dr. Bean.

NOCTILIONIDÆ.

19. *Nyctinomus nasutus* TOMES.

A bat was shot by a member of my party on the St. John's River, near Jacksonville, early in the winter, which I am confident was of this species. This specimen was unfortunately lost.

SHENODERMIDÆ.

20. *Artibeus perspicillatus* MAYNARD.

Tailless Leaf-nosed Bat.

While at Key West in the early winter of 1870, I observed several large bats flying about the city, which closely resembled in flight a species which I had seen in northern Florida two years before, but which flew so high that I was unable to shoot them. I was very anxious to obtain a specimen, but as shooting was prohibited in the streets of the city of Key West, and as I never saw the bats elsewhere on the island, feared that I should be obliged to go away without one. I was, therefore, agreeably surprised one morning to see a boy enter my room with a bat in his hand, which from its large size I knew could be no other than the species which I had so long desired to obtain. He said that he had found it hanging upon the leaf of a tree and had killed it with a piece of limestone. It is a leaf-nosed bat, and Dr. Harrison Allen has kindly identified it, from sketches sent to him, as the above species. This is, I think, the first instance on record of a bat of this form being taken on the Atlantic slope. This species, without doubt, inhabits the whole of Florida. They fly early in the evening, often before sunset, and, as has been remarked, usually very high.

None of the bats of Florida appear to hibernate, or at best they only remain quiet during an occasionally cold night.

SORECIDÆ.

21. *Blarina brevicauda et talpoides* BAIRD.

Mole Shrew.

I found a single specimen of this little species in an unused cistern,

at Miami. I have never seen it elsewhere in the state, although it probably occurs.

TALPIDÆ.

22. *Scalops aquaticus* FISCHER.

Shrew Mole.

Very common at Blue Spring, where they do considerable damage by disturbing the roots of vegetables and plants in the cultivated fields. They are also said to eat sweet potatoes. They form their burrows only an inch or two below the surface; throwing up ridges so that their presence is readily detected. This work is usually performed during the night.

SCIURIDÆ.

23. *Sciurus niger* LINN.

Southern Fox Squirrel.

Quite common in the piny woods, but I do not think that they are ever to be found in the hummocks. They feed upon the seeds of the pines and are therefore usually found in the tops of the trees which are commonly high; thus it is quite difficult to procure specimens, as on the approach of the hunter they conceal themselves among the thick foliage. They are extremely variable in color, specimens being found which exhibit all shades of coloration from pale rufous to black or dusky. The latter colors predominate, however. I think this species is confined to the more northern portions of the state, as I have never seen it at Miami.

24. *Sciurus Carolinensis* GMELIN.

Gray Squirrel.

Very abundant in the northern and central sections of the state, but singularly I did not see it at Miami, or among the Keys. They inhabit the hummocks and are seldom seen in the piny woods. They have much the same habits as those which inhabit New England. But I cannot now remember of ever having seen a nest of sticks and leaves such as this species construct in the north. Specimens are not only smaller in size, but are also more rufous than northern individuals. I have never seen a specimen of the black variety in Florida and am confident that it seldom, if ever, occurs.

GEOMYINÆ.

25. *Geomys pineti* RAFINESQUE.

Salamander.

This singular animal is confined to the more northern portions of the state, none being found south of Lake Harney. They inhabit the dry pine barrens, where in the process of burrowing they throw up

little mounds which in some sections are quite numerous. They are provided with large cheek pouches, with which they are said to convey the earth to the surface. The salamander is seldom seen abroad during the day, and if they ever leave the burrows it is in the night. When by any accident they appear above ground in the daylight, they seem confused, and may be readily captured.

MURIDÆ.

26. *Mus decumanus* PALLAS.

Brown Rat.

Found abundantly at Jacksonville, not only in the city, but on the neighboring plantations. I do not remember of having observed it elsewhere in Florida. I have never seen a specimen of the common mouse (*mus musculus*) in the state.

27. *Mus tectorum* SAVI.

White-bellied Rat.

The first instance of my finding this species in Florida was at Miami. There was an old cistern here which was formerly used by the troops which were stationed at old Fort Dallas. It was about ten feet deep, having cemented sides, and contained nearly two feet of water. Several species of the smaller *rodents* were frequently found dead and floating on the surface, having evidently fallen in while attempting to reach the water. Among them was a specimen of the white-bellied rat. As this was the only instance of my taking it in the southern section of the state I am unable to give any account of its habits there. But I found it in immense numbers at Salt Lake, inhabiting the moist prairies. Here they build nests near the tops of the grass, somewhat after the manner that the white-footed mouse builds in bushes at the North. This species was probably introduced into the country from the vessels of the early Spanish discoverers. In the old world it inhabits the thatched roofs of houses, from which we may infer that this species originally found its home among thick reeds or grasses, of which the roofing would probably be composed. Thus in the white-bellied rat of the wilds of Florida we have an example of a species instinctively returning to its primitive habits, even though its ancestors from force of circumstances have for many generations dwelt in a different manner.

28. *Hesperomys leucopus* WAGNER (= *cognatus*, *myoides* et *gossypinus* of authors).

White-footed Mouse.

This mouse is very abundant throughout all sections of the mainland of Florida, infesting the houses of the smaller settlements after

the manner of the common mouse. I have also known this to occur in New England, especially in isolated buildings. I can see no reason why the so-called *gossypinus* should be separated from *leucopus*, as I can find no constant character which would entitle it to a specific rank.

29. *Hesperomys aureolus* WAGNER.

Golden Mouse.

I obtained two specimens of this beautiful little mouse near Dummett's. Both of them were captured in a house where the common species (*leucopus*) was also abundant. This was in the spring of 1869, but since that time I have never been able to find another, and the people who brought the specimens informed me that they were quite rare.

30. *Hesperomys palustris* WAG.

Rice-field Mouse.

Audubon and Bachman say that a specimen was obtained in the Everglades of Florida by Dr. Leitner. I was aware of the existence of a small *rodent* in these immense marshes, but was unable to obtain specimens. They probably were of this species, however.

31. *Neotoma Floridana* SAY and ORD.

Wood Rat.

I saw nests of this species quite common about Jacksonville and Hibernia, but found none at Blue Springs or at any section south of this point. But Prof. Baird, in his "Mammals of North America," cites a specimen which was taken on Indian River by Dr. Wurdemann.

32. *Sigmodon hispidus* SAY and ORD.

Cotton Rat.

Common throughout the entire mainland of Florida, and appears to frequent the marshy places along the borders of rivers and other bodies of water. Whenever we encamped in such localities the cotton rats would gather around to feed upon remnants of scattered food. It appears to be nocturnal in its habits.

33. *Arvicola pinetorum* LECONTE.

Pine Mouse.

I insert this species on the authority of Audubon and Bachman, who assert that they have received it from Florida.

LEPORIDÆ.

34. *Lepus sylvaticus* BACHMAN.

Gray Rabbit.

Abundant throughout all sections of the mainland, frequenting the

pine woods as well as the hummocks. They appear to have much the same habits as at the north.

35. *Lepus palustris* BACHMAN.

Marsh Rabbit.

Common in the marshes of the St. John's River.

DIDELPHIDÆ.

36. *Didelphys Virginiana* SHAW.

Opossum.

Common throughout the mainland of the state, but does not occur on the Keys. These animals are a decided pest to the inhabitants, for they are prone to rob hen roosts. They are strictly nocturnal, remaining concealed in the trees during the day.

I have never met with an undomesticated animal so variable in color. Three specimens now before me exhibit the extremes. One, evidently an old individual, is gray throughout, inclining more to white, with no decided black markings, excepting the ears, legs and feet. The latter are *black to the nails* on some of the toes, while the other claws have a few white hairs at their bases. The tail is entirely white. Another, younger, has dirty white fur with black tips. Numerous long white hairs appear over the entire upper surface of the body, giving the animal a singular appearance. The hind legs and feet are black, as in the other specimens, to the nails, excepting a few white hairs at their bases. The front legs and feet are black nearly to the claws. The ears are tipped with white, while the tail is black for the basal third, the remainder white. Another young specimen has the base of the fur white, but with the tips so decidedly dark that it nearly conceals the former color, and no one would hesitate to call it a black opossum. Yet its toes are white, there are white markings about the head, and a stripe on the belly is white, with a yellow suffusion between the fore legs. Only one-fourth of the basal portion of the tail is black.

These three represent the widest variation I have ever met with, in point of color, and Mr. J. A. Allen, in the "Bulletin of the Museum of Comparative Zoology" (p. 185), and Dr. Elliott Coues, in the "Proceedings of the Academy of Natural Sciences of Philadelphia," for May, 1871, assert that the skulls are also extremely variable.

APPENDIX.

Mammals which were formerly found in Florida.

According to Bartram the beaver (*Castor Canadensis*) was formerly found in the state. He makes mention of it in his travels in Florida, published in 1791.

The historians of De Soto's travels speak of herds of wild cattle being found in Florida. They probably allude to the buffalo (*Bos Americanus*), which without doubt extended its range to the prairies of the west coast.

The last mentioned authors and other early writers also speak of a wild dog as inhabiting Florida. They cannot mean the wolf or the fox, for these are included in their lists of the animals of the then new country. It is possible that the singular species of dog now used by the Seminoles of Florida was once wild.

Domesticated species found in a wild state.

There are hundreds of cattle in Florida which are now perfectly wild and have been in this condition since the first Indian war, at which time they escaped from their owners. They generally inhabit what is termed the "Turnbull Swamp," a wide expanse of waste land which lies about the head of Indian River. But I have seen them in the interior, near the head waters of the St. John's River. They are rapidly becoming exterminated, however, as the settlers consider them common property and shoot them whenever they can.

Hogs are also found wild in some sections, but not in any great numbers. The usually black color of the domestic hogs of Florida has been noticed by Darwin in his fifth edition of "Origin of Species" (p. 26) on the authority of Prof. Wyman. He says that the light colored hogs contract a disease from eating the paint-root (*Lachnanthes tinctoria*) which causes their hoofs to drop off, whereas black ones are not affected by it. I have carefully inquired into this matter and have not only observed for myself, but conversed with many intelligent men upon the subject. I find that a slight error has been made in the statement. The color of the hair or bristles has nothing to do with the health of the animal, but its hoofs must be black in order that it may eat the paint root with impunity. I have seen black pigs having white feet lame from this cause, and this is the usual opinion of all the pig raisers with whom I conversed. Yet this does not materially affect Mr. Darwin's argument, which is that the mere existence of a certain plant causes the hogs of this section to assume a dark color, for if the hoofs are dark the whole animal is usually dark. That the case may be made seemingly stronger I will say, that in some sections of Florida, where the paint root does not grow, white hogs are as numerous as black ones.

I find that there is another reason why the settlers select hogs which are of a dark color. This is that they stand a better chance of escaping from bears than white ones, as they are less conspicuous, especially in the night. Now I can go a step farther and show that

the hogs of themselves assume a protective color. It is noticeable that hogs which have lived for generations in the piny woods are of a reddish hue, corresponding exactly with the color of the fallen pine leaves, so that it is almost impossible to detect one at a little distance when it is lying upon a bed formed of them.

This instance, together with the fact that the black hoof is a safeguard against the poisonous effects of the paint root, seems a conclusive argument in favor of the theory that the Florida hogs have made a slight advance towards forming a new variety or species.

But I look upon it in another way, and see in these instances but illustrations of a law in nature which grants to nearly all animals the power of assuming protective colors, under certain circumstances, but in a limited degree. This is to be seen in many cases among animals, the most familiar of which is that of the northern hare (*Lepus Americanus*), which in autumn puts off its brown summer dress and takes on one of the color of the snow, among which it has to live throughout the winter. The hogs of Florida return to the mixed colors in sections where the paint root does not grow and where no pains are taken to select black ones, or where their food and surroundings are varied. There are apparently few or no analogous instances to the black hoofs being a protection against poison, yet I will venture to say that did we understand the entire economy of nature, we should find many similar ones.



QUARTERLY MEETING, WEDNESDAY, AUGUST 14, 1872.

THE meeting was held at 3 P. M. The President in the chair.

Stephen P. Driver of Salem and Charles F. Crocker of Lawrence were elected resident members.



REGULAR MEETING, MONDAY, OCTOBER 21, 1872.

First evening meeting, present season, commenced at 7 30 P. M. The President in the chair. Records read.

The SECRETARY announced the following correspondence :—

From American Geographical Society, Sept. 18; Belfast Naturalists' Field Club; Brooklyn Mercantile Library Association, Oct. 8; Buffalo Historical Society, Sept. 12; Edinburgh Royal Society, March; Iowa State Historical Society, Aug. 3; Leeds Philosophical and Literary Society, Sept. 4; London Society of Antiquaries, Aug. 31; Minnesota Historical Society, Aug. 22; Maryland Historical Society, Aug. 12; Moravian Historical Society, Aug. 9; New Jersey Historical Society, Aug. 30, Sept. 3; New York, Cooper Union, Sept. 6, Oct. 15; New York Genealogical and Biographical Society, Aug. 21; New York Lyceum of Natural History, Oct. 7; New York State, Aug. 30; Ohio Historical and Philosophical Society, Aug. 5, Sept. 6; Yale College, Corporation, Sept. 23; Ammiden, P. R., Boston, Aug. 22; Anthony, H. B., Providence, Aug. 8; Babson, J. J., Gloucester, Aug. 12; Boow, E. P., New York, Sept. 28, Oct. 4, 17; Chever, D. A., Denver, Col., Oct. 13; Clark, B. H., Rochester, N. Y., Sept. 20; Crocker, Chs. F., Lawrence, Aug. 17; Cram, Milo T., Holyoke, Mass., Aug. 19; Dall, C. H., Boston, Oct. 11; Drake, S. G., Boston, Sept. 13; Frary, Lucius H., Middleton, Sept. 3; Hanaford, P. A., New Haven, Conn., Sept. 23; Higginson, T. W., Newport, R. I., Oct. 20; Hough, F. B., Lowville, N. Y., Aug. 7; Marston & Prince, Lowell, Aug. 20; Perry, W. S., Geneva, N. Y., Oct. 1; Roundy, Henry, Salem, Sept. 28; Venable, J. E., Paducah, Ky., Sept. 16; Yeomans, W. H., Columbia, Conn., Aug. 8, Oct. 17.

A letter was read from W. A. WILLIAMS, engineer on the Copiapo Railroad, to Capt. Robert Manning, accompanying a box of fossil shells and radiates, some found above the sea at Caldera, in extensive beds, at four hundred feet above sea level; the others at Molle, about one hundred miles from the coast, at a height of five thousand feet above the sea, where the ground is strewn with them.

Daniel Varney, Charles Baker and Catherine T. Woods, all of Salem, were elected resident members.

Dr. J. L. Smith, Louisville, Ky.; Prof. E. B. Andrews, Marietta, Ohio; Prof. E. T. Cox, Indianapolis, Ind.; Dr. G. M. Levette, Indianapolis, Ind.; J. Collett, Esq., Eugene, Vermilion Co., Ind.; Prof. C. A. White, Iowa City, Iowa; J. L. Waters, Esq., Chicago, Ill.; Col. J. W. Foster, Chicago, Ill.; Prof. C. G. Swallow, Columbia, Mo.; Prof. J. S. Newberry, New York, N. Y.; Prof. A. Winchell, Ann Arbor, Mich.; Prof. Raphael Pumpelly, Cambridge, were elected corresponding members.

THE LIBRARIAN reported the following additions :—

By Donation.

ANDREWS, MISS. Manual for the General Court, 1864, 1 vol. 12mo. Bland's Treatise of Military Discipline, 1 vol. 8vo. London, 1727. Report of the Comptroller of New York, 1854, 1 vol. 8vo. Report of the Portsmouth Relief Association, 1855, 1 vol. 8vo. The Railroad Jubilee, 1851, 1 vol. 8vo. Patent Office Report, 1848, 1 vol. 8vo. Foster's Book Keeping, 1 vol. 8vo. Pickering's Vocabulary, 1 vol. 8vo. Miscellaneous pamphlets, 16.

BOLLES, E. C. Miscellaneous pamphlets, 29.

BROOKS, MRS. HENRY M. Woman's Journal, 26 nos.

BUTLER, B. F., of U. S. H. R. Message and Documents, 1871-2, 5 vols. 8vo. Report of the Committee on Agriculture, 1869, 1870, 2 vols. 8vo. Ku-Klux Conspiracy, 13 vols. 8vo. Patent Office Reports, 1868, 4 vols. 8vo. Smithsonian Report, 1870, 1 vol. 8vo. Mineral Resources West of the Rocky Mts., 1871, 1 vol. 8vo. Report on Commerce and Navigation, 1870, 1 vol. 8vo. Congressional Globe, 3rd Sess., 41st Cong., 1870-1, 3 vols. 4to. Statistics of Population. Ninth Census. Tables I-VIII. 1 vol. 4to, 1870. Report on Investigation and Retrenchment, 8vo pamph. Report of the Commissioners of Education, 1870-1, 2 vols. 8vo. Explorations in Nevada and Arizona, 1871, 1 vol. 4to.

CHANDLER, Z., of U. S. S. Proceedings of the National Union Republican Convention held at Phila., June 5, 6, 1872, 1 vol. 8vo.

CLARK, B. H., of Rochester, N. Y. Directories of Rochester for 1870, 1871, 2 vols. 8vo. Miscellaneous pamphlets, 5.

COLE, MRS. N. D. Salem Gazette, 70 nos. Miscellaneous pamphlets, 20.

CONANT, W. P. Ninth and Eleventh Report of the St. Louis Agricultural and Mechanical Association, 1870, 1872, 2 vols. 8vo. Miscellaneous pamphlets, 6.

CUTTER, A. E., of Charlestown, Mass. Proceedings at the Dedication of the Soldiers' and Sailors' Monument at Charlestown, June 17, 1872. 8vo pamph.

DALAND, W. S., of New York. Directory of New York City, 1871, 1 vol. 8vo.

DE LORIMER, W. K., of Dubuque, Iowa. Iowa State Gazetteer, 1865, 1 vol. 8vo.

GILMORE, L. B., of Ann Arbor, Mich. Directory of Ann Arbor, 1868, 1 vol. 8vo.

HAWKS, J. M., of Pensacola, Fla. The Florida Gazetteer, 8vo pamph., 1871.

KELLOGG, C. A. & CO., of Rochester, N. Y. New York State Directories, 1864, 1869, 2 vols. 8vo. Directory of over one hundred Cities and Villages in the State of New York, 1869-70, 1 vol. 8vo. Directories of Central New York, 1865, 1867, 2 vols. 8vo. Buffalo City Directories, 1866, 1867, 1869, 1870, 4 vols. 8vo. Rochester City Directories, 1864-5, 1866-7, 1867-8, 1870, 4 vols. 8vo.

KIMBALL, JAMES. Lawrence Directories, 1857, 1859, 2 vols. 16mo.

LEE, JOHN C. Commercial Bulletin, Aug. 10, 17; Sept. 7, 14, 21, 28; Oct. 5, 1872.

LOUBAT, ALPHONSE, of New York. Vine Dresser's Guide, 1 vol. 12mo.

MANNING ROBERT. Miscellaneous pamphlets, 65.

MC. CREERY, J. L., of Dubuque, Iowa. Directory of Dubuque, 1865-6, 1 vol. 8vo. Miscellaneous pamphlets, 6.

MOORE, CHAS. B., New York. Indexes. Town of Southold, L. I. 8vo pamph.

NATIONAL ASSOCIATION OF WOOL MANUFACTURERS. Bulletin for Apr., Sept., 1872.

OLIVER, HENRY K. Patent Office Reports, 1847, 1850-1, 1851, 1852-3, 1853, 1854, 1856, 1857, 1858, 1859, 1861, 13 vols. 8vo. Message and Documents, 1867-8, 2 vols. 8vo. Auditor's Report, 1867, 1 vol. 8vo. Hawaiian Club Papers, Oct. 1868, 1 vol. 8vo. Eighth Annual Report of the Insurance Commissioners, 1 vol. 8vo. Key to the Element of Arithmetic, by P. E. Chase, 1 vol. 12mo. Miscellaneous pamphlets, 352.

[To be continued.]

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 4. SALEM, MASS., NOVEMBER, 1872. No. 11.

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

DR. PACKARD gave the following account of recent

EXPLORATIONS OF ST. GEORGE'S BANK.

During the past summer Prof. S. F. Baird, the U. S. Fish Commissioner, with the assistance of Prof. Verrill, fitted up an expedition to explore St. George's Banks with the dredge, for the sake of ascertaining the nature and quantity of the animals living upon and about these shoals, to which our Cape Ann fishermen annually resort for cod and halibut. Prof. Peirce, the Superintendent of the Coast Survey, who had detailed the steamer "Bache," Commander Howell, to make soundings on and about the bank, generously made accommodations aboard the steamer for the dredging party; and two naturalists, Messrs. S. I. Smith and O. Harger, assistants in the Yale College Museum, spent a portion of September aboard, and made several hauls with the dredge on the bank in about twenty fathoms, and again on the eastern edge of the bank in sixty-five fathoms, while

the most interesting results were obtained farther east towards the Gulf Stream at a depth of four hundred, and four hundred and thirty fathoms. At this depth the dredge brought up about forty species of invertebrate animals, among them *Schizaster fragilis*,* an arctic European sea urchin, *Eupyrigus scaber*, an arctic holothurian, and numerous worms, together with *Pecten pustulosus* Verr., not before found on our coast. On the sandy bottom of the top of the bank the large *Pecten tenuicostatus* was abundant.

The season being late, they were obliged to relinquish the work for their duties at New Haven, and Messrs. Packard and Cooke, of the Peabody Academy at Salem, on the 11th of October, ran out from Boston in the Bache, and were able to make one day's dredging on the northeast end of the bank, in forty and forty-five fathoms, on the sandy and gravelly bottom near the crown of the bank, at or near the fishing grounds for cod and halibut; and then at the bottom of the bank in eighty-five, one hundred and ten, and one hundred and fifty fathoms, respectively, on a sandy, muddy bottom. The first haul of the dredge, made in one hundred and ten fathoms, proved exceedingly rich, bringing up numerous shells and worms, though few crustacea, but several spatangoids (*Schizaster fragilis*) and several sea pens (*Pennatula aculeata*) which had been dredged for the first time on this coast by Mr. Whiteaves in the Gulf of St. Lawrence in one hundred and sixty fathoms. The hauls made in one hundred and fifty fathoms also revealed these forms, and a singular starfish (*Solaster fuscifer*), and *Archaster arcticus*, an additional species of

*This and the other species mentioned were identified by Prof. A. E. Verrill, who is publishing a résumé of the results in the current numbers of the American Journal of Science and Arts.

sea pen (*Virgularia Lyngmanni*) and other interesting mollusks and worms; while two actiniæ, one an enormous *Cerianthus* (*C. borealis*), ten inches in length and inhabiting a tough, slimy tube, and the other, *Bolocera Tuediæ* were discovered, together with *Thyone scabra*, and a Norwegian shell, *Arca pectunculoides* and *Næra arctica*, and several new species of mollusks and worms. The marine fauna of this bank seems to be much like that of the Bay of Fundy, the Gulf of St. Lawrence, the banks of Newfoundland, and, in a less degree, the coast of Labrador. The discovery of the *Pennatula*, *Schizaster* and *Arca pectunculoides* also makes its relations with that of Norway intimate, and suggests that the assemblage of life at this region is a continuation of the Norwegian and arctic European deep sea fauna, and that it represents a continuous stream of arctic life pervading the ocean at great depths wherever the water is of sufficiently low temperature, from the polar regions to Cuba and Florida. The great abundance of life about the bank seems to show that the food for our edible fishes is in this region almost inexhaustible.

After exploring this bank the Bache pushed on nearly a hundred miles farther east and with some difficulty, owing to an approaching gale from the southeast, obtained soundings in thirteen hundred fathoms. The sea rising made dredging impossible, and the steamer was obliged from rough weather to run into Provincetown, and the weather continuing boisterous, to the great disappointment of all, made any further attempts impracticable. Every possible facility was extended by Commander Howell and officers Jacques, Hagerman, Jacob and Rush, who personally superintended the dredging operations, which were carried on by night as well as by day, and to them the success of the explorations was largely due.

Mr. F. W. PUTNAM of Salem made the following communication on an

ANCIENT INDIAN CARVING.

By the kindness of Dr. Palmer of Ipswich, I am enabled to exhibit a very interesting carved stone, which was found by an elderly lady while hoeing potatoes in her garden located at Turkey Hill, Ipswich.

Turkey Hill, situated between two small streams, and not far from the centre of the town, is a collecting ground well known to our local archæologists from the large number of stone implements that have been found in its immediate vicinity, and is especially noted for the small arrowheads of white quartz and other stone that have been found there in considerable numbers. The discovery of the carved stone now exhibited will further identify the locality as one of interest to archæologists.

This stone was evidently carved with care for the purpose of being worn as an ornament, and was probably suspended from the neck. It is of a soft slate, easily cut with a sharp, hard stone. The markings left in various places by the carver, showing where his tool had slipped, indicate that no very delicate instrument had been used, while the several grooves, made to carry out the idea of the sculptor, indicate as plainly that the instrument by which they were made, had, what we should call, a rounded edge, like that of a dull hatchet, as the grooves were wider at the top than at the bottom, and the striæ show that they were made by a sort of sawing motion, or a rubbing of the instrument backwards and forwards. In fact, the carver's tool might have been almost any stone implement, from an arrowhead to a skin scraper, or any hard piece of roughly chipped stone.

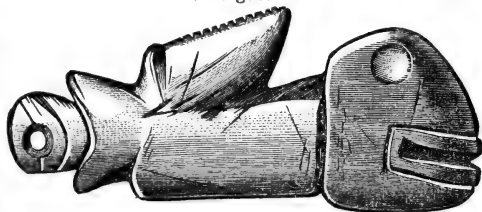
The figure on the opposite page represents the stone of natural size, its total length being two and a half inches.

It is of general uniform thickness, about one-fifth of an inch, except where the angles are slightly rounded off on the front of the head and on the abdominal outline, and the portion representing the forked tail, or caudal fin, which is rapidly and symmetrically thinned to its edges, as is the notched portion representing the dorsal fin.

The carving was evidently intended to represent a fish, with some peculiar ideas of the artist added and several important characters left out. The three longitudinal grooves in front represent the mouth and jaws, while the transverse groove at their termination gives a limit to the length of the jaw, and a very decided groove on the under side di-

vides the under jaw into its right and left portions. The eyes are represented as slight depressions at the top of the head.

Fig. 5.



Natural size.

The head is separated from the abdominal portion by a decided groove, and the caudal fin is well represented by the forked portion, from the centre of which the rounded termination of the whole projects. In this part there is an irregularly made hole of a size large enough to allow a strong cord to pass through for the purpose of suspension. The portion of the sculpture rising in the place of a dorsal fin is in several ways a singular conception of the ancient carver. While holding the position of a dorsal fin, it points the wrong way, if we regard the portion looking so much like a shark's tooth as intended to represent the fin as a whole. It is very likely that the designer wished to show that the fin was not connected with the head and, as he was confined by the length of the

piece of stone, after making the head so much out of proportion, he was forced to cut under the anterior portion of the fin in order to express the fact. If we regard it in this light, the notches on the upper edge may be considered as indicating the fin rays; but the figure best shows the character of the sculpture, and persons interested can draw their own conclusions.

The symmetry of the whole carving is well carried out, both sides being alike, with the exception that the raised portion at the posterior part of what I have called the dorsal fin is a little more marked on the left side than on the right, and the edge on the same side is surrounded by a faint, irregularly drawn line.

The carving was, I think, unquestionably made by an Indian of the tribe once numerous in this vicinity and, as it was almost beyond a doubt cut by a stone tool of some kind, it must be considered as quite an ancient work of art, probably worn as a "medicine," and possibly indicated either the name of the wearer or that he was a noted fisherman.

Additions to the LIBRARY announced.

(Continued from page 152.)

By Donation.

OSGOOD, ALFRED, of Newburyport, Mass. History of Newburyport, by Mrs. E. Vale Smith, 1 vol. 8vo. Reports of the School Committee of Newburyport, 1841-1871, inc. 26 Nos.

PARSONS, C. W., of Providence, R. I. Hydrate of Chloral, by donor, 8vo pamph.

PATCH, CHAS., of Hamilton, Mass. Miscellaneous Almanacs, 54.

PERKINS BROS., of Sioux City, Iowa. Directory of Sioux City, 1871-2, 1 vol. 8vo.

PERKINS, GEO. A. The Spirit of Missions, 8 nos.

PERRY, W. S., of Geneva, N. Y. Journal of the General Convention of the Protestant Episcopal Church, 1868, 1871, 2 vols. 8vo. Vestry Songs, 1 vol. 12mo. Trinity Psalter, 1 vol. 12mo. Miscellaneous pamphlets, 310.

STONE, B. W. Directory of New York City, 1869, 1 vol. 8vo. First Annual Report of the Board of Commissioners of the Department of Public Parks, 1 vol. 8vo. Miscellaneous pamphlets, 8.

SUMNER, C., of U. S. S. Letter to the Colored Citizens, June 29, 1872, 8vo pamph.

TENNEY, RICHARD, of Georgetown, Mass. Catalogue of the Georgetown Peabody Library, 1 vol. 8vo. The Peabody Memorial Church in Georgetown, 1 vol. 8vo.

TOWNE, JOSEPH H. Mass. Register and Business Directories, 1852, 1853, 1854, 1855, 1858, 5 vols. 8vo. Condition of the Banks, 1857, 1858, 1860, 1861, 4 vols. 8vo. N. E. Mercantile Directory, 1849, 1 vol. 8vo. Comptroller's Report of the Currency, 1867, 1 vol. 8vo. Finance Reports, 1852-3, 1855-6, 2 vols. 8vo. Mass. State Record, 1851, 1 vol. 12mo. Blue Book, 1 vol. 12mo. Mass. Registers, 1830, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 17 vols. 16mo. Descriptive Register of Genuine Bank Notes, 1 vol. 4to. Hodge's American Bank Note, 2 vols. 4to. Miscellaneous pamphlets, 100.

U. S. PATENT OFFICE, of Washington, D. C. Official Gazette, July 23, Aug. 13, 20, 27, Sept. 3, 10, 17, 24, 1872.

WILLSON, E. B. Address by C. A. Bartol before the Essex Conference, Feb. 28, 1872. 8vo pamph.

WITHALL, ELIJAH, of Rochester, N. Y. Annual Catalogues of the University of Rochester, 1859-1872. 13 pamphlets.

YEOMANS, W. H., of Columbia, Conn. Mineral Resources of the U. S., 1867, 1 vol. 8vo. Report of the Conn. Board of Agriculture, 1871, 1 vol. 8vo. Reports of the Committee on the Conduct of the War, 1 vol. 8vo. Miscellaneous pamphlets, 28. Diplomatic Correspondence, 1865, 4 vols. 8vo.

By Exchange.

ACADÉMIE IMPÉRIALE DES SCIENCES BELLES-LETTRES ET ARTS IN BORDEAUX. Actes, 3e Série, 32e Année, 1870.

ACADEMY OF NATURAL SCIENCES OF PHILA., Proceedings of. Jan., Feb., Mch., Apr., 1872.

AMERICAN ACADEMY OF ARTS AND SCIENCES OF BOSTON. Proceedings of, pp. 137-296 of vol. viii. 1869-70.

AMERICAN ANTIQUARIAN SOCIETY AT WORCESTER, Proceedings of, Apr., 1872.

AMERICAN PHILOSOPHICAL SOCIETY OF PHIL., Proceedings of, Jan.-June, 1872.

BIBLIOTHÈQUE UNIVERSELLE ET REVUE SUISSE. Archives des Sciences, Physiques et Naturelles, Juin, Juillet, Août. Nos. 174-6, 1872.

CROSSE ET FISCHER. Journal de Conchyliologie. 3e Série, Tome xii. No. II, 1872.

INSTITUT HISTORIQUE IN PARIS. L'Investigateur, 4e Série, Tome x, Liv. 426, 427, 1870.

KONGLIGA DANSKE VIDENSKABERNES SELSKAB IN KJÖBENHAVN. Oversigt, 1871. No II. 8vo pamph.

KONGLIGA VETENSKAPS-SOCIETEN IN UPSAL. Nova Acta. Vol. viii, Fasc. 1, 1871. 4to pamph. Bulletin Météorologique Mensuel, vol. i, Nos. 1-12, 1868-9. Vol. iii, Nos. 7-12, 1871.

LITERARY AND PHILOSOPHICAL SOCIETY OF LIVERPOOL, Proceedings of the. Vol. xxv, 1870-71. 1 vol. 8vo.

NATURWISSENSCHAFTLICHEN GESELLSCHAFT "ISIS" IN DRESDEN. Sitzungs-Berichte. Jan., Feb., März, 1872.

NATURWISSENSCHAFTEN VEREIN IN BREMEN. Abhandlungen, Bd. III, Heft 1, 1872.

NEW JERSEY HISTORICAL SOCIETY, Proceedings of. 2nd Series, vol. iii, No. 1, 1872.

PEABODY INSTITUTE, Peabody, Mass., Twentieth Annual Report of the Trustees of the. 8vo pamph., 1872.

PHYSIKALISCH-MEDICINISCHE GESELLSCHAFT IN WURZBURG. Verhandlungen, Neue Folge, Bd. II, 4 Heft, 1872.

RHODE ISLAND HISTORICAL SOCIETY, Proceedings of, 1872. 8vo pamph.

SOCIÉTÉ D'ACCLIMATION PARIS. Bulletin Mensuel. 2me Série, Tome ix, 1872. Nos. 2, 3, 4, 5. 4 pamphlets.

SOCIÉTÉ D'ANTHROPOLOGIE PARIS. Bulletins, Tome vi, 11e Série, 2e Fascicule, 1871. 8vo pamph.

SOCIÉTÉ VANDOIZE DES SCIENCES NATURELLES OF LAUSANNE. Bulletin, vol. xi, Nos. 66-67. 2 pamphlets, 1871-2.

ST. GALLISCHE GESELLSCHAFT IN ST. GALLEN. Bericht, Vereinsjahres, 1870-1. VEREINS FÜR ERDKUNDE IN DARMSTADT. Notizblatt, Heft X, iii Folge. Nos. 109-121, 1871.

VERMONT STATE LIBRARY. Thirteenth and Fourteenth Registration Reports, 1869, 1870. 2 vols. 8vo. Catalogue of the Vermont State Library, Sept. 1, 1872. 1 vol. 8vo. Governor's Message of the State of Vermont, Oct., 1872. 8vo pamph.

WISCONSIN STATE HISTORICAL SOCIETY, Collections of, vol. vi, 1869-72, 1 vol. 8vo.

ZOOLOGISCHE GESELLSCHAFT. Zoologische Garten, xiii Jahrg., nos. 1-6. Jan.-Juli, 1872.

PUBLISHERS. American Naturalist. Canadian Naturalist. Christian World. Francis's Catalogue. Gardener's Monthly. Gloucester Telegraph. Hardwicke's Science Gossip. Haverhill Gazette. Ipswich Chronicle. Land and Water. Lawrence American. Little Giant. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Sailors' Magazine and Seamen's Friend. Salem Observer. Silliman's Journal. Western Lancet.



REGULAR MEETING, MONDAY, NOV. 4, 1872.

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 U. S. Dep't. of Interior, Washington, Oct. 28; Bergen, Norway, The Museum at, Sept. 22; Ipswich, Lyceum, Oct. 24; New York, Cooper Union, Oct. 23; Smithsonian Institution, Washington, Aug. 14; Boow, E. P., New York, Oct. 24, 31; Chever, D. A., Denver, Col. Ter., Oct. 28; Cleaveland, N., Westport, Conn., Oct. 31; Ellis, George E., Boston, Oct. 29, Nov. 2.

The **LIBRARIAN** reported the following additions:—

By Donation.

COOPER UNION, of New York. Report of the Metropolitan Board of Health, 1869, 1 vol. 8vo. Nineteenth Annual Report of the Prison Association of New York, 1864, 1 vol. 8vo. Tehuantepec Railway Company, 1869, 1 vol. 8vo. Annual Report of the Board of Education, 1859, 1 vol. 8vo. Report of the Board of Immigration of the State of Missouri, 1865-66, 1 vol. 8vo. Comptroller Report of City of New York, 1864, 1 vol. 8vo. Miscellaneous pamphlets, 11.

GILLIS, JAMES A. German Encyclopädie, 1 vol. 4to. Maps to Gibson's Report, 1 vol. 8vo. French Statistics, 1 vol. 8vo. National Magazine and Industrial Record, 1845, 1846, 2 vols. 8vo. Archivo Americano, 1 vol. 4to. Spurzheim's Outlines of Phrenology, 1 vol. 12mo. Spanish Teacher, 1 vol. 16mo. German Phrase Book, 1 vol. 12mo. Tariff, by James Campbell, 1 vol. 8vo. Revenue Book, by A. Jones, 1 vol. 8vo. Flügel's Dictionnaire, 1 vol. 8vo. Nature Displayed, 2 vols. 8vo. Patent Office Report, 1848, 1 vol. 8vo. Commerce and Navigation of the U. S., 1830-45, 8 vols. 8vo. Tobacco Statistics, 3 vols. 8vo. Obituary Addresses on the Death of Hon. W. R. King, 1 vol. 8vo. Tables showing the Trade of the United Kingdom with different Foreign Countries and British Possessions, 1834-41. Commercial Tariffs and Regulations, 5 pamphlets. Commercial and Financial Legislation of Europe and America, 2 vols. 8vo. The Daily Union, 27 nos. Tableau Général du Commerce de la Belgique, 2 vols. folio. The Southerner, 38 nos. Miscellaneous pamphlets, 179.

GREEN, S. A., of Boston. Miscellaneous pamphlets, 41.

KIMBALL, JAMES. Abstract of the Seventh Census, 1 vol. 8vo. I. O. of O. F., Digest of the Laws of the Order, 1 vol. 12mo. Miscellaneous pamphlets, 70.

LEE, JOHN C. Commercial Bulletin, Oct. 12, 19, 1872.

PATCH, G. W., of Marblehead, Mass. Manuals for the General Court, 1863, 1864, 1866, 3 vols. 16mo. Christian Union, 60 nos. Independent, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863. 1864, 1865, 1866, 1867, 1868. Our Dumb Animals, 12 nos. The Macedonian and Home Mission Record, 37 nos. American Missionary, 46 nos. Miscellaneous pamphlets, 90.

U. S. DEPARTMENT OF THE INTERIOR. House Miscellaneous, 2d Sess., 41st Cong., 1869-70, 5 vols. 8vo. 3d Sess., 41st Cong., 1870-71, 2 vols. 8vo. Foreign Relations of the U. S., 3d Sess., 41st Cong., 1870-71, 1 vol. 8vo. Finance Report and Report of Comptroller of the Currency, 3d Sess., 41st Cong., 1870-71, 1 vol. 8vo. Report of the Department of Agriculture, 3d Sess., 41st Cong., 1870-71, 1 vol. 8vo. Reports of the Committee of the House of Reps., 3d Sess., 41st Cong., 1870-71, 1 vol. 8vo. Senate Documents, 3d Sess., 41st Cong., 1870-71, 1 vol. 8vo. Senate Miscellaneous, 2d Sess., 41st Cong., 1869-70, 1 vol. 8vo. 3d Sess., 41st Cong., 1870-71, 1 vol. 8vo. Senate Journal, 3d Sess., 41st Cong., 1870-71, 1 vol. 8vo. Senate Reports, 3d Sess., 41st Cong., 1870-71, 1 vol. 8vo. House Journal, 3d Sess., 41st Cong., 1870-71, 1 vol. 8vo. Executive Documents, 3 Sess., 41st Cong., 1870-71, 5 vols. 8vo. Report of the Secretary of War, 3d Sess., 41st Cong., 1870-71, 2 vols. 8vo. Report of the Secretary of the Navy and Postmaster General, 3d Sess., 41st Cong., 1870-71, 1 vol. 8vo. Patent Office Report, 1870-71, 1 vol. 8vo. Report of the Secretary of the Interior, 3d Sess., 41st Cong., 1870-71, 2 vols. 8vo.

U. S. PATENT OFFICE. Official Gazette, Oct. 8, 1872.

By Exchange.

BOSTON PUBLIC LIBRARY. Bulletin for Oct., 1872. 8vo pamph.

IOWA STATE HISTORICAL SOCIETY. The Annals of Iowa, July, 1872. 8vo pamph.

NEW ENGLAND HISTORIC-GENEALOGICAL SOCIETY. Register and Antiquarian Journal, Oct., 1872. Vol. xxvi, No. IV. 8vo pamph.

NEW YORK GENEALOGICAL AND BIOGRAPHICAL SOCIETY, Record of. Oct., 1872. 8vo pamph.

PUBLISHERS. American Journal of Science and Arts. American Naturalist. Christian World. Gloucester Telegraph. Haverhill Gazette. Historical Magazine. Ipswich Chronicle. Land and Water. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Salem Observer.

THE ORIGIN OF SURNAMES.

A communication was read from GEORGE H. DEVEREUX of Salem on the origin of surnames. This subject is receiving considerable attention, especially since so many persons devote their time and leisure to genealogical and historical researches, and, from the records and papers on file in our various state, town, parish and other offices, have gleaned and published many facts that will tend to elucidate more fully the history of the past and delineate the character of the early pioneers and their immediate descendants in the settlement of this country.

The paper was an ably prepared document and commenced with a few brief remarks upon general language. It then proceeded to the special consideration of the names of persons and places, as now extant in the English language. We give the following condensed synopsis of this portion.

All names had, originally, a significance of their own, derived from some peculiarity of person, place or prominent circumstance. We have grown so familiar with them, as merely arbitrary designations, that we pay no heed to this special meaning, which no longer has, in most cases, any particular applicability; and we talk of a man called Lion or Hare, King or Straw, without a moment's thought of the idea once conveyed when the name was primarily given. The meaning of many biblical, classic, Saxon, Italian, French and other designations was then stated, as well as some of Puritanic and fanciful origin. In the earliest times no person had more than one name, as John, Peter, Albert, etc. But in process of time it was found necessary to distinguish individuals of the same designation, of whom there would soon be many in every neighborhood, by superadded descriptions.

These were what we call surnames and became, by transmission from father to son, family names. The various modes in which these originated and grew up were then systematically explained.

The most obvious would be from personal peculiarities. As, of two Johns in one neighborhood, one would soon become known as John the Long, and another as John the Short. Hence we get all the Shorts, Longs, Whites, Blacks, Browns, etc.

Next, children came to be particularized after their parents, as John, Robert's son, or John Robertson, James, William's son, or James Williamson, and so on. Again, men got names from their occupations, as John the Smith or soon simply John Smith, Hugh the Miller or Hugh Miller. So in other languages, as the Scotch synonymes of Baxter or Baker, Thaxter or Thacher, etc.

Then we find many getting titles from their residence. Noblemen, it is well known, are called from their estates. So through all ranks, as Peter of the Lane, Sam on the Hill, Jem of the Meadows, etc., and in this way grow up in time countless family appellatives, as Lanes, Hills, Meadows, Heaths, Dales, Downs, Forests, Brooks, Rivers and the like. Of this class, too, are Greenwood, Underwood, Redfield and many similar.

Parts of the human body and various objects of nature, plants, animals, even minerals, have by some singular association, hopeless now to trace, given special designations to individuals first, and then to families. For instance, Head, Leg, Foote, Blood, Ash, Birch, Root, Branch, Hedge, Straw, Peach, Pear, Thorn, Berry, Rice, Millet, Hare, Fox, Badger, Bull, Partridge, Sparrow, Bird, Drake, Fish, Pollock, Herring, etc., and Stone, Jasper, Marble, Jewell and many more of similar character.

Very many of these names are, when we consider their actual signification, extraordinary and surprising, and we cannot but wonder how a man could ever come to be called a Wolf, a Hog, a Crane, a Gull, or by so curious a title as Moon, Salt, Doll, Pinchbeck and others quoted equally strange. These anomalies and eccentricities were analyzed and explained by references to heraldic bearings, jocular and familiar sobriquets or nicknames, corruptions, abbreviations, etc. A great many singular and striking instances were given, and elucidated by explanations yet available in history, social customs and records and derivations of various sorts, from which light may yet be thrown upon these apparent vagaries. A large number, seemingly utterly incomprehensible at first sight, were traced to their incidental origins, and the curious transformations they had undergone clearly developed. A long list was also given of grotesque and unaccountable appellatives, of the origin of which no reasonable conjecture seems to be now possible.

The nomenclature of places, towns, cities, castles, estates, etc., was fully investigated, and followed up through contractions and the corruptions of time to its sources in the primitive Celtic of the Britons, the Saxon, the Latin terms of the Romans and the Norman French introduced by the conquest. The frequent transfer of these to family names was also illustrated by examples. The changes effected by translation into other languages were considered too, and made plain by numerous instances.

The system of nomenclature of the Greeks and Romans was briefly described, and its analogies with the customs of later times noticed.

It is impossible in this compendium to note even all the leading points of the essay. Of course, we cannot recapitulate here the large number of carefully collected

and arranged illustrations; or follow out the theory and state the conclusions deduced, either upon general or special instances. Our narrow space is inadequate to give a competent view of a thoroughly digested and systematic analysis of such a subject.



REGULAR MEETING, MONDAY, NOV. 18, 1872.

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

The SECRETARY announced the following correspondence:—

Bremen, Naturwissenschaft verein, Sept. 7; Brunn, Naturforschende verein, Apr. 2; Cherbourg, Société Nationale des Sciences Naturelles, Juillet; Chicago Academy of Sciences, Oct. 8; Danvers, Peabody Institute, Nov. 7; Sacramento, Agassiz Institute, Nov. 1, 3; Chipman, R. M., Lisbon, Conn., Nov. 8; Foster, J. W., Chicago, Ill., Nov. 11; Levette, Gilbert M., Indianapolis, Nov. 9; Newberry, J. S., New York, Nov. 13; Perry, W. S., Geneva, N. Y., Nov. 14; Pumpelly, Raphael, St. Louis, Mo., Nov. 11; White, C. A., Iowa City, Iowa, Nov. 11; Waters, J. Linton, Chicago, Ill., Nov. 9; Woods, Katie T., Salem, Oct. 24.

The letters from the "Agassiz Institute," the one by Dr. Thomas M. Logan, the President, the other by the Corresponding Secretary, Rev. J. H. C. Bonté, may be especially noticed, as officially announcing the organization of a scientific institution under the above name in Sacramento; and sending "its first greeting to the Essex Institute, Salem, Mass." "In framing our constitution and laws," Rev. Mr. Bonté writes, "we have used yours as our model, and we therefore address you first. Our opportunity for adding material for the study of natural history is, we think, great, and we begin with great hopes of a splendid future."

The LIBRARIAN reported the following additions :—

By Donation.

- FOOTE, C. Files of several County Papers, Aug., Sept., Oct., Nov., 1872.
 KIMBALL, JAMES. Freemason's Monthly Magazine, 1859-68, 10 vols.
 LEE, JOHN C. Commercial Bulletin, Oct. 26, Nov. 2, 1872.
 LOGAN, THOMAS M., of Sacramento, Cal. Report of the California State Board of Health, 1870-71, 1 vol. 8vo.
 PEABODY ACADEMY OF SCIENCE. Fourth Annual Report, 1871. 8vo pamph.
 SIBLEY, J. L., of Cambridge, Mass. Catalogus Universitatis Harvardianæ, 1872. 8vo pamph.
 U. S. PATENT OFFICE. Official Gazette, Oct. 15, 22, 29, 1872.
 WILLIAMS, HENRY L. Miscellaneous pamphlets, 4.

By Exchange.

- CROSSE ET FISCHER, Paris, France. Journal de Conchyl. Tome xii. No.3, 1872.
 GEOLOGICAL SURVEY OF CANADA. Report of Progress for 1870-71. 8vo pamph.
 INSTITUT HISTORIQUE, of Paris, France. L'Investigateur, Jan.-Juin, 1872.
 L'ACADÉMIE IMPÉRIALE DES SCIENCES DE ST. PETERSBOURG, Bulletin of. Tome xvi, Nos. 1-6. Tome xvii, Nos. 1-3. Memoires. Tome xvii, No. 12, 1871. Tome xviii, Nos. 1-6, 1872.
 LITERARY AND HISTORICAL SOCIETY OF QUEBEC, Transactions of, 1871-72. New Series, Pt. IX. 8vo, 1872.
 NATURFORSCHENDEN VEREIN IN BRÜNN. Verhandlungen, Bd. ix, 1870.
 PHILADELPHIA ACADEMY OF NATURAL SCIENCES, Proceedings of. Pt. II. May-Sept., 1872. 8vo pamph.
 SOCIÉTÉ D'ANTHROPOLOGIE, Paris, France. Bulletin. Tome vi. 11e série, 3e fascicule. Oct., Nov., 1871. 8vo pamph.
 SOCIÉTÉ NATIONALE DES SCIENCES NATURELLES, Cherbourg, France. Memoirs. Tome xvi, 1871-72. 8vo pamph.
 SOCIÉTÉ ROYALE DES ANTIQUAIRES DU NORD KJOBENHAVN. Memoires, Nouv. Ser., 1870-71. 2 pamphlets, 8vo. Tillaæg til Aarboger for Nordisk Old-Kyndighed og Historie, 1870, 1871. 2 pamphlets, 8vo.
 PUBLISHERS. Asher's Catalogue. Essex County Mercury. Gloucester Telegraph. Haverhill Gazette. Historical Magazine. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Salem Observer.

The PRESIDENT called the attention of the Institute to a package of old papers recently presented by Mr. Eben G. Berry of Danvers. Several of the papers were read, and were interesting, showing the spirit of the times in which they were written. The following may be specified :

The commission of Benjamin Berry to be Ensign of the third Foot company in the town of Andover in the 4th Regiment of Militia in the County of Essex, whereof

Rich. Saltonstall, Esq., is Col. ; signed by Wm. Shirley, dated 2 July, 1754.

Bill of sale, Mr. George Daland of Salem to Mr. Benjamin Berry of Andover, for a negro named "Fortune," dated Aug. 30, 1756.

Warrant from Hon. Henry Gardner, Treasurer of Mass., to Benjamin Berry, constable or collector, dated 21 Feb., 1777, to collect the tax of 277£ 7s., assessed upon the town of Andover.

A summons from the selectmen of Andover to Capt. Benjamin Berry, surveyor of highways, dated March 19, 1767, requiring him to see that each person, named in this list, work out the sum annexed to their names in the months of May or June next ensuing, on the roads hereafter mentioned.

Several deeds of land, also military orders, for calling out the militia for inspection and parade.

Some of the papers proved that the "treating to the drinks" on every occasion of purchasing a new saddle or article of dress, etc., was a custom of that period, and a certificate of its performance was given. Thus :—

Andover, August 19, 1750.

This may Certify All Home It may Concern, That Mr. Benjamine Berry Hath Paid Suffitient Beaverige For A New Red Plush Saddle and lite Colard Housen To The Full Satisfaction of The Subscribers Hereof.

Henry Abbot.

Henry Abbot, Jr.

Andover, March the 19 day, 1756.

This may Certify All Home it may Concern that Benjamin Berry junr Hath Paid suffitient Beaverige for A new blew sarge Coot with blew morehare buttens with

A red lining to the full satisfaction of the subscribers hereof.

Benja. Berry.

Mary Robinson.

Mr. F. W. PUTNAM exhibited a photograph of a human skeleton found in a cave in France. This photograph, which had been sent to the Peabody Academy of Science by Mr. S. H. Scudder, formerly of the Boston Society of Natural History, now residing in Mentone, France, showed the skeleton, as found in the cave. Mr. Putnam, taking the photograph for his text, spoke of the great antiquity of man, as proved by the finding of human bones and the works of man in various caves in Europe, and in the river drift of various places.



THE ADJOURNMENT OF THE QUARTERLY MEETING from Wednesday the 13th inst., was then held.

Daniel B. Hagar was unanimously elected Vice President of the Department of the Fine Arts, to fill the vacancy caused by the resignation of George Peabody.

Arthur S. Rogers of Salem, Solomon Varney of Salem and John Todd Moulton of Lynn, were elected resident members.

Voted, That the regular meetings in December be held on the 2d and 4th Monday evenings in lieu of the 1st and 3rd.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 4. SALEM, MASS., DECEMBER, 1872. No. 12.

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

REGULAR MEETING, MONDAY, DECEMBER 9, 1872.

Meeting this evening at 7 30 o'clock. The PRESIDENT in the chair. Records of preceding meeting read.

The evening was occupied by the reading of a communication, by Mr. John Robinson, on

FERNERIES, HOW TO MAKE THEM, AND WHAT TO PUT IN THEM.

Fern cases, or ferneries, as most of us call them, were originally called Wardian cases, in honor of their inventor, Dr. B. N. Ward of London, who published a book upon the subject in 1842. These cases are only a modification of the handglass always used to force or protect plants in the greenhouse or open air; yet the placing of this in a practical way renders it easy to import the plants of foreign tropical countries, which otherwise could never be seen here in a living state, besides enabling us to grow at home as beautiful ferns and other delicate, moisture-loving plants as are seen in the hot-house or conservatory.

The fern case, as it comes from the cabinet-maker's, is

a handsome piece of furniture, but an expensive one; so expensive, perhaps, as to deter many from possessing a fernery. This need not be, for at home a case can be made just as serviceable, and having some advantages even over the expensive ones.

Procure from your carpenter a good pine board, of the dimensions you may wish, for the base of your structure, which by the way should be about one-third longer than wide. Next obtain a suitable moulding, black walnut is the best, and fit it around the base board as if it was a picture frame on end. Next have a zinc pan made to fit closely inside of this, coming up to the top of the moulding; do not have any turned over edge or ring to the pan, as they are of no use, neither should the pan be made first, as it is difficult to make a neat box to fit outside it. Have the pan painted on the inside with a good coat of tar, as the delicate roots of the plants dislike to come in contact with a metal surface. Next comes the glass, and here is where most persons fail. Be sure the glass is inside the pan, and never have the pan inside the glass, for the moisture collecting on the glass runs down outside the pan to the woodwork, rotting it, and very likely between the moulding and base board on to the table or what else the case rests on, causing much trouble; also, in watering, the glass directs the water in like manner, with the same, if not worse, results.

A good proportion for the glass is to have it as high above the base as the case is wide, and it should go to the bottom of the pan; have the corners true and the top level, that the plate of glass which covers the top, and which should be one-fourth of an inch larger all around, shall be even. With common flour paste attach narrow strips of cloth up over the corner angles on the outside and but only an inch or so down the inside from the top.

When dry, paste some dark paper over it, so as to cover the cloth, also around the top plate of glass to prevent the edge from cutting your hands; no cloth is necessary for this. Fill and oil the black walnut moulding, and the case is complete.

A still more simple one is to tar the inside and paint the outside of a shallow pine box, and place the glass directly inside it. If you intend purchasing a handsome case, it will be better to have one made to order, as all the ready made ones usually offered for sale have the case poorly and incorrectly constructed in more ways than one; nearly all have flat tops, to be avoided where there is woodwork (the home made case having no woodwork at the top, it is not a disadvantage). One advantage possessed by the expensive case is that the whole top takes off, enabling you to work all around and not entirely from overhead. Here you may construct ruins, grottos, arches, etc., with pumice and cement; pumice is so light that it adds but little weight to the case, and the cement will bind the whole together as firmly as one rock, all at a very slight expense, at the same time adding much to the beauty of the interior. Very neat circular cases are for sale at the stores, and can be filled so as to be very attractive; they can also be used as fern nurseries. To do this, make the earth damp and firm on top, having first placed a few small pieces of broken flower pots in the upper soil. Take a leaf of some fern, or several different species of ferns, if you desire, that have the fruit quite ripe; this can be discovered by shaking over white paper, when, if ripe, a brown powder will come off; these are the spores or seeds. Dust these over the prepared earth, replace the glass, and leave the case in a warm shady corner. In a few weeks, if not permitted to become dry, a green scum will appear, which in time

will transform itself into the most beautiful little ferns, that may be separated, potted, or transferred to other cases.

Now to fill the case. First make, if the pan be three inches deep, about one inch in depth of drainage, pebbles, charcoal, broken bricks, or, better still, broken flower pots; over this a thin layer of moss or coarse fibrous stuff of some sort to prevent the earth washing into the drainage and choking it. Some cases have holes in the bottom and glass receptacles for superfluous water; but if care be used in watering, this will be entirely unnecessary. For soil suitable to grow most plants likely to be in the fernery, a mixture of one part sand, one part peat, two parts light pasture loam (leaf mould may be used for peat), will do well. The earth should be heaped up a little in the centre, or if the case is large two or three little elevations may be made; upon these place the larger ferns or plants, with the others distributed around them. A log of wood covered with moss and small ferns is a very pretty centre piece, and to cover the ground the little running *Selaginella*, common in all greenhouses, answers better than almost anything else, except our own native mosses, which must be treated with care, or else they mould or dry up.

Fergeries may be divided, if you like, into two classes, dormant and active. By dormant I mean such as contain plants which lie at rest during the winter months, chiefly our natives and others like them in habit that have been introduced. These it is well to arrange separately, as they require less heat than the species growing all the year round, chiefly from the tropics, which form the active fernery. The dormant fernery can be made very interesting, the plants in it keeping about the same all the winter, but growing towards spring; and as many like

the pleasure of filling their case every fall, this is as good a way as any to do, as it is a pretty ornament for winter, and in summer need not be cared for. Of the two thousand exotic species known to exist, but three hundred probably can be purchased in this country, and of these comparatively few are suitable to grow in the case. Most of the smaller growing species for sale hereabouts will do, particularly those of *Pteris*, *Doodia*, and *Adiantum* (maiden hair ferns). Gold and silver ferns require care, as the yellow and white farina washes off in watering. Besides ferns, *Begonias*, *Dracænas* and *Marantas* do well for the centre of a case, and many others can be tried; even if they do not succeed there is a pleasure in experimenting.

In New England there are about the same number of ferns as in Old England, forty-five or six. About Salem, say within ten miles' radius, there are sixteen genera, twenty-nine species; of these, few are suited to the fernery. The larger ones grow well in the garden, on the northerly side of a fence or building. Of the smaller ones, the ebony spleenwort, two or three of the *Aspidiums* or shield ferns, the *Asplenium Trichomanes*, do well; the climbing fern will look pretty for a while and some of the ferns which lose their foliage at the frost, will, if their roots be planted just under the moss, grow toward spring, such as the beech ferns, hay scented ferns, New York ferns and others. The moonwort, and common polypody which grows every where, should never be left out, and the harts tongue, and walking ferns, are valuable accessions if they can be had. This comprises about all the native ferns of use that can be collected here, but there are many little plants to associate with them which add much to the beauty of the case. The partridge berry (*Mitchella repens*) can be gathered in bunches, regardless

of roots, tucked in the moss and earth, where it will grow, bloom, and often fruit.

The rattlesnake plantain (incorrectly called adder's tongue), the Hepatica, gold thread, Linnea, all do well, and club mosses, wintergreen, checkerberry, all add to the effect. The larger foreign and native ferns may be grown in an open fernery, which should be in a room with as moist air as possible.

Do not drown your plants. Persons frequently ask, "How often shall I water my plants?" It is impossible to answer, except to say "whenever they are dry;" with the same amount of water per day, in a cool room the earth in a flower pot would be mud, while in a hot room it would be powder in a few hours. To avoid pests, mould, etc., sprinkle the ferns occasionally and give air an hour or more every day. Wiping off the moisture from the glass will take away many impurities. Cases sprinkled often seldom require watering, and it is surprising how long life will last on a small supply of water. I once planted in the bottom of an olive bottle a fern and some moss, corked it, and sealed the top over with sealing wax, placed it upon a light shelf, and left it; the fern flourished about a year, and weeds which sprang up lived six months longer; life lasted eighteen months in all, without the addition of a single drop of water.

Do not place the fernery at the southern window, in the full glare of the sun; an eastern or western one is better; turn it around every week that the plants may grow evenly. The case may be filled in August, to be established by winter. Some fill them as early as June, others not till October, but August is the best for the tropical fernery; the natives need not be attended to till September, if you like. Not only may ferns be grown in cases but some species are very beautiful as basket or pot plants.

A cocoanut may be formed into a very neat basket by sawing off the top and burning holes half an inch across all over the shell with two small ones at the top opposite each other for the wire to suspend it by; if in this a fern is planted which has running roots with leaf buds, the effect is in time to cover the whole shell with the beautiful foliage, as these little roots find their way to every hole before long. For this, *Adiantum setulosum* and *A. Æthiopicum* are the best. Baskets to hang in the top of a fern case may be made of thin pliable bark, wired together. Wire baskets lined with moss and filled with earth are fine for ferns with stems which run on top of the soil, such as most of the *Davallias*, *Polypodium aureum* a native of Florida, and others. The hare's foot fern is one such, throwing out woolly feet in advance of the leaves. A log hollowed out on one end is most suitable to grow the stag horn ferns upon; they will in time form huge crowns on the top of the log, while little creeping species may be grown successfully on the side at the same time if wired on with a little moss and earth. Hollow stone ware pillows are made with pockets in the sides, the centre filled with earth, ferns planted in the pockets, and the whole covered with a bell glass. Wire netting can be formed into a tube filled with coarse earth, and ferns inclined to climb by rooting stems, as the ivy does, can be made to cover it with foliage. In fact, there is no end to the variety of design that can be introduced into the fernery whether it be a simple bell glass or a structure one hundred feet long by forty wide and high. Of this latter class of ferneries most beautiful ones are described in foreign books, where sometimes the side walls are of turf covered with the creeping *Lycopods* and ferns, while little brooks, mimic waterfalls and ponds add both to the beauty of the place and to the air, the moisture necessary for the

health of the plants. This is called the natural cultivation of ferns, and approaches as near as possible to their natural habitat. It is to be hoped that such will soon be established by our wealthy amateurs on this side of the water, as it is much more instructive than the ordinary way of growing these plants, and that there will be a steady increase in the already growing interest in ferns and ferneries.

The evening was made more enjoyable and the remarks much more interesting and clear by the exhibition of ferneries and plants upon the platform illustrating the subject. They were chiefly as follows: A large black-walnut fern-case (cabinet-maker's pattern) containing stone grotto and choice tropical ferns, Selaginellas, Begonia rex, etc.; a square home-made case (large) containing native plants entirely; circular fernery (large) containing tropical plants; log with a fine specimen of *Platyserium alcicorne*, stag horn fern growing upon the top, other ferns and mosses on the sides; wire basket with *Davallia*; cocoanut shells with maiden-hairs; bell glass with *Adiantum Capillus-Veneris* or English maiden-hair, also other ferns in pots, cut fronds, etc.

Ferns suitable for ferneries which can be purchased at the greenhouses at fifty cents or less:—

<i>Pteris serulata</i> ,	<i>Adiantum Capillus-Veneris</i> ,
“ <i>argyrea</i> ,	“ <i>affine</i> ,
“ <i>longifolia</i> ,	“ <i>Æthiopicum</i> ,
“ <i>tremula</i> ,	“ <i>cuneatum</i> ,
“ <i>cretica</i> , var. <i>albo-lineata</i> ,	“ <i>fulvum</i> ,
<i>Pellæa rotundifolia</i> ,	“ <i>hispidulum</i> ,
“ <i>hastata</i> ,	<i>Aspidium molle</i> ,
<i>Gymnogramme sulphurea</i> ,	<i>Selaginella Martensii</i> ,
“ <i>calomelanos</i> ,	“ <i>densa</i> ,
<i>Doodia caudata</i> ,	“ <i>Braunii</i> ,
<i>Asplenium Mexicanum</i> ,	“ <i>Kraussiana</i> ,
<i>Onychium Japonicum</i> ,	“ <i>uncinata</i> .

The SECRETARY announced the following correspondence:—

From E. A. Andrews, Lancaster, Fairfield Co., Ohio, Nov. 22; John Collett, Indianapolis, Ind., Nov. 18; C. W. Jenks, Philadelphia, Penn., Nov. 23; John Todd Moulton, Lynn, Nov. 25; G. C. Swallow, Columbia, Boone Co., Mo., Nov. 20; Henry White, New Haven, Conn., Nov. 29; A. Winchell, Ann Arbor, Nov. 25; Berwickshire, Naturalists' Field Club, Aug. 26; Bogota, La Souldad de Naturalista Columbiano; Brooklyn, N. Y., Mercantile Library Association, Nov. 21; Danvers, Peabody Institute, Dec. 2; Lund, Die Carolinische Universitate, Aug. 1; Würzburg, Die Physicalische Medicinische Gesellschaft, Aug. 28.

THE LIBRARIAN reported the following additions:—

By Donation.

AGASSIZ INSTITUTE, of Sacramento, Cal. Constitution and By-laws of. 8vo pamph, 1872.

CLOGSTON, WM., of Springfield, Mass. Oswego County Directory, 1866-7, 1 vol. 8vo. Utica City Directory, 1858-9, 1 vol. 12mo. Bangor Directory, 1867-8, 1 vol. 12mo. Brattleboro Directory, 1871-2, 1 vol. 8vo. Ontario County Directory, 1870, 1 vol. 12mo. Directory of Cities and Villages on the line of the Boston & Albany Railway, 1869-70, 1 vol. 8vo. Erie Business Directory, 1867-8, 1 vol. 8vo. Directory of Binghamton, Elmira, Ithaca and Oswego, 1864-5, 1 vol. 12mo. Janesville Directory, 1859-60, 1 vol. 12mo. American Advertising Directory, 1831, 1 vol. 12mo.

FARMER, MOSES G. Patent Office Reports, 22 vols. 8vo. Department of Agriculture, 4 vols. 8vo. Finance Report, 1870, 1 vol. 8vo. Commercial Digest, 1 vol. 8vo. Compendium of U. S. Census, 1850, 1 vol. 8vo. Cyclopædia of Commerce, 1 vol. 8vo. The Practical Model. 7 nos. Journal of the Telegraph. 72 nos. Engineering. 32 nos. Journal of Chemistry. 24 nos. Salem Directories for 1851, 1853, 1855, 1857, 1859, 1864, 6 vols. 12mo; 1866, 1869, 2 vols. 8vo. Congressional Globe 1855-6, 2 vols. 4to. Scientific American, 4 vols. folio. Miscellaneous pamphlets. 65. Scientific American. 610 nos.

GREEN, S. A., of Boston. Miscellaneous pamphlets. 20.

LEE, JOHN C. Commercial Bulletin, Nov. 9, 16, 1872.

MIDDLESEX MECHANICS' ASSOCIATION, Lowell, Mass. By-laws etc., of the Library and Reading Room, 8vo pamph. 1872.

U. S. PATENT OFFICE. Official Gazette for Nov. 5, 12, 1872.

By Exchange.

ARCHIV DER ANTHROPOLOGIE IN BRAUNSCHEWIG. Band v, Heft III, 1872. 4to pamph.

BERWICKSHIRE NATURALISTS' CLUB. Proceedings of, 1871-2, 8vo pamph.

GEOLOGICAL AND POLYTECHNIC SOCIETY OF THE WEST RIDING OF YORKSHIRE. Proceedings of, New Series Pt. 1, pp. 1-56, 1871-2. 8vo pamph.

KONGLIGA UNIVERSITETS LUND SWEDEN. Lund Universitets Biblioteks Accessions Katalog, 1869, 1870, 1871. 3 pamphlets 12mo. Acta Universitatis Lundensis, 1868, 1869, 1870. 7 pamphlets 4to.

NATURHISTORISCHEN GESELLSCHAFT ZU HANNOVER. Einundzwanzigster gahresbericht, 1870, 1871. 8vo pamph.

NATURHISTORISCHEN VEREIN DER PREUSSISCHEN RHEINLANDE UND WESTPHALENS IN BONN. Verhandlungen, xxviii, xxix. Jahrg. 1871, 1872. 2 pamphlets 8vo.

NATURWISSENSCHAFTLICHEN VEREINE ZU BREMEN. Abhandlungen Band iii, Heft II, 1872. 8vo pamph.

PHILOSOPHICAL AND LITERARY SOCIETY. Annual Report for 1871-2. 8vo pamph.
PHYSIKALISCH-MEDICINISCHE GESELLSCHAFT IN WÜRZBURG. Verhandlungen, Neue Folge. Bd. iii. Heft 1, 2, 1872.

SOCIÉTÉ D'ACCLIMATATION, Paris. Bulletin Mensuel. Tome ix, Nos. 6, 7, 1872. 2 pamphlets, 8vo.

VERMONT STATE LIBRARY. Vermont Legislature Directory, 1872-3, 1 vol. 12mo. Montpelier, 1872.

PUBLISHERS. American Journal of Science and Arts. American Naturalist. Christian World. City Post. Gloucester Telegraph. Haverhill Gazette. Historical Magazine. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Sailors' Magazine and Seamen's Friend. Western Lancet.

The SUPERINTENDENT of *Museum* reported the following :—

From FARMER, MOSES G. Portrait of Bishop Griswold.

LAMSON, F. Paper-weight, formerly belonging to Charles Dickens, bought in London by donor.

MARSH, Miss MARY. A Loom, used in the farmer's family in the last century.

PORTER, Miss M. A. View of Northey's Block, built in 1872.

STIMPSON, JAMES C. Relics from the Boston Fire, November, 1872.



REGULAR MEETING, MONDAY, DECEMBER 23, 1872.

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 T. C. Amory, Boston, Dec. 19; Jacob Batchelder, Lynn, Dec. 5, 18; P. A. Hanaford, New Haven, Dec. 12; Charles V. Hanson, Peabody, Dec. 13; Alfred Osgood, Newburyport, Dec. 13; Proctor Bros., Gloucester, Dec.; Buffalo Historical Society, Dec. 19; Peabody Institute, Danvers, Dec. 14; New Jersey Historical Society, Dec. 21.

The LIBRARIAN reported the following additions :—

By Donation.

AMORY, THOMAS C. Our English Ancestors, 8vo pamph. A Home of the Olden Time, 8vo pamph.

BOARDMAN, S. L., of Augusta, Me. Agriculture of Maine, 1871, 1 vol. 8vo. Water Power of Maine, 1 vol. 8vo, 1869. Report of the Commissioners on "Paper Credits," 1870, 1 vol. 8vo. Miscellaneous pamphlets, 7.

CHAPMAN, G. R. Annual Report of the American Board of Commissioners for Foreign Missions for 1872. 8vo pamph. Sermon by Dr. Bartlett at the Annual Meeting in New Haven, Ct., Oct. 1, 1872. 8vo pamph.

GREEN, S. A., of Boston. Miscellaneous pamphlets, 5.

HAMMOND, J. Memoirs of Russia from 1727 to 1744. 1 vol. 4to. London, 1773.

LEE, JOHN C. Commercial Bulletin, Dec. 7, 1872.

PEIRSON, GEO. H. Proceedings of the Grand Lodge of the Most Ancient and Honorable Fraternity of Free and Accepted Masons of Mass., Mch. 8-Dec. 27, 1871. 1 vol. 8vo.

STONE, JOSEPH W. Salem Directories for 1842, 1850, 1853, 3 vols. 12mo.

U. S. PATENT OFFICE, Washington, D. C. Official Gazette, Nov. 26, Dec. 3, 1872.

WHITE, CAPT. A. H., of Boston, The White and Haskell Family, compiled by P. Derby, 1 vol. 8vo. 1872.

By Exchange.

SOMERSETSHIRE ARCHÆOLOGICAL AND NATURAL HISTORY SOCIETY OF TAUNTON, Proceedings of, for 1871. 12mo pamph.

PUBLISHERS. 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.

The PRESIDENT read a communication from Rev. P. A. Hanaford of New Haven containing a memoir of Miss Quiner of Beverly. Referred to the committee on publications.

The PRESIDENT read a communication from Nehemiah Cleaveland, Esq., containing a sketch of the life of his grandfather, Rev. John Cleaveland, of that part of Ipswich known as Chebacco, now the town of Essex, with the letters and journals copied and condensed of the campaign of 1758, having received the appointment of chaplain to one of the regiments from Gov. Pownall. Referred to the publication committee.

The following is a list of the names of the persons who have been appointed to the various offices of the Board of Education for the year 1900-1901.

President: J. W. Smith
Vice-President: A. B. Jones
Secretary: C. D. Brown
Treasurer: E. F. Green
Members: G. H. White, I. J. Black, K. L. Gray, M. N. Blue, O. P. Red, Q. R. Purple, S. T. Yellow, U. V. Orange, W. X. Silver, Y. Z. Gold.

The Board of Education has the honor to announce that the following persons have been appointed to the various offices of the Board of Education for the year 1900-1901.

President: J. W. Smith
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Vol. 5/7

BULLETIN

OF THE

ESSEX INSTITUTE,

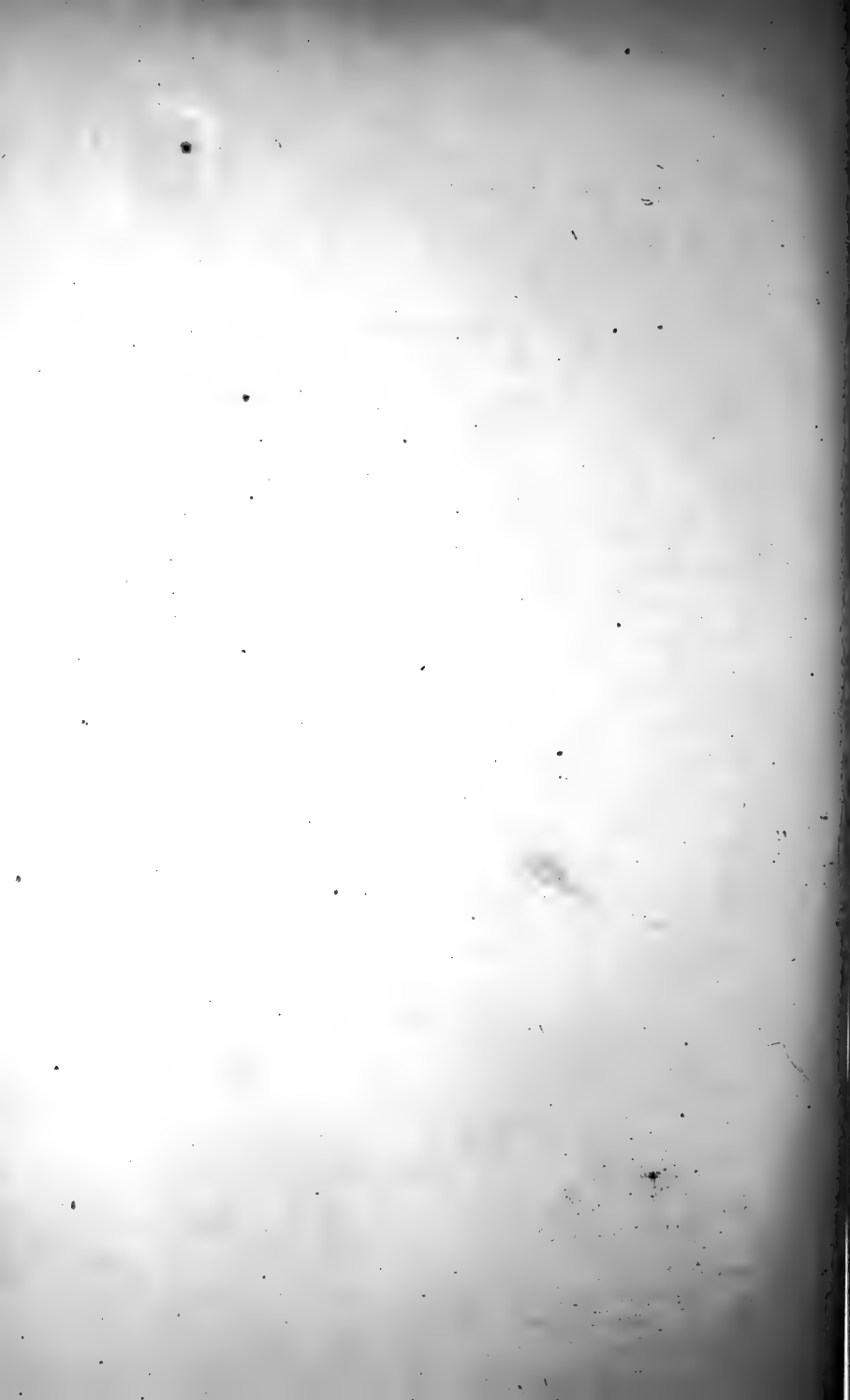
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OF THE

ESSEX INSTITUTE.

VOL. 5. SALEM, MASS., JAN. AND FEB., 1873. No. 1.

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

REGULAR MEETING, MONDAY, JANUARY 6, 1873.

THE PRESIDENT in the chair. Records of preceding meeting read.

DR. A. S. PACKARD presented a verbal communication, of which the following is an abstract, on

THE GLACIAL PHENOMENA OF NORTHEASTERN AMERICA
COMPARED WITH THOSE OF EUROPE.

DR. PACKARD said that during a hurried tour through the Alps, he had specially observed the glacial phenomena of the regions which had been glaciated in past times. The impression made on his mind was that the evidences of the former presence of glaciers in valleys, at the heads of which were the ends of glaciers now existing, were scarcely more distinct than in the valleys of the White Mountains, the Adirondacks and even the coast of Maine and Massachusetts, in all of which localities he had in years past studied these phenomena. As he approached the Alps from the valley leading up to Kempten from Munich, he had noticed that in the region of Kempten

the valley was flanked by rounded moraines, clothed with pines and firs, and no better marked than those in the valley of the Saco about Conway. Their presence was revealed by the clearing away of the forests in the same manner as in the White Mountains and the Adirondacks. In one important feature, the marks were less apparent, as one does not see in the Alps the broad trains of boulders so common in the White Mountains, as they have been cleared away after centuries of occupation of the country. It was more difficult to detect striated and rounded rocks in the Alpine valleys than he had imagined from the accounts of Alpine geologists.

He should, however, make an exception to the valley of Hasli, in which the striæ on the sides of the mountains are wonderfully distinct.

In Norway also the grooves and striæ may be often seen in protected places, but are scarcely more apparent than about Salem, for example.

He also compared the ice marks and moraines in Wales with those of this country, and alluded to the identical appearance of the marine glacial beds of Sweden with those of northern New England. He thought that the student of this subject need not go outside of the limits of New England for excellent examples of the work done by ancient glaciers.

A general conversation followed on the subjects suggested by the remarks of Dr. Packard, participated in by Messrs. F. W. Putnam, A. C. Goodell, Jr., E. S. Atwood, A. H. Johnson and others; also on the inscriptions on stones, which have been supposed to be Runic, but are probably Indian; and on the visit of the Northmen, which seems to be historically believed, but of which no relics have been found.

The President remarked that, twenty-five years ago this day, a meeting of the Essex County Natural History Society was held to act upon the report of a committee, appointed at a previous meeting, to confer with a similar committee of the Essex Historical Society, on the subject of a union of the two societies. The resolutions reported by the committee and adopted with some slight modifications were the basis of our present organization.

A committee was appointed to petition the Legislature for an act of incorporation, a committee for the same purpose having also been appointed by the Historical Society. The act was duly passed and was accepted by the two societies at meetings held March 1, 1848, and the organization of the Institute immediately followed thereon.

The President presented a brief statement of the organization and condition of the two societies at the time of the union, and made some remarks on the causes that led to this result, and alluded to the various conversations and discussions among the members before any definite action was taken by either society. He suggested the propriety of adopting some measures to commemorate this event.

After a discussion on this subject, a committee consisting of Messrs. A. C. Goodell, A. H. Johnson and E. S. Atwood was appointed to consider and report at an adjournment of this meeting, a plan to commemorate this epoch in the history of the Society.

The SECRETARY announced the following correspondence:—

From Samuel L. Boardman, Augusta, Maine, Dec. 20; A. J. Cook, Lansing, Michigan, Nov. 15; John T. Moulton, Lynn, Dec. 26; Edward Russell, Boston, Jan. 4; J. Lawrence Smith, Louisville, Kentucky, Dec. 23; New York, Genealogical and Biographical Society, Oct 31; New York Lyceum of Natural History, Dec. 23.

E. A. Goldthwaite of Salem was elected a resident member.

Voted, To adjourn to Saturday evening next at 8 o'clock.



ADJOURNED MEETING, SATURDAY, JANUARY 11, 1873.

The PRESIDENT in the chair.

Mr. A. C. Goodell reported, for the committee, several plans that had been suggested — after a discussion on motion of Dr. A. H. Johnson.

Voted, That the twenty-fifth anniversary be celebrated by a banquet on Wednesday, the fifth of March, ensuing — at which members can procure tickets for themselves and their friends.

On motion of Mr. D. B. Hagar,

Voted, That a committee be appointed with full powers to make all arrangements.

The committee consists of Henry Wheatland, A. C. Goodell, Jr., William Sutton, F. W. Putnam, D. B. Hagar, A. H. Johnson, John Robinson, James O. Safford, E. C. Bolles, C. Cooke, E. S. Atwood, William Neilson, George D. Phippen, Joshua Coit, and G. M. Whipple.

Adjourned.



REGULAR MEETING, MONDAY, JANUARY 20, 1873.

THE PRESIDENT in the chair. Records of preceding meeting read.

The SECRETARY announced the following correspondence :—

From Jacob Batchelder, Lynn, Jan. 9; E. M. Coffin, Orange, Jan. 8; A. W. Greenleaf, Newburyport, Jan. 7, 9; J. C. Holmes, Detroit, Mich., Jan. 9; M. L.

Huntley, South Lancaster, Mass., Dec. 24; J. Munsell, Albany, N. Y., Jan. 16; C. Fessenden Nichols, Boston, Dec. 27; A. T. Perkins, Boston, Jan. 16; John C. Ropes, Boston, Jan. 11; J. Henry Stickney, Baltimore, Md., Jan. 18; Cyrus Woodman, Cambridge, Jan. 14; Belfast Naturalists' Field Club, Nov. 1; Boston Society of Natural History, Jan. 1; Brooklyn Mercantile Library, Jan.; Bowdoin College, Jan. 13; Hague, Entomological Society of the Netherlands, Oct. 25; Hamburg, Naturwissenschaftlicher Verein, Dec. 10; Lisbon, Academie Royale des Sciences, Sept. 27; Maine Historical Society, Jan. 13; Maryland Historical Society, Jan. 13; New Haven, Yale College, Jan. 9; New York State Library, Jan. 13; Pennsylvania Historical Society, Jan. 16; U. S. Bureau of Education, Jan. 17.

The LIBRARIAN reported the following additions :—

By Donation.

CHAMBERLAIN, JAMES A. Manual for the General Court, 1858, 1 vol. 16mo. The New York State Guide, 1 vol. 16mo. Military Commission to Europe 1855, 1856, 1 vol. 4to. Proposition concerning Protection and Free Trade, 1 vol. 12mo. The Cultivator, 1845, 1 vol. 8vo. Guide through the Middle, Northern and Eastern States, 1847, 1 vol. 16mo. Patent Office Reports, 1854, 1856, 1857, 1858, 4 vols. 8vo. Report on Agriculture, 1862, 1863, 2 vols. 8vo. Salem Directory, 1851, 1 vol. 12mo. Miscellaneous pamphlets, 60.

COLE, Mrs. N. D. Salem Gazette for 1872, 33 Nos.

EDITORS OF "THE NATION," New York. The Benson Family of Newport, R. I. 1 vol. 8vo.

FOOTE, C. Files of several County Papers for 1872. 209 Nos.

FULLER, MISS. Memoirs of Denmark, 1 vol. 12mo. London, 1700. Treason Unmask'd: or the Queen's Title, 1 vol. 12mo. London, 1713.

GARRISON, W. P., of New York. Constitution and By-laws of the New England Society of Orange, N. J., Dec. 1872. 16mo pamphlet.

HAWAIIAN BOARD OF EDUCATION. Ka Huinahelu Hov; via hoi ka Arimatika Kulanui, 1 vol. 8vo. Ka Buke Ao Heluhelu, 1 vol. 8vo. Ka Hoailona Helu, 1 vol.

HOLDEN, N. J. The Commonwealth, 1872. 38 Nos.

NATIONAL ASSOCIATION OF WOOL MANUFACTURES, Bulletin. Oct. Dec., 1872.

NEW ENGLAND TRACT AND MISSIONARY SOCIETY OF SEVENTH-DAY ADVENTISTS AT SOUTH LANCASTER, MASS. United States in Prophecy, 1 vol. 16mo. Battle Creek, Mich., 1872.

NICHOLS, C. F. Webster's Dictionary, 1 vol. 4to. French's Poems, 1 vol. 8vo. Signs of the Times, 1 vol. 4to. Journal of Education, 1 vol. 4to. Chamber's Edinburgh Journal, 1838, 1 vol. 4to. Lessons on the Gospel of St. John. 1 vol. 12mo. Outlines of Phrenology, 1 vol. 12mo. Several pieces of Music.

ROPES, W. L., of Andover, Mass. Catalogue of the Andover Theological Seminary, 1872-3, 8vo pamph.

RUSSELL, EDWARD, of Boston. The Mercantile Agency Reference Book for July, 1871. 1 vol. 4to.

STONE, MISS MARY H. "The Nation." 222 Nos.

U. S. PATENT OFFICE, Washington, D. C. Official Gazette for Dec. 17, 24, 31, 1872.

By Exchange.

BELFAST NATURALISTS' FIELD CLUB. Sixth, Eighth and Ninth Annual Reports, 1868-9, 1870-1, 1871-2. 3 pamphlets, 8vo.

BIBLIOTHEQUE UNIVERSELLE ET REVUE SUISSE. Archives des Sciences Physiques et Naturelles, Sept., Oct., Nov., 1872. 3 pamphlets, 8vo.

CANADIAN INSTITUTE OF TORONTO, CANADA. *Journal of Science, Literature and History*, Dec., 1872. 8vo pamph.

HARVARD COLLEGE LIBRARY. *Annual Reports of the President and Treasurer of Harvard College for 1871-2*. 8vo pamph.

IOWA STATE HISTORICAL SOCIETY. *The Annals of Iowa*, Oct., 1872. 8vo pamph.

KONIGLICHE PHYSIKALISH-OKONOMISCHE GESELLSCHAFT IN KONIGSBERG, PRUSSIA. *Shriften, 1871-2*. 3 pamphlets, 4to.

NATURHISTORISCHEN GESELLSCHAFT ZU NÜRNBERG. *Abhandlungen*, v Bd., 1872. 8vo pamph.

NATURWISSENSCHAFTLICHEN VEREIN IN HAMBURG. *Abhandlungen aus dem Gebiete der Naturwissenschaften*. Bd. v, II Abth. Mit 9 Tafeln. 4to pamph. *Uebersicht der Aemter-Vertheilung und Wissenschaftlichen Thätigkeit, 1869, 1870*. 2 pamphlets, 8vo.

NEW ENGLAND HISTORIC-GENEALOGICAL SOCIETY. *Historical and Genealogical Register and Antiquarian Journal for Jan., 1873*. 8vo pamph.

SOCIÉTÉ ENTOMOLOGIQUE DE BELGIQUE, IN BRUXELLES. *Annales*, Tome xiv, 1870-71, 8vo pamph.

STATE HISTORICAL SOCIETY OF WISCONSIN. *Transactions of the Wisconsin Academy of Sciences, Arts and Letters, 1870-2*, 8vo pamph.

PUBLISHERS. *American Journal of Science*. *American Naturalist*. *Bossange's Monthly*. *Christian World*. *Dexter Smith's Paper*. *Gardener's Monthly*. *Gloucester Telegraph*. *Hardwicke's Science Gossip*. *Haverhill Gazette*. *Historical Magazine*. *Ipswich Chronicle*. *Lynn Reporter*. *Lynn Transcript*. *Medical and Surgical Reporter*. *Merrimac Valley Visitor*. *Nation*. *Nature*. *Peabody Press*. *Sailors' Magazine and Seamen's Friend*. *Salem Observer*. *Western Lancet*.

DR. EMERSON'S EXCURSION TO PHILADELPHIA FIFTY YEARS AGO.

The time at the meeting was chiefly occupied by Rev. E. S. ATWOOD, who read copious extracts from a journal of the late Rev. Brown Emerson, in which was given an account of an excursion which he made to New York and Philadelphia, starting on April 23, 1822, and arriving home again after an absence of four weeks and five days.

The journal contains many interesting incidents of the trip, and quite a full and equally interesting account of the friends and places visited on the way. He left Salem, April 23, in a stage. On Tuesday evening, in Boston, called on Rev. Mr. Wisner and negotiated an exchange. "Called also on J. Peabody and spent most of the evening. He had noticed the publication of my journey in the *Salem Gazette*, which was some mortification to me." On Tuesday night he put up at Earle's Hotel, on Hanover street, and was awakened on Wednesday morning at

two o'clock, at which hour he started in the stage on his way to Northampton, where he arrived at night, and the next morning took great pleasure in visiting the house where President Edwards lived when he was settled in the town.

He started from Northampton at eleven o'clock on Thursday, in a stage, arriving at Hartford at eight in the evening. Springfield, he described as "a pleasant town, having the appearance of considerable business and wealth." There seemed to be sudden changes in the weather fifty years ago as well as now; for while the ride of Wednesday was a very cold one, on Thursday it was a hot summer day, the thermometer indicating 88 degrees, and the cattle panting in the shade. The advent of a minister from a distance seemed to be regarded as quite a distinction on the way, and at Bennett's hotel, on Friday morning, at breakfast, the landlord conducted him to the head of the table, and, calling the attention of the company, requested him to ask a blessing. Dr. Emerson adds: "This was a gratification to me, because it was apparent the company were not accustomed to this religious duty at the breakfast table, *and I was saved from the painful office of calling their attention to it myself*; and because it evinced in the landlord a regard to religious duty and a respect for the ministerial character."

He remained at Hartford, visiting among other things, the Deaf and Dumb Asylum, until the following Tuesday, when, at nine o'clock, A. M., he started for New Haven, where he arrived at four in the afternoon. He remained here until the following Friday, seeing many ministers, visiting Yale college, etc. On Friday, went on board the steamboat which started for New York at a quarter before seven o'clock, P. M. He describes the steamer as a "floating ark, one hundred and forty-six feet long and

forty-two broad, and the supper table in the principal cabin as being laid with as much taste and elegance as we find in our best hotels, and furnished with as great and rich a variety." So the palatial steamboat living is not so modern an idea as some of us seem to think. The drawing for berths, by lot, is described, but the following shows that the drawing was not altogether impartial:—

"When my name was called, Capt. B. smiling, said, 'There has been great inquiry about Mr. Emerson, and many of my New Haven friends desired me to give him a good berth.' The captain then drew for me a ticket, which gave me one of the best berths in the boat. I mention this as a proof that, though the berths are assigned by lot, 'the whole disposing thereof' is not directly 'of the Lord,' and as an expression of kind attention to a stranger on the part of some of the citizens of New Haven."

The only other incident of note connected with the trip to New York, was the open announcement at an early hour, which all could hear in their berths, "No fear, we have passed the gate of Hell,"—alluding to the passage at "Hurlgate."

The boat arrived at New York at three o'clock on Saturday morning, and he remained there, seeing the sights, and hearing some of the eminent and other preachers, until the following Friday, when he sailed for New Brunswick, N. J., thirty-five miles distant. There he remained until the succeeding Tuesday, May 14, when he started, by a very slow and dilapidated stage, for Trenton, where he was to take the boat for Philadelphia. The team arrived too late, but it pressed on to Bristol, ten miles below, and there caught the boat, which, at eight o'clock, began to move down the Delaware, the city of Philadelphia coming in sight at half-past ten.

During his stay in Philadelphia, he visited the different

localities of interest, and attended some of the sessions of the Presbyterian Assembly. One of the sermons to which he listened was that of Rev. Mr. Howe, of New Brunswick, whom he described as a "noisy, boisterous, declamatory, and dashing preacher."

Dr. Emerson remained in Philadelphia until twelve o'clock on Wednesday, May 22, when he took the steamboat on his way home, by way of Trenton, New Brunswick, New York, New Haven, and New London. He arrived at Boston on Saturday night, May 26th; and, hearing of the severe sickness of his wife, and, finding that an exchange which he had previously arranged, could be provided for, he took a conveyance home early on Sunday morning,—his journal concluding with a warm expression of the abundant reason he had for gratitude to God that his trip had been made with so much pleasure and safety.

In the back part of the book in which this journal was kept, Dr. Emerson gives a minute account of his expenses, and we reproduce the list, as having interest for comparison with present prices:—

Salem to Boston, \$1.00; lodging at Earle's hotel, 25 cents; stage, Boston to Framingham, \$1.50; breakfast, 50 cents; Framingham to Brookfield, \$2:50; Brookfield to Belchertown, \$1.31; Belchertown to Northampton, \$1:00; supper, breakfast and lodging at Northampton, 75 cents; cake at Suffield, Conn., 6 cents; stage from Northampton to Hartford, \$3.00; supper, breakfast and lodging at Bennett's hotel, \$1.00; stage from Weathersfield to New Haven, \$2.25; dinner at New Haven, 50 cents; shaving in New Haven, twice, 12½ cents; conveyance to steamboat, 25 cents; steamboat fare from New Haven to New York, \$5.00; cleaning boots in steamboat, 12½ cents; conveyance of baggage from steamboat 25 cents; break-

fast at Bunker's hotel, N. Y., 50 cents; carrying baggage 25 cents; boat and stage fare from N. Y. to Princeton, \$2.00; dinner in boat, 75 cents; supper, lodging, and carrying baggage at P., 68 cents; stage, extra, from Princeton to Bristol, Pa., \$2.00; steamboat from Bristol to Philadelphia, 50 cents; breakfast on boat, 50 cents; carrying baggage, 25 cents; shaving at N. H., 12 cents; ferry, N. Y. to Brooklyn, 8 cents; four meals and two lodgings at Mrs. Anstris', \$2.00; museum, 25 cents; hospital, 12½ cents; porter, 18 cents; boat and stage from Philadelphia to N. Y., \$2.50; lodging at N. Brunswick, 25 cents; dinner and breakfast in boat, \$1.00; porter 12½ cents; stage from New London to Boston, \$7.00; breakfast and dinner, \$1.00; stage from Boston to Salem, \$1.00. Total expenses, \$52.42.

In May, 1837, Dr. Emerson made substantially the same trip with his brother Reuben, and he noted the principal expenses as follows:

Salem to Boston, \$1.00; Boston to Providence, \$2.00; P. to N. Y. ("found") \$5.00; N. Y. to Philadelphia, \$3.00; total, \$11.00.



REGULAR MEETING, MONDAY, FEBRUARY 3, 1873.

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 William Gray Brooks, Boston, Jan. 28; Caroline H. Dall, Boston, Jan. 9; J. H. Emerton, Boston, Jan. 31; Samuel Henshaw, Boston, Jan. 20; Edward P. Hurd, Newburyport, Jan. 26; Wm. Parsons Lunt, Boston, Jan. 28; J. Munsell, Albany, N. Y., Jan. 24; J. L. Sibley, Cambridge, Jan. 22; D. J. Tapley, New York, Jan. 27; W. O. Townsend, New York, Jan. 20; Charles A. Walker, Chelsea, Feb. 3; Boston, Public Library, Jan. 27; Calcutta, Indian Museum, June 4; Harvard Col-

lege Corporation, Jan. 24; Marburg, Gesellschaft zur Beförderung der Gesammten Naturwissenschaften, Oct 18; Smithsonian Institution, Jan. 17; Yale College, Corporation, Jan. 31; Zurich, die Naturforschende Gesellschaft, July 1.

The LIBRARIAN announced the following additions : —

By Donation.

ATWOOD, E. S. Miscellaneous pamphlets, 85.

BROOKS, Mrs. H. M. Woman's Journal. 1872. 21 numbers.

CHAMBERLAIN, JAMES A., Boston. Board of Trade, 1856, 1867. 14 vols. 8vo. Instruction for Field Artillery, 1 vol. 8vo. Boston Directories for 1861, 1863, 1864. 3 vols. 8vo. Patent Office Reports for 1849-1850, 1850, 1850-1851, 1856. 4 vols. 8vo. New England Business Directory, 1860. 1 vol. 8vo. Boston Almanacs for 1853, 1855. 2 vols. 16mo. The Tax Payer's Manual. 1 vol. 8vo. Miscellaneous pamphlets, 6.

NATURALIST AGENCY. The Great Industries of the United States. 1 vol. 8vo. 1872.

U. S. PATENT OFFICE, WASHINGTON, D. C. Official Gazette. Jan. 7, 1873.

By Exchange.

ENTOMOLOGISCHER VEREIN IN STETTIN. Entomologische Zeitung. Herausgegeben von dem Entomologischen Vereine zu Stettin, xxxiii, Jahrg. 8vo pamph. GESELLSCHAFT ZUR BEFÖRDERUNG DER GESAMMTEN NATURWISSENSCHAFTEN IN MARBURG. Schriften, Bd, ix, x. Sitzungsberichte, 1869, 1871.

HISTORICAL SOCIETY OF PENNSYLVANIA. Memoirs of. Vol. x. 1 vol. 8vo. Catalogue of the Paintings, etc., belonging to the Historical Society of Penn. 8vo. NATURFORSCHENDEN GESELLSCHAFT IN ZÜRICH. Vierteljahrsschrift, Jahrg. xvi. 1871. 8vo pamph. Neuchatel, 1871.

ROYAL SOCIETY OF LONDON. Proceedings of. Vol. xx. Nos. 130-137. 8vo.

SOCIÉTÉ D'ACCLIMATION OF PARIS. Bulletin Mensuel Tome ix, Aout, Sept. Oct., 1872. 3 pamphlets. 8vo.

SOCIÉTÉ DES SCIENCES NATURELLES IN NEUCHATEL. Bulletin, Tome ix. 2me. Cahier. 1872. 8vo pamphlet.

VEREINS FÜR ERDKUNDE ZU DRESDEN. Jahresbericht viii und ix. 1872. 8vo.

PUBLISHERS. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Quaritch's Catalogue. Salem Observer.

The SUPERINTENDENT OF THE MUSEUM announced the following donations to his department :—

STICKNEY, M. A. Miscellaneous manuscripts.

WATERS, E. S., of Chicago, Ill. Water Vase, bought in London, Aug., 1870 stored in the basement of 108 Cass St., Chicago, and dug from its ashes, Nov., 1871.

William Fobes Gavett of Salem, was elected a resident member.

Mr. JAMES H. EMERTON made an interesting statement of the results of his observations on the

WORMS OF THE GENUS NAIS.

He mentioned that, Oct. 21, he took from the large pond near Legg's hill a quantity of bladderwort and other floating plants, among which, with the animals usually found in the pond, were large numbers of worms of the genus *Nais*, each wearing a tubular case covered with seeds and water plants and in part with the eggs of *Daphnia*. On removing the cases, a large proportion of the worms showed the beginning of a division into two and sometimes the struggles of the worm while its case was being removed were enough to complete the separation.

The first appearance of division was a larger interval than usual between two pairs of setæ near the middle of the body, around which a slight wrinkle marked the line of future separation.

Just behind this crease, on the under side of the body, next appeared rudiments of four pairs of bunches of hooked setæ, marking the four segments next behind the mouth of a new worm. At the same time in front of the line of division appeared a great number of new segments crowded together, which were to form the posterior end of the forward worm, and just behind them grew out a pair of long appendages, like those at the end of the old worm. The line of division became more and more distinct, until the appearance was presented of one worm, with another just like it fastened to its tail. At length the division took place, and at the divided part one worm developed a new mouth, and the other a new set of respiratory appendages.

In a few days another worm, *Chætogaster*, appeared in

the water, which divided up in a more complicated way. While one division was going on, and before the parts separated, each half again divided itself, and each of these quarters again divided, and so on, until a chain was formed of a dozen or more unfinished worms, all using the mouth of the foremost one, and having their digestion and circulation in common.

The PRESIDENT announced the death of an associate member, Henry C. Perkins, M. D., of Newburyport, who died suddenly at his home on Saturday. In the morning he was taken ill. No special danger was apprehended during the day, though some anxiety was felt; about seven o'clock in the evening, while physicians were in the house and friends were near him, he suddenly closed his eyes upon this world and expired.

Dr. Perkins was the son of Thomas and Elizabeth Perkins, and was born in Newburyport, Nov. 13, 1804. He fitted for college at the Newburyport academy and entered the Freshman class at Harvard in 1820, graduating in 1824. He immediately commenced the study of medicine with Dr. Richard S. Spofford, of Newburyport. In October, 1825, he entered his name as a student with Dr. J. C. Warren, of Boston, and continued with him until he received the medical degree in August, 1827. On the 3rd of September, 1827, he commenced practice in Newburyport, having had a professional life in that place of a little more than forty-five years.

He was well known as a zealous and enthusiastic student in several branches of science. His investigations went out in a great variety of ways. He undertook the grinding and polishing of the lenses for a telescope. He experimented on the qualities of chloroform and ether as anæsthetics. Some fossil bones, brought to this city in a

vessel of the late Capt. Cushing and given to him, led him into the study of comparative anatomy. He calculated the orbits of comets; he engraved; made for himself a microscope; was the first in this country to follow Daguerre in his remarkable discovery; was a student of meteorology; and after he was sixty-five years old learned the German language, that he might translate a work of Dr. Ernst Hallier, entitled, "Parasitical Investigations upon the Vegetable Organisms found in Measles, Typhus Abdominalis, Small Pox, Kine Pock, Sheep Pock, Cholera, etc." To this translation the doctor added an appendix, giving his own observations continued for months, confirming those of Professor Hallier. He was scholarly in all his habits, and kept up a familiarity with the classics, but the book of nature was his special delight.

Dr. Perkins was highly esteemed for his scientific and other attainments, and was frequently called to offices of honor and trust. He was for two successive terms President of the Massachusetts Medical Society; a member of the American Academy of Arts and Sciences; President of the Common Council of Newburyport during the years 1858-59, and a representative of that city in the state legislature several times; and during many years previous to his decease a trustee of the Putnam Free School, and trustee of the Institute for Savings for Newburyport and vicinity. He was appointed by Mr. George Peabody, in 1867, one of the trustees for the fund for the Promotion of Science and Useful Knowledge in the County of Essex, since incorporated under the title of "The Trustees of the Peabody Academy of Science," and having its museum and collections in this city.

After remarks from Rev. E. C. Bolles, Dr. A. H. Johnson and Messrs. F. W. Putnam and A. C. Goodell,

Jr., on the character of our deceased associate as a scholar, a physician and a citizen, the following resolutions were unanimously adopted :—

Resolved, That the Essex Institute hereby expresses its deep sense of the value of the labors of its late resident member, Dr. HENRY C. PERKINS, in various branches of science ; its appreciation of the purity of his life and character ; and its sympathy in their loss with the members of his family.

Resolved, That the Secretary be instructed to put these resolutions upon record, and to furnish a copy of the same to the family of the deceased.

A resolve was also adopted, directing the Secretary to invite some friend or friends in Newburyport to prepare a memoir of Dr. Perkins for publication in the "Historical Collections of the Essex Institute."



REGULAR MEETING, MONDAY, FEBRUARY 17, 1873.

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 B. F. Browne, Salem, Feb. 5 ; Jacob Batchelder, Lynn, Feb. 11 ; Wm. G. Brooks, Boston, Feb. 15 ; C. H. Dall, Boston, Feb. 5 ; Henry B. Dawson, Morrisania, N. Y., Feb. 4 ; Joseph H. Frothingham, New York, Feb. 14 ; Alfred Osgood, Newburyport, Feb. 11 ; W. Stevens Perry, Geneva, N. Y., Feb. 7 ; Edmund F. Slafter, Boston, Feb. 10 ; Bruxelles, Société Entomologique de Belgique, Jan. 24 ; Iowa State Historical Society, Feb. 5 ; New York State Library, Feb. 1.

The LIBRARIAN reported the following additions :—

By Donation.

BUTLER, B. F., of U. S. H. R. Report of the Department of Agriculture for Jan., 1873. 8vo pamph. Alabama Claims, by donor. 8vo pamph.

CUTTER, ABRAM E., of Charlestown. Annual Report of the School Committee of Charlestown for 1872. 8vo pamph.

HOLDEN, N. J. The Commonwealth, 21 numbers. The Literary World, 12 numbers. The National Standard, 7 numbers. Orders of the Day, Senate, Jan. 19, June 21, 1869.

LEE, JOHN C. Commercial Bulletin, Jan. 4, 11, 18, 25, Feb. 1, 1873.

LEVETTE, G. M., of Indianapolis, Ind. Indiana Agricultural Reports for 1872. 1 volume. 8vo. Report of the Superintendent of Public Instruction of Indiana 1872. 1 vol. 8vo. Geological Survey of Indiana for 1872, by E. T. Cox. 1 vol. 8vo. Maps for the Geological Survey.

LINCOLN, SOLOMON. Industry of Mass. 1865. 1 vol. 8vo. Adjutant General's Report. 1865. 1 vol. 8vo. Report of Board of Education of Mass. 1871. 1 vol. 8vo. Board of Agriculture of Mass., by C. L. Flint. 1868-9. 1 vol. 8vo. Annual Report of the Board of State Charities. 1865, 1868. 2 vols. 8vo. Registration Reports of Mass. 1864, 1866. 2 vols. 8vo. Eighth Census of the United States. 1860. 1 vol. 8vo. Insurance Commissioner's Reports for 1865, 1867. 2 vols. 8vo. Student's Life, by S. Osgood. 1 vol. 12mo. Ciceronis Brutus, by C. Beck. 1 vol. 12mo. Army Regulations. 1861. 1 vol. 12mo. Whitaker's Almanac. 1871-72. The National Almanac. 1863. British Almanac and Companion. 1858. 1 vol. 12mo. Rules and By-laws of Board of Overseers of Harvard College. 1 vol. 12mo. Manual for the General Court. 1864, 1869. 2 vols. 12mo. Statistical Pocket Manual. 1 vol. 16mo. Directory of Cambridge for 1851. 1 vol. 12mo. Boston Almanacs. 1860, 1861. 2 vols. 16mo. Warren's Common School Geography. 1 vol. 4to. Miscellaneous pamphlets, 110.

MASSACHUSETTS HORTICULTURAL SOCIETY. Schedule of Prizes for 1873. 8vo.

MESSRS. WHIPPLE AND SMITH. Industry of Massachusetts for 1855. 1 vol.

MOULTON, JOHN T., of Lynn. Anniversary Address in Wales, Oct. 5, 1862, by A. Gardner. 8vo pamphlet.

U. S. DEPARTMENT OF THE INTERIOR. Ninth Census of the U. S. 1870. 1 vol.

U. S. PATENT OFFICE, WASHINGTON, D. C. Official Gazette, Jan. 21. 1873.

By Exchange.

AMERICAN ANTIQUARIAN SOCIETY OF WORCESTER. Proceedings of, at the Annual Meeting, Oct. 21. 1872. 8vo pamphlet.

AMERICAN PHILOSOPHICAL SOCIETY OF PHILA. Proceedings of, July-Dec. 1872. 8vo pamphlet.

BOWDOIN COLLEGE LIBRARY. Catalogue of the Officers and Students of Bowdoin College for 1872. 12mo pamphlet.

NEW ENGLAND HISTORIC-GENEALOGICAL SOCIETY. Address of Hon. M. P. Wilder at the Annual Meeting, Jan. 1, 1873. 8vo pamphlet. Proceedings of the, at the Annual Meeting, Jan. 1, 1873. 8vo pamphlet.

NEW YORK GENEALOGICAL AND BIOGRAPHICAL SOCIETY. Genealogical and Biographical Record for Jan., 1873. 8vo pamphlet.

NEW YORK STATE LIBRARY. Meteorology of New York. 1850-1863. 1 vol. 4to. 1872.

NOVA SCOTIA INSTITUTE OF NATURAL SCIENCE OF HALIFAX. Proceedings and Transactions, Vol. iii, pts. i, ii. 1870-1872. 2 pamphlets. 8vo.

PUBLISHERS. American Journal of Science and Arts. American Naturalist. 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. Western Lancet.

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REGULAR MEETING, MONDAY, FEBRUARY 17, 1873.

[Continued.]

Mr. STEPHEN M. ALLEN made a communication on the

ANCIENT AND MODERN THEORIES OF LIGHT, HEAT AND COLOR.

Light, heat and color appeal to our senses from the beginning to the end of life. These phenomena, so closely allied, have for generations appeared alike mysterious to youth and age,—to the simple child of nature and the leaders of scientific research. If any persons have satisfied themselves fully as to the true cause of either, they have transmitted no explanatory theory which has stood the test of time.

The discovery and uses of the spectroscope have for the past five years taken the world by storm, and as a natural consequence there have been greater changes in the theories of light and color than for a century past. The physicists of Europe and America, who employ the spectroscope, claim that by its assistance light and color may be employed to discover the primary elements of

luminous bodies, and that by comparing the prismatic effects of sun rays with those of artificial lights, they may identify or discriminate between their causes. This discovery, so confidently announced in 1870, in some respects seemed to confirm the Actien theory which we had the honor to publish some ten years before. The spectroscope would apparently contradict or disprove Sir Isaac Newton's real theory of light; but a careful investigation convinces one that the theory based on the spectroscope is tenable only for our atmosphere, revelations claimed for it outside this, failing in their proof; also, that Newton's theory of the origin of light and its natural properties has been misunderstood and misquoted.

Actien* is a primary principle, the most subtle of all known elements, emanating from the sun in straight lines towards its planets, its flowing rays creating, in their passage to the earth, electricity, magnetism, light, heat, color, and many other properties by their friction upon and combustion with the atmosphere, ultimately reducing all elements to their utmost density, and producing a constant crystallization and consolidation of matter. This creative principle is supposed to pass from the sun, either in all directions through the solar system, or in concentrated rays exclusively upon the planets of its creation, not necessarily bearing light or heat as it passes through space, those elements being generated within the circle of the atmosphere of the planet. When this fluid reaches and pervades the atmosphere, the contact, or friction with it, instantly causes a combustion, producing the magnetic, electric and calorific changes, involving, as a sequence, light, heat and color, the aurora borealis, zodiacal, cometary and phosphorescent lights, as well as the "pole of

* Actien, the primary of Actin, or rays.

cold," and many other phenomena. Heat seems of late nearly divorced from light and color, though this is only an apparent separation. The Action theory materially qualifies the estimate of the nature and origin of all these elements. Late astronomical publications still tell of the heat of the body of the sun, and the hourly consumption of combustible material on its surface necessary for our supply of light and heat. But the present advanced undulatory theory of light promises to qualify such a principle very much.

The fact of increasing darkness and coldness, experienced by one in rising from the mean surface of the earth, either by climbing mountains or balloon ascension, magnifies the doubt that heat is emitted from the sun in the form received by us; and the result of investigation plausibly shows that we may yet account for the origin of the caloric that we use, in a much more satisfactory and perhaps economical manner.

The advocates of the spectroscopic theory base their belief principally on the undulatory theory of light, which they claim Sir Isaac Newton denied, as well as upon the theory that light is composed of colors, which he did, emphatically, deny; and as the correctness of the spectroscopic theory in a measure depends on this misconception of the real constituents of white light, it seems properly a subject for investigation. Newton's theory of white light, as generally understood, is an emission, or corpuscular theory, and that its rays are a compound of seven different colors, made up of corpuseles; thus contradicting the theory of undulations. But from careful investigations of his original work, which these assumptions render necessary, it will be found that his idea was essentially different from that which has usually been attributed to him, during the past fifty years. It not only

disagrees with the spectroscopic theory concerning the taking of prismatic colors as tests of elementary essence, but also qualifies the emission theory, and the theory of color which this is said to represent. It clearly appears that Newton understood and appreciated the undulatory theory as a *transmitting*, if not a *creating* power. Neither he nor his predecessors declared light composed of colors, but called rays of light *color makers*, through prismatic refraction and reflection; colors never appearing until rays were thrown through and were refracted by prisms or lenses, thereby creating the color, according to the angle of refraction, separating the rays unequally and admitting plates of atmosphere between. Various extracts from his well known work on "Optics" distinctly prove that "emission" and "corpuscle" are not used in the sense generally attributed to him, and it does not appear that he contradicted or denied the undulatory theory as a *transmitting* power. He often referred to the condition of the atmosphere or ether of space, as *trembling*, *waving*, etc., so that the rays are transmitted, as sounds are, by waves or undulations; and further, implied that colors may not be created, by any original principle of sun rays other than their mere flexibility or refrangibility. This need not be connected with color as an original principle, though the atmospheric plates, falling between the deflected rays may create color by irregular over and under lappings of shaded lines. It cannot be denied that Newton, though understanding the present undulatory theory, did not credit it with being the *origin*, but only the *vehicle* of light.

Many, since the day of Newton, have worked assiduously in the field of optics and color; prominent among these is Goethe, whose elaborate work was not fully appreciated. His mistakes in quoting Newton come from the inadver-

tent assumption that color pervades the sun rays *before* the prism, instead of *after* it; the fact being that colors never appear in the primary rays until after having passed through a deflecting lens, which creates the colors beyond it. Hence we judge that an *emanating* theory of light, and a *corpuscular* theory of colors are nearer to Newton's real meaning, than the common interpretation. As his statements show the undulations to be *transmitting* rather than creating powers, he appreciated the distinction between crossing and travelling with the ether waves. The separation, or dispersion of rays by a prism, creates in the atmosphere, according to the angle from whence the ray is thrown, a body to the ray, not before possessed.

Any resultant color is a legitimate consequence of the introduction of a plate of the atmosphere with its molecular composition, between, or overlying, the ray, proving as tangible a result, perhaps, as mixing colored pigments with a white base. We may fairly infer that light has not the same consistency in the space between our atmosphere and the sun, as within the atmosphere itself.

Rays of light probably do not meet exactly the same resistance, at any two given points, in passage to our atmosphere. This we may safely assert, though the atmosphere itself is but imperfectly known to us, even at ten miles distance from the earth's surface. Although the principle of light emanates from the sun, light itself is only a small resultant element, as color may be a resultant of light, not necessarily representing a constituent principle of light itself.

Undulations over or through which rays pass, may be simply confined to the atmosphere near the earth's surface, though assumed to extend much farther into space. The primary principle or power from the sun, would naturally be composed of something more subtle than

any single element known to us. Why may not this be the parent of all subordinate elements, as claimed by the Actien theory? This theory does not fix the density or composition of the sun, nor call for the emission of light or caloric, which the old theories demanded; nor is it inconsistent with the great ether-ocean of space (if such a principle exists) through which it may pass, under the same laws which exist for the transmission of magnetic and electric fluids over wires, either by continuous flashes from point to point, or by the displacement of forces, through and over waves of undulation?

This fluid, repellent, yet constructive, adverse to the sun's gravitation, measures precisely the distance and orbits of its creations, and causes their revolutions either axial or orbital at right angles with the line of propulsion.

A ray of light, passing through a small hole in a curtain to a darkened room, when observed, from different points, will present different appearances. From a point horizontal with the line of the ray, it presents one appearance, while at right angles the effect is quite different, and the floating particles of dust which can be detected, either by the naked eye or an instrument, will yield different colors, according to the line of their angles, which is constantly changing. The stratification of the atmosphere, or any transparent substance, will show a similar result, when observed on a line with, or at right angles to, the plane of stratification. And the form of crystallization must ever have a great effect upon the polarization of particles.

The cause of the emanation of Actien from the sun may be accounted for on two principles:—the fluid may be the great ultimate or concentrated principle of the sun itself, the resultant product of all action that has or could take place within its body; if so, that principle could not

remain at rest on the sun itself, or in its atmosphere, whatever the composition of either may be. It must pass off, giving place to other undeveloped, but constantly increasing, forces, behind. It may be inferred that there are such forces, and that each revolution of the sun lifts them on a stage, and that there is a refined and finished part at least that never returns.

This condensed and sublimated principle may be propelled or thrown off from the body of the sun and its atmosphere against its own, or the gravity of the sun by centrifugal forces, with such power as to reach the remotest planets of its own creation, and produce the results there observable. Or this fluid may escape well defined and specific limits of a solar atmosphere by its own volatility or difference in gravity, entering the unresisting ocean of ether beyond, but seeking a lodgment of its own creation through the origin and growth of planetary worlds. It does not matter to us which explanation we accept. It is enough to know that it does flow from that orb, and that it does answer our purpose.

We suppose that Actien passes in straight lines through space, to our own atmosphere, where the work of change and transformation begins. This theory will also admit of a plutonic origin of the germ of a planet, thrown off as a cinder, from the sun, although it would be without form, and void of atmosphere or water, a mere molten mass or shell, hurled into space as a nucleus for further transformation under the influences of Actien. If such was the origin of the nucleus of planetary worlds, they would be somewhat like the moon, which can have but little atmosphere, and consequently no water to fill the immense cavities observable on its surface, unlike our earth whose caverns have been filled with briny sheets of condensed vapor. When the rays of Actien reach the atmosphere,

or any body capable of commencing the process of decomposition, the work begins and increases in measure and action, according to the resistance encountered. Of the elements generated from Actien, we may enumerate electricity, magnetism, light, heat and color, an atmosphere, earth, and all it possesses. Electricity seems to be one of the quickening, disintegrating powers, while magnetism is more concentrative, and belongs to the fixing or consolidating elements. The former takes no rest, but is ever goading all other elements to action and driving them on to their destiny, while the latter seizes the objects of its concentrated labor, holding them fast and crystallizing them in every form that nature demands. Of other existence of these elements, both mechanical and chemical, we have full proof. Mineralogy and chemistry have already enumerated and classified much for us. Geology, vegetable chemistry, and atmospheric changes give us a wide field to work in, and a reliable finger-board is ever pointing us onward. The currents of electricity and magnetism are no doubt governed by fixed laws, which we are getting to understand better and better every day. Their action as a secondary cause (Actien being first) may be considered more important than any other elements we now understand in the creation of worlds, and consolidation of matter. Our planet, like the sun, may also throw off a creating fluid or power, for the formation of planets of its own. The moon appears like a cinder, ragged and cavernous, around which but little atmosphere exists, and consequently with no water or vegetable life. These may be forming—approaching through time to a perfect habitation, peopled and cultivated—a child of earth and one of the gems of infinity.

REGULAR MEETING, MONDAY, MARCH 3, 1873.

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 Francis H. Appleton, Boston, Feb. 17; Geo. Cogswell, Bradford, Feb. 20; C. H. Dall, Boston, Feb. 19, 21; A. W. Morgan, New York, Feb. 17; Wm. S. Peabody, Boston, Feb. 17; Jonathan Pearson, Schenectady, N. Y., Feb. 26; S. J. Spaulding, Newburyport, Mch. 3; E. Steiger, New York, Feb. 25; Danzig, Die Naturforschende Gesellschaft, Oct. 4; Genève, Société de Physique et d' Histoire Naturelle, Nov. 1; Lyon, Société d' Agriculture, d' Histoire Naturelle, et des Artes Utiles, Dec. 20; New York Genealogical and Biographical Society, Feb. 18; Munchen, K. Bayerischen Akademie der Wissenschaften, Dec. 1.

Mr. JOHN ROBINSON spoke of the death of Mr. Abram F. Bosson, which occurred on the 21st ult., at his residence in Salem, by which the society loses one of the most prominent exhibitors of flowers at the horticultural exhibitions. Mr. Bosson's particular favorites were the dahlias and gladiolus; his stands of the former at the exhibitions ten or twelve years since were of the most gorgeous description. Of late years he has cultivated the gladiolus most extensively, the endless variety and profusion of which at the last series of exhibitions held by the Institute caused much comment, and gave great pleasure to the many visitors. After some other remarks the following resolutions were presented and unanimously adopted:—

Whereas, The Essex Institute, by the death of Abram F. Bosson, loses an esteemed member and officer, therefore be it

Resolved, That the Institute recognizes the value of the services of the deceased as a promoter of its objects,

particularly in the department of horticulture, in which centred his entire interest. His large contributions to the exhibitions increased the usefulness of this department of the Institute, and thereby enabled the public to enjoy the beautiful flowers which he cultivated with so much care and well founded pride.

Resolved, That the members of the Institute, deeply regretting their loss, desire to express their sympathy to the family and friends of the deceased, and request that a copy of these resolutions be transmitted to them, and be entered upon the records.



REGULAR MEETING, MONDAY, MARCH 17, 1873.

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 Jacob Batchelder, Lynn, Mch. 1; William Cogswell, Salem, Mch. 17; Samuel G. Drake, Boston, Mch. 6; Samuel A. Drake, Boston, Mch. 14; J. N. Emery, Beverly, Mch. 11; Gurdon Saltonstall, Boston, Mch. 10; E. Steiten, New York, Mch. 3, 10; M. P. Wilder, Boston, Mch. 6; Buffalo Historical Society, Mch. 13; Gottingen, Die K. Gesellschaft der Wissenschaften, Mar. 1; Rhode Island Historical Society, Mch. 13.

The LIBRARIAN reported the following additions:—

By Donation.

BOARD OF PUBLIC CHARITIES OF PENN. Third Annual Report of, 1872. 1 vol. 8vo. Harrisburg, 1873.

BUSWELL, E. W., of Boston. Miscellaneous pamphlets, 50.

BUTLER, B. F., of U. S. House of Rep. Speech in U. S. House of Rep., Feb. 14, 15, 1873. 8vo pamph.

FOOTE, Rev. HENRY W., of Boston. Discourse given in King's Chapel, Boston, Dec. 24, 1871, by donor. 8vo pamph.

GIRARD, Dr. CHAS., of Paris. Principes de Biologie a la Médecine, by donor. 32mo pamph.

HALE, CHAS. R., of Auburn, N. Y. Miscellaneous pamphlets, 3.

- JAMES, THOS. P. *Journal of a Botanical Excursion*, by F. Pursh. 12mo pamph. Phila. 1869.
- LEE, JOHN C. *Commercial Bulletin* for Feb. 8, 15, 22, Mch. 1, 8, 1873.
- PUTNAM, F. W. *Miscellaneous pamphlets*, 28.
- SMITH, N., of Pembroke. *Annual Report of the School Committee of the Town of Pembroke*. 1872-3. 8vo pamph.
- STEPHENS, W. H., of Lowville, N. Y. *Miscellaneous Catalogues*, 15.
- STONE, E. M., of Providence, R. I. *Thirty-first Annual Report of the Ministry at Large*, Feb. 3, 1873. 8vo pamph.
- SUMNER, CHAS., of U. S. S. *Reports in the Senate of U. S.* 3d Sess., 42d Cong., Feb. 20, 1873. 8vo pamph.
- U. S. PATENT OFFICE, Washington, D. C. *Official Gazette*, Jan. 28, Feb. 4, 11, 1873.
- VASSAR, Rev. T. E., of Lynn, Mass. *Address at the Funeral Services of James M. Nye, M. D.*, by donor. 8vo pamph. 1872.
- WILDER, M. P., Boston. *Lecture on the Hybridization of Plants*, by donor. 8vo pamph. 1872. California, by donor. 8vo pamph.

By Exchange.

- ACADEMIE IMPÉRIALE DES SCIENCES, BELLES-LETTRES ET ARTS, DE LYON. *Memoires, Classe des Sciences*. Tome xviii, 1870-71. 8vo pamph.
- INSITUT NATIONAL GENEVOIS IN GENEVÈ. *Bulletin*, No. 36, Vol. xvii, pp. 1-216. 12mo pamph.
- KÖNIGLICH BAYERISCHEN AKADEMIE DER WISSENSCHAFTEN, ZU MÜNCHEN. *Sitzungsberichte d. philos.*, Classe 1871, Heft 4-6, 1872, Heft 1-3. *Sitzungsberichte, d. Math.*, Classe 1871, Heft 3, 1872. *Inhaltsverzeichnis*, zu 1860-1870. 8vo pamph.
- MINNESOTA HISTORICAL SOCIETY. *Collections*. Vol. i, 1850-56. 1 vol. 8vo.
- NATURFORSCHENDE GESELLSCHAFT IN DANZIG. *Shriften, Neue Folge*. Band iii, Heft 1, 1872. 8vo pamph.
- NEW JERSEY HISTORICAL SOCIETY. *Proceedings*. Vol. iii, 2d Series, 1873. No. ii.
- SENCKENBERGISCHE NATURFORSCHENDE GESELLSCHAFT, ZU FRANKFORT Á M. *Bericht*, 1871-72. 8vo pamph.
- SOCIÉTÉ D'ACCLIMATATION ZU PARIS. *Bulletin Mensuel*, Tome ix, 2 me Série, No. 11, 1872. 8vo pamph.
- SOCIÉTÉ D'AGRICULTURÉ D'HISTOIRE NATURELLE ET DES ARTS UTILES IN LYONS. *Annales*, 4th Series, II Tome, 1869. 8vo pamph.
- SOCIÉTÉ D'AGRICULTURE, SCIENCES ET ARTS DE LA SARTHE ZU LE MANS. *Bulletin*, Tome xiii, 1871-72. 2 pamphlets. 8vo.
- SOCIÉTÉ D'ANTHROPOLOGIE IN PARIS. *Bulletins*, Tome vi, Nov., Dec., 1871. Tome xvii, Jan.-Apr., 1872. 4 pamphlets. 8vo.
- SOCIÉTÉ DE PHYSIQUE ET D'HISTOIRE NATURELLE IN GENÈVE. *Mémoires*, Tome xxii, 2d pt., 1872. 4to pamph.
- SOCIÉTÉ LINNEENE DE LYON. *Annales, Années, 1870-71*. (Nouvelle Séries.) Tome xviii. 8vo pamph.
- VEREIN FÜR NATURKUNDE IN WIESBADEN. *Jahrbücher*, Jahrg, xxv, xxvi, 1871-72. 8vo pamph.
- PUBLISHERS. *American Journal of Science*. *American Naturalist*. *Francis's Catalogue*. *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*. *Quaritch's Catalogue*. *Salem Observer*.

The following paper was received from Mr. HAROLD HERRICK of New York :—

A PARTIAL CATALOGUE OF THE BIRDS OF GRAND MENAN, N. B.

GRAND MENAN, the point at which these notes were made, being situated at the mouth of the Bay of Fundy, about ten miles from the coasts of Maine and New Brunswick and twice that distance from Nova Scotia, possesses one of the most interesting faunæ of the Atlantic coast, forming, as it were, a neutral ground upon which stragglers from our southern districts mingle with those of more Arctic birth, and unite to form a local fauna of considerable extent and great interest.

The island is about twenty miles long by five wide. On its western side, for about twelve miles, the surface slopes gently to the shore and is well settled, but all the rest of the coast from the "Southern Head" to the "Swallow-tail Light," is one continuous line of precipitous cliffs, rising perpendicularly to the height of from two to six hundred feet, and broken only by an occasional swale through which pours some miniature torrent. The interior is composed of dense forests of spruce and pine, alternating with alder swamps and heaths of Labrador Tea, the latter the chosen abiding place of thousands of *Lepus Americanus*.

Lying off from Grand Menan are numerous small islands, where the sea-birds breed and have bred, to some considerable extent, since the memory of man. Among the chief of these islands are :—Green, White-horse, Ross, Two, Three and Whitehead islands. But these beloved nesting-places are being gradually broken up, and the persecuted birds are either retiring farther north, or are betaking themselves to the inaccessible cliffs where they cannot be molested.

Audubon was the first student of nature who ever explored the wild and rocky shores of Menan, and he, it seems, not very thoroughly. I believe no catalogue of its local birds has ever been published. Mr. G. A. Boardman's list of "Birds of Calais and Islands in the Mouth of the Bay of Fundy," gives many species that are to be found at Calais, though a number of them never occur on Menan.

The following catalogue and annotations are the result of two visits to the island, one in May, 1871, the other during June, July and August, 1872. I must in this connection acknowledge my indebtedness to Mr. S. F. Cheney, of Grand Menan, for his universal kindness and for the great aid he tendered me, in procuring many valuable specimens; also for much useful information. I cannot but recommend him to all who may contemplate a visit to the island, either for recreation or study, as one who will give all the assistance in his power, and make their stay as enjoyable as possible.

TURDIDÆ.

1. *Turdus migratorius*. Robin. Very common and breeds abundantly, nesting about June 5.
2. *Turdus Pallasii*. Hermit Thrush or Cathedral Bird. It is common and breeds. The song of this species, as well as that of the succeeding, is here very full and strong.
3. *Turdus Swainsonii*. Olive-backed Thrush. Quite common; breeds. I was fortunate enough to secure a fine nest and complement of three eggs, June 21. *T. fuscescens* very possibly occurs, but was not noted.

SAXICOLIDÆ.

4. *Sialia sialis*. Bluebird. Rare. I took none, but saw the remains of a specimen that had been shot July 20. This must be its eastern limit, as it is as rare on the main shore as here.

PARIDÆ.

5. *Parus atricapillus*. Chickadee. Very common. Breeds abundantly.

6. *Parus Hudsonius*. Hudsonian Titmouse. Not very common; only two were noted. It probably breeds in the dense forests. The only specimen captured was among a large flock of *P. atricapillus*, and was first noticed from its exceedingly loud note, which is much harsher, shriller and more quickly given than *P. atricapillus*.

SITTIDÆ.

7. *Sitta Canadensis*. Red-bellied Nuthatch. Common; breeds.
8. *Sitta Carolinensis*. White-bellied Nuthatch. Rare.

CERTHIIDÆ.

9. *Certhia familiaris*. Brown Creeper. Not common; breeds.

TROGLODYTIDÆ.

10. *Troglodytes hyemalis*. Winter Wren. Common; breeds. Its superb song is here heard to the utmost advantage, in the solitudes of its native forests and in the tangled and almost impenetrable swamps. *Troglodytes adon* may occur.

MOTACILLIDÆ.

11. *Anthus Ludovicianus*. Titlark. Occurs in spring and fall, but does not breed.

SYLVIIDÆ.

12. *Regulus calendulus*. Ruby-crowned Wren. Common in spring and fall, but passes to the north to breed.

13. *Regulus satrapa*. Golden-crowned Wren. Common; breeds. I was unable to discover any nests, although I could see, by the actions of the parents, that they had young near by.

SYLVICOLIDÆ.

14. *Mniotilta varia*. Black and White Creeper. Rather uncommon; breeds.

15. *Parula Americana*. Blue Yellow-back. Rare. I took a single specimen in May.

16. *Geothlypis trichas*. Maryland Yellow-throat. Exceedingly common. Breeds in abundance in all the heaths of Labrador Tea. A nest taken June 20 was composed largely of feathers of *Larus argentatus*.

17. *Helminthophaga ruficapilla*. Nashville Warbler. Common; breeds.

18. *Helminthophaga peregrina*. Tennessee Warbler. Not rare; breeds.

19. *Dendræca virens*. Black-throated Green Warbler. Common; breeds, frequenting the thick spruces.
20. *Dendræca Canadensis*. Black-throated Blue Warbler. Rare; may breed.
21. *Dendræca Pennsylvanica*. Chestnut-sided Warbler. Rare.
22. *Dendræca coronata*. Yellow rump Warbler. Very common; breeds.
23. *Dendræca Blackburniæ*. Blackburnian Warbler. Rare; may breed.
24. *Dendræca striata*. Black Poll. The most common warbler; breeds everywhere, but I was not fortunate enough to take a nest.
25. *Dendræca castanea*. Bay-breasted Warbler. Rare; may breed.
26. *Dendræca æstiva*. Yellow Warbler. Rare. I took but three birds and one nest.
27. *Dendræca maculosa*. Magnolia Warbler. Common. On June 27th I took a nest containing four fresh eggs, with advanced embryos. It was in a small spruce, not more than two feet from the ground, on the edge of a heath, and was very slightly built.
28. *Dendræca palmarum*. Yellow Red-poll. Not common, and does not breed.
29. *Dendræca tigrina*. Cape May Warbler. Rare; may breed.
30. *Seiurus aurocapillus*. Golden-crowned Thrush. Quite rare; probably breeds. I took but one. *S. Novboracensis* may occur.
31. *Myiodiocytes pusillus*. Green Black-capped Flycatcher. Rare. I do not think it breeds.
32. *Myiodiocytes Canadensis*. Canada Flycatcher. Rare; may breed.
33. *Setophaga ruticilla*. Redstart. Very common; breeds.

HIRUNDINIDÆ.

34. *Hirundo horreorum*. Barn Swallow. Common; breeds.
35. *Hirundo lunifrons*. Eave Swallow. Common; breeds.
36. *Hirundo bicolor*. White-bellied Swallow. Common; breeds.
37. *Cotyle riparia*. Bank Swallow. Common; breeds.
38. *Progne subis*. Purple Martin. Rare on Menan but very common on the Maine coast.

VIREONIDÆ.

39. *Vireo olivaceus*. Red-eyed Vireo. Rare; may breed.

AMPELIDÆ.

40. *Ampelis cedrorum*. Cedar Bird. Very common summer resident.

LANIDÆ.

41. *Collurio borealis*. Great Northern Shrike. Common in winter, but does not breed.

FRINGILLIDÆ.

42. *Pinicola Canadensis*. Pine Grosbeak. Not rare in winter.

43. *Carpodacus purpureus*. Purple Finch. Common.

44. *Chrysomitris tristis*. Goldfinch. Common during July and August, but does not breed. The flocks appeared to be passing to and fro between Maine and Nova Scotia.

45. *Chrysomitris pinus*. Pine Finch. Rather uncommon; may breed.

46. *Curvirostra Americana*. Red Crossbill. Not rare; probably breeds in the thick woods. I took it in August.

47. *Curvirostra leucoptera*. White-winged Crossbill. Not rare in winter.

48. *Ægiothus linarius*. Redpoll. Common in winter.

49. *Plectrophanes nivalis*. Snow Bunting. Common in winter.

50. *Plectrophanes Lapponicus*. Lapland Longspur. Occurs in winter.

51. *Passerculus savanna*. Savannah Sparrow. Breeds everywhere. I took numerous nests.

52. *Zonotrichia albicollis*. White-throated Sparrow. Common; breeds plentifully.

53. *Zonotrichia leucophrys*. White-crowned Sparrow. Occurs during migrations.

54. *Junco hyemalis*. Black Snowbird. Very common; breeds everywhere.

55. *Spizella monticola*. Tree Sparrow. Occurs in autumn.

56. *Melospiza melodia*. Song Sparrow. Rather uncommon. I took but one nest and three or four birds.

57. *Melospiza palustris*. Swamp Sparrow. Not rare; breeds.

58. *Passerella iliaca*. Fox Sparrow. Occurs during migrations, but does not breed.

59. *Guiraca Ludoviciana*. Rose-breasted Grosbeak. Very rare. I took a fine ♂ May 16, but saw no more. Mr. Cheney never noticed it before.

60. *Guiraca carulea*. Blue Grosbeak. In the spring of 1861, Mr. Cheney shot a fine ♂ specimen and sent it to G. A. Boardman, Esq., in whose cabinet it now is.

ALAUDIDÆ.

61. *Eremophila alpestris*. Shore Lark. Occurs plentifully in winter.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 5. SALEM, MASS., MARCH, 1873. No. 3.

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

REGULAR MEETING, MONDAY, MARCH 17, 1873.

A PARTIAL CATALOGUE OF THE BIRDS OF GRAND MENAN, N. B.

[*Continued.*]

ICTERIDÆ.

62. *Agelæus phœniceus*. Red-winged Blackbird. Has been noticed by Mr. Cheney, but does not breed.

63. *Quiscalus versicolor*. Crow Blackbird. Occurs, but is rare. Others of this family may occur, as they are found on the mainland, but they cannot be common here, else they would have been noted.

CORVIDÆ.

64. *Corvus carnivorus*. Raven. Very common; breeds in abundance, placing its nest indiscriminately on the trees or on the cliffs. The same nest is frequented for many years. The eggs are deposited about the 10th of March. These birds are universally hated; and in truth it is no vulgar prejudice, for they are very destructive, especially to young lambs; and no chance is lost of shooting them, so that with all their proverbial vigilance, they annually decrease. The 12th of June I found an enormous nest on the outer Wood Island. It was placed on the cliff so as to be perfectly inaccessible, and contained four fully fledged young, two of which were dislodged by the plentiful use of stones. The rest in itself is a curiosity worth seeing and would make no mean load for a horse to draw. It had evidently been

the home of many broods of young plunderers, and probably will continue to be for some time to come, and a wild enough home it is, with no sound but the roar of the surf below and the harsh scream of the gull above.

65. *Corvus Americanus*. Crow. Here as elsewhere common; breeds abundantly. I think the eggs collected here are of a darker color and more intensely spotted than those collected further south. In fifty specimens obtained, there was scarcely a light example, while in the same number from Long Island or New Jersey there would be a very large percentage of light and sparsely spotted specimens.

66. *Cyanurus cristatus*. Blue Jay. Common; breeds.

67. *Perisoreus Canadensis*. Canada Jay. Not rare in winter; it may breed in the thick woods and swamps, but was not noted.

TYRANNIDÆ.

68. *Tyrannus Carolinensis*. Kingbird. Common during early June, but by the 20th all had passed over to the mainland. This seems rather strange as there is no obvious reason why Grand Menan should not afford as good facilities for the breeding of this species as New Brunswick or Nova Scotia.

69. *Contopus virens*. Wood Pewee. Not rare; breeds.

70. *Empidonax Traillii*. Traill's Flycatcher. Rather common summer resident, but extremely difficult to procure, because of its retiring habits. Its note is frequently heard in the alder swamps, but it is a rare occurrence to see one.

71. *Empidonax flaviventris*. Yellow bellied Flycatcher. Rare; probably breeds. I took but a single specimen.

ALCEDINIDÆ.

72. *Ceryle alcyon*. Kingfisher. Not common. I did not meet with it breeding.

CAPRIMULGIDÆ.

73. *Chordeiles popetue*. Night Hawk. Common; breeds. *A. vociferus* may occur, as it is given by Boardman as a summer resident at Calais.

CYPSELIDÆ.

74. *Chætura pelasgia*. Chimney Swallow. Not common; breeds.

TROCHILIDÆ.

75. *Trochilus colubris*. Ruby-throated Hummingbird. This hardy little wanderer is not uncommon in this cold and bleak region, where birds of stronger flight and hardier growth do not venture.

CUCULIDÆ.

76. *Coccygus erythrophthalmus*. Black-billed Cuckoo. Common; breeds. I took a nest, containing three fresh eggs, July 10. *C. Americanus* may occur, as it is given as common at Calais (Boardman).

PICIDÆ.

77. *Picus pubescens*. Downy Woodpecker. Common; breeds.

78. *Picus villosus*. Hairy Woodpecker. Not rare; breeds.

79. *Picoides arcticus*. Three-toed Woodpecker. Not rare in winter; may breed on the back of the island in the heavy timber, where few persons ever go. *P. hirsutus* probably occurs in winter.

80. *Sphyrapicus varius*. Yellow-bellied Woodpecker. Not common; may breed.

81. *Colaptes auratus*. Golden-winged Woodpecker, called here the Wood Pigeon. Very common; breeds.

STRIGIDÆ.

82. *Bubo Virginianus*. Great Horned Owl. Occurs in the forests, but is not often seen.

83. *Scops asio*. Mottled Owl. Common; breeds.

84. *Otus Wilsonianus*. Long-eared Owl. Rather common during summer. I got a set of fresh eggs from Whitehead Island, May 24, 1871.

85. *Brachyotus Cassinii*. Short-eared Owl. Not rare. I secured a set of eggs from the same locality as the preceding.

86. *Syrnium cinereum*. Great Gray Owl. Occurs in winter.

87. *Nyctea nivea*. Snowy Owl. Very common in winter; remains till late in spring.

88. *Surnia ulula*. Hawk Owl. Rather rare; probably breeds, as its eggs have been taken at Calais (Boardman). *S. nebulosum* and *N. acadica* probably occur.

FALCONIDÆ.

89. *Falco anatum*. Duck Hawk. Common; breeds on the cliffs, but in such inaccessible situations that its nest is rarely taken. There is a place between "Fish Head" and the "Old Bishop" known as the "Seven Days' Work," where the cliff is divided into seven strata as sharply defined as lines of masonry. On an indentation in the face of this cliff, about one hundred feet from the top, and one hundred and fifty feet from the bottom, a pair of these falcons have had their eyry for a succession of years; secure alike from the assaults of the most zealous naturalist and the small boy of bird's-egging proclivities.

90. *Hypotriorchis columbarius*. Pigeon Hawk. Not rare.

91. *Falco sacer*. Jerfalcon. Mr. Cheney has observed this superb falcon during winter.

92. *Tinnunculus sparverius*. Sparrow Hawk. Observed on Nantucket Island, near Menan.

93. *Astur atricapillus*. Goshawk. Not rare; probably breeds.

94. *Accipiter fuscus*. Sharp-shinned Hawk. Common; breeds. I secured a nest of four eggs from Whitehead Island.

95. *Buteo borealis*. Red-tailed Hawk. Not rare.

96. *Buteo lineatus*. Red-shouldered Hawk. Not rare.

97. *Archibuteo lagopus*. Rough-legged Hawk. Common; may breed.

98. *Circus Hudsonius*. Marsh Hawk. Very common; breeds abundantly in the heath, and subsists largely upon the young of *Lepus Americanus*. I took several nests.

99. *Pandion Carolinensis*. Fish Hawk. Not very common; perhaps breeds.

100. *Aquila Canadensis*. Golden Eagle. Given as rare (Boardman).

101. *Haliaetus leucocephalus*. Bald Eagle. Very common resident. On Feb. 20 Mr. Cheney found a nest in a tall pine, upon the main island; he ascended with some difficulty, and after digging a hole through the nest, secured the only egg it contained. The embryo was well advanced, but frozen. The parents did not attempt to molest him, but confined their demonstrations to sailing overhead at a respectful distance. The egg, now in my cabinet, is of a dirty white color, and measures three inches by two and thirty hundredths.

COLUMBIDÆ.

102. *Ectopistes migratorius*. Wild Pigeon. Not rare; said to breed in the interior of the island.

TETRAONIDÆ.

103. *Bonasa umbellus*. Ruffed Grouse. Rare. At North Head, June 29, I flushed a fine ♂, but was unable to shoot him; I was sorry for this, as the inhabitants insist that the grouse is never found on Menan.

CHARADRIIDÆ.

104. *Charadrius Virginicus*. Golden Plover. Rare.

105. *Ægialitis melodus*. Piping Plover. Given by Boardman as breeding on the islands in June. I did not meet with it, although I searched carefully.

106. *Æ. semipalmatus*. Ringneck Plover. Common; some breed.

SCOLOPACIDÆ.

107. *Philohela minor*. Woodcock. Rather rare; breeds in the thick alder swamps.

108. *Gallinago Wilsonii*. Wilson's snipe. Rare.

109. *Macrorhamphus griseus*. Red-breasted Snipe. Common in July.

110. *Pelidna Americana*. Red-backed Sandpiper. Not common.
111. *Ereunetes pusillus*. Semipalmated Sandpiper. Very common during August. One day while in pursuit of plover, I killed, at a single discharge, twenty-six from a passing flock.
112. *Tringa canutus*. Robin Snipe. Rather rare during summer.
113. *Arquatella maritima*. Purple Sandpiper. Very common in winter, immense flocks frequenting the stony beaches. In summer, rare. I took a single specimen, Aug. 13, among a large flock of *E. pusillus*.
114. *Actodromas minutilla*. Least Sandpiper. Very common in August.
115. *Symphemia semipalmata*. Willet. Rather common in August. The old men tell about a bird they call a "Tiukasheer" that used to breed in abundance on Menan fifty years ago, and from their description it seems to be identical with the species in question.
116. *Gambetta melanoleuca*. Winter Yellow Legs. Common.
117. *Gambetta flavipes*. Summer Yellow Legs. Common.
118. *Rhyacophilus solitarius*. Solitary Sandpiper. Common.
119. *Tringoides macularius*. Spotted Sandpiper. Common; breeds everywhere.
120. *Philomachus pugnax*. Ruff. Given by Boardman.
121. *Limosa Hudsonica*. Hudson Godwit. Mr. Cheney sent me a pair that he shot in November, 1871. They were the only ones he ever saw.
122. *Numenius borealis*. Esquimaux Curlew. Rare.
123. *N. longirostris*. Long-billed Curlew. Not rare in autumn.
124. *N. Hudsonicus*. Short-billed Curlew. Rare during migrations.

HÆMATOPODIDÆ.

125. *Streptilas interpres*. Turnstone. Not rare in August.

PHALAROPODIDÆ.

126. *Phalaropus hyperboreus*. Northern Phalarope, "Sea Goose." Very common. Thousands may be seen all summer on the "Ripplings" about eight miles from Menan, where they congregate to feed on the shrimp and animalculæ that are drifting in the eddies made by the advancing and receding tide. They never come on shore unless driven by storms, and are so tame, especially in foggy weather, that I have almost run them down with a sail boat. *P. Wilsonii* and *fulicarius* probably occur.

ARDEIDÆ.

127. *Ardea herodias*. Great Blue Heron. Common; but I did not find it breeding.
128. *Botaurus lentiginosus*. Bittern. Rather rare.
129. *Butorides virescens*. Green Heron. Not rare; it may breed, but I do not think it does.

ANATIDÆ.

130. *Anser hyperboreus*. Snow Goose. Rare in winter.
131. *Bernicla Canadensis*. Canada Goose. Common in spring and fall; bred abundantly in years past.
132. *Bernicla branta*. Brant. Common during migrations.
133. *Anas boschas*. Mallard. Very rare.
134. *Anas obscura*. Black Duck. Common; breeds.
135. *Dafila acuta*. Pintail. Rare.
136. *Nettion Carolinensis*. Green-winged Teal. Common.
137. *Querquedula discors*. Blue-winged Teal. Rare.
138. *Mareca Americana*. Widgeon. Rare.
139. *Spatula clypeata*. Shoveller. Rare.
140. *Chaulelasmus streperus*. Gadwall. Rare.
141. *Aix sponsa*. Summer Duck. Rather rare.
142. *Fulix marila*. Greater Black-head. Uncommon.
143. *Fulix affinis*. Lesser Black-head. Common.
144. *Aythya Americana*. Red-head. Not uncommon.
145. *Aythya vallisneria*. Canvas-back. Rare.
146. *Bucephala Americana*. Golden-eye. Common in winter.
147. *Bucephala albeola*. Buffle-head. Very common in winter.
148. *Bucephala islandica*. Barrow's Golden Eye. Rare.
149. *Histrionicus torquatus* Harlequin Duck. Common in winter. It is noted, among gunners, for its diving propensities, it being almost impossible to shoot one sitting on the water, as they go under at the flash. I do not think it breeds now, although it may have done so in years past.
150. *Harelda glacialis*. Old Squaw. Very common in winter; may breed, as I saw a pair in full breeding plumage, that had been shot June 18. They would scarcely have been about at that late day without having a nest on one of the islands.
151. *Camptolemus Labradorius*. Labrador Duck. Very rare. I received a ♀ from Mr. Cheney, that had been shot in April, 1871.
152. *Melanetta velvetina*. Velvet Duck. Common in winter. A few remain all summer.
153. *Pelionetta perspicillata*. Surf Duck. Common in winter. One day in June a specimen alighted in the yard of a house on Whitehead Island, and was captured alive.
154. *Eidemia Americana*. Scoter. Common in winter.
155. *Somateria mollissima*. Eider Duck. This is the most common of all the ducks, breeding in abundance on all the small islands about Menan, but it is fast decreasing, as not one bird in three raises any progeny, because of the continued depredations of the islanders, who rightly esteem their eggs as a great delicacy, and collect them as fast as laid. Their eggs are easily found, because of the careless manner

in which the nest is placed, an old gull's nest, with the addition of a little down, often being made to answer in place of a more elaborate structure. I saw the young, in companies of fifteen or twenty, following their parents, in the beginning of August.

156. *Somateria spectabilis*. King Eider. Rare.

157. *Erismatura rubida*. Ruddy Duck. Uncommon.

158. *Mergus Americanus*. Sheldrake. Common.

159. *Mergus serrator*. Red-breasted Merganser. It used to breed but has almost entirely left the island during the season of incubation, those remaining being only immature or unproductive birds.

160. *Lophodytes cucullatus*. Hooded Merganser. Not common and does not breed.

PELECANIDÆ.

161. *Pelecanus erythrorhynchus*. American Pelican. A specimen was taken some years since.

SULIDÆ.

162. *Sula bassana*. Gannet. It was once common and used to breed on the "Gannet Rock," but since the lighthouse has been built, the Gannets have left. The only instance in which I found it was near Dark Harbor, on back of Menan, where one solitary individual was sitting like a sentinel on a piece of the wreck of the steamer New England, that had gone to pieces on the Wolf Islands, some days before.

PHALACROCORACIDÆ.

163. *Graculus carbo*. Common Cormorant. Occurs in spring and fall.

164. *Graculus dilophus*. Double-crested Cormorant. Occurs, but does not breed now; probably it did once.

PROCELLARIIDÆ.

165. *Procellaria leucorrhoa*. Leach's Petrel. Very common and breeds by thousands on the Green and Whitehorse Islands, where the soil is so impregnated with its peculiar odor, that it is quite perceptible some distance to leeward on a windy day. They deposit their single egg about the 8th of June, incubate from four weeks to a month and if robbed will lay three times. Mr. Cheney has assured me that once, while duck shooting on Green Island on November 10, his dog dug out a young petrel still in the down, when all the other summer visitors had departed for more southern regions. Though so elegant and graceful a bird on the water, this petrel seems to lose all understanding and power on land, and when dug from its hole prefers to skulk away in the grass to taking flight; and may even be thrown like a ball from one person to another. It breeds in such astonishingly large communities that it is nothing of a feat to dig four or five hundred eggs in a single day; but the most energetic oölogist would scarcely undertake a second day's work, as the first would have worn

off his finger-nails, and demoralized his hands and arms to such an extent that he would gladly stay at home and blow his eggs.

166. *Oceanites oceanica*. Wilson's Petrel. Occurs on the fishing grounds, but does not breed.

167. *Procellaria glacialis*. Fulmer. Occurs on the fishing grounds in autumn.

168. *Nectris fuliginosus*. Sooty Shearwater. This species and the two succeeding are given by Boardman, but were not noted by myself.

169. *Puffinus major*. Greater Shearwater. Haglin.

170. *Puffinus anglorum*. Mank's Shearwater. Black Haglin.

LARIDÆ.

171. *Stercorarius pomatorhinus*. Pomarine Jaeger. Common in autumn on the fishing grounds.

172. *Stercorarius parasiticus*. Arctic Jaeger. Common fall visitant; comes about the fishing boats to pick up bits of bait, and is so tame that it is often killed with a gaff.

173. *Stercorarius cephus*. Buffon's Jaeger. "Marlin-spike Bird." "Common in the Bay of Fundy in August" (Boardman).

174. *Larus glaucus*. Burgomaster. Winter resident.

175. *Larus Hutchinsii*. Hutchins' Gull. I have a fine specimen of this rare gull, killed by Mr. Cheney's son in January, 1872. It corresponds exactly with a specimen, in the cabinet of G. N. Lawrence, Esq., that was shot on Long Island.

176. *Larus leucopterus*. White-winged Gull. Noted by Dr. Brewer.

177. *Larus marinus*. Great Black-backed Gull. Common winter resident; used to breed with the Herring Gulls, but being of a wilder nature it was the first to move in the direction of new and more secure breeding grounds.

178. *Larus argentatus*. Herring Gull. Very abundant and breeds on almost all the islands, in every situation, from the open heath to the ragged and precipitous cliff. On the Southern Head is a very extensive nursery, and from the edge of the cliffs the eggs can be counted by the hundred, all the way down, until they grow indistinguishable in the distance. But little effort is made to secure these eggs, as of late years it has been rightly deemed too dangerous an undertaking to descend the cliffs, even with the aid of a rope. I know of at least one adventurous climber who met with a fearful death in consequence of his temerity. The present inhabitants of the island can remember when it was an easy thing to go out and collect four or five hundred eggs in an afternoon; but, alas! those times are no more and unless something is done, and that soon, to prevent the promiscuous destruction of these useful birds, gulls' eggging at Grand Menan

will be among the things of the past; for though to a stranger the eggs seem so abundant, the inhabitants represent them as few compared with the myriads of former years.

179. *L. Delawarensis*. Ring-billed Gull. Common during migrations.

180. *Chrococephalus atricella*. Laughing Gull. Given as breeding by Boardman.

181. *Chrococephalus Philadelphia*. Bonaparte's Gull. Common in autumn.

182. *Rissa tridactyla*. Kittiwake. Common in winter but does not breed, which is curious, as the cliffs afford most excellent nesting-places.

183. *Pagophila eburnea*. Ivory Gull. Winter visitant.

184. *Sterna Wilsoni*. Wilson's Tern. Breeds on the Seal islands.

185. *Sterna macroura*. Arctic Tern. Rather rare. Others of this family probably occur, but are not recorded.

COLYMBIDÆ.

186. *Colymbus torquatus*. Loon. Common about the islands, but does not breed.

187. *C. arcticus*. Black-throated Diver. Occurs in winter.

188. *C. septentrionalis*. Red-throated Diver. Winter resident.

189. *Podiceps griseigena*. Red-necked Grebe. Rather common. *P. cristatus* and *podiceps* may occur, as they have been noted at Calais.

ALCIDÆ.

190. *Alca torda*. Razor-billed Auk. This bird is still common about the Murre rocks and Seal islands, where it breeds without much molestation. A curious circumstance connected with the breeding of this species here is that it never associates with *Uria grylle*, but is sole occupant of these two places, which seem to afford as advantageous nooks and crannies to the Guillemot as to the Auk. The only explanation is that the Razor-bills drive them away.

191. *Alca impennis*. Great Auk. Formerly occurred, as bones have been dug from the shell-heaps of Nantucket island, close to Menan.

192. *Uria grylle*. Black Guillemot. Common yet, but is doomed to extinction; as are all the sea-birds that still haunt these old breeding places, each spring seeing fewer birds come back to breed than went away in the fall.

193. *Uria lomvia*. Foolish Guillemot. Common in winter, but never breeds.

194. *Mergulus alle*. Sea-dove. Common winter resident, but none stop to breed.

TWENTY-FIFTH ANNIVERSARY,

WEDNESDAY, MARCH 5, 1873.

DURING the winter of 1872-3, at several meetings of the Essex Institute, the matter of the proper celebration of the twenty-fifth anniversary of the Society was discussed, and as the outcome of these deliberations, the matter was put into the hands of a committee, with full powers. The committee consisted of H. Wheatland, A. C. Goodell, Jr., Wm. Sutton, F. W. Putnam, D. B. Hagar, A. H. Johnson, John Robinson, James O. Safford, E. S. Atwood, E. C. Bolles, G. D. Phippen, Joshua Coit, George M. Whipple, Caleb Cooke, Wm. Neilson.

The various sub-committees were chosen as follows:—

On Invitations, A. C. Goodell, Jr., E. S. Atwood, D. B. Hagar, H. Wheatland, E. C. Bolles.

On Finance, William Neilson, J. O. Safford, A. C. Goodell, Jr., H. Wheatland.

On Decorations, John Robinson, C. Cooke.

On Banquet, A. C. Goodell, Jr., E. S. Atwood, A. H. Johnson, D. B. Hagar, G. M. Whipple.

On Printing, F. W. Putnam, J. O. Safford, Henry Wheatland.

Weekly meetings of the committee, for the comparison of views and the perfecting of plans, were held at the houses of various members, and arrangements were finally made for a literary festival and banquet at Plummer Hall on the evening of March 5, 1873. Invitations were sent to various gentlemen of high literary and scientific repute, and tickets were issued to members and their friends at five dollars each.

About seven o'clock the members and invited guests

assembled in the upper hall of the Institute building. The beauty and talent of the city were well represented. Among the distinguished invited guests, most of whom were present, were his Excellency the Governor; President Loring of the Senate; Speaker Sanford of the House; his Honor Mayor Cogswell; Hon. R. C. Winthrop, President of Massachusetts Historical Society; Hon. Stephen Salisbury, President of American Antiquarian Society; Prof. Asa Gray, President of American Academy of Arts and Sciences; Hon. Marshall P. Wilder, President of the New England Historic-Genealogical Society; T. T. Bouvé, President of the Boston Natural History Society; J. D. Runkle, President of the Massachusetts Institute of Technology; William Wood, M. D., President of the Portland Society of Natural History; O. C. Marsh, Professor of Palæontology in Yale College; Nathaniel Paine, President of the Worcester Natural History Society; President Eliot and Professors Agassiz, Pierce and Lovering of Harvard University; John G. Whittier; E. H. Chapin, D. D., of New York, and others.

After the guests had assembled and a short time had been spent in social intercourse, the company proceeded to the lower hall, which had been fitted up as a banquetting room. Three tables extended through the entire length of the hall, at the heads of which were seated Vice Presidents Wm. Sutton, A. C. Goodell, Jr., and F. W. Putnam, and at right angles to these, on the platform, a table was spread for the invited guests. In the alcoves, to the right and left of the guest table, were spread tables for the reporters. The hall had been tastefully decorated under the direction of Messrs. John Robinson and Caleb Cooke. On the gallery front, over the guest table, was a white tablet, bordered with green, with the inscription in box and brilliant autumn leaves,

1848—E. I.—1873. Running round the gallery front, over each alcove, were similar tablets, bearing the names of the Presidents of the Institute, and of the Essex Historical and Essex County Natural History Societies, by whose union the Institute was formed. The names as read round were as follows:—NICHOLS, TUCKER, WHITE, HUNTINGTON, WHEATLAND, PEABODY, PICKMAN, HOLYOKE, RUSSELL. To the right and left of the stage were tablets inscribed: E. H. S.—1821. E. C. N. H. S.—1833. In front of each alcove in the library was suspended a hanging basket filled with growing plants. The columns were wreathed with evergreen, and topped with masses of hemlock. To the right and left of each column were carved brackets, with vases of choice flowers. The fronts of the library cases were covered with material of a pearl gray color, to form a background for pictures. Portraits of Goethe, Humboldt, Hyrtl, Müller, Cuvier, Agassiz, Hawthorne and other eminent men adorned these improvised walls. Ferns and growing plants of every variety were massed wherever there was room to display them. The whole arrangement evinced fine taste and a nice appreciation of the proprieties of the occasion. The banquet was prepared under the supervision of Mr. Edward Cassell. The tables glittered with elegant china and silver ornaments, relieved by bouquets of exquisite flowers furnished by Francis Putnam and arranged with great taste by W. H. Gardner. The supper, which was of several courses, was served up in the following order:

FIRST COURSE.

Raw Oysters; Escalloped Oysters; Curried Oysters;
Lobster Salad; Chicken Salad.

SECOND COURSE.

Filet de Bœuf; Sweetbreads; Pâté of Chicken; Tongue.

THIRD COURSE.

Boned Turkey; Grouse; Quail; Partridge; Fowls.

FOURTH COURSE.

Frozen Pudding; Charlotte Russe; Tom Thumb;
Bon Glace; Wine Jelly.

FIFTH COURSE.

Ices: Chocolate, Vanilla, Lemon, Pine Apple, Strawberry, Harlequin Fruit.

SIXTH COURSE.

Apples; Oranges; Bananas; Figs; Crystallized Fruits and Nuts.
Cake: Currant, Citron, Pound, Sponge, Coconut,
Macaroons, Meringues.
Coffee; Tea.

The number who sat down to the feast must have been not far from one hundred and seventy, and included both ladies and gentlemen.

The company was seated at the table at half past eight, and was called to order by the President, Henry Wheatland, who requested the Rev. E. S. Atwood to offer prayer. After an hour pleasantly spent in discussing the supper in all its bearings, the company being regaled with the choice selections performed by Upton's Quadrille Band, the literary portion of the entertainment was introduced with the following address by the PRESIDENT:—

LADIES AND GENTLEMEN:— We are assembled this evening to commemorate the formation of the Essex Institute in 1848, by the union of the Essex Historical and the Essex County Natural History Societies. It is, perhaps, needless to trace in detail the growth of these institutions; the principal facts in their history having appeared in the printed publications of the Institute.

The occasion, however, suggests many associations that

cannot be passed over in silence ; this place and its surroundings are crowded with them—the building—the varied relics—the books—are not without their history, and are continually reminding us of the debt of gratitude we owe to those through whose instrumentality they were obtained.

Some remind us of the Social Club, composed of the leading spirits of the town, that was wont to hold its weekly meetings, during the middle of the last century, at the old Pratt's Tavern, to discuss the topics of the day, especially those of a literary and scientific character. Thence originated the Social Library in 1761.

Others bear the signature of "R. Kirwan," a celebrated Irish chemist, and call to remembrance some of the scenes in the Revolutionary period,—the privateer Pilgrim, its bold and intrepid commander, Hugh Hill, his daring exploits, the capture, in the English Channel, of a schooner having on board a portion of the library of this distinguished chemist, the bringing of these books into the neighboring port of Beverly, the purchase of the same by some seven scientific men of Salem and Beverly,—and hence the origin of the Philosophical Library, in 1781.

The collection of log books and sea journals calls to mind that brilliant commercial career which immediately followed the closing drama of the Revolution, when the sails of our merchantmen whitened every sea, and the products of the most distant climes, "*divitis Indiæ usque ad ultimum sinum,*" were landed at our wharves. In the midst of this prosperity the navigators in those remote seas organized a society to assist the widows and children of deceased members ; to collect such facts and observations as tend to the improvement and security of navigation and to form a museum illustrative of the civil and natural history of the countries visited during their

long and protracted voyages. The nucleus then formed in 1799, by gradual accretions became the world-renowned museum of the East India Marine Society. This museum, and the scientific collections of the Institute, have recently been rearranged in the East India Marine Hall, under the direction of the trustees of the Peabody Academy of Science, and opened to the public, free, six days in the week.

The portraits on these walls, the old relics in the cabinets, the frame of the first building erected for the first church in Salem, cared for and placed in good condition for preservation by the kindness and liberality of our late President, Francis Peabody, are alike suggestive of topics for consideration; but time will not permit me to dwell longer.

In 1638, Emmanuel Downing, of the Inner Temple, London, came to Salem, where he lived several years in great esteem, often representing the town in the General Court. His dwelling was on or near this spot, in the middle of an estate comprising some four acres. His wife was a sister of Gov. Winthrop. His son George, a lad of about fourteen summers, was preparing, under the tuition of Rev. John Fisk, to enter the college, where he graduated in the first class in 1642. This son then went to England, entered into Cromwell's service and became highly distinguished. Was his (Cromwell's) minister to the Hague, and afterwards held the same situation under Charles II, from whom he received a baronetcy; united with "the blood of all the Howards," by marrying Frances, sister of the first Earl of Carlisle. A grandson, Sir George Downing, dying in 1747, left a large bequest (£150,000) for the founding of Downing College, in Cambridge, England.

Ann, the youngest daughter of Emmanuel, came into

possession of this estate, and the mansion in which she resided was a few rods west of this spot. She first married Capt. Joseph Gardner, who was killed, Dec. 19, 1675, at the great Narraganset Swamp fight, in King Philip's war. Secondly, she married Simon Bradstreet, and there the old Nestor governor of Massachusetts lived and died. The house was then known as the Bradstreet mansion, and was taken down about 1750. Gov. Bradstreet had previously married Ann, daughter of Gov. Thomas Dudley. She is the most distinguished of the early matrons by her literary powers; a volume of her poems is now extant.

Nearly opposite the last named house, on the western corner of Liberty street, was the residence of Major William Hathorne, who came to Salem in 1636, and from that date his name appears in our records as holding important positions,—Commissioner, Speaker of the House of Representatives, counsel in cases before the courts, judge on the bench, soldier commanding important and difficult expeditions, etc.

Johnson, in his "Wonder-Working Providence," thus says of him: "Yet, through the Lord's mercy, we still retain among our democracy the godly Captaine William Hathorne, whom the Lord hath imbued with a quick apprehension, strong memory and rhetoric, volubility of speech which hath caused the people to make use of him often in public service especially when they have had to do with any foreign government."

He died in 1681. His son John seemed to have inherited many of his traits of character, and to have succeeded in all his public honors, and held a like prominent position in public affairs till his decease, which occurred in 1717. In an easterly direction, on Union street, in a small two-story gambrel-roofed house, a descendant in the sixth generation was born, in 1804, whose name has

been equally if not more conspicuous in the field of letters than either of his ancestors had been in the civil history of the colony.

A few rods in a northerly direction we find the birth-place of Bowditch, whose "Navigator" is in the hands of every seaman, and who, as translator of La Place's "Mecanique Celeste," is ranked among the leading mathematicians of his age.

The house that was taken down to erect on its site the building in which we are assembled was the place where Prescott, the historian, first saw the light of day; and afterwards, for nearly half a century, it was the residence of one of our most successful and opulent merchants, Joseph Peabody.

In this connection, it is meet that we should pay a tribute of respect to the memory of Miss Caroline Plummer, a lady of great literary culture and refinement, who died in May, 1854, and bequeathed to the proprietors of the Salem Athenæum, the sum of thirty thousand dollars for the erection of a building, to deposit therein the books of the Athenæum, with liberty to have the rooms used for the meetings of literary and scientific societies and for the deposit of works of art and natural productions. If you desire to know in what manner this money has been expended, and ask for her monument, "Circumspice!"

This locality, around which cluster so many associations of exceeding interest to the student in history, the scholar, the scientist, and the general public, seems to be especially adapted for the establishment of an institution for the promotion of literature, science, and the arts. A good beginning has thus far been made,—additional land and more buildings will be requisite to furnish suitable accommodations for its proper management.

Let us resolve, henceforth, that we will not pause in our efforts until this so desirable an object shall have been successfully accomplished. Thus, supplementing the scientific collections in the hall now owned by the trustees of the Peabody Academy of Science, Salem will be well provided with materials for the promotion of general culture and education among her citizens.

A brief allusion to the tablets on the railing, containing the names of the several ex-presidents, may not be inappropriate at this time.

The first in chronological order, EDWARD AUGUSTUS HOLYOKE, M. D., LL. D., President of Essex Historical Society, 1821-1829, graduate of Harvard in the class of 1746, came to Salem in 1749. The first medical charge in his books bears date July 6, 1749; the last Feb. 17, 1829; covering a period of nearly eighty years in the profession at Salem; an active member of the Social Library in 1761; of the Philosophical Library in 1781; and at the time of his death, March 31, 1829, he was President of the Salem Athenæum, and of the Essex Historical Society; thus interested in the literary and scientific societies in Salem for sixty-eight years. He was an original member of the American Academy of Arts and Sciences, and also of the Massachusetts Medical Society; of both of these societies he had been elected President, of the latter institution the first.

BENJAMIN PICKMAN, President of Essex Historical Society 1829-35, a graduate of Harvard, class of 1784; member of the two houses of our State Legislature, and one term a member of Congress; a merchant, and a liberal friend to our public institutions. He died in 1843.

ICHABOD TUCKER, President of Essex Historical Society, 1835 to 1837; born in Leicester; graduate of Harvard in 1791; commenced the practice of the law in

Haverhill; removed to Salem about 1807; Clerk of the Courts for Essex for upwards thirty years; died in 1846.

DANIEL APPLETON WHITE, President of Essex Historical Society, 1837-48, and President of Essex Institute, 1848-61; born in that part of Methuen now Lawrence; graduate of Harvard in the class of 1797; commenced the practice of the law in Newburyport; removed to Salem in 1815; Judge of the Probate Court of Essex for more than forty years; died in 1861; a fine classical scholar.

ANDREW NICHOLS, President of Essex County Natural History Society, 1833 to 1845, a valued physician; born in the rural part of Danvers he early imbibed a taste for the study of nature, which continued through life. He was very conversant with the local natural history of this vicinity, and took a great pleasure in guiding his young friends to the rural retreats, in quest of some rare floral gems. He lived in South Danvers, now Peabody, and died March 31, 1853.

JOHN LEWIS RUSSELL, President of Essex County Natural History Society, 1845-48, Vice President Essex Institute 1848-61, a graduate of Harvard in the class of 1828, and of the Theological School in Cambridge in 1831, distinguished as a botanist, and especially conversant with our cryptogamic flora. He was also an able and instructive lecturer on the various departments of Natural History, especially in his favorite one, Botany.

ASAHEL HUNTINGTON, President of Essex Institute 1861-65, born in Topsfield; a graduate of Yale in 1819; commenced the practice of the law in Salem; District Attorney, and for many years preceding his death, which occurred Sept. 5, 1871, was the genial and efficient Clerk of the Courts for Essex.

FRANCIS PEABODY, President of Essex Institute 1865-7;

born on the spot where we are now assembled, and with the exception of a few years had resided in this immediate vicinity, always interested in scientific investigations and mechanical industries. He died October 31, 1867.

Before taking my seat, permit me to allude briefly to the status of the two societies at the time of the union. It required considerable billing and cooing to bring about the desired result, the organization of the two being on an entirely different basis.

The Historical Society always had a small membership. Members were elected; an entrance fee was required; no regular assessment, though occasionally one was levied; rooms never opened to the public at stated times, though persons could obtain access by calling upon the librarian or some officer who was always courteous and ready to grant any favor.

The Natural History Society was on an entirely different basis. Any inhabitant of the county could become a member by signing the constitution and paying the small annual assessment. The rooms were always central and accessible; opened frequently for horticultural and other exhibitions; its aim to make the rooms attractive, thereby to awaken a public interest in furtherance of its objects. The collections increased in value and importance; the membership was enlarged; consequently more available means to extend its operations. The Horticultural Exhibitions, though not an original object, became in course of a few years one of the most important features of the society, and at the time of the union were included as one of the departments. For several years exhibitions were held weekly during the summer months, with the annual in September, and increased in interest with each successive season.

Several nurseries were established, the demand for fruit

trees, and ornamental trees and shrubs increased, and Salem became, as it were, a centre for horticultural operations, and the exhibitions at the metropolis were largely indebted to the Salem gardens for the requisite proportion of fruits and flowers.

This city and vicinity had a goodly array of enthusiastic and successful cultivators of the choicest productions of Flora and Pomona; among them the name of Robert Manning stands prominent, as a pioneer in the cultivation of fruit, especially that of the pear. The garden of Mr. J. F. Allen exhibited for several seasons a fine display of that gorgeous lily "Victoria Regia," and his excellent treatise on that flower, with illustrations, finds a place in every public library. It was also noted for the great variety of grapes and other fruits grown under glass. The gardens and grounds of the Messrs. Putnam, Lee, Cabot, Emmer-ton, Upton, Ives, Bertram, Hoffman, Phippens, Ropes, Bosson, and others, may be mentioned in this connection.

The guiding principles that actuated the Natural History Society were engrafted upon the new organization, and to these what little success it has had may be justly attributed.

For an institution to succeed it is necessary to interest the people in its success, by horticultural and other exhibitions, permanent display of works of art and natural productions, instructive and at the same time attractive lectures, field and other meetings that will combine amusement with instruction, so far as not to compromise its dignity and standing,—having always in view, however, the promotion of the primary and leading objects of its organization. I thank you for your attention to this brief recital of a few thoughts suggested by the occasion.

At the conclusion of his address, the President re-

requested Vice President D. B. HAGAR to officiate as master of ceremonies for the occasion, which he did in his usual graceful manner, and not only were his few opening remarks characterized by wit and pleasantry, but he introduced the various speakers with a very nice savoring of clever things that did much to make the stream of oratory run smoothly.

The Health of Gov. WASHBURN was proposed who responded as follows :—

MR. PRESIDENT, LADIES AND GENTLEMEN :—I am happy to meet you on this interesting occasion. Having been in your city but once during some twenty years, and then for only a few hours, I am to most of you an entire stranger. But your reception has made me feel that I am among friends, and I thank you for this opportunity of an acquaintance with those whom I have learned to honor, not only for their personal qualities, but for the good work in which they are engaged. Not to be somewhat conversant with the early history of Salem is to be ignorant of the history of the Commonwealth. Here was one of the first settlements of the colony of Massachusetts Bay. Hither came Endicott and Winthrop, names foremost among those of our colonial times. Here the former lived and died, and here are still found his direct descendants. Here Roger Williams lived and preached till the people, believing his doctrines injurious to the best interests of the community, compelled him to seek a locality more favorable to his peculiar tenets. This was the home of Story and others who have adorned our judiciary, and some of the most influential members of Congress and the national cabinet have resided here, while time would fail me to mention the names connected with this locality which are favorably known in literature. Neither can I

forget, for I have had it thrown in my face often during the last few years, that this is particularly the place where witches were hung. I know that unmeasured abuse has been heaped upon your ancestors for this fact. They were stern men in their judgments of evil and evil tendencies, and they had stern and swift methods of dealing with those whom they believed dangerous to society and religion. Unquestionably they erred in their treatment of the witchcraft delusions, but I confess to something of admiration for the spirit and moral courage which they displayed. I am aware, also, that for a long period yours was the chief commercial city of the State. While it has lost its position in this regard it is rapidly assuming the characteristics of a manufacturing community, and I trust it may see a thriving and prosperous future. The new and elegant structures which meet our glances on every hand, are tangible evidences of thrift pleasant to observe, and I am glad to notice that some edifices yet remain as monuments of the taste and skill of former generations. Mere outward, physical developments are not, however, what should most be valued in your city; it is of far more consequence that rare facilities have been and still are afforded for moral and intellectual growth and culture. This indeed is one of the marked peculiarities of our Commonwealth. We are not without internal improvements of which we may be justly proud; there are abundant witnesses of the energy and enterprise of our people—wharves and warehouses and manufacturing establishments of one kind and another. But these are not the things that have given Massachusetts its chief renown and standing before the world. Partially at least we owe our good name to the qualities which characterized our ancestors, and we shall find that this good name has departed from us when we have fallen

from public and private virtue. The true greatness of a community is in its moral worth. The desire to give our children a better education and better advantages in every respect than we ourselves were permitted to enjoy, to test and make the most of the intellectual and moral powers of every human being—this is an omen of the most encouraging promise. Jealous of each other, jealous of our neighbors, we may be; but what parent is there who is not anxious to secure for his children the privileges that will best fit them for life's duties? Intelligence, earnestness in the search for truth, desire for something purer and better—these are among the real signs of prosperity. That you have not been unmindful of this nobler good I find testified by what I see around me. The twenty-fifth anniversary, which we have assembled to-night to commemorate, is an indication that the improvement of the citizens of Essex has not been neglected. The happy and valuable influence of this society has been felt in every town of the county, and we may reasonably indulge the hope that it will continue to be felt for many long years to come. When I look upon its President, growing gray in his honorable work, and reflect that his power for good is not to be computed by figures, I cannot but wish that some way were devised for retaining the benefit of that power after the machinery which now propels it is worn out. You do wisely in preserving the records of his labor. He will pass away to the great company of those who have given your town its worthy name in our history, but the fruit of his endeavors will live and be perpetuated from generation to generation, not only in these beautiful records, but in the lives and labors of the thousands of young men and young women of Essex who are even now reaping the results of his work. They constitute the new machinery which will preserve and keep

in active use the powers we all honor so much to-day, and thus the years that are to come after we have gone to our reward will find him still a beneficent force in the community.

In response to a toast to the city of Salem, the Mayor, GEN. WM. COGSWELL, spoke as follows:—

I yield to no one in my sympathy with the aims and objects of this Institute, which to-night celebrates and completes its twenty-fifth year of existence. Though a passive rather than an active member of it, I have never failed to watch with interest its doings, and I can bear witness to its success; and to you, Mr. President, chiefly and above all others, is due the fact that we of a younger generation have seen the coming in, and do now see the going out, of the year which goes to make the first quarter of a century of its existence; and as some of these gentlemen about me will say that a man who has weathered the storms of twenty-five years of his life is more likely to live another equal term of years than one who has not reached that age, so I believe that this is but one of another and still another, and many more quarter centuries, of an institution dedicated to a higher education and better knowledge of the good old County of Essex.

I cannot refrain from saying again, that whatever measure of success, whatever of advancement, whatever of good, has so far been obtained, is, as it seems to me solely because of the devotion, industry and skill of one whose modesty on this, and on other occasions, is the best indication of the true worth of its possessor. Seldom, sir, is it given to man to see so much of the success of his own good works, as is given to you on this occasion, while it is never given to us to appreciate at their full value such works, until the hand, the heart, the brain which wrought

them out, has passed from among us — a day, in this case, which I pray for your own sake and for our sakes, may be long delayed. But the hour is late; others you await. So far as the City of Salem is concerned, I would thank you for the courtesy you have extended to her on this occasion. She has always watched with pride and satisfaction the onward, upward course of the Essex Institute, an institution which she regards as one of her own, and as among her children; and I feel that I can pledge you notwithstanding the small margin which allows me to speak for her at all, I feel that I can pledge you, certainly, with the consent of the gentleman opposite, the earnest coöperation and best wishes in the cause of science as advanced by the Essex Institute.

HON. MARSHALL P. WILDER was introduced as the President of the New England Historic-Genealogical Society, and as the President of the American Pomological Society. "*By their fruits ye shall know them.*"

MR. PRESIDENT:—You have called on me to respond for two institutions, and thus to do double duty while I am scarcely able to perform the service for one satisfactorily. But, sir, I am most happy to be here and to enjoy the privileges and pleasures of this most interesting occasion. Three years ago the New England Historic-Genealogical Society celebrated its twenty-fifth anniversary, when we were honored with your presence; and I am here now to reciprocate that favor, to join heart and hand in this festival, and to assure you of our desire to coöperate with you in efforts to promote the welfare of your association. Most heartily do I congratulate you on the prosperity of your institution and upon the great good it has already accomplished for the world. It is not often that the founders of institutions live to reap the harvest

of their own sowing, but you, sir, have stood by the cradle of its infancy and have watched its growth and are now permitted to rejoice with us in its full manhood and extensive usefulness.

Your association, like our New England Society, is giving special attention to the preservation and transmission of New England's history to future generations, and it is indeed a grateful and noble service. "History," says a renowned author "is but the development of God's grand plan, to preserve the treasures of human thought, and to increase for countless generations the absolute wisdom of mankind." And what more benevolent and glorious work can we have than the preservation of the history of our own beloved New England! Time will not permit me to refer to the early history of the colonies, with which Salem was so intimately connected, or to those principles of piety, patriotism and philanthropy, which laid the foundations of our free institutions, which have made our nation what it is, and which we believe are yet to revolutionize and christianize the nations of this earth; suffice it to say, that in all that pertains to civil and religious liberty, in whatever relates to the great and benevolent enterprises of the age, Massachusetts has ever stood forth prominently as the champion of progress and principle. It would be pleasant, had we time, to revert to some of the great events and great men which characterize her history from the time when Endicott and Winthrop landed on your shores. I cannot refrain, however, from alluding to a few of her sons who have moved on the stage of life within the last hundred years, and whose names and deeds will gild the page of American history with an effulgence which will shine brighter and brighter unto the perfect day; to Hancock whose bold sign-manual was affixed first to the ever memorable Declaration of Independence; to Frank-

lin who drew the electric spark from the clouds and held it in his hand ; to Morse who trained it in the way it should go, and taught it to speak all the languages of the globe ; to Field who laid that mystic wire in the fathomless depths of old ocean from continent to continent ; to your own Peabody, whose munificent bequests are the praise of all people, whose remains were sent home under royal convoy, here to rest in the bosom of your own soil ; and to Ames, all honor to his name, to whose indomitable energy and perseverance, we are indebted more than to any other man, for opening up a grand highway for nations across this continent in all coming time.

You have alluded to me, sir, in connection with the great industrial pursuits of our country. I thank you for your recognition of the American Pomological Society, which is also to celebrate its twenty-fifth anniversary in Boston next September, when I hope we may be honored with a large delegation from your institution, and where you will be cordially received by its first president, although I hope he may not be its last. Nor would I forget how much we are indebted to Essex County, especially to Salem for the promotion of the agriculture and horticulture of our land. Here was planted by Gov. Endicott one of the first, if not the first nursery, and the first pear tree in New England of which we have any account, and I am happy to know that the old monumental tree still survives. Here were planted just fifty years ago the Pomological Gardens of Salem, in which still live many noble trees as grand memorials of the planter, Robert Manning, to whom Mr. President, you alluded in your opening remarks. To him and to his son of the same name, who resides on the old homestead, the Massachusetts Horticultural Society and the country are indebted largely for the services they have rendered to the cause of American Pomology. These

gardens at one time contained about two thousand varieties of fruits, and where Mr. Manning, the father, had actually proved under his own inspection, eighty varieties of American apples and sixty varieties of American pears, with many other fruits. But Governor Endicott, or Robert Manning, could not have anticipated the influence of their example in fruit culture, which has now spread throughout the land, nor the immense quantities of fruit sent from the western and Pacific states to our eastern shores; nor the amount exported annually to Great Britain, there having been shipped in one vessel from Boston to Liverpool the last week more than two thousand barrels of apples. And now, sir, I desire to place on record the influence of the Essex Agricultural Society; a society which for more than half a century has stood at the head of the agricultural societies of this state, maintaining its high position to the present time. There may it stand forever. Its first president was Timothy Pickering, who had also been secretary of the first agricultural society ever established on this continent, the Philadelphia Society for the Promotion of Agriculture. It has been my privilege to be acquainted, and to labor, with many of the presidents of the Essex society, down to the present incumbent, whose hand and heart are open to every good word and work, and I stand here to-day to acknowledge the great good which the cultivators of your county have conferred on the world. But Mr. President, I must bring these remarks to a close. I thank you for remembering me in connection with the cultivation of fruits and flowers. From my childhood I have loved the cultivation of the soil and the enjoyments which spring from rural life; I am very fond of communing with nature, whether in her sublime or merry mood; I love to hear the thunder roll its awful diapason through the skies; I love to see the lightning flash

its fiery gleam from pole to pole, I love the blooming spring odorous with the fragrance of the garden and orchard, the summer landscape rich with the verdure of the forest and the field, the mellow autumn when nature pours from her overflowing lap the ripened treasures of the year. And I love to be remembered as one who has endeavored to do something for the improvement and embellishment of mother earth; something which shall contribute to the comfort and happiness of my fellow men; and may I not also add, in this presence, something which shall redound to the honor and benefit of our own New England; something which shall live when I am dead.

Prof. O. C. MARSH, of Yale College, being called upon, paid the high compliment to the Institute that through its influence the botany and zoology of Essex county were better understood than that of any other county in the United States. He spoke of the noble work the Institute had done in diffusing scientific knowledge over all parts of the country, and encouraging other societies designed to promote the same objects. It was at the hands of the Essex Institute that he himself acquired his taste for scientific investigations. He hoped that this was only the beginning of the usefulness of this society, and that we might all be present at its golden wedding, twenty-five years hence.

President J. D. RUNKLE, of the Massachusetts Institute of Technology, said his institution was merely following in the tracks of the Essex Institute—"we are making use of scientific knowledge by adapting it to the practical affairs of life."

HON. GEORGE B. LORING, being called upon as President of the Massachusetts Senate, spoke as follows:—

MR. PRESIDENT:—I accepted your invitation to be present on this occasion so full of interest to the lovers of science and good learning, and to you especially, the founder and curator of this institution, with a firm conviction that in all this assembly I should be allowed to enjoy an "evening at home," and to listen to the remarks of the distinguished gentlemen from abroad who have come here to honor us by their presence and to encourage and edify us by their words. It was not until I was approached by the now existing president and toast-master of this occasion, with the question:—"What shall I set you off with this evening" (as if I were ready to be set off at any time and on any notice), that I realized that I should have any part to perform here. I am reluctant even now to respond; but I suppose a double presidency must be obeyed, especially in an institution where the voice of a single leader and presiding officer has always been considered supreme. And so I follow the example set me and endeavor to obey also.

As a citizen of Salem, I feel under great obligations to you and your associates for furnishing us with this opportunity to learn how worthy of all admiration our community is. The achievements of Salem in time past have not been forgotten by the gentlemen who have preceded me. They have not forgotten the efforts made by our ancestors to contribute their share to the independence, prosperity, intelligence and elevation of the nation of which we form a part. It is pleasant to be reminded of this, and to realize from the testimony of those who have no personal interest in, and attachment to, this spot, how worthy of all admiration is that record of past service, which the Essex Institute is gathering together and preserving with so much industry and care. I am gratified to know that Salem is considerable of a place after all.

To us who are surrounded by all the blessings which our ancestors bestowed upon us, this fact has long been familiar. This institution, whose twenty-fifth anniversary we now celebrate, busy as it always is in keeping the history of this city and of Essex County fresh in the minds of the people, forms a part of a system of education, study and investigation, which attracted the earliest attention of our people. The establishment of institutions of learning occupied much of the thought of our ancestors; and we point with pride to the fact that not only to the common school but to the higher seminaries of learning, to the Lyceum, and to the Library, and the Historical Society, and the Scientific Association, did this city turn its attention in the very commencement of its prosperity, and when she was obliged to set an example to others, instead of finding an example ready at her hands to follow.

That this tendency to intellectual enterprise grew out of the more commonplace virtue of industry in material affairs, who can doubt? Our fathers were a busy race. They believed in labor, and a constant exercise of their faculties in every good work. They were true to that fine principle of society laid down in those admirable volumes, Sandford and Merton, which we prized so highly and read so constantly when books were few, and newspapers were weekly, where the call of Mr. Barlow upon his associates to join him in founding a colony is recorded. Even our first governor had an impulse in the direction of toil; and John Endicott exerted himself to plant the single pear tree which now bears his name, before he abandoned the fields of agriculture, and entered upon the harder service of statesmanship. I rejoice in the industry and vigor of those men who gave us a community, and whose precepts have not yet been forgotten

by the enterprising, and successful, and intelligent laborers in this vineyard which we have inherited. For the part which this institution has performed in the encouragement of scientific research, as one element of our busy civilization, this country ought always to be grateful. I value all the accomplishments of our people, their ingenuity and skill, their vigorous literature, their advancement in the business of common school education, their devotion to the cause of freedom, their material success, their intellectual accomplishment, their moral elevation which calls for honesty, and frowns on dishonesty, in public affairs. But I think I am more gratified with the bond they have created between themselves and other nationalities, by their progress in practical science, than by any other of their achievements. I am reminded here, that it was not the skill of the diplomatist which opened to the inquiring young American the great triumph of European engineering, but the reputation secured by a son of this town, a friend of this institution, Benjamin Peirce, the great explorer in the profoundest fields of mathematics. For this recognition, I am profoundly grateful; and I congratulate the young men who are giving their energies to the scientific association of the Essex Institute, on the position secured for them in these modern days, by the great leaders whom they follow through the field upon which they have entered.

I congratulate this city on the existence of the Institute, and I congratulate the founder of the Institute that his eyes behold this cheering and joyful anniversary.

NATHANIEL PAINE, Esq., President of the Worcester Natural History Society, returned thanks to the Essex Institute for its example, which had been a great benefit to the Worcester society, and tendered his warm congratulations on the attainment of this anniversary.

Rev. E. S. ATWOOD then read the following poem:—

“Poeta nascitur, non fit,” they say,
 That is, you cannot make him, any way.
 His song bursts forth in sweet spontaneous swell,
 You cannot draw it from a stoned up well;
 No rude compulsion wakes the sleeping lyre
 To thrill with music through each golden wire.
 The sweet south wind with soft Æolian blows,
 Too light to crush the petals of the rose,
 Calls from the strings the rich, low breathed refrain,
 That flings the summer’s music back again;
 But blustering Boreas, with his rude emprise,
 All to no purpose with his roughness tries.
 In vain his swaggering, and his furious calls,
 The frightened harp strings answer back in “squalls.”
 When “must” and “shall” stand at the poet’s back,
 And drive him on with many a lusty whack,
 What chance for any melody divine
 To voice itself in smoothly flowing line?
 The strident organ, to Italians dear,
 Is what the listeners are doomed to hear.
 ’Tis not the best, nor what we like, ’tis true,
 But when the best is lacking, worse must do.
 We looked for Holmes, and Amesbury’s bard to come,
 But Whittier’s not, and Holmes remains at home.
 Were they but with us, how the gods we’d thank!
 Alas, they’re not — Alphonso, turn the crank.

You’ve seen the country maid, new come to town,
 With quiet mien and simple homespun gown;
 No beauty’s artifice she needs nor knows
 By which the parchment skin is turned to rose;
 The pearl of nature shines along her face,
 And real blushes add their wondrous grace.
 A modest blossom—every charm its own—
 All that delights the eye, not bought but grown.
 But soon the city’s cunning tricks are learned,
 And honest nature out of doors is turned;
 And art comes in, to try with skilful hand
 To mend what fashion says is badly planned.
 What wondrous transformations then occur!
 Arabian Nights grow commonplace to her.
 The modiste’s scissors and the fashion plate,
 In sweet conjunction work her “up to date.”

Paris undoes the work of Paradise,
 And views its mangling with admiring eyes;
 Beflounced, bepannied, and be — who dare tell?
 The country maid blooms out a city belle.
 Now home returned, how all the rustics stare,
 What comments pass upon her gait and air,
 What adjectives set forth her altered state!
 All eyes are curious, and some flash with hate.
 Can this be she, our little modest maid,
 This gorgeous dame, so flauntingly arrayed?
 This strange shaped mass of flounces and of fuss,
 Whose wondrous outlines shock and startle us?
 The mad creation of some crazy dream,
 Such as inspires the art of Vinnie Ream.
 "And still they gaze, and still their wonder grows,"
 That one small dress can carry all those bows.

And some such change, perhaps, the world may deem
 Has come across the spirit of *our* dream,
 When the grave, staid and soleinn Institute
 Comes out in worldly style, in party suit,
 Forsakes its search in Indian heaps of shell,
 To test instead the mollusks of Cassell;
 Studies crustacea in their salad state;
 Puts Darwin's jelly in a china plate;
 Leaves ornithology's hard terms untried,
 Enamored with the partridge at its side;
 Adopts a glacial theory in a trice,
 Choosing 'twixt lemon and vanilla ice;
 Plies knife and fork with scarce a moment's stay,
 And on to grave conclusions eats its way.
 "Is this?" "Is this?" cry people, horrified,
 "Is this the Institute, the city's pride?
 Are these the men that meet in yonder room,
 And sit with faces wrapped in funeral gloom,
 Scowling at bugs, and ferns and pickled fish,
 That form the common Monday evening's dish?
 Are these the calls of science, this the quest
 Which men push on with such a wondrous zest?
 Is this the way they burn the midnight oil,
 And talk to-morrow of their heavy toil?
 The secret's out; this jovial throng, to-night,
 With merry laugh and boundless appetite,
 Careless of isms and of theories deep,
 Toying with viands that will murder sleep,

In reckless mood have let the truth slip out,
 And told us what the Institute's about.
 Its genealogies and dusty lore,
 Its curious specimens of the days of yore,
 Its dredging, delving, these are all a blind;
 There's something very different behind.
 Perhaps for gravity it *used* to strive,
 It studies jollity at twenty-five."

So think the thoughtless, but the wiser sight
 Sees other meaning in our mirth to night.
 The hour of pleasure is the hour of rest,
 That sends us back to work with keener zest.
 So, when the factory bell, at evening time,
 Rings out upon the air its welcome chime,
 And, quick responsive to its clanging beat,
 There comes the answer of a hundred feet,
 The merry jest goes round, and cheerful word,
 With happy laughter all the crowd is stirred.
 Forgotten for a while the thunderous din
 That roared and rattled in the workshop grim,
 Tense nerves relax, gaunt want forgets its pain,
 And childhood's dreams come drifting back again;
 The breath of country fields, the garden's sweets,
 Seem to sift through the smoke of city streets;
 For one brief hour the present fades away,
 While old time splendors glorify the day.
 And then toil takes again its heavy load,
 To travel on along the dusty road,
 Renewed and gladdened by the restful change
 That gave to hope and thought a wider range.
 So here we stand to-night with bows unbent;
 To-morrow sees us all on work intent.
 And, as the mirthful moments fade away
 Before the coming of the toilsome day,
 The earnest future, glowing in their light,
 Brightens before our cheered and quickened sight.

We look to-night a quarter century back,
 And mark the lustre of the shining track
 Left by the footsteps of illustrious sires,
 Who kindled long ago these altar fires.
 Amid the changes of a changing age
Decay's not written on *our* history's page.

Empires have risen, tumbled to their fall,
 The throne of power been shrouded with the pall.
 Fortune's swift turning wheel brought various fate,
 To mighty interests in church and state;
 But, midst them all, secure against their shock,
 The Institute, safe founded on a rock,
 Withstands the tempest and the billows' rage,
 And gives no sign of weakness or of age.
 E'en here at home, what changing scenes and powers
 Have marked the passage of those flying hours!
 The cherished city of our love and pride,
 Sitting so softly by the restless tide,
 Keeps only memories of that earlier time
 That brought the treasures of the Orient clime,
 Its silks, and fragrant gums, and spices sweet,
 To lay in willing tribute at her feet,
 And, o'er the common labor of the day,
 Throw the weird splendors of the far Cathay;
 No more her ships come from the golden quest,
 Fanned by rich gales from Araby the Blest,
 And other works employ the busy hands,
 That gather gold no more from India's Sands.
 But naught of this disturbs *our* prosperous state,
 Nor checks our progress, ever growing great;
 Still! star-eyed Science, running to and fro,
 Eager to find whatever man may know,
 Hunting in upper and in nether world,
 Mining in shell-heaps or through star-rack whirled,
 Contented here pulls off her seven leagued boot,
 And makes her home the ESSEX INSTITUTE.
 See, at our hearthstone, how she sits, and sends
 Her pupils forth to serve her various ends,—
 Some to dig Indians, some the sea to dredge,
 Some to filch treasures from the rocky ledge,
 Some to hunt bugs and spear them with a pin,
 As though bug-murder could not be a sin;
 And when, returning home with various hap,
 Their spoils they empty in her ample lap,
 She looks them o'er, and sorting out, she sends
 The second best to "corresponding" friends;
 The first and rarest for *our* use she "mounts,"
 To be of knowledge the perennial founts.
 Nor this alone—for, lo! on happy nights,
 'Midst breathless hush and half-extinguished lights,

Her magic screens with weird enchantments glow,
 And things of beauty from above, below,
 Snatched from the garden, gathered from the lea,
 Brought from the hill-side, borrowed from the sea,
 Lifted from nothingness to ample size,
 Pass in review before our wondering eyes.
 All lands come trooping with their tribute — meet
 To lay in offering at their Mistress' feet;
 From the far realms where endless winter reigns,
 From tropic forests and from summer plains,
 There comes some gift of leaf, or life, or flower,
 To swell the wonders of th' enchanted hour;
 Each form of marvel on this teeming earth,
 The shaping crystal and the insect's birth,
 The golden argosies that sail the air
 And freights of life to waiting blossoms bear; —
 Each comes, obedient to the Mistress' call,
 And paints itself upon the canvas wall;
 And over all, the magic work to crown,
 The nimble ether of the skies comes down,
 And subtile light waves, tortured for their name,
 Write out their autographs in rainbow flame.

These are our claims, good friends, to love and praise,
 For this to-night, each heart its homage pays,
 For this the tables groan, and flowers' perfume
 Beats out in waves of fragrance through the room.
 Your presence cheers us; may its kindly power
 Be felt for good in many a coming hour!
 You've proved our *feasts*, now give our *fasts* a try,
 They'll be nutritious, if a little dry,
 And the old mother, gathering to her heart
 More lusty children, take another start.
 So will the century, rounding to the sphere,
 See gain and growth with each completed year,
 And to the glorious hundredth festival,
 We bid with hearty welcome one and all.

STEPHEN M. ALLEN of Boston being called upon responded as follows:—

MR. PRESIDENT:—I know of no position more embarrassing to a lay member of a scientific society, who may

be expected to say something on an occasion like this, than to find himself surrounded by both natural and professional scientists, whose experience and wits have been sharpened to the highest point by the study and acquisition of all kinds of scientific knowledge. I think, sir, that we have a slim chance, in such an audience, of expressing ourselves so as to appear either easy or interesting. A professional man has the advantage, for if he ever finds himself embarrassed in speaking, either in public or private, he can at once retire under the umbrella of his specialty and escape from the effects of any passing shower of general criticism. Should he be a geologist, he has but to commence on ichthyolites, oolites, sienites and granites, and his listener will never attempt to storm his fortress. If he be a physician, he can do the same thing, only substituting the tibia, fibula, scapula and aorta. The chemist fares equally well in his defence, when diving into the great sea of oxygen, nitrogen, and sometimes hydrogen, with a profusion of alternatives of nitrates, sulphates and bi-sulphates ever ready; while the mathematician or the astronomer can at once successfully and defiantly flee to the realms of space, talking of revolving worlds, of spheres and hemispheres, of constellations and occultations; and if sometimes it reaches aberrations, his listener, through a want of technical knowledge, may not be the wiser. But it is not so with the layman. To be at all happy in his position, he must have seen and known much of many things; in fact, often it seems as though he was expected to have been everywhere and possessed himself of all knowledge, without which he is reckoned uncultivated and behind the times. He is expected perhaps to consider himself fortunate, if perchance sometimes he is needed as a flux or is honored as the slag of science. But, sir, your Institute is progressing

in the right direction. It is searching and reaching practical knowledge at every step, gathering with both gentle and strong hands the truths which belong especially to the present moment, as well as what was in the past and which must be in the great future. Your coöperators chosen from the gentler sex will prove beyond question, a tower of strength in aiding and sustaining the genius and integrity of your present success, as well as in perpetuating your future usefulness and glory. With the most hearty thanks for your invitation to be present to-night and the best wishes for your future prosperity, I will close with the following sentiment:—

The Scientist and Mechanic: May the former ever be as ready to loan the Umbrella of his Specialty to his lay-friends in a storm, as the latter is to make and present new ones, when the old shall have been worn out.

Able speeches were also made by the Hon. JOHN E. SANFORD, speaker of the Massachusetts House of Representatives, and by Rev. E. C. BOLLES of Salem, of which unfortunately no reports could be obtained.

SELECTIONS FROM LETTERS RECEIVED.

WORCESTER, Feb. 26, 1873.

My Dear Sir:

In behalf of the American Antiquarian Society and personally, I have the honor to thank the officers of the Essex Institute for the invitation to unite with them in celebrating the 25th anniversary of the organization of the Institute on the 5th of March next. But I regret to say that I cannot have the pleasure of attending. Yet I offer the cordial congratulations of the American Antiquarian Society that the Essex Institute, always respected as a leader in scientific inquiry, is now more rapidly growing in strength and usefulness.

Very respectfully yours,

STEPHEN SALISBURY.

President of American Antiquarian Society.

DR. HENRY WHEATLAND, for the committee of the Essex Institute.

AMESBURY, 2nd 3rd Mo., 1873.

Dear Friend:

I fear it will not be in my power to be present at the celebration of the 25th anniversary of the Essex Institute at Salem on the evening of the 5th inst. As an Essex County man I always look upon the Institute as an honor to the county. Apart from its interest in a scientific point of view its festivals and excursions have exerted a very genial and social influence. Thanking the officers of the Institute for the invitation, I am very truly thy friend,

JOHN G. WHITTIER.

REV. E. S. ATWOOD.

BOSTON, March 1, 1873.

My Dear Sir:

I very deeply regret that an engagement, from which I cannot get clear, will prevent me from accepting your kind and cordial invitation to meet the members of the Essex Institute on the 5th of March. I regret it all the more because I think your Institute is doing important work in the advancement of knowledge. As an old Salem BOY, I glory in everything which indicates the interest in science by matured Salem MEN. I cannot too warmly express my interest in your achievements and your plans. Salem, forever, is the feeling with which I sign myself,

Very sincerely yours,

E. P. WHIPPLE.

U. S. COAST SURVEY OFFICE, }
Washington, March 4, 1873. }

Dear Sir:

But for the public duties which have claimed my attention here your invitation would have been gladly accepted.

Regretting that I cannot be with you at Plummer Hall to-morrow night, to join in the social reunion of the Essex Institute,

I remain, very truly yours,

BENJAMIN PEIRCE.

H. WHEATLAND, Salem, Mass.

RIVERDALE AVENUE, }
New York, March 1, 1873. }

My Dear Doctor Wheatland:

I most heartily thank you for your kind invitation to attend the Institute anniversary next week. How much I regret that unavoidable duties here stand in the way of its acceptance, I need not say. You remember my deep interest in the objects and meetings of the Insti-

tute; and you can well understand that the occasion to which you invite me would prove most attractive. The presence and sight of your fellow laborer [Prof. Packard] in connection with the Institute, the other night, at the dinner at Delmonico's in honor of Tyndall, brought back to me delightful memories of the evenings when we used to gather at the rooms in the Plummer building, and Putnam, Morse, Cooke, Goodell, Emerton, Johnson, *et alios*, alas! Peabody, Huntington, Davis, possibly others gone hence, were choice spirits in our discussions. These are memories deeply cherished still; and I count it not the least among the privileges of my residence in old Salem, to have been associated with such as these, much more to my own advantage as was the connection, than it could have proved to my fellow members of the Institute.

I again thank you, my old friend, for your courtesy, and beg to express the wish that your celebration, in all its features of instruction and good fellowship, may prove all that you desire.

Believe me always, faithfully your friend,

GEORGE D. WILDES.

NEW HAVEN, CONN., FEB. 17, 1873.

Dear Sir:

I have to thank you, and through you, the Committee of Arrangements, for the kind invitation I have just received to a banquet on the evening of March 5th.

I should take the greatest pleasure in being present, if I could so arrange as to leave home at that time, but as I fear that will be impossible, I am obliged to forego the pleasure, and so gratefully decline the honor.

The continued prosperity of the Essex Institute is a matter of satisfaction to all the naturalists of the country, and it is to be hoped, and indeed expected, that its brilliant example will be followed in many parts of the land.

Anything that will show to our money-loving nation that there is a truer and higher expression of value than the sign of the dollar, \$, is a thing which will in the end advance the whole people in their ideas of essential and permanent usefulness.

Even the professional advocates of a purer and more unselfish practice of religion will always find a great gain to themselves and their cause from the careful study of Natural History, for only in this way can they learn how it is that all natural phenomena, "creeping things and flying fowl, — fruitful trees and all cedars" fulfil the design of the great Creator, and give back a clear and unmistakable response to the

Psalmist's invitation: "Bless the Lord, all his works, in all places of his dominion."

I am, with deep regret that I can not be with you,
Yours very truly,

DANIEL C. EATON.

D. B. Hagar, Esq., Member of Committee of Arrangements for the
25th Anniversary of Essex Institute.

BROOKLINE, Feb. 20, 1873.

My Dear Sir:

Yours of the 18th inst., has this moment reached me. It is full of temptation. It would give me real pleasure to be with the Essex Institute at their celebration, and to bear witness to their great success in the cause to which their labors are devoted.

But I am compelled to deny myself, and can only offer them my grateful acknowledgments of their kind invitation, with my cordial wishes for their continued success and prosperity.

Believe me, dear sir, with great regard, very faithfully yours,

ROBT. C. WINTHROP.

ABNER C. GOODELL, JR., Esq., Vice Pres't.

BOSTON, Feb. 28, 1873.

My Dear Sir:

Illness will deprive me of the pleasure of accepting your kind invitation to the 25th anniversary of the organization of the Essex Institute. I rejoice that Dr. Wheatland will witness it.

Glorious old Essex is rich in great names some of which yet wait, and can afford to wait, for historical justice. In the day when History shall supplement mere Annals, the portrait of Cutler, the minister of Hamilton, which now adorns the walls of the Institute as a man of local distinction, will, with that of Dane, the Beverly lawyer, be elevated to a chief place among our national portraits, and the names of Manasseh Cutler and Nathan Dane be as household words throughout the land for all time. Their joint work, the Ordinance of 1787, July 13—some months prior to the adoption of our present Constitution, is hardly second in importance to the Declaration of Independence. Except the Constitution it is perhaps the most important instrument among the fundamental acts of the country, for it established the principles of civil and religious liberty as the organic basis of all governments and laws in the northwest. It was "the cloud by day and the pillar of fire by night," warding off slavery and barbarism, and securing the primeval waste of forest and prairie of the northwest for the children of the north Atlantic states, who, like

their fathers, should demonstrate the capacity of man for self-government. It was this civilization that, when slavery, with the warm breath of old world despotism, was against us, gave us Lincoln's Proclamation of Emancipation; it blotted out slavery; it vindicated the Declaration of Independence; and saved the nation. Let the nations love and reverence the names of Cutler and Dane. They

“ — heard the tread of pioneers
Of nations yet to be;
The first low wash of waves where soon
Should roll a human sea.”

Yours, sincerely,

J. WINGATE THORNTON.

ABNER C. GOODELL, Esq., V. P., Chairman of the Com. of Arrangements.

The celebration as a whole must be considered as an eminent success. The evening was propitious, the arrangements well carried out in all their details, the speeches thoughtful and interesting, and no untoward incident marred the enjoyment of the festival from its beginning to the close. The occasion will long be remembered by those who were so fortunate as to be present, as a fitting celebration of the twenty-fifth anniversary of the Essex Institute.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 5. SALEM, MASS., APRIL AND MAY, 1873. No. 4.

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

REGULAR MEETING, MONDAY, APRIL 14, 1873.

Meeting this evening. The PRESIDENT in the chair.
Records of preceding meeting read.

The SECRETARY announced the following correspondence:—

From Stephen M. Allen, Boston, March 27, 28; C. Alice Baker, Cambridge, April 6; Henry Barnard, Hartford, March 17; Oliver N. Bryan, Marshall Hall P. O., Ind., March 17; A. Crosby, Salem, April 10; S. C. Gould, Manchester, New Hampshire, March 24, 31; S. A. Green, Boston, March 29; George Haskell, Ipswich, April 8; D. Webster King, Boston, April 8, 10; G. B. Loring, Salem, April 3; A. A. Scott, Saugus Centre, April 8; James Usher, New York, March 17; Marshall P. Wilder, Boston, April 8; Charles V. Woerd, Waltham, April 10, 12; American College of Heraldry, New York, April 3; Bern, Die Naturforschende Gesellschaft; New York Genealogical and Biographical Society, New York, March 24, 29, April 5; Ohio Historical and Philosophical Society, Cincinnati, March 15.

THE LIBRARIAN reported the following additions:—

By Donation.

ALLEN, STEPHEN M., of Boston. Proceedings of the Laying of the Corner Stone of the Standish Monument on Captain's Hill, Duxbury, Oct. 7, 1872.

- BUTLER, B. F., of U. S. House of Representatives. Bingham's Speech in the U. S. H. R., Feb. 26, 1873. Butler's Speech in U. S. H. R., Feb. 27, 1873.
- CLEVELAND, N., of Topsfield, Mass. Political Pamphlets, 2 vols., 8vo. Miscellaneous Sermons, 2 vols., 8vo. Religious Pamphlets, 2 vols., 8vo. Miscellany, 2 vols., 8vo. The Psalms of David, by I. Watts, 1 vol., 12mo, 1786. Massachusetts Register, 1809, 1 vol., 16mo. Psalms, 1 vol. 12mo.
- GREEN, S. A., of Boston, Mass. Miscellaneous pamphlets, 11.
- MASSACHUSETTS HORTICULTURAL SOCIETY. Transactions of, for 1872.
- OSGOOD, ALFRED, of Newburyport, Mass. Annual Report of the School Committee of Newburyport for 1872. Report of the Directors of the Public Library of Newburyport, 1872.
- PALFRAY, C. W. Miscellaneous pamphlets, 35.
- POTTER, Rev. E. N., of Schenectady, New York. Proceedings at the Inauguration of the President of Union College, 1871-72.
- THURSTON, C. MYRICK. Genealogy of the Thurstons and Pitmans of Rhode Island. 1 vol., 8vo. New York, 1865.
- U. S. PATENT OFFICE of Washington, D. C. Official Gazette, March 4, 11, 18, 1873.

By Exchange.

- ARCHIV FÜR ANTHROPOLOGIE, Band v, Heft iv, 1872.
- BIBLIOTHEQUE UNIVERSELLE ET REVUE SUISSE. Archives des Sciences Physiques et Naturelles, Dec., 1872, Jan., 1873.
- GEOLOGICAL SURVEY OF CANADA. Report of Progress for 1871-72.
- NATURAL HISTORY SOCIETY OF MONTREAL. The Canadian Naturalist, Vol. vii, No. 1.
- PHILADELPHIA ACADEMY OF NATURAL SCIENCES, Proceedings of the. Oct., Nov., Dec., 1872.
- STATE HISTORICAL SOCIETY OF IOWA. The Annals of Iowa for January, 1873.
- PUBLISHERS. American Naturalist. Essex County Mercury. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Quaritch's Catalogue. Sailors' Magazine and Seamen's Friend. Salem Observer. Silliman's Journal. Western Lancet.

Among the donations announced may be specified a Pocket Bible more than two hundred years old, from Miss MARY C. ANDERSON, and bearing the imprint of 1658. Not only is the title page illustrated with a nicely executed steel engraving quite creditable to the period, but the covers and gilt edges are ornamented with an elaborateness rarely equalled at the present day. The inscriptions show the transmission from one person and generation to another. From Mrs. Dolearne to Eliza Whetstone; from Eliza Whetstone to Peter Clarke; from the widow of Peter Clarke, in 1805, to John Jones Gascoigne Clarke; from the latter's administrator to Deborah Fairfax An-

derson, Aug. 9, 1838, and from the latter at her death, March 23, 1841, to her daughter, Mary Clarke Anderson.

From NEHEMIAH CLEAVELAND, Esq., of Topsfield, an ancient stand for a christening basin. It is made of iron, of a rather rude style of construction, and was found under the pulpit when the third Topsfield meeting-house was taken down. It was no doubt used in the second meeting-house built in 1703, and may have belonged to the first house.

From Mr. OLIVER N. BRYAN, of Marshall Hall P. O., Maryland, some relics of the tomb of Mrs. Deborah Fairfax, situated upon the banks of the Potomac, in a most lovely spot, a beautiful grove composed chiefly of white oaks, elevated above the river about fifty feet, commanding a beautiful view down seven and up five miles, overlooking a large portion of Prince George and Charles Counties, Maryland. Mrs. Deborah Fairfax was the daughter of Francis and Deborah (Gedney) Clarke of Salem, and was living in the house on the corner of Essex and North streets, on the site of which now stands the Shepard Block, when William Fairfax came to Salem as collector of the port, with his family, and lived in the house on the corner of Cambridge and Essex streets, taken down the past season to erect on its site a more eligible mansion.* The wife of Mr. Fairfax died in 1731; he afterwards married Miss Clarke and in 1734 removed to Virginia by invitation of his cousin Thomas, the sixth Lord Fairfax, to be the superintendent of the estates that had lately come into his possession through his mother, who was Catherine, daughter of Lord Culpepper.

From Miss EUNICE RICHARDSON, specimens of old continental currency.

*See Bulletin of Institute, Vol. iv, p. 62.

Dr. A. S. PACKARD, Jr., exhibited a large series of photographs of scenery in Colorado and Montana Territories taken by Mr. A. H. Jackson, under the auspices of the United States Geological Survey of the Territories, Dr. F. V. Hayden geologist. They were in two sets, and comprised some of the finest views in the National Yellowstone Park and Colorado Territory. From them one could obtain a very clear idea of the Geyser region which has been studied and mapped out by the Survey; of the springs in course of eruption, and of the falls and basin of the Yellowstone. He gave an account of the supposed origin of these extensive hot springs of which several thousand are supposed to exist. He also alluded to the value and interest of the discoveries made by Dr. Hayden in the west for a period of nearly fifteen years.

STONE KNIVES.

Mr. F. W. PUTNAM occupied the greater portion of the evening with an account of the various forms of cutting instruments made of stone, and classed by archæologists under the general head of knives. A large number of specimens were exhibited, showing the different forms so far as they were represented by specimens in the Museum of the Peabody Academy of Science.

Knives or cutting instruments of various shapes and degrees of perfection have been found in more or less abundance in all parts of the world where stone implements have been collected and studied. Many of these cutting implements are simple flakes of flint or other stone; in fact any stone with a sharpened edge attained either by chipping or grinding, and of such a form as to show that it was not intended for use as a skin scraper, dagger, spearhead, arrowhead, small axe, or other similar implement, is classed under the head of knives; but while

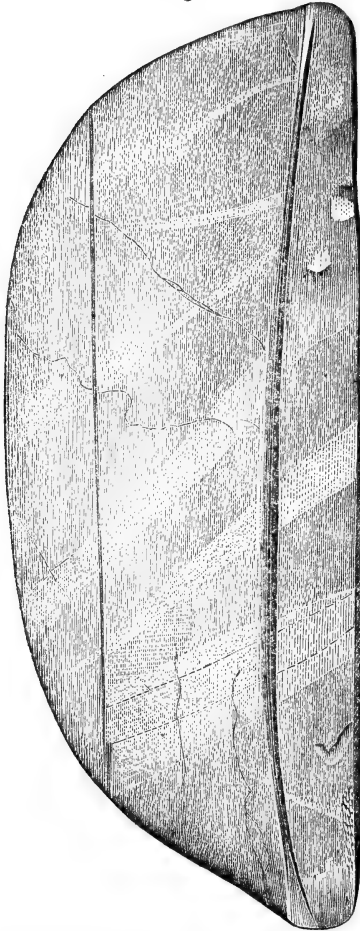
various stones, in many cases showing hardly any work upon them with the exception of providing a cutting edge, are thus brought into the group, it must not be taken for granted that all the stone knives of the prehistoric races were of this rude character.

Many beautiful cutting implements have been found in various countries, especially in North America. Schoolcraft, in his extended work on the Indian tribes, figures several fine specimens, notably the one represented on plate 45, figures 1 to 3 (vol. ii), found at Hartford, Washington County, N. Y., which he states to be carved from a piece of green serpentine. This knife is somewhat sickle shaped, five and three-quarters inches long, with a curved triangular blade descending from a well formed rounded handle. Schoolcraft also figures (vol. ii, pl. 49, fig. 4) a cutting implement with a blade five and three-quarters inches long by an inch in width. The figure shows a thickened portion answering for a back or handle. This specimen was found in Genesee Co., N. Y. The drawing is, however, very poorly executed and the description is so brief as to leave us in doubt as to the exact character of the implement. The specimen figured on his plate 50, figures 5 and 6 (vol. ii), under the title of "fragment of a blade of a battle-axe," and described as made of silicious slate, is far too thin and fragile an implement for a battle-axe, and is more likely another form of slate knife, perhaps having two symmetrical blades, through the centre of which (the figure shows a broken groove, which may represent a hole drilled through the centre of the blades) a wooden handle was inserted.

Squier and Davis in their work on the "Ancient Monuments of the Mississippi Valley," comprising the first of the splendid series of monuments in honor to James Smithson, under the title of the "Smithsonian Contribu-

tions to Knowledge," p. 216, give a small woodcut of a semilunar shaped knife, which they state is a form "occasionally found in the Eastern states. They are sometimes composed of slate, and are of various sizes, often measuring five or six inches in length. They are well adapted for flaying animals, and other analogous purposes." Their figure represents a knife of the same shape as the one here engraved (Fig. 1).

Fig. 1.



Knife from Salem, made of gray slate with dark and red veins and mottlings. Full size.

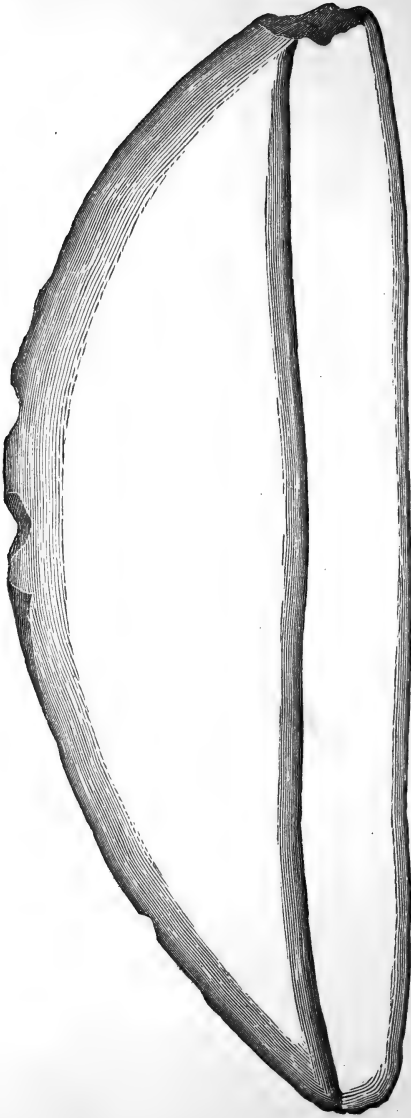
Of these semilunar-shaped knives I have seen quite a number of specimens in various collections, but thus far all, as stated by Squier and Davis, have been from the Eastern states. In the Peabody Museum of Archaeology, at Cambridge, there are several of this form, one of which is about eight inches long and is labelled "Paring Knife. Amoskeag Falls, 1795." Two other knives

of this shape are in the Abbott Collection of the Peabody Academy of Science. These were found near Trenton, New Jersey, and by the kindness of Dr. Abbott I am able to use the woodcut

representing one of them (fig. 2) in advance of its appearance in his work on the "Stone Age in New Jersey," for the purpose of showing its great resemblance to the specimens from Essex County, of which there are two in the Academy Museum. The one represented here as figure 1 is the more beautifully finished and perfect of the two. It was found in Salem and placed in the Museum of the East India Marine Society. It is not quite five inches in length and is a little less than two inches in greatest depth of blade and back. The back is about half an inch in depth and a little over a quarter of an inch in width at the centre; narrowing at the ends; perfectly flat above. The blade is one-fifth of an inch thick along the under side of the thick back; it is gradually thinned out to the cutting edge all round, which is only one-tenth of an inch thick about one-fifth of an inch from its outer margin, which is evenly and nicely brought to a sharp cutting edge. The engraving shows the shape of the knife better than words will describe it. It will be noticed that the blade is slightly more pointed at one extreme than at the other. The material is a gray slate having several fine veins of a harder substance (quartz?) as shown in the engraving; it is quite ornamented with several dark wavy lines, light streaks and bands, and a number of irregular wavy lines of a red mineral running in all directions over the surface, but not indicated in the engraving.

Another specimen, also received by the Academy from the East India Marine Society Museum, was found on the farm in Danvers formerly owned by Governor Endicott. This specimen consists of about one-half of the knife, and was evidently, when perfect, about six inches long and two and a quarter deep. It was made of a slate very much like the Salem specimen, but without the dark and red veins and mottlings.

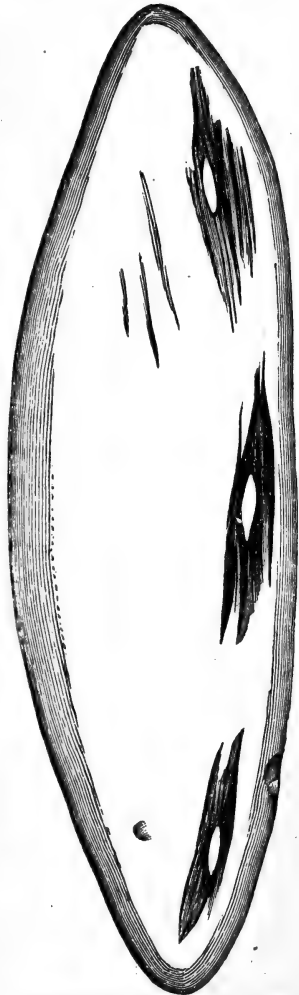
Fig. 2.



Knife made of light clay slate from Trenton, New Jersey. Full size.

Among the many interesting specimens secured for the Museum of the Academy, by Mr. John H. Sears, is a knife of dark talcose slate which is unlike any other that I have seen. The specimen is represented as figure 3. It was found near the church in Putnamville (Danvers) and is thus of marked interest to us as a relic from Essex County. It is slightly over five inches in length, and about one and one-half inches in depth at its centre. It is worked to a rounded point at each end, as shown by the engraving, and the smooth cutting edge is from point to point. The greatest thickness of the blade is one-fifth of an inch. The back of the knife is ground off to quite a thin edge, but evidently was never sharpened to form a cutting edge, though the back is so thin as to render its being held in the hand an uncomfortable matter while using the knife in this way, and the three holes that have been rudely cut, apparently by scraping backwards and forwards with a pointed stone, on both sides, until a hole was made, are evidence that the knife was mounted on a handle by passing bands through the holes and around the handle,

Fig. 3.



Knife made of dark talcose slate, from Putnamville. Full size.

which was probably grooved along its under side to fit over the sharp back of the knife. In common with the other slate knives, this specimen was finished with care and is perfectly smooth and well sharpened along its cutting edge.

Evans, in his instructive work on the "Ancient Stone Implements of Great Britian," mentions (p. 311) that in some Esquimaux knives the blade is tied to a wooden back by a cord which *passes through a hole in the blade*.

It would thus seem that our New England Indians, for to them I think we must look as the makers and owners of the knives I have specially described, were not satisfied with using simple flakes of stone and broken arrow and spear heads for knives, but that with them as with us to-day there were many, and often elaborate, styles of this most useful implement, and who can say that to possess a good knife was not as much the ambition of the men of the departed race as it is with those who have succeeded them?

Messrs. Charles D. Styles, John H. Derby, George F. Breed, Samuel Edson Cassino and Matthew Robson, all of Salem, and John G. Barker of Lynn, were duly elected resident members.

A committee, consisting of Messrs. John Robinson, James Kimball, E. S. Atwood and Caleb Cooke, was appointed to nominate officers to be balloted for at the annual meeting. The president and secretary were afterwards added to the committee.

Adjourned.

REGULAR MEETING, MONDAY, MAY 5, 1873.

Meeting this evening at 7.30 o'clock. The PRESIDENT in the chair. In the absence of the SECRETARY, Dr. WILLIAM NEILSON was requested to act. Records of preceding meeting read.

The SECRETARY announced the following correspondence :—

From Stephen M. Allen, Boston, April 22; Jacob Batchelder, Lynn, April 29; T. T. Bouvé, Boston, March 21; S. P. Boynton, Lynn, April 29, May 1; George Derby, Boston, April 29; Samuel A. Drake, Boston, April 19; James H. Emerton, Boston, March 14; J. C. Holmes, Detroit, Mich., April 12; E. Rupert, Boston, April 26, William H. Rush, Chelsea, April 23; Henry Saltonstall, Boston, April 14; N. Vickary, Lynn, April 30; Charles V. Woerd, Waltham, April 18; William H. Yeomans, Columbia, Conn., May 3; American Antiquarian Society, April 26; American Geographical Society, April 30; Basel, Naturforschende Gesellschaft, August 12, 1872; Boston Public Library, April 23; Buffalo Society of Natural Sciences, April 17; Chicago Public Library, April 23; New Jersey Historical Society, April 21; New York Lyceum of Natural History, April 22; University of Wisconsin, Madison, April 30.

Mr. JOHN ROBINSON gave an account of the floral progress of the year, noticing the period of the opening of the flowers of several of the native plants and comparing the same with that of previous seasons.

He mentioned the finding, by Mr. C. E. Faxon of Cambridge, of a fern (*Aspidium munitum*), hitherto unknown in the United States, but known in the West India islands and other parts of the tropics; also that *Asplenium ebenoides*, only found in Philadelphia some years since, had been noticed in Alabama, growing with *Asplenium ebenum* and *Camptosorus* as at the Philadelphia locality, thereby adding to the weight of the theory that it was a hybrid between the latter two.

He also said that, without doubt, if thorough search be made at the south, many plants not known in our flora would be found, many difficulties having prevented the

tourist and scientist from visiting that region at the proper season of the year to collect the best specimens.

Rev. E. C. BOLLES mentioned the occurrence at Swampscott, on the Stetson farm, very near the railroad, of one of the most beautiful of the microscopic Algæ, the *Batrachospermum moniliforme*. This plant requires very pure running water; and it closely invests the stones in little streams, moving its clusters of soft green threads very gracefully with the flowing of the brook. Under a lens each filament is seen to consist of a central thread, around which, at regular intervals, are whorls of other threads at right angles to the first, so that the whole appears like minute circular brushes, similar to those used for cleaning the flues of a chimney and strung like beads some distance apart. The threads are necklaces of globular cells, and the spores are to be found in a cluster near the centre of each whorl. These plants are with difficulty preserved, as they change color and cease to exhibit this peculiar arrangement when pressed on paper. They are usually put up for the microscope in glycerine jelly.

Mr. F. W. PUTNAM mentioned having noticed the appearance on April 3rd, of the common or white-bellied swallow, *Tachycineta bicolor*.

Charles A. Carlton of Salem was elected a resident member.

Adjourned.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 5.

SALEM, MASS., MAY, 1873.

No. 5.

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

ANNUAL MEETING, WEDNESDAY, MAY 14, 1873.

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,

exhibiting a satisfactory condition of affairs and the progress made, during the interval, in the promotion of the objects of the institution, has been compiled.

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

B. R. Allen. Scarcely had two or three weeks elapsed,

after our last annual gathering, ere the First Congregational Church in Marblehead was called to part with a beloved minister, Rev. B. R. Allen. He was born in Newport, Rhode Island, June 2, 1805, ordained in Marblehead in 1854 and since that time has resided in that town highly esteemed and revered. He joined the Institute several years since, has attended some of its meetings and was interested in its objects. He died June 2, 1872.

Henry Curwen, son of Samuel R. and Mary L. (Holman) Curwen, died July 13, 1872, aged 25; he early associated himself with the Institute. His duties as a clerk in one of our large business houses precluded him from being a very active member.

Brown Emerson. On Thursday evening, July 25, 1872, the South church in this city lost by death the aged and venerable senior Pastor, Rev. Brown Emerson, D. D., who had been connected with them in this holy bond of brotherhood for more than two-thirds of a century. He was the son of John and Catherine (Eaton) Emerson and was born at Ashby in this state January 8, 1778; graduated at Dartmouth College in 1802, and was ordained April 24, 1805, as colleague with the Rev. Daniel Hopkins, D. D., whose daughter Mary he married Oct. 29, 1806, a lady of uncommonly excellent traits of character, who survived until April 4, 1866, sustaining the happiest married relations for a period of nearly sixty years. Dr. Emerson was a person of noble presence, tall, erect, and of fine proportions, courteous and genial in his manners. His patriarchal appearance in his later years will long be remembered.

William S. Cook, son of John and Eliza A. (Leighton) Cook, died December 7, 1872, aged 28.

William Silver, son of James and Susan (Howard) Silver, died at Salem, January 16, 1873, aged 64. In

early life a master mariner ; afterwards a merchant. By his death, Salem loses another link in the chain which connects it with that period in its history when the sails of its merchantmen whitened every sea, and its merchants were known throughout the commercial world. He retired from all his trusts successful and with a proud record, and as a citizen was widely known and respected.

Henry C. Perkins. On Saturday, February 2, 1873, our neighboring city of Newburyport was pained by the announcement of the sudden decease of one of her most eminent physicians, Henry C. Perkins, M. D. ; he was the son of the late Thomas Perkins and was born in that place, Nov. 13, 1804 ; graduated at Harvard college in 1824, and after the usual medical tuition located in the place of his birth and resided there until his decease, devoting the leisure he was enabled to obtain from an extensive and successful practice to scientific investigations, in which he took much pleasure and was an ardent and zealous worker. Rev. Dr. Spalding of Newburyport has kindly consented to prepare a memorial to be read at some future meeting with a view to its publication in the "Historical Collections."

Abraham F. Bosson, of Salem, died February 21, 1873, aged 61 ; a son of Thaddeus and Abigail (Fowler) Bosson. His interest in the Institute centred in the horticultural department ; he was a very zealous and devoted cultivator of the choicest flowers and fruit and liberally contributed to the horticultural exhibitions given under the auspices of the Institute.

John Chapman, the senior editor of the Salem Register, died on Saturday, April 19, 1873, having been able to perform his usual duties in the office until within a few weeks of his decease, when he was stricken by a disease which soon proved fatal. He was son of John and Ruth

(Henfield) Chapman and was born in this city, Sept. 4, 1793, and was consequently on the verge of fourscore. He entered the office of the Register in 1807, having been engaged in the duties of a printer, nearly as many years as his venerated pastor, who died a few months previous, had occupied the pulpit of the South church in this city. Having held many offices of trust and being much in public life, few citizens were so generally known or will be so much missed.

Timothy Ropes died April 25, 1873, aged 75; son of Timothy and Sarah (Holmes) Ropes. In early life he made several voyages to India; afterwards became a dealer in crockery and hardware. He was very fond of horticultural pursuits and was a constant contributor of flowers and fruit to the horticultural exhibitions, especially to those held some twenty or thirty years since.

MEETINGS.—Three field meetings have been held during the season; first, at Middleton, June 12, 1872, by invitation of Mr. Simon F. Esty, who tendered the use of his grounds on the border of "Forest Lake," formerly known as the Great Pond, as the place of rendezvous for the day. At the meeting in the church, remarks were made and resolutions passed to the memory of Dr. Wm. Stimpson; Mr. David Stiles presented some historical notices of Middleton; D. J. Tapley of Danvers exhibited a curious Indian relic found by Mr. Seneca Ladd of Meredith village, New Hampshire; Mr. James H. Emerton spoke on spiders; Rev. E. C. Bolles on Microscopic Fungi—also Mr. F. W. Putnam, Dr. A. H. Johnson, A. C. Goodell, Jr., Esq., Rev. Mr. Frary and others, made appropriate remarks suggested by the occasion.

The second meeting at Groveland, July 16, 1872, by invitation of Dr. Jeremiah Spofford. An object of

special interest was the new iron bridge connecting the town with Haverhill. The new academy building, which was the rendezvous of the day, is also deserving of honorable mention. It was recently built, (mainly through the efforts of Dr. Spofford), on the site of the former building destroyed by fire a few years since. At the meeting Dr. Spofford gave a very interesting sketch of the history of the academy; Prof. E. S. Morse spoke on the "Frog Spittle" *Ptyelus lineatus*, and described the habits of this curious insect; James H. Emerton mentioned several cases of protective colors and habits in spiders which he had seen during the morning walk; Messrs. Abner J. Phipps, agent of the State Board of Education, D. B. Hagar of the State Normal School, Salem, S. C. Beane, E. C. Bolles, LeRoy F. Griffin and others, made interesting remarks.

The third, at Annisquam, on Thursday, Aug. 8, 1872. The pleasant summer's day so congenial and appropriate for a visit to the seashore induced many to accompany the Institute on this excursion to the rock-bound coast of Cape Ann. In the afternoon F. W. Putnam spoke of the shell heaps which he had visited; also gave an account of the development of the skate's egg, the cases which contained the embryo being frequently found cast upon the beaches; Rev. W. E. Coffin of Orange, formerly a pastor of this church, and J. J. Babson, gave interesting historical sketches of this parish; remarks were made by Messrs. A. W. Dodge, L. J. Livermore, James Davis, C. E. Barnes, Addison Davis, and others.

Evening meetings have been held at the rooms, usually on the first and third Monday evenings of each month except on those in June, July, August and September. At these meetings many valuable communications have been

presented, and abstracts have been printed in the *BULLETIN* or reserved for the "Historical Collections;" John Robinson, on our early native plants, with a floral calendar kept by one of our young and enthusiastic collectors, noting the blooming of some of the spring flowers for several years past; also a paper on ferneries, how to make them and what to put in them; George H. Devereux, on the origin of surnames; a catalogue of the mammals of Florida by C. J. Maynard, with notes on their habits, distribution, etc.; A. S. Packard, an account of recent explorations of St. George's Bank in the U. S. C. S. Steamer *Bache*; on the glacial phenomena of northeastern America compared with those of Europe; F. W. Putnam, on ancient Indian carving; E. S. Atwood gave an account and read extracts from a journal, of a journey to Philadelphia by the late Rev. B. Emerson, some fifty years since; James H. Emerton, on worms of the genus *Nais*; Stephen M. Allen, on the ancient and modern theories of light, heat and color; Harold Herrick of New York, a partial catalogue of the birds of Grand Menan.

In this connection it may be deemed appropriate to allude briefly to the meeting, March 5, 1873, commemorative of the twenty-fifth anniversary of the organization of the Institute. On this occasion were present His Excellency the Governor, the President of the Senate, the Speaker of the House, and many other distinguished persons.

LECTURES.—On Wednesday evening, Oct. 16, 1872, Rev. E. C. Bolles commenced a series of eight lectures in Mechanic Hall, Salem, entitled "Eight evenings with the Microscope," and continued on successive Wednesday evenings, except the seventh on Tuesday, Dec. 2, and the eighth on Tuesday, Dec. 9. Mr. Bolles also delivered a

lecture before the Peabody Institute in Danvers, one before the Newburyport Lyceum, a course of six lectures in March and April in Odd Fellows Hall, Lynn, and a supplementary on Monday, May 12. A course of five lectures is in course of delivery in Danvers, having begun on Thursday, April 17. The subjects of the above lectures were selected from those delivered in Salem during the past autumn. A course of familiar lectures on microscopical studies commenced in the rooms of the Institute on Monday, April 21, the second on Wednesday, April 30, and the others on successive Wednesday evenings. The above lectures,* which were under the direction of the Institute, were popular and instructive descriptions of the history and construction of the Microscope; and included exhibitions of specimens in the various fields of nature, illustrating by aid of the calcium light the discoveries which the microscope has made. Mr. E. Bicknell assisted Mr. Bolles in the illustrations and managed the lantern.

CONCERTS.—Five concerts have been given by members and friends of the Institute on Thursday evenings commencing with Thursday, March 27, 1873. They were very successful and gave much pleasure and gratification not only to those interested in this pursuit, but to others. To Mr. Charles H. Higbee, for his untiring and assiduous exertions in the attainment of a favorable result, the Institute is greatly indebted.

MUSEUM.—Many valuable specimens have been given during the year; those relating to Natural History, in accordance with previous arrangements, have been deposited with the Trustees of the Peabody Academy of Science; and of the collection in the custody of the trustees it is

* See BULLETIN, Vol. iv, p. 46.

only necessary to say that the same care is bestowed upon our specimens as is upon their own. Those of an historical character are in the immediate care of the Institute, consisting chiefly of curiosities, relics and early Essex County household chattels. It is desirable that a more systematic arrangement be made, and the curators of that department are requested to consider the propriety of having the same done, at an early date, in an interesting and attractive manner. The visitors to inspect the old frame of the first building for the First Church increase every year.

LIBRARY.—The additions during the year have been as follows :—

<i>Donations.</i>			
Folios,	15	Pamphlets and Serials,	5,834
Quartos,	30	Almanacs,	57
Octavos,	412		—
Duodecimos,	59	Total,	5,891
Sexdecimos,	36	Total of bound volumes,	552
	—		—
Total,	552	Total of Donations,	6,443
<i>Exchanges.</i>			
Quartos,	16	Pamphlets and Serials,	1071
Octavos,	61	Total of bound volumes,	80
Duodecimos,	3		—
	—	Total of Exchanges,	1151
Total,	80	Total of Donations,	6443
			—
		Total,	7594

Of the total number of pamphlets and serials 2,515 were pamphlets, and 4,390 serials.

The donations to the Library for the year have been received from one hundred and twelve individuals and fifteen societies and public bodies.

The exchanges have been received from ninety-one societies and incorporated bodies, of which sixty-eight are foreign.

From the editors of the "American Naturalist" one hundred and thirty-seven serial publications.

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

DEBITS.

Athenæum for rent and Librarian,	\$350.00
Salaries, \$876.88; Coal, \$140.00,	1016.88
Postage and Express, \$45.47; Sundries, \$49.20,	94.67
Lectures (Bolles), \$1251.66; Collecting, \$5.75,	1257.41
Gas, \$32.40; Goldthwaite and Day, \$118.84,	151.24
Insurance, \$40.00; Publications, \$2200.00,	2240.00
To balance,	202.42

Historical.

G. Southward, \$10.00; J. Perley, \$86; Books, \$7.00,	103.00
<i>Natural History and Horticulture.</i>	
J. Perley, \$25.00; C. A. Walker, \$3.50,	28.50
	\$5,444.12

CREDITS.

Dividends Webster Bank, 40.00; Lectures, 1214.57,	\$1254.57
Notes and interest,	1586.51
Sundries,	87.38
Athenæum, proportion of coal, janitor, etc.,	145.00
Assessments, \$1,200; Publications, \$617.18,	1817.18
Balance of last year,	2.48

Historical.

Dividends Naumkeag Bank, \$24.00; Michigan Central R. R., \$47,	71.00
<i>Natural History and Horticulture.</i>	
Dividends Lowell Bleachery, \$80.00; P. S. & P. R. R., \$20,	100.00

Davis Fund.

Coupons Dixon, Peoria and Hannibal R. R. Bonds,	240.00
Coupons Burlington and Missouri River R. R. Bonds,	140.00
	\$5,444.12

PUBLICATIONS.—The BULLETIN has been continued in monthly numbers, giving full reports of the doings of the Institute and abstracts of papers read at the meetings;

this makes an annual volume of some one hundred and sixty pages. Vol. xi, Nos. 2, 3 and 4, of the "Historical Collections," have been printed completing vol. xi.

The SECRETARY announced the following correspondence:—

From Buffalo Society of Natural Sciences, May 12; Buffalo Historical Society, May 10; New York Lyceum of Natural History, May 12.

Also the following letter from Dr. A. H. Johnson was read:—

SALEM, May 14, 1873.

The undersigned regrets that while holding the position of Secretary of the Institute during the past year, he has been able to give but little attention to the duties of the office, which have consequently devolved almost entirely upon its President.

The irregularities connected with the medical profession are incompatible with that regular performance of clerical labor, and punctual attendance upon meetings, which the office properly demands. Therefore, unwilling longer to hold an office whose duties must be left to others to perform; grateful for the kind consideration shown to him during his exceedingly imperfect, although never wilfully neglectful, service; with no abatement of interest in the Institute and its objects, but with the hope to serve it better in some other way, he hereby resigns the office of Home and Recording Secretary of the Essex Institute.

Respectfully submitted,

A. H. JOHNSON.

OFFICERS ELECTED

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

President.

HENRY WHEATLAND.

Vice Presidents.

Of History—A. C. GOODSELL, 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.

CALEB 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, John Robinson, H. W. Putnam.

Curators of Department of the Arts.

C. H. Higbee, Jas. A. Gillis, Geo. M. Whipple.

*Lecture Committee.*Jas. Kimball, Geo. Perkins, Wm. Northey, E. C. Bolles, Joshua
Coit, A. H. Johnson.*Finance Committee.*

John C. Lee, Richard S. Rogers, Jas. Upton, Geo. D. Phippen.

*Field Meeting Committee.*A. W. Dodge, E. N. Walton, Caleb Cooke, N. A. Horton,
Alfred Osgood.*Library Committee.*

J. G. Waters, Alpheus Crosby, E. B. Willson.

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

The PRESIDENT spoke of the movement for a "Free Library" in Salem, and a desire of many citizens for the coöperation of the Salem Athenæum and Essex Institute with the city government and others interested in the

attainment of this object; and suggested the appointment of a committee to confer with a committee of the city government and other institutions, and, when a plan has been matured, to report the same for the action of the Institute, at a meeting legally called for the purpose.

The President, Vice Presidents, Recording Secretary and Librarian were chosen on said committee.

The SECRETARY spoke of some flowers which were upon the table, and alluded briefly to the prospect of the horticultural exhibitions the coming season.



REGULAR MEETING, MONDAY, MAY 19, 1873.

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

Horace B. Sargent of Salem was elected a resident member.

Adjourned to Thursday evening, May 22.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 5. SALEM, MASS., JUNE, 1873. No. 6.

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

ADJOURNED MEETING, THURSDAY, MAY 22, 1873.

THE PRESIDENT in the chair. Records of preceding meeting read.

The SECRETARY announced the correspondence:—

From Stephen M. Allen, Boston, May 16; Jacob Batchelder, Lynn, May 21; Caroline H. Dall, Boston, May 15; B. H. Hall, Troy, New York, May 12, 19; J. C. Holmes, Detroit, Michigan, May 15.

The LIBRARIAN reported the following additions:—

By Donation.

ANDERSON, M. C. The Holy Bible. 1 vol. 12mo. London, 1658.
BUTLER, B. F., of U. S. H. R. Congressional Globe, 2d Session, 42d Congress. 1871-72. 5 vols. 4to. Index, 1871-72. 1 vol. 4to. Appendix, 1871-72. 1 vol. 4to. Ninth Census of the U. S., 1870. 1 vol. 4to. Message and Documents, 1872-73. 4 vols. 8vo. Department of Agriculture, 1871. 1 vol. 8vo. Commercial Relations, 1871. 1 vol. 8vo. Geological Survey of Montana and the Adjacent Territories, 1871. 1 vol. 8vo. Land Office Reports, 1870, 1871. 2 vols. 8vo. Geological Survey of Wyoming and Contiguous Territory, 1870. 1 vol. 8vo. Patent Office Reports. Vols. ii, iii, 1839. 2 vols. 8vo. Finance Report, 1872. 1 vol. 8vo.
CROSBY, ALPHEUS. Boston Daily Advertiser, 1869, 1870, 1871, 1872. The Commonwealth, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872. Boston Daily Journal, 1867, 1868, 1869, 1870, 1871, 1872. Salem Gazette, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870,

1871. Salem Observer, 1833, 1864, 1835, 1865, 1867, 1868, 1869, 1870, 1871, 1872. Salem Register, 1863, 1834, 1865, 1836, 1837, 1838, 1839, 1870, 1871. Boston Daily Transcript, 1865, 1866, 1867.

NATIONAL ASSOCIATION OF WOOL MANUFACTURERS. Bulletin, Jan.-Mch., 1873.

U. S. PATENT OFFICE. Official Gazette, Mch. 25.

WARD, JULIA E. Catalogue of the Mt. Holyoke Female Seminary in South Hadley, Mass., for 1872-3. 8vo pamph.

By Exchange.

BOTANISK TIDSSKRIFT, KJÖBENHAVN. Tidsskrift, Anden Raekke. Forste Bind. Tredje and Fjaerde Haefte. 2 pamphlets, 8vo.

KONGELIGE DANSKE VIDENSKABERNES SELSKAB KJÖBENHAVN, Oversigt, 1871. No. iii. 1872. No. i. 2 pamphlets, 8vo.

KÖNIGLICHE GESELLSCHAFT DER WISSENSCHAFTEN. Göttingen Nachrichten, aus dem Jahre, 1872.

MINNESOTA HISTORICAL SOCIETY. Report for 1872. 8vo pamph.

NATURFORSCHENDE GESELLSCHAFT IN BERN. Mittheilungen, Nos. 745-791. 1871.

NEW ENGLAND HISTORIC-GENEALOGICAL SOCIETY. Register and Journal of, April, 1873.

PHYSIKALISCH MEDICINISCHE GESELLSCHAFT IN WÜRZBURG. Verhandlungen, Neue Folge, iii Bd., iii Heft, Würzburg, 1872.

VEREIN ZUR BEFÖRDERUNG DES GARTENBANES, BERLIN. Wochenschrift, Nos. 1-52, 1872.

YALE COLLEGE. Catalogue of the Linonian Brothers' Library. 1 vol. 8vo.

PUBLISHERS. Bouton's Catalogue. Gloucester Telegraph. Hardwicke's Science Gossip. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Nation. Nature. Peabody Press. Quaritch's Catalogue. The Foxboro Times. Salem Observer.

The PRESIDENT noticed the recent donation,* from Henry K. Oliver of Salem, of a portfolio containing plans of several of the old houses of Salem, and other architectural designs, made by Samuel McIntire, the noted architect of Salem, during the latter part of the last and the first of the present century; also a manuscript book of records, entitled, "The First Book of Records of the Proprietors of Common Lands of Salem Village," presented by Miss Ruth Marsh of Peabody.

Christopher Metzger of Danvers was elected a resident member.

EDWARD BROWN, of Brooklyn, New York, occupied the hour with an interesting lecture upon "Christianity in

its Relation to Moral Philosophy and Literature." Mr. Brown was educated a "Friend," and is now a member of that society, and it was from this standpoint that the subject was viewed.



SPECIAL MEETING, MONDAY, JUNE 9, 1873.

MEETING at 8 P.M. The President in the chair.

The President stated that this meeting was called to pay a tribute of respect to the memory of Rev. John Lewis Russell, of this city, an original member of the Essex County Natural History Society, and its president from 1845 to 1848, when the union with the Essex Historical Society was effected, and a new organization adopted under the name of Essex Institute. Mr. Russell was a vice president of the Institute from its organization until 1861.

Rev. E. B. WILLSON presented the following resolutions, which, after appropriate remarks from Rev. Messrs. Willson and Batchelor, Mr. George D. Phippen and Rev. Messrs. E. C. Bolles and E. S. Atwood, were adopted:—

Resolved, That in the death of JOHN LEWIS RUSSELL, the Essex Institute has lost one of its founders, one of its earliest, most learned and most enthusiastic leaders in scientific study:— one who for many years filled important offices in its management, and devoted himself to its interest with an inspiring zeal and energy.

That in his death science loses a loyal and ardent disciple; and in his own chosen department of Natural History a distinguished proficient.

That public education owes much to him as a lecturer and teacher in her normal and other schools of higher instruction, where his rare power of clothing science in

beauty kindled in many a desire for closer acquaintance with nature, and discovered to them a new and pure joy in the pursuit of that knowledge, through her boundless realms of order and ever unfolding life.

Resolved, That the foregoing resolutions be entered upon the records of the Institute; and that a copy of them be sent to the family of Mr. Russell, with an expression of the sincere sympathy felt by the members of the Institute for them in their bereavement.

A committee consisting of G. D. Phippen, S. P. Fowler and F. Putnam was requested to take such further notice of the deceased as may be deemed appropriate.



FIELD MEETING AT AMESBURY, THURSDAY,
JUNE 19, 1873.

THE leafy month of June, with the fields and landscape clothed in their richest verdure, and dotted with the varied hues of many flowers, invites the Institute to commence the series of field meetings, the succession of which during the season exhibits the different phases which nature assumes, from the opening of the bud to the ripening of the golden fruits of autumn. This county, located in the northeastern corner of the Old Bay State, and having one side washed by the waters of the ocean, offers to the student of nature an opportunity to investigate the marine fauna and flora, in addition to those usually found in our excursions to the inland towns, where an entirely different class of objects, peculiar to such localities, grow in their wild luxuriousness.

The attendance at this field meeting was larger than usual for the opening meeting, and, although the weather was uncomfortably warm, the occasion was one of great

enjoyment. The party went by the train leaving Boston at 7.30, and on arrival at Newburyport were met by Messrs. Brown and Crane, a committee of the Amesbury and Salisbury Historical Society, who had come thus far to welcome them and to escort them to their destination. On arrival at the Salisbury station, guides were found in readiness to accompany those who desired to visit the Indian shell heaps, which were more accessible from that point than from the one at Amesbury. On arrival at the end of the route, many of the leading citizens had assembled and extended a cordial reception. The party then separated into groups, and sallied forth in charge of trustworthy guides to visit various objects of interest abounding in the vicinity. Many who had been long familiar with the writings of the distinguished poet, JOHN G. WHITTIER, now for the first time saw his cheerful face; and his home, and the unpretending meeting-house where he worships, were among the objects sought with a feeling akin to veneration by those who have admired his touching word pictures in simple verse. The extensive woollen mills and the flourishing carriage manufactories attracted much attention, and the general appearance of thrift and industry was a subject of commendation. Several of the churches and school-houses were also objects of interest. The woods, swamps and ponds were peculiarly attractive, and were visited by many. A large company ascended Powow Hill, said to be the highest land in the county, and were well repaid for their toil by the extensive views in all directions. With the unaided eye four states can be clearly seen, and with a powerful glass the mountain peaks of the Green and White ranges can be readily discerned.

Shortly after one o'clock the party repaired to Merri-
mac Hall, where the ladies of Amesbury had prepared

the tables with a bountiful and elegant repast embracing everything seasonable and delectable — meats, pastry, cake, ices, coffee, fruits, flowers, etc.

The meeting for reports and addresses was held at the Universalist Church at 2.30 P.M.

As the audience assembled a voluntary was performed upon the fine organ.

President WHEATLAND in the chair.

Records of preceding meeting read.

The SECRETARY announced the following correspondence:—

From Stephen M. Allen, Boston, June 6; E. C. Bolles, May 19; S. P. Boynton, Lynn, June 17; C. H. Dall, Boston, June 1, 3; G. F. Flint, June 2; J. A. Gillis, May 20; L. F. Griffin, Andover, June 18; Harold Herrick, New York, June 7, 16; A. Lackey, Groveland, May 29; W. P. Lunt, Boston, June 18; A. Osgood, Newburyport, May 9, 17, June 4, 13; G. W. Pease, June 6; M. A. Stickney, May 30; M. Vickary, Lynn, May 31; C. A. Walker, Chelsea, May 20, June 13; E. B. Willson, May 17; G. B. Wood, Elizabethtown, N. Y., June 9; W. C. Wood, Wenham, May 26; Ashbel Woodward, Franklin, Conn., June 6; Berlin, die Gesellschaft Naturforschender, March 22; Buffalo Society of Natural Sciences, June 6.

The LIBRARIAN reported the following additions:—

By Donation.

ATWOOD, E. S. Memoir of Nathaniel Bowditch, 1 vol. 4to. Introductory Discourse and the Lectures of the American Institute of Instruction, 1831, 1833. 2 vols. 8vo. Miscellaneous volumes, 6.

BUTLER, B. F., M. C. Compendium of the Ninth Census of the U. S., 1870. 1 vol. Report on the Commerce and Navigation of U. S., 1872. 1 vol.

CITY OF BOSTON. Boston City Documents, 1872. 3 vols.

CLOGSTON, WM., of Springfield, Mass. Zanesville Directory, 1872-73. 1 vol. Lockport City Directory, 1871-72. 1 vol. Manchester Directory, 1871. 1 vol. Auburn Directory, 1869. 1 vol. New Bedford Directory, 1835. 1 vol. Burlington Directory, 1871-72. 1 vol. Lawrence Directory, 1857. 1 vol. Manchester Directory and Almanac, 1856. 1 vol. Northampton Directory and General Advertiser, 1860-61. 1 vol. Chelsea Directory, 1860-61. 2 vols.

DRIVER, SUSAN S. History of the late Polish Revolution. 1 vol. Agriculture of Mass., 1854, 1857. 2 vols.

FOLGER, W. C., of Hingham. Miscellaneous Town Reports, 5.

GRANT, J. C. Scientific American, 1853-72.

GREEN, S. A., of Boston. Miscellaneous pamphlets, 9.

JOHNSON, MRS. SAMUEL. Miscellaneous pamphlets, 26. Almanacs, 6.

LEE, JOHN C. Commercial Bulletin, March 15, 22, 29, April 5, 12, 1873.

MARSHALL, WM., of New York. Reports of the Brooklyn Park Commissioners, 1861-1873. 1 vol.

OSGOOD, C. S. Manual for the Common Council of Salem, 1873. 1 vol.

- PALFRAY, C. W. Steam-Boiler Explosions, by J. R. Robinson. 1 vol. Protection to Native Industry. 1 vol. Miscellaneous pamphlets, 20.
- POOLE, F., of Peabody, Mass. Peabody Press and Danvers Monitor, 1872.
- SALEM MARINE SOCIETY. Laws and List of Members from 1766-1872. 1 vol.
- SILSBEE, Mrs. B. H. The Science of Government, by C. B. Goodrich. 1 vol. Report on the Trees and Shrubs in Mass. 1 vol. History of the Water Works of Boston, 1868. 1 vol. Abstract of the Mass. School Returns, 1845-46. 1 vol. Eighth Census of the U. S., 1860. 1 vol. Patent Office Report, 1854. 2 vols. Salem Municipal Register, 1867. 1 vol. Water Power of Maine. 1 vol. 22 pamphlets.
- STEARNS, R. E. C., of San Francisco, Cal. Directories of San Francisco for 1863-64, 1870. 2 vols.
- TENNEY, HARRIET A. Catalogue of the Michigan State Library, 1873-74. 1 vol.
- U. S. PATENT OFFICE. Official Gazette, May 6, 13, 27, 1873.
- WALKER, F. A., of Washington, D. C. Compendium of the Ninth Census of the U. S., 1870. 1 vol. 8vo.

The PRESIDENT, in his opening remarks, alluded to the pleasant associations connected with a visit to this town of Amesbury, well known, with its neighbor, Salisbury, to the mercantile community, for its varied mechanical industries, and especially in the field of letters, as the home of New England's best known and honored poet, Whittier, who from this quiet retreat has sent forth many of those graphic lines that have contributed so much to the cause of liberty and human progress. He said that ten years had elapsed since the Institute held its first meeting in this town. It was on Thursday, June 25, 1863, one of the loveliest of June days. The people were very kind and hospitable, and pointed out the various objects of historic and scientific interest. Our vice president, Mr. A. C. Goodell, Jr., was present on that occasion, and gave an account of his rambles among the historic memorials and relics, noticing among others the graves of two of the first ministers, Rev. William Worcester and Rev. John Wheelwright, the latter distinguished for his persistent advocacy of the cause of Anne Hutchinson and for the persecutions he endured therefor; the old Bartlett house, where Josiah Bartlett, one of the first signers of the Declaration of Independence, was born, and the room in the building where the commis-

sioners met to define the boundary between New Hampshire and Massachusetts.

The President alluded to a singular coincidence that had occurred during the past week: the remains of three persons who had been in years past interested in the objects of the Institute, have been consigned to the silent tomb, and he offered the following tribute to their memories.

1st. Rev. JOHN LEWIS RUSSELL, one of the founders of the Natural History Society and, after 1848, the vice president of the Natural History department of the Essex Institute; one of the earliest, most learned and most enthusiastic leaders in scientific study; for many years filling important offices in these institutions; cabinet keeper, curator, vice president and president. At all our early field meetings he was a constant attendant and frequently the presiding officer, devoting himself with an inspiring zeal and energy to contribute to the interest and importance of these gatherings. He was the son of Col. John and Eunice (Hunt) Russell, and was born at Salem, Dec. 2, 1808, and received the first rudiments of instruction at her schools. When John was about the age of eleven his father removed with his family to Amesbury and resided several years in that place, having the charge of the Amesbury Iron factory, and then returned to Salem; during this period John attended the Newburyport Academy, under Masters Bailey and Pike, except the year immediately preceding his admission to Harvard College in 1824, which was spent in the town where we are now assembled, studying under the direction of Rev. Mr. Barnaby, the Baptist clergyman—probably well known to some now present. After graduation he entered upon the study of the ministry, and in due course of time was licensed to preach. He was settled over churches in Chelmsford,

Hingham, Brattleboro and several other places. He, however, always considered Salem his home, and for the last twenty years has permanently resided there, withdrawing from ministerial labors and devoting almost exclusive attention to scientific investigation. He was eminently known as a botanist, particularly in the cryptogamic flora of this county. He died on Saturday afternoon, June 7, 1873.

2nd. WILLIAM OLIVER THAYER, son of Oliver and Rachel (Bancroft) Thayer, of Salem. In his early boyhood William brought to the horticultural exhibitions contributions of fruits and flowers from his father's garden. Since that time he has always been an interested member, although his business avocations prevented him from taking an active part in the meetings of the Institute. He died on Monday, June 9, 1873, aged thirty-nine years and nine months.

3rd. HON. RICHARD SALTONSTALL ROGERS, well known to those of a past generation as an active merchant in the firm of N. L. Rogers & Bros., who were the pioneers and founders, in the United States, of the Zanzibar and New Holland trades; for many years, down to 1842, were actively engaged in foreign commerce mainly with the East Indies, and were among the most distinguished merchants of Salem. He was son of Nathaniel and Abigail (Dodge) Rogers, who were both eminent teachers in Salem. He was earnestly interested in municipal affairs, a good citizen and an energetic, enterprising and efficient man of business, and much respected for his many excellent qualities; always a liberal patron of the Institute and contributed largely to its success. He died at his residence in Salem, June 11, 1873, aged eighty-three years.

Expressing great pleasure at meeting so many of those

who were present at the meeting of 1863, and the opportunity now afforded of extending our acquaintances in this goodly place, the President called upon

HON. ALLEN W. DODGE, of Hamilton, who responded and said that while he did not profess to be much of a scientific man, he did claim to be second to none in his love for nature and his desire to see the objects of the Essex Institute accomplished. The President had spoken of the death of some who had been identified with us, and we are reminded that men die, but events live. If the man who makes a blade of grass grow where it did not is a benefactor, so is he who introduces a new fruit or a new flower, or who opens up some new view of nature. The last quarter of a century had been one of great progress, and we cannot foresee what the next twenty-five years will bring in the department of scientific investigation. The question may be asked, What good will it do? It will make somebody better; it will make somebody happier. He spoke of the pleasant morning hours he had spent in his garden, and advised any one who did not know by experience what it was to take a little exercise before breakfast, to get up some morning at four o'clock, and try the experiment.

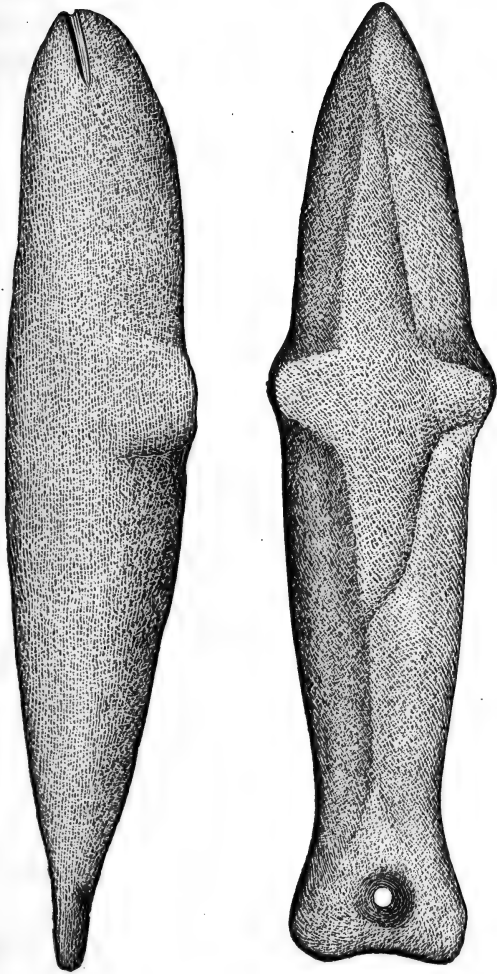
Mr. Dodge then referred to some ancient wills and inventories he had examined, and spoke of the curious insight afforded by probate documents into domestic and social life of the olden times. Our forefathers did not have friction matches, but tinder boxes, or, earlier still, tinder horns. Our maternal ancestors manufactured their own cloth, and made it into garments and bedding, and in those days it required these things in abundance to provide for the large families of children, then called blessings. At that period they raised children, and

cattle, and all kinds of stock, in great abundance. Well, there was more room to grow then than now, and our ancestors were equal to the occasion. Mr. Dodge concluded with some valuable practical suggestions, expressed in humorous and attractive phrase, and thanked the people of Amesbury and Salisbury for the active interest manifested on this occasion.

Mr. F. W. PUTNAM exhibited a number of stone implements which he had been allowed to select for the purpose from the very interesting collection belonging to the Amesbury Natural History Club. He stated that he had selected the forms on the table as they illustrated the various types of stone implements found throughout New England and consisted of the several forms of arrow-heads, spearheads, skin-dressers and scrapers, chisel and gouge-shaped implements, axes, hammer-stones, sinkers, pestles, etc. Many of the forms on the table were common the world over, and showed conclusively that the same ends were accomplished by the same means; other forms, though belonging to the same general groups, were, however, slightly different in the details of their execution and were peculiar to New England so far as he knew. The long-bladed axe, with the rounded upper portion, and some of the gouged-shaped implements came into this group. The large, roughly made "plumb bob" shaped "sinkers" are one of the forms, as yet to his knowledge, found only in New England. These large pear-shaped implements are quite common on the sea-coast and are so well adapted for use as sinkers to nets that they are generally classed as such, though it cannot be questioned but that many of them run into the forms of pestles, and would serve well for use as such, provided grit was no objection as a component of "Indian cake;"

though the grit would be avoided if such pestles were used in wooden mortars similar to those in use by the early white settlers in this country. The extreme softness of the stone of which these large pear-shaped implements were made, combined with the fact that they seldom exhibit signs of use at their rounded end, was the only argument against their use as pestles. But as an argument that they were sometimes used as pestles it was stated by one of the gentlemen of the Amesbury Club that the specimen on the table was found in a stone mortar; there was also a specimen in the Salem collection that was said to have been found in the same connection. Some of the arrowheads among the specimens were very fine, and exhibited the several forms, from the leaf-shaped to the barbed and stemmed, several specimens being of the form, having one of the wings longer than the other. While some of the symmetrical arrowheads were very long and slender, others were of the short and broad shape. There were also in the collection a number of specimens of stone-drills which are often placed by collectors with the arrowpoints, but which on examination show that a different use was intended, and implements of this character are now believed to have been made and used simply for the purpose of drilling holes in other implements. One of the largest and most perfect of these drills which Mr. Putnam had ever seen was exhibited.

Besides these various implements there was a very interesting carved stone belonging to the collection, which Mr. Putnam had obtained permission to figure. It rudely represented a porpoise or still better a white whale or *Beluga*, as it had no protuberance representing the dorsal fin of the porpoise, and the *Beluga* is without the fin. The flippers or pectoral fins were represented by the pro-



Indian totem from Seabrook, N. H., one-half natural size. In Coll. Amesbury Nat. Hist. Club.

tuberances on the sides, and the mouth was cut in and well indicated. The broad horizontal tail was decidedly cetacean in character, and the whole carving, though rudely done by picking the sienitic rock from which it was made with stone implements, was yet so characteristic as to indicate at once that a porpoise or Beluga was intended. A hole through the portion representing the tail shows that the object was suspended, but the stone is so large and heavy that it can hardly be classed as a personal ornament, though it is probably to be regarded as a totem. It measures ten inches in length by about two in depth at the pectoral fins, and is about two and a quarter inches wide across the pectorals as measured on the under side. This interesting specimen was found at Seabrook, N. H., and it is said that two other similarly worked stones have been found at the same place.

[The figures here given from drawings made by Capt. J. A. Greeley of Amesbury, and Mr. J. H. Emerton of Salem, represent the "totem" in profile and from the under side.]

MR. JAMES H. EMERTON gave a curious account of several species of spiders, particularly one that never builds its own house, but dislodges some other tenant, thus living by acquisition rather than construction.

MR. EMERTON having placed a few batrachians, collected by some of the party, on the table, MR. PUTNAM was called upon to give an account of them, which he did by reviewing the batrachian fauna of the state, and noticing the various habits and peculiar notes of the several species of toads and frogs found in the vicinity, and comparing them with the salamanders, which are another order of the same class. He also gave an account of the development of the batrachians and showed the dif-

ferences between the salamander and frog in certain details, and that in the general law of development from the egg they agreed with each other and approached more nearly to the fishes than to the true reptiles, with which they were so commonly but erroneously classed by persons generally. He concluded his remarks by showing the close agreement between the true reptiles, comprising the snakes, lizards, turtles, etc., and the birds.

Rev. W. H. EATON, of Amesbury, by request, gave a short sketch of Rev. Mr. Barnaby, formerly settled over the Baptist church in Amesbury, and now, at the age of eighty-five years, engaged in his fourth pastorate over the church in East Hardwick, where he was originally ordained, and into which organization he had received more than twelve hundred members on profession of faith.

Mr. HOMER B. CRANE, of Amesbury, spoke briefly of the geological peculiarities of Amesbury, especially of Powow Hill.

Dr. H. G. LESLIE, President of the Amesbury and Salisbury Historical Society, alluded to the benefits to be derived from scientific research, and spoke of the vein of lead discovered near the summit of Powow Hill and also offered a few remarks on some of the stone implements that he had collected.

Mr. WILLIAM ASHBY, of Newburyport, now in his eighty-sixth year, spoke of his long interest in the Essex Institute, and bade it God speed in its work.

Rev. C. M. DINSMORE, of the Methodist church in Amesbury, spoke eloquently of the importance of teach-

ing from nature rather than depending exclusively upon text-books, and hoped that the minds of the people would turn more to the study of nature. In England, he said, the laboring people crowd out to scientific lectures, but in America, comparatively speaking, science has no interest.

WILLIAM C. BINNEY, Esq., of Amesbury, said he wished to express his gratitude to the Institute for this visit; he had been interested and had gained much information. He hoped ten years would not intervene before the next field day in Amesbury.

Rev. P. S. BOYD, of the Congregational church, in Amesbury, Mr. GEORGE WILLIAMSON, of Amesbury, and Dr. W. H. NOYES, of Newburyport, offered a few remarks.

William H. Dennet of Beverly and W. H. H. Marsh of Salem were elected resident members.

ALFRED OSGOOD, Esq., of Newburyport, introduced the following resolutions:—

Resolved, That the grateful thanks of the Essex Institute be tendered to Mrs. Jacob R. Huntington, Mrs. J. Hume, Mrs. S. S. Spear, Mrs. P. S. Boyd, Misses A. M. Boardman, Lizzie Hume and May Huntington, Dr. A. T. Brown, Messrs. E. A. Brown, H. B. Crane, J. Hume, J. T. Greeley, Wm. D. Pecker and J. G. Whittier; also to the Amesbury and Salisbury Historical Society, the proprietors of Merrimac Hall and of the Universalist church, and all who have contributed to make this meeting so successful.

The resolution was unanimously adopted and the meeting adjourned.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 5.

SALEM, MASS., JULY, 1873.

No. 7.

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

FIELD MEETING AT LYNNFIELD, WEDNESDAY, JULY 30, 1873.

THE party arrived about 10.30 A.M., and after assembling in the church, which was the head-quarters for the day, and where the preliminary arrangements were made, separated into groups for the various excursions; some went to "Robin's Rock," some visited the woods; others collected about the borders of the lake. Owing to the purity of the water the dredging party were not very successful in collecting specimens though several curious and interesting forms were detected.

Lynnfield is a place which has many natural attractions. It was formerly a part of Lynn, at which time it was known as Lynn End. It is almost exclusively a farming town, and its public affairs are always conducted frugally and with good judgment, so that its taxation is low, and the town is never in debt. It has about a thousand in-

habitants, and two villages which are three miles apart, neither being large settlements, but the largest of the two being at the Centre, which has two meeting houses and the town hall. The latter institution is, in fact, contained in the old church, which, in Parson Motey's day, began to harbor a larger share of the "liberal" theology than has been common in country towns; Mr. Motey himself, in his closing years, being a Unitarian. The result was the building of a new church devoted to the more exclusive propagation of the "Orthodox" creed. The second story of the old church is still retained as a place of worship, and Mr. Eben Parsons, a lay minister, of the Unitarian denomination, regularly officiates there. The other church is at the present time without a pastor. In South Lynnfield, near the hotel, there is a small meeting house, where regular preaching is supplied by Mr. J. F. Wilson, a student from Andover. For a number of years, the ministerial duties were performed by Mr. Jacob Hood, who formerly resided in Salem, but is now a resident of Lynnfield Centre.

The Lynnfield hotel, which is an institution that dates with the building of the Newburyport turnpike, is not now used for public purposes, but in its day it has served as a landmark which will be long remembered as the resort of sleighing parties from Salem.

Humphrey's Pond, near the hotel, is a beautiful sheet of very pure water. During the war times, the pond, with the level land adjoining, afforded sufficient advantages for the location of an encampment, and the twenty-second and twenty-third regiments were stationed there. The pond has for many years afforded a desirable location for summer residents, and the estate of Mr. Henry Saltonstall (on the Peabody side of the line) has long been noted for the attractiveness of its situation. Mr.

D. P. Ives has also recently built a summer residence on the margin of the pond.

Humphrey's Pond was so named from John Humphrey, who, in the early settlement of the country, received from the king a grant of five hundred acres of land, which included this sheet of water. Humphrey married a daughter of the Earl of Lincoln, and sister of the Lady Arabella Johnson. Suntaug Lake is a later designation for this pond, and one which is growing into common use. The region about the pond is high land. The pond itself has a small water-shed, and, as no stream flows into it, it is believed to be supplied from springs. The streams which flow from it, on either side, are tributary to the Saugus and Ipswich rivers. Its high position and the great purity of the water have combined to cause the pond to be frequently spoken of as desirable in supplying other and larger places with water for domestic purposes, though as yet no steps have ever been taken in this direction. There is an island in the pond, and it is recorded that, in the early days of the settlement, munitions were stored there "for the time of need."

Robin's Rock, about half a mile from the hotel, is a big rock with a hollow in the top, which is said always to contain water. The ledge is granite, of very excellent quality, and Prof. Hitchcock says it cannot be distinguished from that of Quincy. In August, 1849, a company was formed here for the purpose of working this quarry; but the transportation facilities not being all that was desirable, the work was finally relinquished. Of late another part of the quarry is being worked by parties from Peabody, and there is no reason to doubt that eventually it will be worked quite extensively.

Gen. Josiah Newhall, who is now in the neighborhood of eighty, is a man of much activity, and retains the full enjoyment of all his faculties. He moves about with the

briskness of a man of fifty, and feels a warm interest in the history and welfare of his native town, as well as in all objects that come under the special cognizance of the Essex Institute. He was born on the spot where he now lives, in a house built by his grandfather a hundred and twenty-five years ago; his present house having been built by himself in 1823. Nearly or quite all the trees growing about and near his premises were planted by himself, and the interest in his grounds was enhanced, to many of the party, by the fact that he has as many as fifty bearing fig trees, which are annually removed to his cellar before the cold weather begins, and again set out in spring. He has also one pomegranate tree or bush. During the day his house was thrown open to the party, and he kindly provided tea and lemonade for their refreshment.

The afternoon meeting was called to order at a quarter before three—the PRESIDENT in the chair. Records of preceding meeting read.

The SECRETARY announced the following correspondence:—

From George Arnold, Boston, July 11; J. W. Chadwick, Brooklyn, New York, June 19; W. H. Dennet, Boston, June 21; Samuel A. Drake, Boston, July 28; Samuel G. Drake, Boston, July 24; W. H. Eaton, Amesbury, June 25; Charles Hallock, New York, July 22, 26; W. P. Lunt, Boston, July 18; W. H. H. Marsh, Salem, June 21; Alfred Osgood, Newburyport, July 10; James Perkins, Boston, July 7; S. J. Spalding, Newburyport, June 26; H. L. Williams, Salem, July 19; American Pomological Society, Circular, 14th Session; Brazil, Legação do, Washington, June 10; Belgique, Société Entomologique de, fev. 3; Erlangen, Die physikalisch-Medicinische Societat in, 3, 2, 73; Frankfurt a M., Naturforschenden Gesellschaft, Jan. 10; Freiburg, Die Naturforschende Gesellschaft, Marz 16; Liverpool Literary and Philosophical Society, April 9; Lisbonne, L' Académie Royale des Sciences, March 26; Riga, der Naturforscher Verein zu, Nov. 1; Hobart Town, Royal Society of Tasmania, Nov. 28; Washington, Smithsonian Institution, July 22, 28.

THE LIBRARIAN reported the following additions:—

By Donation.

ALLEN, JOHN FISKE. Boston Cultivator for 1871, 1872. Christian Register for 1871, 1872.

BUTLER, B. F., M. C. Memorial Address on Hon. Garrett Davis, Dec., 1872. Compilation of the Internal Revenue Laws of the U. S., Jan. 6, 1872.

- EMERSON, GEO., B. Massachusetts Teacher, 9 numbers.
- FOOTE, C. Files of several County Papers for April, May and June, 1873.
- FOOTE, H. W., of Boston. James Freeman and King's Chapel, 1782-87. A Chapter in the early History of the Unitarian Movement in New England. Sixth Annual Report of the Directors of the Mass. Infant Asylum, April 1, 1873.
- GREEN, S. A., of Boston. Miscellaneous pamphlets, 16.
- HITCHCOCK, GEO. B., of San Francisco. San Francisco Directory, 1850. 1 vol. 18mo. Hand-Book Almanac for the Pacific States, 1863. 1 vol. 12mo.
- HUMPHREYS, Brig. Gen. A. A., of Washington. Report on the Potomac Aqueduct of the Alexandria Canal. 1835-40. 1 vol. 4to.
- LEE, JOHN C. Commercial Bulletin for June 7, 14, 21, 28, July 5, 12, 19, 1873.
- LORING, GEORGE B. Thirty-sixth Annual Report of the Board of Education, Jan., 1873. 1 vol. 8vo. Thirtieth Registration Report of Mass., 1871. 1 vol. 8vo. Ninth Annual Report of the Board of State Charities, 1871-72. 1 vol. 8vo. Agriculture of Mass., by C. L. Flint. 2d Series, 1872-73. 1 vol. 8vo. State Board of Health of Mass., Jan., 1873. 1 vol. 8vo. Miscellaneous pamphlets, 3.
- NATIONAL ASSOCIATION OF WOOL MANUFACTURERS. Bulletin for April-June, 1873.
- NORTH CHURCH AND SOCIETY. First Centenary of the North Church, Salem, 1772-1872. 1 vol. 8vo.
- PERKINS, JAMES, of Boston. Half Century Membership in R. W. Charles W. Moore in Lodge of St. Andrew, Boston. 1 vol. 8vo.
- PHILLIPS, STEPHEN H., of San Francisco. San Francisco Directories for 1867-68, 1868-69. 2 vols. 8vo.
- SAVILLE, J. H., of Washington, D. C. Report of the Board of Civil Service Examiners for the Treasury Department, Jan., 1873.
- STICKNEY, M. A. Miscellaneous pamphlets, 25.
- STONE, Mrs. J. H. Boston Almanacs, 1839-1862. 29 vols. 16mo. Salem Directories, 1837, 1842, 1846, 1850, 1853, 1855, 1857, 1859, 1861. 9 vols. 12mo. American School Hymn Book. 1 vol. 16mo. Oliver Optics, 39 numbers. The Churchman, 50 numbers. Farmer's Monthly Visitor, 36 numbers. Boys' and Girls' Weekly, 27 numbers. Miscellaneous pamphlets, 77.
- UPHAM, W. P. Centennial of the Boston Pier, or Long Wharf Corporation, 1873.
- U. S. PATENT OFFICE. Official Gazette for June 3, 10, 17, 24. July 1, 8.
- VALENTINE, Mrs. Geological Survey of Park County, by B. C. Hobbs, LL.D.
- WILLIAMS, HENRY L. Miscellaneous pamphlets, 67.
- WINTHROP, ROBT' C., of Brookline. Dedication of the Brookline Town Hall Feb. 22, 1873.

By Exchange.

- ACADEMIA REAL DAS SCIENCIAS IN LISBOA, PORTUGAL. Lendas da India por Gaspar Correa, Tomo i, parts 1, 2. Tomo ii, parts 1, 2. Tomo iii, parts 1, 2. Tomo iv, parts 1, 2, 1859-1866. Journal de Sciencias Mathematicas, Tomo i, ii, iii, 1868-1871. 3 vols. 8vo.
- ACADÉMIE ROYALE DES SCIENCES, ARTS ET BELLES-LETTRES IN CAEN. Memoires, 1873. 1 vol.
- AMERICAN ACADEMY OF ARTS AND SCIENCES, BOSTON. Proceedings of, pp. 409-504, 1872-3. 8vo pamph. Memoirs of, New Series. Vol. ix, part 2.
- AMERICAN PHILOSOPHICAL SOCIETY. Proceedings of the, May-June, 1873.
- BIBLIOTHÈQUE UNIVERSELLE ET REVUE SUISSE. Archives des Sciences Physiques et Naturelles. Nos. 182, 183, 184. Feb., March, April, 1873.
- BUFFALO SOCIETY OF NATURAL SCIENCES. Bulletin of. Vol. i, No. 1. April, 1873.
- CANADIAN INSTITUTE. Journal of Science, Literature and History. May, 1873.

CINCINNATI PUBLIC LIBRARY. Annual Report of the Common Schools of Cincinnati, 1872-3. 1 vol.

CROSSE ET FISCHER. Journal de Conchyliologie. 3e Série, Tome xii, No. 4, Tome xii, No. 1. 1872-73.

DER PHYSICALISCH-MEDICINISCHEN, SOCIETAT IN ERLANGEN. Sitzungsberichte, iv Heft. Nov., 1871-Aug., 1872.

GEORGIA HISTORICAL SOCIETY. Proceedings, Resolutions and Communications of the Hon. E. J. Harden.

GESELLSCHAFT NATURFORSCHENDER FREUNDE IN BERLIN. Sitzungsberichte. Jahrg. 1872. 1 vol.

IMPERIAL GOVERNMENT OF BRÉSIL. Climats, Geologie, Faune et Geographie botanique du Bresil. 1 vol. Svo.

INSTITUT HISTORIQUE IN PARIS. L' Investigateur, Nov., 1872-Jan., 1873. 38e Année.

IOWA STATE HISTORICAL SOCIETY. The Annals of Iowa, April, 1873.

K. K. ZOOLOGISCH BOTANISCHE GESELLSCHAFT IN WIEN. Verhandlungen, Bd. xxii, 1872. 1 vol.

KÖNIGLICHE BAYERISCHE BOTANISCHE GESELLSCHAFT IN REGENSBURG. Flora, 1872. 1 vol.

L' ATHÉNÉE ORIENTAL IN PARIS. Bulletin, 10 Année, No. 13. Juin, 1869.

LIVERPOOL LITERARY AND PHILOSOPHICAL SOCIETY. Proceedings, Vol. xxvi, 1871-72.

MASSACHUSETTS HISTORICAL SOCIETY. Proceedings of, 1871-73. 1 vol.

NATURFORSCHENDEN GESELLSCHAFT IN EMDEN. Jahresbericht, 1871.

NATURFORSCHENDE GESELLSCHAFT ZU FREIBURG. Berichte, Bd. vi. Heft 1, 1873,

NATURFORSCHENDE VEREIN IN BRÜNN. Verhandlungen. Bd. x, 1871. 1 vol.

NATURWISSENSCHAFTLICHEN VEREINE ZU BREMEN. Abhandlungen, iii Bd., 3 Heft, 1873. Beilage, No. II, zu den Abhandlungen des.

NEW ENGLAND HISTORIC-GENEALOGICAL SOCIETY. Genealogical and Antiquarian Journal, July, 1873.

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SOCIÉTÉ ROYALE DES ANTIQUAIRES, DU NORD A COPENHAGUE. Mémoires, Nouv. Série. 1872. Tillaeg til Aab ger for Nordisk Old Kyndighed og Historie. Aargang, 1872.

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ZEITSCHRIFT FÜR DIE GESAMMTEN NATURWISSENSCHAFTEN IN BERLIN. Bd. v, vi. Neue Folge, 1872. 2 vols.

ZOOLOGISCHE GESELLSCHAFT. Zoologische Garten, xiii Jahrg. Nos. 7-12, 1872.

ZOOLOGISCH-MINERALOGISCHER VEREIN IN REGENSBURG. Correspondenz-Blatt, xvii Jahrg, 1872. 1 vol.

PUBLISHERS. American Naturalist. 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. Sailors' Magazine and Seamen's Friend. Salem Observer. Silliman's Journal. Western Lancet.

The PRESIDENT in his opening remarks alluded to the pleasure that he had always derived, even in childhood from rambling over these hills, fishing in the pond near by and collecting flowers from the meadows and fields. Since the organization of the Institute, four meetings have been held in this place and vicinity. The second field meeting took place in this town, July 24, 1849 (the first having been held in Danvers in the same year). Among the noticeable productions were the locust trees (*Robinia pseudacacia*), large and vigorous, and free from the borer. The serpentine ledges were also duly investigated and discussed at the afternoon session, in the house of the late Asa T. Newhall, Esq. On October 15, 1856, another meeting was held at the house of Rev. A. P. Chute, who had a fine collection of shells and minerals, a meeting having been attempted one day in the August previous, that failed on account of a drenching rain. On June 26, 1861, another meeting took place, at which Rev. E. B. Willson presided; and this was the last that had occurred in the town previous to the one this day, except the meeting at Lynnfield Centre, in August, 1858.

The President alluded to the recent death of a corresponding member, Col. JOHN WELLS FOSTER, who died at his residence in Hyde Park, Chicago, on Sunday, June 29, 1873, aged fifty-eight, one of the most eminent persons of the city of his adoption. He was born at Brimfield, Mass., in 1815; his profession was civil engineering and at an early period of his career he began to follow the bent of his genius. He was prominent in Massachusetts

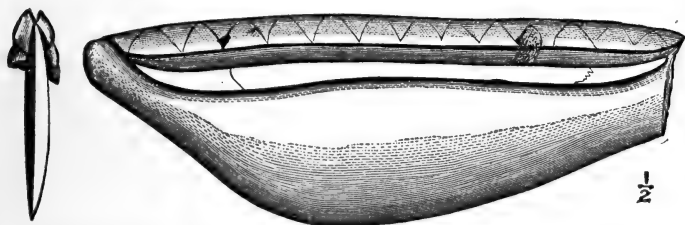
politics from 1854 to 1857. About 1858 he removed to Chicago. His rank as a *savant* was at the very front and his reputation world-wide.

Mr. F. W. PUTNAM being called upon spoke of Col. Foster's eminence as a geologist and archæologist. He was also one of the early government surveyors, and with Prof. Whitney, surveyed the mineral regions of Lake Superior, their joint report being printed by the United States government. Col. Foster had made several discoveries in geology and especially in connection with the formation of the Laurentian hills. Of late years he paid especial attention to the study of the mound-building race, and only a few days before he died, his volume on the prehistoric race of America was published.

Mr. PUTNAM then proceeded to speak of toads and fishes. The young toads now abound on the margin of the pond, having just passed from the tadpole state, the tail being nearly absorbed. Mr. Putnam described the hatching and growth of the tadpoles. They are first provided with external branchiæ which are soon lost, and the internal gills are developed; these are in turn absorbed and, the lungs developing, the young toads are gradually forced to seek air above the surface of the water. They then rapidly assume their perfect form, leave their aquatic life and become terrestrial animals. To-day we have seen myriads of young toads undergoing this important change, and these young will probably remain along the damp margin of the pond until a warm rain comes, which will induce them to wander off, and, as in the course of their march they will possibly be seen by persons, perhaps in the act of crossing a street or garden, it is very likely that we shall hear of another instance of "toads raining down."

Mr. Putnam, in his remarks upon the fishes, confined himself to the structure of the skeleton, pointing out the homologies of the various bones with those of higher animals, and the adaptation of the fish structure to the special purposes for which it was designed.

Mr. PUTNAM stated that since the Amesbury Field Meeting he had received from Capt. J. A. Greely, of Amesbury, a drawing of an Indian knife which differed in details somewhat from any that he had mentioned in a former communication to the Institute (see p. 111). This knife was said by Capt. Greely to be made of "red slate." It is nearly perfect, one end only being broken off, as shown in the figure. Allowing for this missing



Knife made of "red slate" from Kingston, New Hampshire. One-half natural size. Side view and section.

fragment the knife was about seven inches long; the back is three-quarters of an inch deep and the blade about one and one-half inches. The thickness of the blade in the centre is about three-tenths of an inch. The peculiar workmanship of the back, as shown in the section, in the form of a series of uneven knobs, was probably intended to give firmness to the hold when grasped by the hand. This specimen was found in a sand deposit near Kingston Falls, Kingston, New Hampshire. The figure, which is from the drawing of Capt. Greely, represents the knife of half its size.

The PRESIDENT read the following communication from N. Cleaveland, Esq., in connection with the presentation of the herbarium therein referred to, and several specimens in mineralogy collected near Erzroom in Asia Minor :—

“The collections and insertions in this herbarium were begun by OLIVER ALDEN TAYLOR in 1824, he being at that time a student in Union College, Schenectady. It was by the advice of Dr. Yates and for the benefit of his health that he engaged in botanical study and pursuits. The taste and habits then formed continued through life, as the entries in this hortus siccus abundantly show. In Andover, where for many years he lived a laborious student-life, in Manchester, Mass., where his last years were spent in faithful pastoral work, and in every journey that he made, he seems to have kept up the practice of observing, collecting and examining plants.

The book is presented to the Essex Institute, not as containing anything of special interest for scientific men, but as a curious record of painstaking study and care on the part of one who was always earnestly devoted to other researches, and eminently successful in them. To any who may chance, hereafter, to glance at these dry leaves and stems and flowers, and who may never before have heard of him who gathered and placed them here, let me say that the Rev. Mr. Taylor was not only an amiable and good man, but distinguished, also, for varied learning and great philosophical attainments. In evidence of this it will be sufficient to state that he at one time acted as assistant professor of Biblical Literature in the Andover Divinity School, and that the celebrated Edward Robinson, when contemplating a long absence from his post, for European and Asiatic travel, earnestly requested Mr. Taylor to fill his place in the department of Biblical and Oriental learning at the Union Theological Seminary of New York. Mr. Taylor died (1851) at Manchester, Mass.”—N. C.

These mineralogical specimens were sent in 1845 from

Erzroom in Asia Minor by Rev. Jonah Peabody to Rev. O. A. Taylor. Mr. Peabody, a native of Topsfield, Essex County, Mass., was then living at Erzroom, as a missionary of the American Board.

In Mr. Taylor's Journal (See Memoir of Rev. O. A. Taylor, p. 402) he mentions the receipt of the present, thus:—"To my wife was sent a bottle of water from the Euphrates; to me lava one thousand years old from near Khoy; marble from the Chifteh minaret; lava from Hassan Kulaah, or, as is supposed, the ancient Theodosiopolis; lava from near the base of Mt. Ararat."

Rev. E. C. BOLLES, of Salem, said that in dredging in Humphrey's Pond he had found only four species of shells. This pond is very free from animals, and it contains less parasitic life than usual. The dredge brought up only one form of vegetable life in profusion—that being one of the green globular algæ, each specimen of the size of a buckshot. He then alluded to certain forms of sponges found in the pond, and of the different varieties, the horny, flinty and limy sponges. Sponges are animals, and he explained how they lived, the system of circulation by which they are sustained, and the progress of their growth. The examples from this pond were all of the common *Spongilla fluviatilis*, and exhibited not only the green porous structure of the sponge, but the embedded gemmules, which in time would float out upon the water, and each one would attach itself to some object and develop into the characteristic green mat of the spongilla. The fresh-water sponges have been made a special subject of study by Mr. Carter, an Englishman living in India. Great masses of spongillæ of various species are to be found in the fresh-water tanks in Bombay and other East Indian cities.

Mr. JOHN ROBINSON, of Salem, the Recording Secretary, exhibited and explained some specimens of the wild flowers and ferns that had been gathered, and also made commendatory reference to the fig and pomegranate trees grown by Gen. Josiah Newhall. In explanation of the growth of figs, he said that it was an error to suppose that they had no blossoms, for great numbers exist, though of small size.

Rev. S. H. TAFT, president of Humboldt College, Humboldt County, Iowa, on being called upon, expressed his pleasure at being here, and also at seeing so large a representation of the Essex Institute at his college in Iowa, on the occasion of the meeting of the American Association for the Advancement of Science at Dubuque last year.

Gen. JOSIAH NEWHALL, of Lynnfield, being called upon, spoke of the general situation of the town, with particular reference to its water facilities.

Mr. N. A. HORTON, of Salem, after making some remarks upon the day and the unusual heat, gave a brief résumé of the rambles of his party, and offered the following resolution, which was unanimously adopted:—

Resolved, That the thanks of the Essex Institute be tendered to Gen. Josiah Newhall, Messrs. J. B. C. Fuller and Joseph Brown for their courtesies and attention during the day; to Mr. G. Saltonstall for the use of his boats; and to the Congregational Society for the use of their church.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 5. SALEM, MASS., AUGUST, 1873. No. 8.

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

FIELD MEETING AT CHEBACCO POND, TUESDAY, AUGUST 12, 1873.

By the kind invitation of Messrs. J. Whipple & Sons, who have for more than ten years successfully kept the Chebacco House at this place, the Institute held a field meeting, this day, in this rural retreat which has grown in public favor and has become quite celebrated for its great beauty and general attractiveness. The particular charm of the place, however, to many people who have a taste for natural scenery and productions, is in spending a quiet day here in small parties. The winding road through the woods, which leads to the place, is very attractive. The ponds, five in number, abound in fish and pond lilies. All the ponds are quite deep and afford good boating places, but the boats are generally concentrated on Chebacco Pond, which lies partly in Essex and partly in Hamilton. This is a large sheet of water, and its many

indentations render it very attractive to sailing parties and amateur explorers. The place is also one of great interest to the students of our local botany.

In point of numbers the attendance at the meeting was unusually large, and a number of persons proficient in scientific pursuits were present and consequently a great amount of scientific work was performed in the gathering of zoological and botanical specimens and a greater and better variety has seldom been collected.

The meeting was called to order by the **PRESIDENT**, on the platform in the grove, at a quarter before two o'clock, and the Secretary read the proceedings of the meeting at Lynnfield.

The **SECRETARY** announced the following correspondence:—

From H. W. S. Cleveland, Chicago, Ill., Aug. 6; Charles F. Crocker, Lawrence, Aug. 11; Charles B. Rice, Danvers Centre, Aug. 13; John J. Somes, Gloucester, July 29; American Geographical Society, July 21; Christiana, Det. Kgl. Norske Universitet, Janvr; La Société Royale des Sciences et des Lettres de Throndhjem.

The **LIBRARIAN** reported the following additions:—

By Donation.

CROCKER, CHARLES F. of Lawrence. History of Lawrence. 1 vol. 8vo. Lawrence, 1888. Catalogue of the Lawrence Public Library. 1 vol. 8vo. Lawrence, 1873. Anniversary Services of the Grace Church, Lawrence, Oct., 8, 10, 11, 1871.

MILLS, R. C. Nation for 1869, 1870, 1871, 1872. The Week for 1868.

SAUNDERS, Miss. Neuvo Testamento. 1 vol. 12mo. Conquest of Mexico. 2 vols. 8vo. Dictionary of the Spanish and English Languages. 2 vols. 8vo. Ai Vola Ni Veralayalati Vov ni Anda Twaga kei Na Nodai Vakabula Ko Jisu Kraisita. 1 vol. 12mo.

U. S. PATENT OFFICE. Official Gazette, July 15, 1873.

WILLSON, E. B. Miscellaneous pamphlets, 14.

By Exchange.

BUFFALO SOCIETY OF NATURAL HISTORY. Bulletin of. Vol. i, No. 2.

IOWA STATE HISTORICAL SOCIETY. The Annals of Iowa for July, 1873.

KONGELIGE NORSEKE VIDENSKABERS-SELSKABS IN THRONDHJEM. Skrifter i det 19de Aarhundrede 7de Bind 1ste Hefte. 8vo pamph.

PHYSIKALISCH-MEDICINISCHE GESELLSCHAFT IN WÜRZBURG. Verhandlungen Neue Folge, iv Bd., i Hefte. 8vo pamph.

SOCIÉTÉ VAUDOISE DES SCIENCES NATURELLES IN LAUSANNE. Bulletin, Vol. xi. No. 68. 8vo pamph.

UNIVERSITÉ ROYALE DE CHRISTIANIA. Forhandlinger i Videnskabs-Selskabet Aar, 1871. 8vo pamph. Animal Life, by Geo. O. Sars. 4to pamph. Forekomster af Kise i Norge, by A. Helland. 8vo pamph. Anden Beretning von Ladegaardsens Hovedgaard, Forse Hefte. 4to pamph. On the Rise of Land in Scandinavia, by S. A. Sexe. 8vo pamph.

PUBLISHERS. 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. Silliman's Journal.

The PRESIDENT in his opening remarks alluded briefly to two ranges of territory located in the southern part of Essex County, favorable for the pursuit of the naturalist, and more especially of the botanist. One is a tract extending inland from the shores of Swampscott and Marblehead, and lying within the limits of Marblehead, Swampscott, Lynn, Salem, Peabody and Lynnfield, very diversified with rough and craggy hills, bowlders, beautiful ponds, woods and meadows, the habitat of many rare floral gems; with this tract is associated the name of Dr. Andrew Nichols, who was one of our most noted local botanists. He delivered a course of lectures on botany as early as 1816, and was the first President of the Natural History Society. He died in the spring of 1853, as the little *Draba verna*, a plant he took delight in finding, was expanding its tiny petals to another vernal season. The other is the range of woods in which we are now assembled, extending from Beverly to Gloucester and lying within the limits of these and the intermediate towns. Here are found many rare plants, as the Magnolia, Kalmia, Linnea, Cornels, etc. These woods may be considered, to an Essex County botanist, hallowed ground: here Dr. Cutler, some ninety years since botanized, and prepared in 1784 "An account of some of the vegetable productions naturally growing in this part of America, botanically arranged," which was printed in the first volume of

the "Memoirs of the American Academy of Arts and Sciences." He also formed an arboretum of considerable extent adjoining his residence, and may be considered as one of the pioneers in botanical science in this country. He died July 28, 1823, having enjoyed in an eminent degree the confidence and honor of his fellow men. Dr. George Osgood of Danvers, as a pupil and friend of Dr. Cutler, may be mentioned in this connection. He was present at a meeting in this place some thirteen years since, and alluded to his residence in Hamilton about the beginning of this century, to his rambles through these woods with the venerable Cutler, from whose lips he learned his first lessons in botany and the study of nature, and during a long life had continued his interest in these pursuits, having derived from them much pleasure, happiness and instruction. He died May 16, 1863, at the age of fourscore. Dr. Osgood always spoke with much pride of the late William Oakes as once his pupil, who was wont to accompany him in his rambles and from him imbibed a taste for, and soon eclipsed his old instructor in botanical attainments. Mr. Oakes was a resident of the old town of Ipswich, and made extensive collections of plants gathered in these woods, and the name of Manchester had become famous as a botanical region, from being attached to the specimens which he preserved and so widely distributed.

The President then alluded briefly to some of the pleasing associations that cluster around this place. He spoke of an informal gathering of several members of the Natural History Society in July, 1836, when Benjamin Hale Ives, a very enthusiastic student of nature, was present and took a very active part in all the proceedings. By him more perhaps than by any other was the foundation laid upon which the present superstructure of our

organization has been erected. He died on the twenty-sixth of the January following, at the age of thirty. At a meeting in 1850, a few members, consisting of Drs. A. Nichols and George Osgood, and Messrs. S. P. Fowler, Thomas Cole, George D. Phippen and others made explorations to collect specimens and then met in the parlor of the old farm-house,* that stood on the site of the present Chebacco House, to talk over such scientific topics as the occasion might have suggested. He also spoke of the meetings in 1860 and 1862. On these two occasions our friend Hon. Allen W. Dodge, who is with us this day, presided, and cordially welcomed the members and their friends to the town of his adoption. The numbers in attendance were large, and the meetings were very successful.

The President then introduced Mr. GEORGE D. PHIPPEN, one of the early members of the Natural History Society, who was present at the early meetings of the society in this place, and has always taken a great interest in its proceedings.

Mr. PHIPPEN then came forward and made further reference to the early explorations referred to, and alluded to the progress made in science not only from the early times of Winthrop, but through the influence of meetings such as these. He considered Dr. Cutler the first botanist who was indigenous to the soil, but he referred not only to him but also to the late Dr. George Osgood of Danvers,

*The house was a good specimen of the farm-houses of the last century, one story, gambrel roof in front and lean-to in the rear, running down near to the ground. In the open lawn in front was the well with a long well sweep; around and near it stood four ash trees, planted there, saith tradition, to keep the snakes from the well. It was known as "Knowlton's," being owned and occupied by an elderly lady of that name. Small parties frequented the place, bringing with them their own supplies. Mrs. Knowlton would prepare the repast, and a small fee and the remnants of the feast were considered an ample compensation.

and others with whom he had himself rambled and pursued botanical investigations.

The President then called upon Hon. ALLEN W. DODGE of Hamilton, to tell the company what he knew about the Rev. Manasseh Cutler.

Mr. DODGE said that Mr. Cutler was the second minister of the Hamlet Parish, as it was called at the time of his settlement, in 1771, it being a part of old Ipswich, from which it was set off in 1793, and given its present name, in honor of Alexander Hamilton, of whom the doctor was an ardent admirer,—his parishioners sharing in his feelings. Of the doctor, personally, Mr. Dodge said his reminiscences were rather dim, but he well recollected hearing him preach in his own pulpit, after he was compelled to sit through the sermon, as he did for years, owing to the asthma. He also remembered him at a large social gathering of the Col. Robert Dodge family, to which he (Mr. Dodge) belonged, when the doctor was the life of the party. It was at the same ancestral farm that witnessed these festivities that, at an earlier period, on the occasion of a barn-raising, the doctor led off a dance on the green with one of his church members, grandmother to the speaker, against which neither tradition nor the church record bears traces of any remonstrance. He was, in truth, always ready to contribute to the innocent recreation of his people, ready to minister to their wants, physical as well as spiritual, and ready to make the common schools of the town preëminently thorough in their instruction. To interest the people in the schools, he early instituted the custom of each committeeman giving either a dinner or a supper at every examination day; and on these occasions the doctor made even the roast turkeys and plum puddings to help on the good cause.

To show how free and familiar with him were his own people, one of them having written a work on the cultivation of the potato, and taken it to him for revision, said as he was leaving the house, "Now, doctor, if you think it worth printing, just stick in a little religion, now and then, and it will sell all the better!" Grotesque as this may seem to us, it was strictly in accordance with the times. That rare little book, by Dr. Jared Elliott, of Killingly, Conn., entitled "Field Husbandry in New England, as it is, or may be ordered," is interlarded with Scripture texts. As a specimen, after giving various receipts relating to the protection of crops and animals, he says he shall close the chapter with one receipt more, which is infallible and invaluable: "Seek first the kingdom of God and His righteousness, and all these things shall be added unto you."

Doctor Cutler was born in Killingly, Conn., May 3, 1742 (where Elliott, the author of this quaint old work, lived, preached and wrote); graduated at Yale College in 1765. He studied law and was admitted to the bar in 1767. Soon after quitting this profession he prepared for the ministry, and here entered on its duties, his first and only charge extending over a period of more than fifty years. Of course he lived in the war of the Revolution—the time that tried men's souls—and he served in it as a chaplain. On his return he studied medicine and practised as a physician among his parishioners for years after. As a preacher he was sound and instructive, not given to flights of oratory, but more intent on the edification of his hearers. He was a prompt man in the discharge of ecclesiastical as well as secular duties. Once, at a meeting of the Bible Society of Salem and its Vicinity, a question arose at the preliminary meeting, whether or not it should be opened with prayer.

The discussion began to wax warm, when the doctor, who was presiding, rapped on the desk and said, "Gentlemen, while the propriety of the duty is being discussed, the duty itself might have been performed. Let us pray!"

He received as boarders in his family, young men from out of town to fit for college, mercantile pursuits and navigation. He was well versed in astronomy, and for years kept a minute diary of the weather, the temperature, the winds, the diseases and the seasons, a couple of these manuscripts from 1780 to 1790, being among the archives of the Institute, witnesses of his painstaking accuracy in this department. But he was best known to his contemporaries by his knowledge of botany, both practical and scientific. He contributed to the Memoirs of the American Academy, papers on this and other scientific subjects. He was well known abroad, and his society and conversation were sought by many an intelligent foreigner. Among others was Count Castiglione, a distinguished Italian, who travelled in this country in 1785-7, and in his book speaks of his visit to Dr. Cutler. Doubtless he roamed with him through these woods, guided by him to rare and beautiful plants. The doctor's garden was full of flowering plants and trees. Among the rest was a grand old tulip tree, that lived to show, spring after spring, by its gorgeous blossoms, the worth of such a man, not to distant places only, but to his neighborhood as well, long after he had gone to his rest.

The efforts of Dr. Cutler in securing the passage by Congress of the ordinance of 1787, by which freedom was decreed to the whole northwestern territory, are perhaps not so fully known as in justice to him they should be. Mr. Webster was accustomed on all fit occasions to speak of them in terms of highest commenda-

tion. More recently, Mr. Poole, of the Cincinnati public library, has given a graceful and thorough account of them. Soon after, he organized, in Ipswich and the neighboring towns, the first band of pioneers for the settlement of Ohio. They took their departure from his door in a large wagon, bearing the inscription "Ohio, for Marietta on the Muskingum," firing a salute to the doctor with the muskets with which they went armed. They were followed the year after by Dr. Cutler himself, who rode all the way in a sulky, accompanied by a few friends.

In 1800, in acknowledgment of his signal services to the country and his vast acquaintance with men and affairs, he was chosen a representative to Congress. He served two terms in this capacity, his people at home willingly acquiescing in an arrangement that was so honorable to the man whom they loved and revered. It was on his visit to Philadelphia in 1787, while the Constitutional Convention was in session and while he was negotiating for the purchase of the Ohio lands, that he stopped at the house of Dr. Franklin, with whom he had corresponded, and found him at tea with his family on the lawn in the rear of the house. Of this interview he wrote out a full account. It is said to contain the best description of the great philosopher and statesman, both of his personal appearance, manners and dress, that has come down to us. It is copied by Sparks, in his life of Franklin, and is well worth the reading by every one who would get a most striking picture of him. But, said Mr. Dodge, the whole subject is too fascinating to be disposed of in a few brief remarks. He hoped that a full account would be given by one who had for years been gathering the materials for it, and was abundantly able to do justice to it—he alluded to the Rev. Edwin M. Stone, of Providence, R. I., formerly of Beverly in this county.

Prof. ASA GRAY, of Harvard College, in speaking of the flowers about us and those found during the morning, alluded to plants having peculiar properties or aptitudes, and particularly treated of the so-called pitcher-plant (*Sarracenia purpurea*). One will ask what these pitchers are for, and looking into them we shall find a little dirty water and few or many flies or other insects drowned in it; now if we notice this "sun-dew" (*Drosera*), we shall see that flies, when they alight on the leaf, are caught and held fast by the clear drops which tip every one of the bristles that beset its upper surface. And, as if to make sure of this, within a few hours the surrounding bristles, which the fly had not touched, bend in one by one, and bring their sticky glands into contact with the fly, thus multiplying the bands that held him. Soon the leaf itself is seen to close round the insect, just as a man might close his hand, say upon a mouse. Now, before we make up our mind that this capture is accidental and meaningless, it is as well to consider why flies are more expeditiously caught by a near relative of the sundew, viz., the Venus-fly trap (*Dionæa*), of North Carolina. Here, when the fly alights on the leaf the two sides come together with a sudden motion; and the bristles, which are all on the margin, and destitute of sticky glands, by their intercrossing prevent escape, until the sides of the trap have closed down firmly upon the imprisoned insect.

Returning now to our pitcher-plant, it is naturally asked, What attracts the flies that are so copiously drowned in the water at the bottom? In this our northern species we know of no attraction beyond the water itself. But in at least one of the southern species (*Sarracenia flava*) a correspondent informs us that he has noticed a sweetish secretion just over the top of the tube, which is eagerly

sought by flies, and which intoxicates them, so that they fall into the pit below. Once there, the stiff hairs of its lining, which, as in the species before us, all point downwards, prevent all return. Dr. Gray had this summer verified this statement as to the existence of the attractive secretion. Now in the case of the *Dionæa* the fly, after being caught, is soon covered with a secretion from the inside of the leaf, and finally absorbed, except the tough and fibrous parts: then the leaf opens and may catch another fly. Reasoning from this to the sundew, it may be inferred that this also catches flies with intention, and it may be suspected that either the juices of the fly are absorbed through the sticky glands, or that the ammonia etc., which is given off in decomposition is absorbed,—in either case affording food to the plant. And finally, if pitcher-plants are contrivances for catching insects, as they seem to be, Dr. Gray thought it most likely that the water they contain, charged as it is with the products of animal decomposition, is actually absorbed by the plant as a liquid manure, to its benefit.

S. B. BUTTRICK, of Salem, presented the following list of plants collected during the forenoon's excursion:—

<i>Némopantes Canadensis</i> , . . .	Mountain Holly.
<i>Verbena hastata</i> ,	Vervain.
<i>Myrica Gale</i> ,	Dutch Myrtle.
<i>Aspidium marginale</i> and others,	Shield Fern.
<i>Rhexia Virginica</i> ,	Deer Grass, or Meadow Beauty.
<i>Eriocaulon septangulare</i> ,	Pipewort.
<i>Lycopodium lucidulum</i> ,	
<i>Aralia hispida</i> ,	Bristly Sarsaparilla.
<i>Gerardia maritima</i> ,	Seaside Gerardia.
<i>Cornus Canadensis</i> ,	Dwarf Cornel.
<i>Lycopodium dendroideum</i> , . . .	Ground Pine.
<i>Spiræa tomentosa</i> ,	Hardhack; Steeple Bush.
<i>Spiræa salicifolia</i> ,	Meadow Sweet.
<i>Monotropa uniflora</i> ,	Indian pipe.

<i>Decodon verticillatum</i> ,	Swamp Loosestrife.
<i>Pontederia cordata</i> ,	Pickerel Weed.
<i>Brasenia peltata</i> ,	Watershield.
<i>Nymphæa odorata</i> ,	Water Lily.
<i>Clethra alnifolia</i> ,	Sweet-pepper Bush.
<i>Cassandra calyculata</i> ,	Leatherleaf.
<i>Cephalanthus occidentalis</i> , . . .	Buttonbush.
<i>Vaccinium ocyccoccus</i> ,	Cranberry.
<i>Sarracenia purpurea</i> ,	Sidesaddle Flower.
<i>Drosera longifolia</i> ,	Long-leaved Sundew.
“ <i>rotundifolia</i> ,	Round-leaved “

Prof. GEORGE L. GOODALE, of Harvard College, after a few brief remarks on several of the plants which he had noticed during the forenoon's ramble through these woods, so rich with floral treasures and possessing so many attractions not only to the student in botany but the lover of the picturesque in natural scenery, gave an interesting account of the cross fertilization of plants by the agency of insects.

Mr. J. J. H. GREGORY, of Marblehead, expressed a desire to bring to the notice of the Institute the importance of teaching children the distinctive characteristics of the several poisonous plants and animals that are occasionally met with in their rambles; after some general remarks on this subject, he introduced the following resolution, which was adopted:—

Resolved, That so much instruction relative to insects, other animals and plants found in Massachusetts, should be given in her common schools, as shall enable the community to protect itself from bodily harm and banish all unnecessary fear.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 5. SALEM, MASS., SEPT., 1873. No. 9.

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

FIELD MEETING AT CHEBACCO POND, TUESDAY, AUGUST 12, 1873.

[Continued.]

MR. F. W. PUTNAM spoke on the fishes of the pond and gave an account of the general structure of fishes, and of the characteristic habits of several species, especially noting the mode of spawning of the horned pout and the bream, and the care which the pouts take of their young for some time after they leave the spawning nest.

The fishes taken with the seine by himself and Mr. Cooke during the morning consisted of the following species:—

Pimelodus catus, Horned Pout, not fully grown; *Esox reticulatus*, Pickerel, not fully grown; *Leuciscus Americanus*, Shiner, adults and young specimens about one inch in length; *Leuciscus pulchellus*, Chub, young specimens; *Perca flavescens*, Perch, adults and half-grown specimens; *Labrax rufus*, White Perch, adults; *Pomotis vulgaris*, Bream, adults, and young of from one-half to one inch in length; *Hololepis fusiformis*, Little Darter, adults.

A few other species, as the redfin, the sucker, the barred bream, the short-nosed pickerel, the banded minnow and the eel, are found in the pond, but none were taken to-day. The black bass has also been introduced and is said to be increasing in numbers.

Of the reptiles and batrachians the following were collected in the pond and on its shores :—

Chrysemys picta, Yellow-bellied Turtle; *Ozotheca odorata*, Musk Turtle; *Rana fontinalis*, Green Frog; *Rana sylvatica*, Wood Frog; *Bufo Americana*, Common Toad, young specimens near the water.

Other species are also found here, as the snapping-turtle, the spotted turtle, several snakes, salamanders, three or four other frogs and the tree toad.

Three hauls of the dredge were made across the pond, but the bottom proved very muddy and only a few fresh-water clams were obtained.

Quite a number of aquatic insects were collected, of species common to our ponds.

A large green caterpillar was passed to the table, and Mr. Putnam gave an account of its habits and the transformations it would undergo in developing from its present state, when it is known as the tomato worm, or larva of *Sphinx quinquemaculata*, to that of its winged condition, when it would become a large moth.

After passing a vote of thanks to Messrs. John Whipple & Sons for the use of their grounds, and for courtesies and civilities extended on this occasion, the meeting adjourned.

FIELD MEETING AT DANVERS CENTRE, FRIDAY,
SEPT. 5, 1873.

THE fourth field meeting, the present season, was held at Danvers Centre, this day, postponed from the day preceding on account of unfavorable weather. The 9.25 train from Salem took the party to the Plains, where carriages were soon in readiness for conveyance to the meeting house, which was the place of gathering for the day. A somewhat informal meeting was then held, and the various points of interest designated, and then the party separated into groups and went in various directions, as inclination dictated; the botanists repaired to the woods; the larger portion, however, under the lead of very instructive guidance, visited several of the old houses that are invested with an historic interest; or the sites of others that had long since crumbled into dust, marked by a depression of the earth, with a few loose stones lying around.

The meeting house in which the party assembled is the one which accommodates the church and society that began in the year 1671, having been set off from the First Church in Salem at that time, and known in our early records as the Salem Village Church. The first house was built in 1671, and was connected with the witchcraft delusion and witnessed many of its trials. The second one was erected in 1700 upon the site of the present house, and stood until 1785, when it was voted to build another upon the same spot. This third house was destroyed by fire, Sept. 24, 1805. The society decided to have a new meeting house, which was built upon the same spot that the last house stood upon. This fourth house was of brick and was known as the "Brick Meeting

House." It was finished in 1806, and taken down in 1839, and in that year the fifth and present house was built. Rev. Charles B. Rice, the present pastor, was installed Sept. 2, 1863. His predecessors were James Bailey, 1671 to 1680; George Burroughs, 1680 to 1683; Samuel Parris, 1689 to 1696; Joseph Green, 1698 to 1715; Peter Clarke, 1717 to 1768; Benjamin Wadsworth, 1772 to 1826; Milton P. Braman, 1826 to 1861—a list of revered and honored names of men who, in their times, were distinguished for their learning and piety.

The general aspect of the town is rather level, though it is diversified with numerous elevations. The land appears to be well adapted to agricultural purposes, and is dotted with workshops of the manufacturing industries that add so much to the thrift of many of our New England towns.

The common at Danvers Centre is a place of some interest, from the fact that it was given to the village "for a training place forever," by the will of Nathaniel Ingersoll, the leading man of the village. It has doubtless been used as a parade ground from the earliest times; and the rudiments of military practice have probably here been imparted to those who have taken up arms against the Indians, the French and the British.

Danvers has, from the earliest times, been closely identified with the prominent events in our history. With the exception of the town most directly concerned by locality, it gave up more victims than any other in the Lexington fight. It was the abode of the first and also of the last British governor of Massachusetts. The Collins House, now owned by Mr. Francis Peabody, has been greatly improved by him without disturbing the old fashioned aristocratic appearance of the place, and is always an interesting object of contemplation, partly

from the beauty of its surroundings and partly from the fact that it is the place where Gov. Gage formerly had his headquarters. Gen. Gage, before he took command of the British forces in the colonies, was governor of Montreal. He did not succeed well as governor of Massachusetts, and went back to England before independence was declared, though he had enough to do with the inauguration of our revolution to set on foot the expedition which resulted in the battle of Lexington. He lived long enough to see our independence acknowledged, and died in 1787, the year when our present constitutional form of government was adopted. Gov. Endicott came over, the first governor, in 1628, and, on April 30, 1629, he was elected governor for one year; but, meantime, the charter and Company were transferred to New England, and John Winthrop, who had joined the Company, was elected governor six months afterwards. Gov. Endicott resided at what is now Danversport, and Gov. Gage, at the Collins house, as above stated, though it was but a temporary residence.

But the section of the town where the meeting was held is especially interesting from the fact that it was the region where most of the "Salem Witchcraft Delusion" took its rise. The first meeting house of Salem Village stood not many rods from the present structure, on Hobart street, near the house of Mr. Hiram Hook. The first minister of the Salem Village church was James Bailey, and he lived in a house occupying the site where now stands the house of Mr. Benjamin Hutchinson near the old road leading from the old meeting house to the Plains, and not far from the Tapleville village. On this same road, not far from the Plains, and near the gravel pit, may still be seen the remains of the old cellar of the house of Nathaniel Put-

nam, who figured during the witchcraft period. It was one or more of his horses that George Jacobs, Jr., was charged with drowning, though with no very conclusive evidence, as the horses were trespassing, and were probably drowned while being driven away. With reference to Mr. Bailey, the first minister, it may here be said that great opposition arose to him during his ministry, and a series of serious troubles, jealousies and hard feelings followed.

The Samuel Parris house stood upon a piece of land now owned by Messrs. E. and A. Mudge, and was formerly a part of the parsonage. The place is marked by a signboard which bears this inscription: "Site of the first parsonage house occupied by Rev. Samuel Parris in 1692." It is believed that some of the material of which this house was built was put into a shed or outbuilding connected with the old Wadsworth house, which is on the main road, and not far distant. It has been supposed that the small building standing opposite and near to the Collins house was a part of the old Parris house; but this has been well ascertained not to be the case in the sense in which the identity has heretofore been understood. While the small building referred to was a part of the Parris house, it was an addition to that structure which was not put on until full forty years after the witchcraft delusion. The building is old, and is now used by its owner, Mr. Solomon Morrison, as a residence for one cow and several pigs.

Near to the house of Samuel Parris is a ridge of land of curious geological formation, known as "Watch House Hill." This is so called, because, in the early days of the settlement, a house was erected here from which a watch was kept in anticipation of Indian raids.

The Rebecca Nourse house is one of the oldest in town.

It is situated, some distance in the field, on the Salem road leading out from Tapleyville, and is quite near the carpet factory. It is now owned by Mr. Orrin Putnam, and remains in a good state of preservation. There is an orchard in front of it, an inclosed burial lot twenty or thirty rods to the west, and the surroundings indicate quite a thrifty farm.

At Samuel Parris's house, for a year preceding the breaking out of the delusion in full force, a circle of girls met and practised the arts of fortune-telling. Among these were Mary Walcott, Mary Warren and Ann Putnam. Mary Walcott, who was a daughter of Jonathan Walcott, lived at the time in a house on the field northeast of the common, now owned by Mr. Moses Prince.

One of the pleasant drives during the day was that which a small party took in company with Mr. Mudge and Mr. Wm. R. Putnam. It extended through the fine estate of Mr. George Peabody, which is one of the most attractive in this part of the town, over the Newburyport turnpike to the farm of Mr. Francis Dodge on Hathorne's Hill, and thence down upon the other side to Mr. Wm. R. Putnam's house, which is historically distinguished by something more creditable than witchcraft, namely, as being the birthplace of Gen. Israel Putnam, of French war and revolutionary fame.

Hathorne's Hill is put down on some of the county maps as Prospect Hill, though Dodge's Hill is perhaps as familiar a designation as any in the neighborhood. We do not know how many hills there are in Essex County, each claiming to be the highest, but this certainly is spoken of as the highest in the southeast part of the county. It commands a very wide and extensive prospect of the surrounding country, including all the neighboring towns and villages, Wachusett, and a number of the

prominent mountains in the southern part of New Hampshire. The vessels and islands of the harbor can be seen, and the venerable Mr. Samuel Preston informed us that he has counted over fifty church steeples from this summit. The farm which includes this hill was part of the old Hathorne grant, that originally came down to the brook which runs through the Peabody farm. It has been successively owned by Mr. Ray, Eben Porter, James Prince, Nathaniel Ingersoll (son of Capt. Jona.), Capt. John Andrew (who built and owned Mr. James O. Safford's present mansion near the common, in Salem), Capt. Stephen Wilkins, John Dexter (who came from Essex), and Francis Dodge, the present owner and occupant. Mr. Dodge married a daughter of Samuel Preston, and sister of Miss Harriet Preston, the authoress. Mr. Preston, who is now eighty-one years of age, was here at the farm at the time of our call, and showed us around with great apparent pleasure, cheerfulness and activity. His room in the farmhouse was very interesting, a fine old English ivy, which extended nearly all the way around the room, claiming special attention. Capt. Andrew, during his ownership, planted a grove of English oaks on this hill, which are now vigorous and thrifty. This farm has recently been offered, with some forty-two acres belonging to Mr. W. R. Putnam, making two hundred acres in all, as a site for the new State hospital for the insane. It is certainly a fine situation.

The Israel Putnam house, at the foot of the hill, is a mansion bearing every mark of comfort, inside and out. The larger portion of the house is not conspicuously old, there being not much left of the original part beyond the portion containing the two rooms which formerly constituted the one in which Gen. Israel was born. The farm descended from Thomas Putnam, to whom it was origi-

nally granted. From Thomas it came to his son Joseph, then to Lieut. David (who was a brother to Gen. Israel), then to his son Israel, then to Daniel, and finally to William R., the present occupant. Mr. Putnam and his sister were very kind in showing the old relics, and the visit was really one of much pleasure. Gen. Israel Putnam is of course remembered as a man who, even in his boyhood and youth, was characterized by a spirit of daring and intrepidity. He was born Jan. 7, 1718, and at the age of twenty-one married Hannah Pope, of Salem, and removed to Pomfret, Conn. He commanded a company during the French war, was Major General at Bunker Hill, and died May 19, 1790, aged 72.

At the roadside, close by the church, stands the old tavern, now a dwelling house, in which the genial widow Smith ministered to the wants of weary travellers, and higher up is the parsonage, which was once used for the same purpose. Every house has its history, and every history finds some willing tongue to publish its wild and thrilling narratives. At the house of the Rev. Mr. Rice, the pastor, are to be found the records of the parish during those troublous times when Bailey and Parris presided over the church, and many quaint specimens of penmanship and rhetorical beauty were noticed on their pages.

At the close of the rambles and examination of the old records, the company gathered in the basement of the church and partook of refreshments. Here tea and coffee were furnished, and the citizens showed a degree of hospitality that was quite commensurate with their courtesies and attentions during the day.

The afternoon session was held in the church at 3 P. M. The PRESIDENT in the chair. Records of preceding meeting read.

The SECRETARY announced the correspondence:—

From Charles F. Crocker, Lawrence, Aug. 15; Pardee & Chamberlin, Fulton, N. Y., Aug. 31; W. F. Poole, Cincinnati, Ohio, Aug. 23; Charles B. Rice, Danvers Centre, Aug. 21; S. J. Spalding, Newburyport, Aug. 30; E. R. Sullivan, Zanesville, Ohio, Aug. 23; E. N. Walton, Salem, Aug. 26; A. Williams & Co., Boston, Aug. 15; Marshall P. Wilder, Boston, Aug. 15; U. S. Bureau of Education, Washington, Sept. 1; Buffalo Historical Society, Aug. 22.

The LIBRARIAN announced the following additions:—

By Donation.

APPLETON, FRANCIS H., of Peabody. Miscellaneous pamphlets, 25.
 LEE, JOHN C. Commercial Bulletin, July 26, Aug. 2, 9, 16, 1873.
 MORSE, E. S. On the Systematic Position of the Brachiopoda, by donor. 8vo pamph. Boston, 1873.
 MUNSSELL, JOEL, of New York, N. Y. Albany Penitentiary Laws for 1872. 1 vol. 8vo. Miscellaneous pamphlets, 16.
 PEABODY, ALFRED. San Francisco Directories for 1852-3, 1859. 2 vols. 8vo. Manual of the Corporation of San Francisco, 1853. 1 vol. 8vo.
 PERKINS, A. T., of Boston. Copley's Life and Paintings, by A. T. Perkins. 1 vol. small 4to. Boston, 1873.
 RICE, CHAS. B., of Danvers. Centennial Celebration at Conway, June 19, 1867. 8vo pamph.
 U. S. PATENT OFFICE. Official Gazette, July 22, 29, Aug. 5, 12, 1873. General Index of "The Official Gazette." 1872.

By Exchange.

BIBLIOTHEQUE UNIVERSELLE ET REVUE SUISSE. Archives des Sciences physiques et naturelles, Mai, Juin. Nos. 185, 186. 1873.
 GEORGIA HISTORICAL SOCIETY. Collections of. Vol. iii. 1 vol. 8vo. Savannah. 1873.
 PUBLISHERS. American Naturalist. Forest and Stream. 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. Western Lancet.

The PRESIDENT in his opening remarks mentioned that this is the first time that the Institute has held a meeting in this spot, so full of historic incidents, some of which are of national importance, although it has convened in three other places in the town.

It possesses some attractions to the naturalist. Within a short distance in one direction is the locality where William Oakes, the noted botanist of Essex County, and

his friend, Dr. George Osgood, of Danvers, discovered the *Vaccinium vitis-idaea* (a species of cranberry), a very rare plant in this section of the state. It is said that after a fatiguing ramble at the close of a summer's day, in the year 1820, in search of botanical specimens, upon the finding of this plant Oakes raised his hands above his head and with all the enthusiasm of an ardent lover of nature exclaimed, "we have found a rare plant that will repay us for our toil." In another direction, near the intersection of the Andover and Newburyport turnpikes, is the place where is found occasionally the rare toad *Scaphiopus solitarius*. We well remember the enthusiasm which our late esteemed friend, Dr. Andrew Nichols, manifested, when conducting us to that place in June, 1843, where a small pond, usually dry in the summer months, was filled with these toads and the tadpoles in the various stages of growth. This toad never appears except under a peculiar combination of circumstances, that only occurs at intervals of several years. Other incidents might be cited of equal interest to the student of nature, but time will not permit a further digression in this direction.

The President then gave a brief review of the work of the society and its objects, which he said was to collect materials for the natural and civil history of the county, and to cultivate a taste for the study of the sciences and the arts, and to promote the general culture of the community.

Mr. F. W. PUTNAM, of Salem, was then introduced, and gave an account of the doings of the recent meeting at Portland of the American Association for the Advancement of Science, and also of the work of Prof. S. F. Baird, as U. S. Commissioner of Fisheries, located at Peak's Island in Portland Harbor the present season, in

carrying out the objects of his mission. He exhibited a sketch of the feather of the ruddy duck, its structure being very peculiar, consisting of two feathers, in fact; the first an odd or deciduous feather, which was pushed up from the flesh by the true feather, in a similar manner to the first teeth of the child, which are pushed out by the second. He said that this was a contribution to science by Dr. Elliot Coues, U. S. A., and that it would be published with a cut in the *American Naturalist*.

Mr. Putnam presented the following paper by Dr. CARPENTER:—

ON THE GENERIC AFFINITIES OF THE NEW ENGLAND CHITONS.

BY PHILIP P. CARPENTER, OF MONTREAL.

It has been common with conchologists, even of the "advanced" school, to call every mollusk with eight valves a *Chiton*, except the vermiform species, which Lamarck separated as *Chitonellus*. The consequence has been that very little is known of most Chitonidæ, except the external characters; the differentiation shown in the soft parts, and even in the shelly valves, having been overlooked.

We have been fortunate, during the explorations of the United States Fish Commission, in observing four species alive; another was taken alive at Eastport last year; a sixth has been captured on the southern coast. These are all as yet known to inhabit the American Atlantic seas, from Labrador to Florida. A seventh, called *Chiton cinereus*, is said to have been taken alive by Dr. Pickering, and to be in the collection of the Philadelphia Academy of Natural Sciences; but it may prove to belong to one of the other species, or to be a ballast specimen.

The six authentic species present well-marked characters, ranging under five genera.

It may be premised that the Lamarckian genus *Chiton* was first divided by the Rev. L. Guilding, according to the external characters of the West Indian species. About the same time, the Rev. T. Lowe published the peculiarities in the insertion plates of the British species. Both papers appeared in the "Zoological Journal." Dr. Gray, however, was the first to present, in the Proc. Zool. Soc., a full description of the forms of Chitonidæ, accurately arranged under genera and sections, partly according to the external, but prin-

cipally according to the internal characters. Mr. Henry Adams, in compiling the "Genera" from H. Cuming's collection, was not allowed to examine the insertion plates. He thought he saw, however, a correlation between the internal and external marks; and accordingly redescribed Gray's genera, with lists of species, according to the surface diagnosis. Gray in his "Guide" unfortunately copied from H. Adams' list without examination. Lastly Chenu, as usual, reproduced the mistakes of H. Adams, with fresh ones of his own.

Having had unusual opportunities of dissecting-out the valves of Chitons, I have felt compelled to rectify the previously published lists, and also to propose various new genera. These I communicated to Mr. Binney, while his edition of Dr. Gould's "Invertebrata" was passing through the press; but he did not think well to alter the position of every one of our species, as I feel compelled to do.

1. The *Chiton apiculatus* does not appear in H. Adams or Gray. It is a true *Chatopleura*; distinguished by the thin hairy girdle, regular valves with sharp teeth, and long series of gills. I have not seen it alive. It ranges from southern Massachusetts to Florida. The genus is for the most part tropical.

2. The *Chiton ruber* is *Leptochiton ruber* of H. Adams; and is probably *Callochiton puniceus* Couth. of the same author. It is the *Tonicia rubra* of Gray's "Guide," to which he adds as synonymes in P. Z. S., *marmorea* and *fulminata*; and it also appears in Gray's "Guide" as *Corephium? rubrum*. It has not the characters of either of these four genera, in which our two best authors have placed it. It belongs to Gray's genus *Ischnochiton* (= *Lepidopleurus* H. Ad., not Risso) section †, "mantle-scales minute, granular;" but as the gill-rows are short, instead of surrounding the foot as in the typical species, it is necessary to establish a fresh genus, *Trachydermon*. The insertion-plates are, as in *Ischnochiton* and *Chatopleura*, regularly slit and sharp all round. Mr. Emerton first observed a great peculiarity in the animal; that there is a cancellated space between the posterior gill and the caudal extremity. Prof. Verrill observed that in different specimens there were either one, two or three rows of holes on each side. The caudal lobe is generally figured as an anal tube, but in truth it is an imperforate muscle, working the posterior part of the girdle. The fæces were distinctly seen to escape, sometimes on one side, sometimes on the other; as it appeared to me, from a slit on each side.

3. The *Chiton albus* is *Leptochiton albus* of H. Adams, = *sagrinatus* Couth. I twice captured a live specimen, but each time it eluded the after-search. I do not doubt that this is also a *Trachydermon*, but cannot vouch for the peculiar characters above quoted. The genus belongs, in the main, to cold and temperate seas.

4. The British *C. marginatus* is also a *Trachydermon* and not a *Lep-*

tochiton. It is the *C. cinereus* of Lovèn, Forbes and Hanley; but not of many other writers. Of the unique American shell, so called, I can say nothing.

5. The *C. marmoreus*, common at Eastport and northwards to Greenland, is *Tonicia* of H. Adams and Gray, simply because the girdle is smooth. The true southern *Tonicia*, however, have pectinated insertion-plates and ambient gills, like the typical Chitons; while the northern species, so called, have sharp plates and short gills. They differ in fact from *Trachydermon* simply in the girdle being destitute of the minute scales. I distinguish the group as *Tonicella*.

6. The *C. mendicarius* does not appear in the lists, and is probably unknown in Europe. Fortunately a very few specimens were dredged by the "Bluelight," one of them smashed, but very large. It is known outside by the minute bristles on the girdle; but within it presents the very abnormal characters which had before been observed only in the minute British *C. Hanleyi*. This appeared as *Leptochiton Hanleyi* in Gray's first paper, but as *Acanthopleura Hanleyi* in his "Guide," p. 183. But in the same book, p. 186, the same species reappears as *Hanleya debilis*; the genus (constituted for that species alone) being said to have lateral tufts of spines; insertion plates entire, of terminal valves alike. H. Adams, following this diagnosis externally, described other species which really had these spine-tufts, though not the internal characters. However, on examining every specimen of the species in the market, I could not discern a single spine-tuft, though announced by the accurate Lovèn. I found, however, excellent internal characters. All the valves were destitute of insertion plates, except the anterior one, which really was entire, having one continuous plate, not slit. I did not know whether to believe my own eyes, or the testimony of Lovèn and Gray, till Prof. Verrill allowed me to open the large smashed specimen of *C. mendicarius*. It proved to be a true *Hanleya*, according to my diagnosis, but not according to Lovèn and Gray. I presume that the contraction of the skin, in so minute a shell, led to the appearance of tufts, and that Dr. Gray supposed that the posterior valve had an entire plate like the anterior. I should be glad of the opinion of others, whether the genus *Hanleya* should follow the type against the diagnosis, as here given; or an unreal diagnosis against the type, as followed (in part only) by H. Adams. The animal of this species resembles *Leptochiton* in having short posterior gills, and a central anal tube from which the fæces were seen to exude.

7. A similar confusion attends the last and most remarkable species, *C. Emersonii*. Several live specimens were dredged by the Bluelight, one of extraordinary size; and still more have been dredged by Pl. Dawson at Murray Bay. For the original species, *C. vestitus*, from

Alaska, a genus *Amicula* was constituted by Gray, characterized by covered valves and regular pore-tufts. The elder Sowerby figured the *Emersonii* as *vestitus* in his Conch. Illustr. Hence Dr. Gould naturally looked for the pore-tufts, and found them. Having received a fresh specimen from Dr. Stimpson, I could not find them. I wrote to Dr. Gould, who sent me his type specimens with sketch of regular pore-tufts, as he saw them; but still I could not. He died without clearing the difficulty; and I presumed there might be two species, one with and one without pores. But after examining both northern and southern suites of specimens, I feel confidence in stating that there are no true pores; but simply a profusion of hair bunches, generally very irregular, but sometimes, in early stages, more conspicuous at the sutures. I propose, therefore, to keep the name *Amicula* for the Alaskan pore-bearing species; and to name this (with the Alaskan *Pallasii*), *Stimpsoniella*, in honor of one of the best naturalists born in New England. In this genus, as in *Trachydermon*, the fæces are expelled through slits close to the caudal lobe, one on each side. When at rest, the creature makes a posterior fold in the girdle, corresponding to the wave in the posterior valve.

I should be extremely indebted to any gentlemen who would lend me unusual Chitons for examination, previously to the publication of my "Contributions towards a Monograph of the Chitonidæ" by the Smithsonian Institution. There is also a great field open for investigation to all those who can examine living chitons, or even dissect alcoholic specimens. It is known that the external characters are not coördinate with the internal ones; it remains to be found out whether either of them correlate with the anatomical characters of dentition, gills, vent, etc., which ought to furnish the best divisions in arranging this difficult group.

The Secretary, Mr. JOHN ROBINSON, gave an interesting account of the botanical work in the morning. His remarks were chiefly confined to a description of the ferns found during the excursion, as follows:—

Among the rarer ferns in this region is *Phegopteris polypodioides*, a fine specimen of which was collected by Miss Page this morning. This and its associate, *P. dryopteris*, are only to be found in a few localities in this county, while north and south they are very abundant, particularly near mountain streams. Of the other New England ferns that are rare, or not as yet found here, may be enumerated *Struthiopteris Germanica*, *Ophio-*

glossum vulgatum, *Adiantum pedatum* (maiden hair), *Asplenium thelypteroides*, *Phegopteris hexagonoptera*, *Aspidium aculeatum*, *A. Goldianum*, *Cystopteris bulbifera*, *Lygodium palmatum* (climbing fern), and some species of *Botrychium*. To these may be added as impossible to find, the mountain species, *Aspidium fragrans*, *Woodsia glabella* and the limestone ferns. I know only one locality in this county for the *Ophioglossum*, or the climbing fern; the maiden hair is abundant in one town and can be found sparingly throughout the county. It is very doubtful if *Asplenium thelypteroides*, *Cystopteris bulbifera* or *Aspidium aculeatum*, can naturally grow here, but it is to be hoped that *Aspidium Goldianum*, *Phegopteris hexagonoptera* and the *Struthiopteris*, as well as some of the rarer species of *Botrychium*, may yet be found in some of the beautiful nooks of which our county has so many. For three seasons past I have searched faithfully in this vicinity for the native ferns, and have been rewarded each season by the finding of species not known, or at least not noted by any collector, as indigenous to this county. Nearly all our ferns can be cultivated with success in the garden if a shady portion can be devoted to this purpose. They throw out their beautiful fronds and often hide some unsightly fence, or fill the crevices between stones, with their delicate green foliage.

Rev. E. C. BOLLES, of Salem, in giving his account of the findings during the forenoon, spoke particularly of the minute fungi, which feed upon plants as certain insects feed upon other insects. He illustrated his remarks upon the blackboard, and in closing alluded to the importance of the study of these minute forms, especially to agriculturists, as many of the crops are affected more or less by these parasitic plants.

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

FIELD MEETING AT DANVERS CENTRE, FRIDAY,
SEPT. 5, 1873.

[Continued.]

The PRESIDENT presented the following paper, found among the archives of the Institute :—

“Our Breath'n & Neibours at y^e ffarmes Request.”
To the respective Towne of Salem.

Wee whose names are vnder written desire to informe you of our condition by reason or Habytations are distant from our publike Meeting house at least four miles vpon the rode the neerist, the farthist about 8 or 9 ; if one or two of a great family goeth to meeting, the rest being Children and Servants tarry at home And wee feare spend the day vnprofitably if not pfainly, and in consideration herof wee all judge the afflicted state of y^e body ought to bee relieved how much more the condition of Soules. Wee feare if not releevd that our Children will bee as the Hethen whome God drone out before vs. Therefore or humble request is that you will be pleased

to take into yor Christian consideration our condition either to pvide for vs a Minister and so maintaine him in Common that so we may enjoy the word of God amongst vs, or be pleased to dismisse to vs such anumber of ffamilies as liueth remote from y^e Towne so as that wee may bee able to maintaine a Minister amongst our Selves, & if the Towne be pleased to leave vs distinct to or-selves then our desire is to begin at y^e Horse bridge to Serg^t Leaches, Jacob Barney, Sarg^t Porter, Mr. Endecot to the wooden bridge swamp & the inhabitance beyond y^e River & so we desire to waite vpon God for helpe & his assistance and vpon you for yor loveing answer.

The 4 : 12, $\frac{68}{89}$	Rob't Prince,	Rich. Hutchison,
	Jonat, Knight,	Thomas Putnam,
	James Hadlock,	Bray Wilkins,
Joseph Houlton.	Joseph Herick,	Nath'l Putnam,
	Tho. Small,	Jno. Putnam,
	Jno. Burton,	Thomas Fuller,
	Jno. Gingel,	Josh. Rea,
	Tho. Wilkins,	Joseph Hutchison,
	Philip Knight,	Nath'l Ingerson,
	Jno. Simson,	Jno. Wilkins,
		Henry Keny.

Rev. CHARLES B. RICE, the pastor of the church, spoke words of welcome and expressed his gratification that the meeting was held in his church, and alluded to some of the old historical houses, of which not a vestige now remains.

Mr. DAVID STILES, of Middleton, being called upon, spoke of the old Townsend Bishop house, and exhibited pieces of the wood of the house which he had recently taken from the ridgepole and narrated some interesting reminiscences. He alluded in the highest terms of commendation to the services rendered to this community by Mr. William P. Upham, in making us better acquainted

with the many interesting incidents connected with our early history, whilst collecting materials for his father's admirable work on the Salem Witchcraft.

Dr. JEREMIAH SPOFFORD, of Groveland, spoke of the geological evidence that the Merrimac River once emptied into the ocean by another channel south of its present one.

Dr. Spofford then alluded to the remarks of Mr. Putnam on the restocking of rivers, especially the Merrimac, with fish, and questioned the success of the plan.

A discussion followed, participated in by Messrs. J. Spofford, F. W. Putnam, C. P. Preston, and others; during which Mr. Putnam made a statement as to the results already attained by the several Fish Commissioners, and urged that they be aided in their work, as the principles, upon which the experiments were being made, were sound, and if the people would have patience and assist the Commissioners in their efforts, he believed the day would not be far distant when salmon and shad would again be plenty in our rivers.

Mr. AUGUSTUS MUDGE, of Danvers Centre, spoke of the important work done by the Institute at their meetings, and was gratified to have a meeting in his town. He alluded in highly complimentary terms to Mr. Upham's valuable history of the Salem witchcraft, which he said was of inestimable worth to students of history; but the great mass of the people could not devote their time to its study. He said that there was a little book called "Witch Hill," which was admirably adapted to popular reading. He spoke of the local history of the place, and said that the first and last English governors of Massachusetts resided in Danvers — Gov. Endicott and Gov. Gage, the one at his farm near Danversport, the other at

the Collins House, now owned and occupied by Francis Peabody, Esq. The house where Gen. Israel Putnam was born still stands about one mile away, and a number of the ancient witch houses are still in existence in various parts of the town.

Mr. WILLIAM P. UPHAM, of Salem, related some facts about the original Parris house, the birthplace of witchcraft. Some distance from the site of the house stands another house, a part of which was supposed to be a part of the original Parris house; but which proves to be an addition built in the eighteenth century and which was moved away. He exhibited, however, a well authenticated fragment of the old house which came from a shed built of the pieces of the house when it was torn down. He also exhibited some pears gathered from a tree planted by the Rev. Mr. Bailey, the first minister of the parish.

Mr. GEORGE TAPLEY, of Danvers, spoke of the Hon. Samuel Holton,* a very noted, prominent and influential citizen in the annals of the town, and paid a fitting tribute to his memory. The mansion in which he resided for many years is still extant and is near to this place of meeting. Mr. Holton was a man of great integrity and

*Samuel Holton, the only son of Samuel and Hannah (Gardner) Holton, was born at Salem Village, now Danvers, June 9, 1738. In early life a successful practitioner of medicine. His public career commenced in 1768, when he was elected a representative to the general court from Danvers. He was eight years a representative, five years a senator, and twelve councillor, in Massachusetts legislature, five in congress under the confederacy and two under the Federal constitution, a member of the constitutional convention of 1780; a delegate to the State convention for ratifying and adopting the Federal constitution, twice served as presidential elector. For thirty-two years a justice of the court of common pleas for Essex, being for half of that time the presiding justice, a judge of probate of Essex from July 2, 1796, to May 29, 1815. He also discharged the duties of several town offices and other public and private trusts. He died Jan. 2, 1816, and tributes were paid to his memory by numerous grateful hearts and a sermon was preached at his funeral by the Rev. Dr. Benj. Wadsworth, which was published and widely circulated.

ability; courteous and unaffected, enthusiastic in promoting the cause of liberty, yet dignified, firm and prudent in all his actions. His long and faithful services in various important stations, legislative as well as judicial, have caused his name to be cherished with gratitude and respect.

Mr. S. B. BUTTRICK, of Salem, presented the following list of plants observed by him during the excursion in the forenoon:—

<i>Gerardia purpurea</i> ,	Purple gerardia.
“ <i>tenuifolia</i> ,	Slender gerardia.
<i>Eupatorium purpureum</i> , . . .	Trumpet weed.
“ <i>perfoliatum</i> , . . .	Thoroughwort.
<i>Spiræa salicifolia</i> ,	Meadow sweet.
“ <i>tomentosa</i> ,	Hardhack.
<i>Arum triphyllum</i> ,	Indian turnip (in fruit).
<i>Nabalus albus</i> ,	White flowering lettuce.
<i>Mulgedium leucophæum</i> , . . .	Blue lettuce.
<i>Onoclea sensibilis</i> ,	Sensitive fern.
<i>Cuscuta Gronovii</i> ,	Dodder.
<i>Rudbeckia laciniata</i> ,	Tall cone flower.
<i>Apocynum androsæmifolium</i> ,	Dogsbane.
<i>Typha latifolia</i> ,	Reed mace (in fruit).
<i>Trichostema dichotomum</i> , . .	Blue curls; pennyroyal.
<i>Lespedeza capitata</i> ,	Headed bush clover.
<i>Oxalis stricta</i> ,	Yellow wood sorrel.
<i>Cichorium intybus</i> ,	Succory.
<i>Lobelia inflata</i> ,	Indian tobacco.
“ <i>cardinalis</i> ,	Cardinal flower.
<i>Brunella vulgaris</i> ,	Common selfheal.
<i>Eriophorum polystachyon</i> ,	
var. <i>angustifolium</i> ,	Cotton grass.
var. <i>latifolium</i> ,	“ “
<i>Goodyera repens</i> ,	Rattlesnake plantain.

Mr. F. W. PUTNAM, after some appropriate remarks, introduced the following resolution, which was unanimously adopted:—

Resolved, That the thanks of the Essex Institute be presented to the proprietors of the First Congregational Church and to the citizens of Danvers generally for their generous and kind attentions, which have contributed so much to the pleasure and interest of the day.

Messrs. J. Fletcher, of Lawrence, and J. Henry Badger and Edgar Vivian, of Salem, were elected resident members.

Adjourned.



SPECIAL MEETING, THURSDAY, SEPT. 11, 1873,

Was held this evening, commencing at 7.15 o'clock, in the Whitefield church, Newburyport, for the reading of a memorial address by Rev. SAMUEL J. SPALDING, D.D., upon the late HENRY COIT PERKINS, M.D., of Newburyport, an interested and esteemed member of the Institute.

The following exercises were observed on this occasion :

1. Hymn.—“The spacious firmament on high.”
2. Reading of Scripture and Prayer, by Rev. R. Campbell.
3. Singing.—“Blessed are the dead who die in the Lord.”
4. Address by Rev. S. J. Spalding, D.D.
5. Singing.—“God who madest earth and heaven.”
6. Benediction.

The singing was by a quartette under the direction of Mr. Wm. P. Dodge.

The thanks of the Institute are due to Rev. Dr. Spalding for his faithful and correct delineation of the character and services of our late associate. The request for a copy of the address for publication has been freely granted, and the same will accordingly be printed in the twelfth volume of the “Historical Collections.”

REGULAR MEETING, MONDAY, OCT. 6, 1873.

MEETING this day at 4 P.M. The PRESIDENT in the chair.

John G. Barker, of Lynn, was elected a resident member.



REGULAR MEETING, MONDAY, OCT. 20, 1873.

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

The SECRETARY announced the following correspondence :—

From E. C. Bolles, Sept. 12, 15; E. P. Boow, New York, Oct. 6; Henry I. Bowditch, Boston, Sept., Oct. 10, 18; E. C. Cowles, Ipswich, Sept. 29; J. E. Deane, New York, Oct. 17; William J. Fletcher, Lawrence, Sept. 8; John C. Holmes, Detroit, Mich., Oct. 6; F. B. Hough, Lowville, N. Y., Sept. 13; S. G. Howe, Boston, Sept. 27; T. Morong, Ipswich, Sept. 20, Oct. 4, 8; J. R. Nichols, Haverhill, Sept. 28; A. Osgood, Newburyport, Sept. 8; G. D. Phippen, Sept. 12; S. C. Rodgers, Troy, N. Y., Sept. 30; J. L. Robinson, Wenham, Oct. 7; Edward E. Rice, Boston, Sept. 30; Rogers Stuart, Providence, R. I., Oct. 14; George Russell, Boston, Sept. 27; John J. Somes, Gloucester, Sept. 9, 12, Oct. 6, 14; S. J. Spalding, Newburyport, Sept. 13, 20, Oct. 10; J. M. Thompson, Sept. 5, 9; Henry E. Waite, West Newton, Sept. 20; Charles A. Walker, Chelsea, Sept. 26, Oct. 8; W. C. Wood, Wenham, Oct. 18; W. H. Yeomans, Columbia, Conn., Sept. 22; American Geographical Society, Oct. 11; Berlin, Akklimatisations Verein, June 26; Buffalo Historical Society, Oct. 7; Essex Horticultural and Agricultural Society, Oct. 1; Liege, Société Royale des Sciences, July; Liverpool, Royal Institution, Aug. 21; New York Historical Society, Oct. 10; New York Genealogical and Biographical Society, Oct. 2; New York Lyceum of Natural History, Oct. 6; New York State Library, Oct. 2; Paris, Société Anthropologique, Juin 12; Vermont State Library, Oct. 1.

The LIBRARIAN reported the following additions :—

By Donation.

BARLOW, JOHN. Acts and Resolves of Mass. Leg., for 1869. 1 vol. 8vo. Annual Report of the Adjutant General of Mass. for 1862. 1 vol. 8vo. Seventh Annual Report of the Board of State Charities of Mass. for 1869-70. 1 vol. 8vo.

BEMIS, LUKE, of West Chester, Penn. History of Delaware County, Penn., by Geo. Smith, M. D. 1 vol. 8vo. Phila., 1862. History and Directory of Norristown and Bridgeport, 1860-61. 1 vol. 12mo.

GREEN, SAM'L A., of Boston, Mass. Miscellaneous pamphlets, 16.

HAYDEN, F. V., of Washington, D. C. *Acrididæ of North America*, by Cyrus Thomas, Ph. D. 4to pamph.

LEE, JOHN C. *Commercial Bulletin for Sept. 13, 20, 1873.*

MERRITT, L. F. *Shanghai Budget and Weekly Courier for July 12, 19, 26, Aug. 2, 9, 1873.*

NATIONAL ASSOCIATION OF WOOL MANUFACTURERS. *Bulletin July-Sept., 1873.*

NORTON, M. E. B., of Rockford, Ill. *Catalogue of the Officers and Students of Rockford Seminary for 1864, 1865-6, 1867-8, 1868-9, 1869-70, 1872-3.* 6 pamphlets.

PACKARD, A. S., of Brunswick, Maine. *Miscellaneous college pamphlets, 4.*

PALFRAY, C. W. *Miscellaneous pamphlets, 20.*

STAPLES, C. E., of Worcester, Mass. *Programme of the Sixteenth Annual Festival of the Worcester County Musical Association, Oct. 6, 7, 8, 9, 10, 1873.*

STEPHENS, W. H., of Lowville, N. Y. *Autobiography of L. Norton.* 1 vol. 12mo.

STONE, E. M., of Providence, R. I. *Annual Report of the School Committee of the City of Providence, July, 1873.* 8vo pamph.

SUMNER, CHARLES, U. S. Senate. *Medical and Surgical History of the War of the Rebellion.* 2 vols. 4to.

UPHAM ROGER F. *Annual Report of the Young Men's Christian Association of Worcester, 1873.*

U. S. BUREAU OF EDUCATION. *Report of the Commissioners of Education, 1872.* 1 vol. 8vo. *Circulars of Information of the Bureau. Nos. 1, 2, 3, 1873.*

U. S. DEPARTMENT OF THE INTERIOR. *Meteorological Observations during the year 1872 in Utah, Idaho and Montana, by H. Gannett.*

U. S. PATENT OFFICE. *Official Gazette for Aug. 19, 26, Sept. 2, 9, 16, 23, 1873.*

By Exchange.

AKKLIMATISATIONS VEREIN IN BERLIN. *Zeitschrift, Vol. ix, Nos. 7-12, 1871. Vol. x, Nos. 1-12, 1872.*

AMERICAN ANTIQUARIAN SOCIETY. *Proceedings of the, at the Semi-Annual Meeting, held in Boston, Apr. 30, 1873.*

BERWICKSHIRE NATURALIST CLUB. *Proceedings of, 1872.*

BOSTON PUBLIC LIBRARY. *Twenty-First Annual Report, 1873.*

CROSSE ET FISCHER. *Journ. Conchyliologie, Tome xiii. 3e Série. Nos. 2, 3, 1873.*

GEINITZ, HANNS BRUNO. *Königliche Mineralogische Museum zu Dresden. 1873.*

INSTITUT HISTORIQUE IN PARIS. *L' Investigateur, Jan., Feb., March, April, 1873.* 2 pamphlets. 8vo.

KONGELIGE DANSKE VIDENSKABERNES SELSKAB IN KJÖBENHAVN. *Oversigt, 1872. No. ii.*

L'ACADÉMIE IMPÉRIALE DES SCIENCES, in St. Petersburg. *Memoires, Tome xviii, Nos. 8, 9, 10, 1872. Tome xix, Nos. 1, 2, 1872. 5 pamphlets. Bulletin, Tome xvii, Nos. 4, 5, 1872. Tome xviii, Nos. 1-2, 1872. 3 pamphlets.*

NATURHISTORISCHE GESELLSCHAFT ZU HANNOVER. *Zweiundzwanzigster Jahresbericht, 1871, 1872.*

NATURWISSENSCHAFTLICHEN GESELLSCHAFT "ISIS" IN DRESDEN. *Sitzungs-Berichte. Oct., Nov., Dec., 1872. Jan., Feb., März, 1873.*

NATURWISSENSCHAFTLICHEN VEREIN IN HAMBURG. *Uebersicht der Aemter-Vertheilung und Wissenschaftlichen Thätigkeit, 1871. Abhandlungen aus dem Gebiete der Naturwissenschaften. V Bd. 3 Abth. mit 8 Tafeln, 1872.*

Rufus B. Gifford, of Salem, Mrs. Mary Safford Blake, of Boston, Charles A. Torrey, of Swampscott, and Frank O. Poor of Peabody, were duly elected resident members.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 5. SALEM, MASS., NOV., 1873. No. 11.

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

REGULAR MEETING, MONDAY, NOV. 3, 1873.

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 Frances A. A. Appleton, Reading, Sept. 26, 1873; S. L. Boardman, Augusta, Me., Oct. 22; E. P. Boow, New York, Nov. 1; C. J. Maynard, Ipswich, Oct. 29; Thomas Morong, Ipswich, Oct. 27; William Northey, Oct. 29; J. H. Putnam, Danvers, Oct. 27; William S. Vaux, Philadelphia, Oct. 31; John A. Vinton, Winchester, Oct. 23, 30; Charles A. Walker, Chelsea, Nov. 1; William C. Wood, Wenhams, Oct. 18; H. T. Williams, New York, Oct. 23; Vermont State Library, Oct. 30; U. S. Naval Observatory, Washington, Oct. 26; Bruxelles, Académie Royale, Mai 10; Calcutta, Geological Survey of India, Sept. 3, 1872; Lyon, Société d' Agriculture, Histoire Naturelle et Arts Utiles, Juillet; Historical and Philosophical Society of Ohio, Oct. 23.

THE LIBRARIAN reported the following additions :—

By Donation.

ANDREWS, Miss ELIZA. North British Review, 1856. 14 nos.
BOLLES, E. C. Boston, As it was and is. 1 vol. 8vo. 1872.
BOWDITCH, HENRY I., of Boston. Nation, 1865, 1866, 1867, 1868. 7 vols. 4to, and 226 numbers of subsequent years. Army and Navy Journal for 1863-4, 1864-5, 1865-6. 3 vols. 4to.

- CROSBY, A. Triennial Catalogue of Dartmouth College, 1873. 8vo pamph.
- LEE, JOHN C. Commercial Bulletin for Sept. 27, Oct. 4, 11, 18, 1873.
- LINCOLN, SOLOMON, Hingham. The Old Meeting House in Hingham, 1681-1873. 8vo pamph.
- NICHOLS, JOHN H., of New York, N. Y. Miscellaneous pamphlets, 50.
- PUTNAM, GEO. G. Salem Directory for 1864. 1 vol. 16mo. The Rural Cemeteries of America, pts. 3, 4. 2 pamphlets, 4to. 1846.
- RAYMOND, JOHN H., of Poughkeepsie, N. Y. Catalogues of Vassar College for 1865-6, 1866-7, 1867-8, 1869-70, 1871-2, 1872-3. Communications to the Board of Trustees of Vassar College, by its Founder. 8vo pamph. Biographical Sketch of Matthew Vassar, by J. H. RAYMOND. 8vo pamph. A Sketch of Vassar College, by J. H. Raymond. May, 1873. 8vo pamph.
- SAUNDERS, MARY. History of the town of Warwick, Mass., by Hon. Jona. Blake. 1 vol. 8vo. 1873.
- WEBB, S. P. Wood's Institute. 1 vol. 4to. London, 1763. Elementary Treatise on Mechanics. 1 vol. Cambridge, 1825. Wealth of Nations. 2 vols. 8vo. Hartford, 1811. Patent Office Report for 1848. 1 vol. 8vo. Stewart on the Mind. 1 vol. 8vo. Boston, 1821. The Federalist. 1 vol. 8vo. Washington, 1818. Laws of Mass. Vol. ii, iii. 2 vols. Boston, 1823. Holy Bible. 3 vols. 8vo. Phila., 1804. Sermons by Rev. J. S. Buckminster. 1 vol. 8vo. Boston, 1814. Memoir of Nath'l A. Haven. 1 vol. 8vo. 1827. Element of Physics. 1 vol. 8vo. Phila., 1829. Adverse Enjoyment. 1 vol. 8vo. Boston, 1827. Lectures on Rhetoric and Belles Lettres. 1 vol. 8vo. N. Y., 1826. Memoirs of Gen. Lafayette. 1 vol. 8vo. Boston, 1824. The Power of Solitude. 1 vol. 8vo. Bards of the Bible. 1 vol. 8vo. New York, 1851. Discourses by F. Wayland. 1 vol. 8vo. Boston, 1833. Poems by G. Mellen. 1 vol. 8vo. Boston, 1833. Philosophy of Religion. 1 vol. 8vo. Phila., 1849. Sullivan's Lectures. 2 vols. 8vo. Portland, 1805. The Scriptures on the Guilt of Slavery. 1 vol. 8vo. Boston, 1860. Elements of Technology. 1 vol. 8vo. Boston, 1829. Essays on Phrenology. 1 vol. 8vo. Phila., 1822. Universal History, Vols. i, ii, iv. 3 vols. 12mo. Collections of the Mass. Historical Society for 1799. 1 vol. 8vo. Boston, 1800. The Throne of David. 1 vol. 8vo. Phila., 1860. Memoirs of the Revolution. 1 vol. 8vo. Phila., 1839. Spurzheim on Education. 1 vol. 8vo. Boston, 1832. Jefferson's Manual. 1 vol. 12mo. History of Nova Scotia, etc. 1 vol. 12mo. 1837. Washington's Letters. 2 vols. New York, 1796. Unitarian Tracts. 3 vols. 12mo. Legend of St. George. 16mo. 1836. The Works of Alexander Pope. 1 vol. 16mo. London, 1736. Notes on the State of Virginia. 1 vol. 16mo. Boston, 1802. Hymns and Psalms. 1 vol. 16mo. Boston, 1828. The Life and Death of the Rev. A. Fuller. 1 vol. 12mo. 1818. Channing on Slavery. 1 vol. 12mo. Miscellaneous Works of Oliver Goldsmith. 1 vol. 16mo. Phila., 1827.

By Exchange.

ACADÉMIE IMPÉRIALE DES SCIENCES, BELLES-LETTRES ET ARTS IN LYON. Mémoires, tome xix. 1871-72.

ACADÉMIE ROYALE DES SCIENCES, DES LETTRES ET DES BEAUX-ARTS DE BELGIQUE IN BRUXELLES. Annuaire, 1872, 1873. Bulletins, 2me série, 40me année, tomes xxxii, xxxiii, xxxiv, 1871-2. Centième Anniversaire de Fondation (1772-1872). Tome i, ii. 2 vols. 8vo. Observations des Phénomènes Périodiques pendant l'année, 1870. 4to pamph.

GEOLOGICAL SURVEY OF INDIA. Memoirs of the Geological Survey. Vol. viii, pts. i, ii. 2 pamphlets. Vol. ix, pts. i, ii. 2 pamphlets, 1872. Records of the Geological Survey. Vol. v, pts. i, ii, iii, iv. 4 pamphlets. Memoirs of the Geological Survey. Vol. iv, pts. i, ii. 1872. 2 pamphlets.

- L'ACADÉMIE IMPÉRIALE DES SCIENCES DE ST. PETERSBURG. Mémoires, tome xix, Nos. 3, 4, 5, 6, 7. 1873. 5 pamphlets.
- NATURAL HISTORY SOCIETY OF MONTREAL. Canadian Naturalist. Vol. vii, Nos. 2, 3.
- NEW ENGLAND HISTORIC-GENEALOGICAL SOCIETY. Historical and Genealogical Register and Antiquarian Journal for Oct., 1873.
- NEW YORK GENEALOGICAL AND BIOGRAPHICAL SOCIETY. Genealogical and Biographical Record for Oct., 1873.
- NEW YORK LYCEUM OF NATURAL HISTORY. Proceedings of the, 2d Series, Jan. 3d, March 3d, 1873. 8vo pamph. Annals of, March-June, 1873.
- NEW YORK STATE LIBRARY. Twenty-fourth Annual Report of the New York State Museum of Natural History, 1870. 1 vol. 8vo. Reports of the Regents of the University of N. Y. for 1870, 1871, 1872. 3 vols. 8vo. Reports of the Trustees of the N. Y. State Library for 1872-1873.
- OBERHESSISCHEN GESELLSCHAFT FÜR NATUR UND HEILKÜNDE IN GIESSEN. Vierzehnter Bericht, tome xiv, 1873.
- PEABODY ACADEMY OF SCIENCE. Fifth Annual Report of the Trustees of the, for 1872.
- REALE ACCADEMIA DELLE SCIENZE IN BOLOGNA. Rendiconto, Anno Accademico, 1871-72.
- SOCIÉTÉ D'ACCLIMATION IN PARIS. Bulletin Mensuel, tome x, Nos. 1-5. 1873, 5 pamphlets. 8vo.
- SOCIÉTÉ D'AGRICULTURE D'HISTOIRE NATURELLE ET DES ARTS UTILES, Lyon, Annales, tome iii, 1870.
- SOCIÉTÉ D'ANTHROPOLOGIE IN PARIS. Bulletins, tome vii, No. 4; tome viii, No. 1. 1872-3. 2 pamphlets, 8vo.
- SOCIÉTÉ LINNÉENNE IN LYON. Annales, tome xix, 1872.
- SOCIÉTÉ ROYALE DES SCIENCES DE LIÈGE. Mémoires 2e Série, Tome iii, 1873.
- VERMONT HISTORICAL SOCIETY. Vermont House Journal, 1872. 1 vol. 8vo. Senate Journal, 1872. 1 vol. 8vo. Vermont Legislative Documents, 1872. 3 vols. 8vo. The Capture of Ticonderoga. 1 vol. 8vo. Report of the Transactions of the Vermont Dairymen's Association for 1872. 8vo pamph. Report of the Vermont Insane Hospital for 1873. 8vo pamph.
- PUBLISHERS. 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. Quaritch's Catalogue. Sailors' Magazine and Seamen's Friend. Salem City Post. The Penn Monthly.

The following donations were announced to the Museum :—

- GEORGE G. CREAMER. A sea-letter with the signatures of Geo. Washington and Edw. Randolph.
- GEORGE D. PHIPPEN. A Memorial Pitcher.
- Mrs. P. P. PINEL. A Miniature of Capt. Eben Shillaber.
- Mrs. EDWARD APPLETON of Reading. A piece of the first Patch or India Copper Plate, as it was called, that was imported into Boston by Hon. Thaddeus Mason, of Cambridge (b. Jan. 7, 1707, and d. May 1, 1802), probably more than 120 years old.

Mr. C. J. MAYNARD, of Ipswich, gave an interesting sketch of the mechanism of the flight of birds, which he illustrated by a series of preparations of the breast bones, and by drawings on the blackboard. He also alluded to the means by which animals belonging to other classes are enabled to fly with a greater or less degree of perfection; such as the bats, flying fishes, flying reptiles, etc.

A discussion on some points of structure followed, participated in by Messrs. F. W. Putnam, A. S. Packard, Jr., and others.

Mr. F. W. PUTNAM read the following communication:

NOTES ON THE BIRD-FAUNA OF THE SALT LAKE VALLEY AND THE ADJACENT PORTIONS OF THE WAHSATCH MOUNTAINS.

BY ROBERT RIDGWAY.

THE recently published paper of Mr. J. A. Allen* upon the birds collected and observed by him in the vicinity of Ogden, in the Salt Lake Valley, has called the attention of ornithologists to that field; and has, moreover, particularly attracted those interested in the subject of the geographical distribution of North American birds.

While Mr. Allen's observations were made during the season of the autumnal migration, I had the good fortune to explore nearly the same ground during the breeding season,† or when the summer fauna was stationary. Combining, therefore, the results of the two explorations, and taking into additional consideration that we collected in localities a few miles apart—Mr. Allen at Ogden and I at and about Salt Lake City—the character of the avi-fauna of the western watershed of the Wahsatch may be pretty well shown.

* See Bulletin of the Museum of Comparative Zoology, Cambridge, Mass., Vol. iii, No. 6, July, 1872. Part viii, List of the Birds collected in the vicinity of Ogden, Utah Territory, from Sept. 1 to Oct. 8, 1871; with Annotations. pp. 164-173. (Species 137.)

† It is fitting to state here that my investigations were made under the auspices of the government, I being attached to the U. S. Geological Survey of the 40th parallel, as zoologist. Mr. Clarence King, U. S. Geologist in charge of the Survey, throughout the continuance of the work, offered me every possible facility. The general report upon the birds collected and observed by Mr. King's Survey is now in press and nearly completed, and will ere long be before the public.

The season of my investigations extended from the 20th of May until the middle of August, 1869. The area which they covered comprised the immediate vicinity of Salt Lake City, where most of the month of May was passed, and where a few birds were collected by me the previous October. In the early part of June a trip was taken to the large islands, Antelope, Stansbury and Carrington, in the Great Salt Lake. On the 23d of the latter month our camp was removed to Parley's Park, an elevated meadow in the Wahsatch mountains, about twenty-five miles east of Salt Lake City. In Parley's Park a rich bird-fauna was found, and I had the good fortune to be there in the height of the breeding season. About the beginning of July, an excursion was made to the western spur of the Uintah Mountains, crossing Kamas Prairie on the way. Returning along the Provo River, passing by Utah Lake, and thence northward along the western base of the Wahsatch, to Salt Lake City, the field of my observations was still farther extended.

Throughout this considerable area of country no marked local variations in the bird-fauna were noticed, beyond occasionally the occurrence at a certain point of a species not noticed elsewhere. Thus, on Antelope Island, the true *Empidonax Traillii* was obtained. In Kamas Prairie, *Actiturus Bartramius* was noticed, while along the Provo River, *Turdus fuscescens* was very abundant. In Parley's Park, a single individual of *Calamospiza bicolor* was seen and obtained, and at Salt Lake City the *Melanerpes erythrocephalus* was seen. Of course the necessary diversity of woodland, desert and aquatic faunæ was everywhere observed in their respective haunts, but the same kind of locality was inhabited by the same characteristic set of birds, wherever we went.

The western water-shed of the Wahsatch Mountains is a region remarkable as forming a natural, and nearly abrupt, limit to the westward range of the bulk of the species characterizing the eastern region of North America, though the western fauna overlaps for a distance of nearly one thousand miles to the eastward. In the *Ornis* of the Salt Lake Valley there is thus a combination of these two opposite faunæ, which gives to it an interesting variety and peculiar richness, compared with other western localities. This mixture of eastern and western birds at first rather surprises the collector in this section, for it is so far within the area of the western region that the former are supposed to be all left behind. Taking the vicinity of Salt Lake City, the collector will find, in the lower portions of the cañons of the Wahsatch, the Cat-bird (*Galeoscoptes Carolinensis*), skulking through the same thickets with the Woodhouse's Jay (*Cyanocitta Floridana*, var. *Woodhousei*), while the Olive-backed Thrush (*Turdus Swainsonii*) joins in song with the Solitaire (*Myiadestes Town-*

sendii). In the willow copses along the streams of the valley portions, the Tawny Thrush (*Turdus fuscescens*) sings in company with the Western Tanager (*Pyrranga Ludoviciana*) and Black-headed Grosbeak (*Hedymeles melanocephalus*); the Redstart (*Setophaga ruticilla*) and Fairy Titmouse (*Psaltriparus plumbeus*) may often be seen flitting through the same thickets; in the meadows, Bobolinks (*Dolichonyx oryzivorus*) and Yellow-headed Blackbirds (*Xanthocephalus icterocephalus*) mingle together; in the same cottonwood trees may be found nests of the Eastern and Western Kingbirds (*Tyrannus Carolinensis* and *T. verticalis*), while around them sport together the eastern Red-headed Woodpecker (*Melanerpes erythrocephalus*) and its ring-necked cousin (*M. torquatus*). Besides those above mentioned, are many other eastern species whose ranges find their western limit in this neighborhood. Mr. Allen gives the following as found at Ogden:—*Dendroica Blackburnia* (Sept.); *Vireosylva olivacea* (Sept.). Other eastern species, given in Mr. Allen's list, I have obtained at various points in Nevada, as follows:—*Helminthophaga ruficapilla* (East Humboldt Mts., Sept.; also California, Xantus and Gruber); *Lanivireo solitaria* (West and East Humboldt Mts., Sept. and Oct.); *Ampelis cedrorum* (Humboldt Valley, Sept.); *Dolichonyx oryzivorus* (Ruby Valley, August); *Tyrannus Carolinensis* (Truckee River, July and August); also *Spizella monticola* (western Nevada; winter resident) and *Ectopistes migratoria* (West Humboldt Mts., Sept.), not given in Mr. Allen's list. Besides the foregoing species, Mr. C. Drexler obtained at Fort Bridger, near the northeastern corner of Utah, and still within the Wahsatch region, the following additional species:—*Seiurus noveboracensis*, *Empidonax minimus*, and *Quiscalus purpureus* var. *aeneus*. These will undoubtedly yet be found in the Salt Lake Valley.

In addition to these species, Mr. H. W. Henshaw, of Lieut. Wheeler's expedition, procured the *Melospiza palustris* in southern Utah, and obtained good evidence of the breeding of *Cistothorus stellaris* in Utah Lake.

Another very remarkable peculiarity of the Wahsatch region, which I wish particularly to mention in this connection, is the fact that, in the case of representative species or races, the eastern or Rocky Mountain forms breed there, while the more western forms replace them in the fall and winter. Thus *Zonotrichia leucophrys* and *Junco hyemalis* var. *caniceps* are the only species of these two genera which breed on the Wahsatch, and they nest there very numerously; but in the fall their place is taken by the western *Z. leucophrys* var. *Gambelii* and *J. hyemalis* var. *Oregonus*, which are unknown in summer. *Lanivireo solitaria* var. *plumbea* breeds there, while var. *solitaria*, coming from the northwestward, replaces it in autumn. The same is the case with *Turdus Pallasii* var. *Auduboni* (summer resident) and var. *nanus*

(autumnal migrant); and apparently the case also, with *Helminthophaga Virginiae* (summer) and *H. ruficapilla* (autumn).

I shall notice first, the results of Mr. Allen's investigations, as embodied in the list above cited; and as I desire to add some notes on species whose range, etc., Mr. Allen had no chance to determine, I shall go through the catalogue in regular order. (The numbers prefixed to the species correspond to those in Mr. Allen's catalogue.)

- P. 165. No. 2. = *T. Pallasii* var. *Auduboni*.
- P. 166. No. 10. *Cistothorus stellaris* is a misprint for *C.* (= *Telmatodytes*) *palustris* var. (*paludicola*).
- No. 5. (*Sialia arctica*.) I found this species breeding in Salt Lake City, on Antelope Island, in the lake, and on the Wahsatch Mountains, in June.
- No. 7. (*Regulus calendula*.) Found in the pine woods of Parley's Park (altitude 8,000 feet) in June, July and August, and no doubt breeds there.
- No. 16. (*Helminthophaga celata*.) Found by me breeding in the aspen woods at an altitude of 7,000-9,000 feet, in the Wahsatch.
- No. 17. (*Dendroica Auduboni*.) Breeding in the pine woods of the Wahsatch, at an altitude of 7,000-9,000 feet.
- No. 19. ("*D. nigrescens?*") This was very probably that species, as I found it breeding in tolerable abundance on the East Humboldt Mts. Mr. Aiken has also found it on the mountains of Colorado.
- P. 167. No. 22. (*Setophaga ruticilla*.) I found this species to be common in the Salt Lake region, both in the valley portions and in the lower portions of the cañons. Obtained in June on Antelope Island.
- No. 31. = *C. Ludovicianus* var. *excubitoroides*.
- No. 34. Should be *C. Cassinii*.
- No. 38. Should be var. *alaudinus*.
- No. 39. Should be var. *confinis*.
- No. 41. We found the true *leucophrys* breeding abundantly in Parley's Park, and high up in City Creek Cañon, and, from May till the latter part of August, never saw a single specimen of *Z. Gambelii*.
- P. 168. No. 45. Should be *S. pallida* var. *Breweri*.
- No. 46. Should be var. *fallax*.
- No. 51. Should be var. *megalonyx*.
- No. 63. According to the strict rules of binomial nomenclature, the name "*Aphelocoma*" (Cabanis) cannot be used for this genus, the proper name of which is *Cyanocitta* (Strickland) of prior date, and strictly congeneric type (*C. Californica*).
- No. 72. Should be var. *Henryi*.
- No. 74. No doubt var. *Gairdneri*, which species I found in July and August in Parley's Park.
- P. 170. No. 82. Should be var. *calurus*.
- P. 171. No. 92. Should be var. *umbelloides*.
- No. 103. Eggs obtained in Uintah Mts. in July. Very common in Wahsatch during summer.
- No. 104. Not seen by us in June on Antelope or Stansbury Islands, but observed in the ponds on the southeast shore of the lake.

- P. 172. No. 108. This is the *I. guarana*, a south and middle American species common in the middle provinces of the United States (where *I. "Ordii"* does not occur). It is specifically distinct from "*Ordii*" which is absolutely identical with the *I. falcinellus* of Europe.
- No. 109. *Ibis alba*. This locality is entirely new for this bird, it having not been previously obtained within the middle province of the United States.
- No. 114. Should be *R. elegans*.
- P. 173. No. 135. Another species new to the fauna of the Great Basin.

The following species, not given in Mr. Allen's list of autumnal birds in the vicinity of Ogden, were found by me breeding in Salt Lake City and the neighborhood:

No.	Species.	Where found.	Alt.	Numbers.
1.	TURDUS FUSCESCENS.	Willows of river valleys.	4,000-	Abundant.
2.	TURDUS SWAINSONI.	Mountain streams.	6,000- 6,000-	"
3.	CATHERPES MEXICANUS, var. CONSPERSUS.	City Creek Cañon near Salt Lake City.	9,000- 4,000-	Rare.
4.	CERTHIA AMERICANA.	Pine region of Wahsatch	5,000- 8,000-	Not com- mon.
5.	SITTA CANADENSIS.	" " " "	10,000- 8,000-	Rare.
6.	PARUS MONTANUS.	" " " "	10,000- 8,000-	Common.
7.	HELMINTHOPHAGA VIRGINLE.	Scrub oaks of foot-hills, and mahogany woods.	10,000- 4,000- 6,000	"
8.	DENDROICA ÆSTIVA.	Everywhere.	4,000-	Abundant.
9.	COTYLE RIPARIA.	Valley portions.	10,000- 4,000	"
10.	PROGNE SUBIS.	Aspen woods.	7,000-	"
11.	LANIVIREO SOLITARIA, var. PLUMBÆA.	"Mahogany" and cedar woods.	9,000- 7,000-	Rare.
12.	CARPODACUS CASSINI.	Cottonwoods in parks.	10,000- 6,000-	Abundant.
13.	CARPODACUS FRONTALIS.	Valleys.	8,000- 4,000-	"
14.	CHRYSOMITRIS PINUS.	Pine region and aspens.	6,000- 8,000-	Extremely abundant.
15.	CHONDESTES GRAMMACA.	Valleys-artemisia.	10,000- 4,000-	Very abun- dant.
16.	ZONOTRICHIA LEUCOPHRYS.	Parks.	5,000- 6,000-	Abundant.
17.	JUNCO HYEMALIS, var. CANICEPS.	Pine region.	8,000- 8,000-	Common.
18.	POOSPIZA BILINEATA.	Artemisia plains.	10,000- 4,000-	Abundant.
19.	SPIZELLA PALLIDA, var. BREWERI.	" "	5,000- 4,000-	"
20.	CALAMOSPIZA BICOLOR.	Parley's Park.	5,000- 7,000	1 spec.
21.	PIPILO ERYTHROPHthalmus, var. MEGALONYX.	Scrub oaks of foot-hills.	4,000- 6,000	Very abun- dant.
22.	MYIARCHUS CRINITUS, var. CINERASCENS.	Parley's Park.	7,000	Rare.
23.	SAYORNIS SAYUS.	Valleys.	4,000- 5,000	Rath. com.
24.	EMPIDONAX TRAILLII.	Antelope Island.	4,000?	1 spec.

No.	Species.	Where found.	Alt.	Numbers.
25.	<i>E. TRAILLI</i> , <i>var. PUSILLUS</i> .	Willows along streams.	4,000- 7,000	Very abundant.
26.	<i>MOLOTHRUS PECORIS</i> .	Valleys.	4,000	Not common.
27.	<i>PICUS PUBESCENS</i> , <i>var. GAIRDNERI</i> .	Parks.	8,000	Very rare.
28.	<i>PICUS VILLOSUS</i> , <i>var. HARRISII</i> .	All wooded portions.	4,000- 10,000	Common.
29.	<i>SPHYROPICUS VARIUS</i> , <i>var. NUHALIS</i> .	Aspen woods.	7,000- 9,000	Very abundant.
30.	<i>SPHYROPICUS THYROIDEUS</i> .	Pine region.	8,000- 10,000	Rare.
31.	<i>SPHYROPICUS WILLIAMSONII</i> .	" "	8,000- 10,000	"
32.	<i>MELANERPES</i> <i>ERYTHROCEPHALUS</i> .	Salt Lake City.	4,000	1 spec.
33.	<i>MELANERPES TORQUATUS</i> .	Cottonwoods of river valleys.	4,000?	Not common.
34.	<i>TROCHILUS ALEXANDRI</i> .	Flowery places every- where.	4,000- 8,000	Common.
35.	<i>PANYPTILA MELANOLEUCA</i> .	City Creek Cañon.	5,000?	Rare.
36.	<i>BUTEO SWAINSONII</i> .	Everywhere.	4,000- 9,000	Very common.
37.	<i>FALCO LANARIUS</i> , <i>var. POLYAGRUS</i> .	Cliffs of cañons; valleys.	4,000- 9,000	Rare.
38.	<i>SYMPHEMIA SEMIPALMATA</i> .	Marshes.	4,000- 7,000	Very common.
39.	<i>NUMENIUS LONGIROSTRIS</i> .	Marshes of lake shores.	4,000	Abundant.
40.	<i>ÆGIALITIS CANTIANUS</i> , <i>var. NIVOSUS</i> .	Shore of Warm Spring Lake.	4,000	Very abundant.
41.	<i>PORZANA JAMAICENSIS?</i>	Parley's Park, meadows.	7,000	Not rare!
42.	<i>LARUS ARGENTATUS</i> , <i>var. CALIFORNICUS</i> .	Salt Lake.	4,000	Very abundant.
43.	<i>STERNA REGIA</i> .	" "	4,000	"
44.	<i>STERNA FORSTERI</i> .	" " "	4,000	"

Mr. Allen obtained the following species in October, which I did not find among the summer birds. Those marked * are probably resident and breeding; the others are autumnal migrants from the northern and northwestern regions:—

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|---|---|
| 1. <i>Anthus Ludovicianus</i> . | 11. <i>Macrorhamphus griseus</i> . |
| 2. <i>Helminthophaga ruficapilla</i> . | 12. <i>Pelidna alpina</i> , <i>var. Americana</i> . |
| 3. <i>Dendroica Blackburniæ</i> . | 13. <i>Gambetta melanoleuca</i> . |
| *4. " <i>nigrescens</i> . | 14. " <i>flavipes</i> . |
| *5. <i>Vireosylvia olivacea</i> . | *15. <i>Ibis alba</i> . |
| 6. " <i>solitaria</i> . | 16. <i>Rallus elegans</i> ("crepitans"). |
| *7. <i>Ampelis cedrorum</i> . | 17. <i>Anser hyperboreus</i> . |
| 8. <i>Zonotrichia leucophrys</i> , <i>var. Gambelii</i> . | 18. <i>Chroicocephalus Philadelphia</i> . |
| 9. <i>Junco hyemalis</i> , <i>var. Oregonus</i> . | 19. <i>Xema Sabinii</i> . |
| *10. <i>Corvus Americanus</i> . | 20. <i>Podiceps cornutus</i> . |

Mr. F. W. PUTNAM also read the following communication:—

THE BIRDS OF COLORADO.—BY ROBERT RIDGWAY.

THE present paper is based upon the observations of Mr. Charles E. Aiken, made in El Paso county, Colorado, chiefly in the vicinity of Fountain.* The results of this gentleman's explorations in that field were communicated, from time to time, to Professor Baird, Dr. Brewer and myself, for use in our forthcoming work on North American Birds; but they are of such great interest that we cannot refrain from giving the public the benefit of them sooner than their appearance in our work.

In a paper on the birds collected by Mr. C. H. Holden, Jr., in the southern part of Wyoming,† Dr. Brewer has incorporated some notes furnished by Mr. Aiken upon the birds observed by him in the contiguous portions of northern Colorado; but Mr. Aiken having since sent to me a list of all the birds obtained and observed by him within the limits of the latter Territory, I have availed myself of his list as a nucleus for preparing a catalogue of all the species known to have been found within its limits. A few additions to Mr. Aiken's list have been made from Mr. Allen's "Ornithological Reconnoissance‡" of portions of Colorado, and from the collections made by the Government exploring parties under the direction of Dr. F. V. Hayden, U. S. Geologist, each species so included having the fact properly noted.

Mr. Aiken's researches were attended by many very important results. A new snowbird (*Junco hyemalis*, var. *Aikeni* RIDGWAY, Am. Nat., vol. vii, No. 10, Oct., 1873, p. 615), with two white bands on the wing, and of much larger size than the common form, was found among the high peaks and valleys of El Paso county; and two specimens of *Centronyx Bairdii* were taken in the same locality, being the second and third examples that were then known. These speci-

* See American Naturalist, vii, No. 1, p. 13. "A Glimpse at Colorado and its Birds. By C. E. Aiken."

† Notes on the Birds of Wyoming and Colorado Territories. By C. H. Holden, Jr.; with additional memoranda by C. E. Aiken. (Edited by T. M. Brewer, M.D.) Proceedings of the Boston Soc. of Nat. Hist., vol. xv, pp. 192-210: Dec., 1872. (142 species.)

‡ Notes of an Ornithological Reconnoissance of portions of Kansas, Colorado, Wyoming and Utah. By J. A. Allen. Bulletin of the Museum of Comparative Zoology, Cambridge, Mass., vol. iii, No. 6. Part iii. List of Birds observed at the eastern base of the Rocky Mountains in Colorado Territory, between Colorado City and Denver, in July and August, 1871; with annotations, pp. 147-153. (81 species.) Part vi. List of Birds observed in South Park, Park County, Colorado Territory, in July, 1871; with annotations, pp. 153-159. (54 species.) Part vii. List of Birds observed in the Vicinity of Mt. Lincoln, Park County, Colorado, from July 19 to July 26, 1871; with annotations, pp. 159-164. (36 species.)

mens, one procured in the fall and the other in the spring, are in different plumages from the type, which is a midsummer bird, thereby attesting the entire distinctness and perfect dissimilarity of this species from any other yet known. But important and creditable as these two discoveries are, the new facts in regard to the geographical distribution of certain species, brought to light by Mr. Aiken's investigations, are of even greater value.

These facts are, first, the much greater northeastward range of forms heretofore supposed to be confined to the Colorado Province, in Arizona; second, the occurrence in the mountains of Colorado of many species found upon the Sierra Nevada, which seem to be entirely wanting in the intermediate widely spread area of the Great Basin; and, third, the occurrence in the mountains of Colorado of many strictly eastern species, not previously traced beyond the eastern border of the Plains. The latter result of Mr. Aiken's collecting in Colorado, joined to that of Mr. Allen in the same Territory and that of the writer, and subsequently Mr. Allen and other ornithologists in Utah, establishes the Rocky Mountain Range as the dividing line, or, more properly, the meeting ground, of the avi-faunæ of the Eastern and Western Regions, this system being, throughout its whole extent, almost as nearly related to the one as to the other,—though, as would be expected from the physical conditions of the country, the western element preponderates. Besides these discoveries in the geographical distribution of the species, new facts in relation to the range, habits or other peculiarities, of certain species are among other of the very satisfactory results of Mr. Aiken's ornithological explorations in Colorado. As a particular example, I may mention the discovery of the fact that *Corvus cryptoleucus*, formerly supposed to be confined to the Llano Estacado of Texas, is a very common bird along the eastern base of the Rocky Mountains, as far north as Cheyenne!

Upon examining a map of Colorado, it will be seen that the topography of this Territory is peculiarly favorable to an extremely varied fauna. The water-shed of the Continent runs across it almost in the middle, the streams on the eastern slope flowing into the Gulf of Mexico through the western tributaries of the Mississippi River, and those of the western slope emptying into the gulf of California, through the northeastern tributaries of the Rio Colorado. The direct result of its central position between several drainage systems is that the general eastern and western faunæ meet, or overlap; the birds characteristic of the Rio Grande district also enter its limits by following the head waters of that stream northward into San Louis Park and the adjacent country, while those of the Arizona district follow the northeastern tributaries of the Colorado River, and diffuse themselves over the western portion. In the northwestern corner

there is also a slight impress of the desert fauna of the Middle Province in consequence of the arid nature of the Green River district, while along the eastern base of the mountains the peculiar fauna of the Plains is the prevailing one upon the grassy foot-hills and prairies.

The following tables will show more clearly the distinct geographical elements in the Colorado avi-fauna. The species with an asterisk (*) prefixed were first found in Colorado by Mr. Aiken.

I. EASTERN SPECIES FOUND IN COLORADO.

	<i>Supposed Western Limit.</i>
1. Turdus fuscescens.	Salt Lake Valley; breeding; common. RIDGWAY.
2. Turdus Swainsoni.	E. Humboldt Mts., Nevada; Sept. RIDGWAY.
3. Galeoscoptes Carolinensis.	Islands of Salt Lake; breeding. RIDGWAY.
4. Harporhynchus rufus.	Eastern base of Rocky Mountains. GOV'T SURVEY.
*5. Sialia sialis.	El Paso Co., Col. AIKEN.
*6. Helminthophaga peregrina.	El Paso Co., Col. AIKEN.
*7. Parula Americana.	El Paso Co., Col.; May 11. AIKEN.
8. Dendroica coronata.	Denver, Col. WERNIGK. El Paso Co. AIKEN.
9. Setophaga ruticilla.	Islands of Salt Lake; breeding. RIDGWAY.
*10. Passerculus savanna.	El Paso Co., Col. AIKEN.
11. Zonotrichia leucophrys.	Wahsatch Mts.; W. slope; breeding. RIDGWAY.
12. Junco hyemalis.	Arizona. COUES. Utah. HENSHAW. Colorado. AIKEN.
13. Spizella monticola.	Col. R. KENNERLY. W. Na.; com. win. res. RIDGWAY.
14. Euspiza Americana.	Denver. ALLEN.
*15. Cyanospiza cyanea.	El Paso Co., Col. AIKEN.
16. Dolichonyx oryzivorus.	Ruby Valley, Nevada, Aug. and Sept. RIDGWAY.
*17. Icterus Baltimore.	El Paso Co., Col. AIKEN.
18. Icterus spurius.	Denver, Colorado. ALLEN.
19. Quiscalus æneus.	Fort Bridger, Wyoming. DREXLER. Col. AIKEN.

- Supposed Western Limit.*
20. *Tyrannus Carolinensis.* W. Na; breeding; S. L. Val.; breeding. RIDGWAY.
21. *Empidonax Traillii.* Antelope Island, Salt Lake; June, 1869. RIDGWAY.
22. *Empidonax minimus.* Fort Bridger, Wyoming. DREXLER. Col. AIKEN.
- *23. *Sphyrapicus varius.* Colorado. AIKEN.
- *24. *Centurus Carolinus.* Colorado. AIKEN.
25. *Melanerpes erythrocephalus.* Salt Lake City; June. RIDGWAY.
26. *Nisus Cooperi* Doubtful.
- *27. *Grus Americanus.* Colorado. AIKEN.
28. *Actiturus Bartramius.* Kamas Prairie, Utah; July; breeding. RIDGWAY.
- *29. *Anas obscura.* Colorado. AIKEN.
30. *Querquedula discors.* W. Nevada; rare; breeding? RIDGWAY.

II. OTHER EASTERN SPECIES FOUND AT MORE WESTERN POINTS, NOT YET DETECTED IN COLORADO.

1. *Cistothorus stellaris.* Utah Lake; breeding. HENSHAW.
2. *Helminthophaga ruficapilla.* California. XANTUS and GRUBER. Ogden, Utah, Sept. ALLEN. E. Humboldt Mts., Na.; Sept. RIDGWAY.
3. *Dendroica Blackburniæ.* Ogden, Utah; Sept. ALLEN.
4. *Seiurus Noveboracensis.* Fort Bridger, Wyoming. DREXLER.
5. *Lanivireo solitaria.* W. and E. Humboldt Mts., Nevada; Sept. RIDGWAY. S. L. Val.; Sept. ALLEN.
6. *Vireosylvia olivacea.* Fort Bridger, Wyoming. DREXLER. Salt Lake Val.; Sept. ALLEN.
- 7? *Plectrophanes Lapponicus.* W. Nevada; winter. RIDGWAY.
8. *Melospiza palustris.* Southern Utah; Oct. HENSHAW.
9. *Passerella iliaca.* Saticoy, Cal.; Nov. DR. COOPER.
10. *Corvus Americanus.* W. Nevada; Oct. and Nov. RIDGWAY.

11. **Coccygus Americanus.** Sac., Cal., June; RIDGWAY. W. Nevada, July and Aug. RIDGWAY. TUCSON, ARIZ.; breeding. BENDIRE. Fort Burgwyn, New Mex. DR. ANDERSON.
- 12? **Coccygus erythrophthalmus.** N. Cal. DR. NEWBERRY.
13. **Hylotomus pileatus.** Columbia River. TOWNSEND.
14. **Colaptes auratus.** California. COOPER.
15. **Ectopistes migratoria.** W. Humboldt Mts., Nevada; Sept. RIDGWAY.

III. SPECIES OF THE SOUTHERN BORDER OF THE U. S., WHICH HAVE BEEN FOUND IN COLORADO, BUT WHICH PROBABLY DO NOT OCCUR IN THE GREAT BASIN AT CORRESPONDING LATITUDES.

a. Found from Florida to California.

- *1. **Mimus polyglottus.** (Colorado bird is var. *caudatus* Baird.)
- *2. **Polioptila cærulea.**
- *3. **Guiraca cærulea.**
- *4. **Cardinalis Virginianus.** (var. *igneus* Baird.)

b. From Florida to the Rocky Mountains.

- *5. **Meleagris gallopavo.** (var. *Mexicana* Gould.)
6. **Demiegretta** — sp. ?

c. From the Rio Grande to California.

7. **Tyrannus vociferans.**
- *8. **Geococcyx Californianus.**
- *9. **Pipilo fusca.** (var. *mesoleuca* Baird.)

d. Eastern base of Rocky Mountains, only.

- *10. **Corvus cryptoleucus.**

IV. WESTERN SPECIES FOUND IN COLORADO, WHICH APPARENTLY DO NOT OCCUR IN CORRESPONDING LATITUDES IN THE GREAT BASIN.

- *1. **Sialia Mexicana.** (Found in western Iowa by Mr. Atkinson!)
- *2. **Lophophanes inornatus.**
3. **Sitta aculeata.**
4. **Sitta pygmæa.**
- *5. **Glaucidium Californicum.**

CATALOGUE OF THE BIRDS KNOWN TO OCCUR IN COLORADO; DISTINGUISHING (WITH AN ASTERISK) THOSE WHICH HAVE BEEN ASCERTAINED TO BREED WITHIN THE LIMITS OF THE TERRITORY, AND APPROXIMATELY INDICATING THEIR RANGE DURING THE BREEDING SEASON.

No birds are included in the following list which are not positively known to occur within the limits of Colorado, nor are any of those marked as breeding in the Territory so distinguished without as good reason. Many species not found by Messrs. Aiken and Allen have been obtained by one or more of the several Government expeditions, chiefly those in charge of Dr. F. V. Hayden, which have from time to time made portions of Colorado their field of exploration.

No.	Species.	Centre of abundance during breeding season.
*1.	Turdus fuscescens STEPHENS.	Along the lower streams.
*2.	Turdus Swainsoni CABANIS.	“ “ mountain “
*3.	Turdus Pallasii CABAN., <i>var. AUDUBONI</i> Baird.	Pine region.
*4.	Turdus migratorius L.	All wooded portions.
*5.	Galeoscoptes Carolinensis (L.).	Along streams.
*6.	Oreoscoptes montanus (TOWNS.).	Artemisia plains.
*7.	Harporhynchus rufus (L.), <i>var. LONGICAUDA</i> Baird.	Foot-hills.
*8.	Mimus polyglottus , <i>var. CAUDATUS</i> Baird.	
*9.	Cinclus Mexicanus SWAINS.	Mt. streams and torrents.
10.	Sialia sialis (L.).	
*11.	Sialia Mexicana SWAINS.	Foot-hills.
*12.	Sialia arctica SWAINS.	Bare portions of mountains, near tree-limit; occasionally breeds lower down.
*13.	Regulus calendula (L.).	Pine region.
14.	Regulus satrapa LIGHT.	
15.	Polioptila cærulea (L.).	
*16.	Lophophanes inornatus (GAMB.).	Foot-hills?
*17.	Parus montanus GAMB.	Pine region.
*18.	Parus atricapillus L., <i>var. SEPTENTRIONALIS</i> Harris.	Streams of lower portions.

No.	Species.	Centre of abundance during breeding season.
*19.	<i>Psaltriparus minimus</i> (TOWNS.), <i>var. PLUMBEUS</i> Baird.	Cañon streams.
*20.	<i>Sitta Carolinensis</i> LATH., <i>var. ACULEATA</i> Cass.	Pine region.
*21.	<i>Sitta pusilla</i> LATH., <i>var. PYGMEA</i> Vig.	" "
*22.	<i>Certhia familiaris</i> L., <i>var. AMERICANA</i> Bonap.	" "
*23.	<i>Salpinctes obsoletus</i> (SAY).	Stony localities—everywhere.
*24.	<i>Catherpes Mexicanus</i> , <i>var. CONSPERSUS</i> Ridgw.	Rocky gorges or precipitous cañons.
*25.	<i>Troglodytes ædon</i> VIEILL., <i>var. PARKMANNI</i> Aud.	All wooded portions, chiefly on mountains.
26.	<i>Troglodytes parvulus</i> KOCH., <i>var. HYEMALIS</i> Vieill.	
*27.	<i>Telmatodytes palustris</i> (WILS.).	Rushes of lakes, ponds, etc., chiefly in valley portions.
*28.	<i>Anthus Ludovicianus</i> (GM.).	Alpine summits.
*29.	<i>Helminthophaga Virginiae</i> BAIRD.	Foot-hills, scrub oaks and "mahogany" woods.
*30.	<i>Helminthophaga celata</i> (SAY).	Aspen woods, near the pine region.
31.	<i>Helminthophaga peregrina</i> (WILS.).	
32.	<i>Parula Americana</i> (L.).	
*33.	<i>Dendroica æstiva</i> (GM.).	Woods everywhere, chiefly lower portions.
34.	<i>Dendroica coronata</i> (L.).	
*35.	<i>Dendroica coronata</i> (L.), <i>var. AUDUBONI</i> Towns.	Pine region.
36.	<i>Dendroica nigrescens</i> (TOWNS.).	Cedar, mahogany and piñon groves.
*37.	<i>Geothlypis Philadelphia</i> (WILS.), <i>var. MACGILLIVRAYI</i> Aud.	Cañons and ravines of mountains.
*38.	<i>Geothlypis trichas</i> (L.).	Along the lower streams, or marshy meadows.
*39.	<i>Icteria virens</i> (L.), <i>var. LONGICAUDA</i> Lawf.	Along streams below pine region.
40.	<i>Myiodioctes pusillus</i> (WILS.).	
*41.	<i>Setophaga ruticilla</i> (L.).	Streams below pine region.

No.	Species.	Centre of abundance during breeding season.
*42.	Progne subis (L.).	Pine region and adjoining aspen woods; occasionally lower.
*43.	Petrochelidon lunifrons (SAY).	Cliffs, everywhere below the Alpine region.
*44.	Hirundo horreorum BARTR.	Caves everywhere.
*45.	Tachycineta bicolor (VIEILL.).	With <i>P. subis</i> .
*46.	Tachycineta thalassina (SWAINS.).	In cliffs with <i>Panyptila melanoleuca</i> ? occasionally in holes with <i>T. bicolor</i> and <i>P. subis</i> ?
*47.	Cotyle riparia (L.).	Earth banks, valley portions.
*48.	Stelgidopteryx serripennis (AUD.).	With <i>C. riparia</i> .
*49.	Vireosylvia gilva , var. SWAINSONI Baird.	All deciduous woods.
*50.	Lanivireo solitaria (WILS.), var. PLUMBEA Coues.	Foot-hills with <i>Helminthophaga Virginia</i> .
51.	Ampelis garrulis L.	
52.	Ampelis cedrorum VIEILL.	
*53.	Myiadestes Townsendii (AUD.).	Cedars of foot-hills and rocky gorges.
54.	Collurio borealis (VIEILL.).	
*55.	Collurio Ludovicianus (L.), var. EXCUBITOROIDES Swains.	Open places at nearly all altitudes.
*56.	Pyrranga Ludovicianus (WILS.).	All wooded places, but chiefly lower part of pine region.
57.	Hesperiphona vespertina , var. MONTANA Ridgw.	
58.	Pinicola enucleator (L.), var. "CANADENSIS Briss."	
*59.	Carpodacus Cassinii BAIRD.	Cottonwoods at lower edge of pine region.
*60.	Carpodacus frontalis (SAY).	Valley portions and foot-hills.
*61.	Chrysomitris pinus (WILS.).	Pine region and adjoining aspen woods.
*62.	Chrysomitris tristis (L.).	Valley portions.
*63.	Chrysomitris psaltria (SAY).	Foot-hills?
64.	Loxia curvirostra L., var. MEXICANA Strickl.	

No.	Species.	Centre of abundance during-breeding season.
65.	Leucosticte tephrocotis SWAINS.	
*66.	Leucosticte tephrocotis , <i>var. AUSTRALIS</i> Allen.	Alpine summits.
67.	Plectrophanes nivalis (L.).	
*68.	Plectrophanes ornatus (TOWNS.).	Plains — eastern base of Rocky Mountains.
*69.	Plectrophanes Maccowni LAWR.	With <i>P. ornatus</i> .
70.	Centronyx Bairdii (AUD.). AIKEN.	Foot-hills.
*71.	Coturniculus passerinus , <i>var. PERPALLIDUS</i> Ridgw.	Meadows, val. portions.
72.	Passerculus savanna (WILS.).	
*73.	Passerculus savanna (WILS.), <i>var. ALAUDINUS</i> Bonap.	With <i>C. passerinus</i> .
*74.	Pooeaetes gramineus , <i>var. CONFINIS</i> Baird.	Mountain parks, chiefly.
*75.	Chondestes grammaca (SAY).	Artemisia plains; occasionally mt. parks.
*76.	Zonotrichia leucophrys (FORST.).	Mountain parks.
77.	Zonotrichia leucophrys (FORST.). <i>var. INTERMEDIA</i> Ridgway.	
78.	Junco hyemalis (L.).	
79.	Junco hyemalis , <i>var. AIKENI</i> Ridgway.	
*80.	Junco hyemalis (L.), <i>var. CANICEPS</i> Woodh.	Pine region.
81.	Junco hyemalis (L.), <i>var. ANNECTENS</i> Baird.	
82.	Junco hyemalis (L.), <i>var. OREGONUS</i> Towns.	
*83.	Poospiza bilineata (CASS.).	Artemisia plains. (Colorado drainage only?)
*84.	Poospiza Bellii , <i>var. NEVADENSIS</i> Ridgw.	With <i>P. bilineata</i> .
85.	Spizella monticola (GM.).	
*86.	Spizella socialis , <i>var. ARIZONÆ</i> Coues.	Woods, chiefly foot-hills.
*87.	Spizella pallida (Sw.).	Only east of the foot of the mountains; plains and foot-hills.
*88.	Spizella pallida (Sw.), <i>var. BREWERI</i> Cass.	Artemisia plains.

No.	Species.	Centre of abundance during breeding season.
*89.	Melospiza melodia (WILS.), <i>var. FALLAX</i> Baird.	Vicinity of streams up to the pine region.
*90.	Melospiza Lincolni (AUD.).	Mountain parks.
*91.	Passerella iliaca (MERR.), <i>var. SCHISTACEA</i> Baird.	Streams of the mountain parks.
*92.	Calamospiza bicolor (TOWNS.).	Plains, chiefly eastward of the mountains.
*93.	Euspiza Americana (GM.).	Plains east of the mountains. Denver(ALLEN).
*94.	Hedymeles melanocephalus (SWAINS.).	Margin of streams below pine region.
95.	Guiraca cærulea (L.).	
96.	Cyanospiza cyanea (L.).	
*97.	Cyanospiza amœna (SAY).	Streams and scrub below pine region.
98.	Cardinalis Virginianus (BRISS.), <i>var. IGNEUS</i> Baird?	
*99.	Pipilo erythrophthalmus (L.), <i>var. ARCTICUS</i> Swains.	Eastern foot-hills and val. streams east of the mts.
*100.	Pipilo erythrophthalmus (L.), <i>var. MEGALONYX</i> Baird.	Western foot-hills and mountain streams.
*101.	Pipilo chlorura (TOWNS.).	Mountain parks.
102.	Pipilo fusca Sw., <i>var. MESOLEUCA</i> Baird.	
103.	Eremophila alpestris (L.), <i>var. "CORNUTA</i> Wils."	
104.	Eremophila alpestris (L.), <i>var. OCCIDENTALIS</i> McCall.	
*105.	Eremophila alpestris (L.), <i>var. CHRYSOLEMA</i> Wagl.	Arid plains.
106.	Dolichonyx oryzivorus (L.), <i>var. ALBINUCHA</i> Ridgw.	
*107.	Molothrus pecoris (GM.).	Chiefly the val. portions.
*108.	Xanthocephalus icterocephalus (BONAP.).	Marshes of the valleys.
*109.	Agelaius phœniceus (L.).	With <i>X. icterocephalus</i> .
*110.	Sturnella magna (L.), <i>var. NEGLECTA</i> Aud.	Meadows below the pine region.
111.	Icterus Baltimore (L.).	
*112.	Icterus Bullockii SWAINS.	All wooded portion below the pine region.

No.	Species.	Centre of abundance during breeding season.
113.	<i>Icterus spurius</i> (L.).	Streams of lower portions. Denver (ALLEN).
*114.	<i>Scolecophagus cyanocephalus</i> (WAGL.).	Foot-hills, cedar woods.
115.	<i>Quiscalus purpureus</i> , <i>var. AENEUS</i> Ridgw.	
*116.	<i>Corvus corax</i> L., <i>var. CARNIVORUS</i> Bartr.	Everywhere.
*117.	<i>Corvus cryptoleucus</i> COUCH.	
*118.	<i>Picicorvus columbianus</i> (WILS.).	Pine region.
*119.	<i>Gymnokitta cyanocephala</i> (PR. MAX.).	Piñon woods of foot-hills.
*120.	<i>Pica caudata</i> L., <i>var. HUDSONICA</i> J. Sabine.	Streams below the pine region.
*121.	<i>Cyanura Stelleri</i> (GM.), <i>var. MACROLOPHA</i> Baird.	Pine region.
*122.	<i>Cyanocitta Florida</i> (BARTR.), <i>var. WOODHOUSEI</i> Baird.	Foot-hills and lower mountain streams.
*123.	<i>Perisoreus Canadensis</i> , <i>var. CAPITALIS</i> Baird.	Pine region.
*124.	<i>Tyrannus Carolinensis</i> (L.).	Lower portions and mountain parks.
*125.	<i>Tyrannus verticalis</i> SAY.	With <i>T. Carolinensis</i> .
*126.	<i>Tyrannus vociferans</i> SWAINS.	
*127.	<i>Contopus borealis</i> SWAINS.	Pine region.
*128.	<i>Contopus Richardsonii</i> SWAINS.	All woods below pine reg.
*129.	<i>Myiarchus crinitus</i> (L.), <i>var. CINERASCENS</i> LAW.	Streams up to the mountain parks.
*130.	<i>Sayornis Sayus</i> BONAP.	Rocky arid portions, plains and cañons.
131.	<i>Empidonax Traillii</i> (AUD).	
*132.	<i>Empidonax pusillus</i> (SWAINS).	Willows along streams up to the parks.
*133.	<i>Empidonax flaviventris</i> BAIRD, <i>var. DIFFICILIS</i> Baird.	Pine region.
134.	<i>Empidonax minimus</i> BAIRD.	
135.	<i>Empidonax Hammondii</i> XANTUS.	
*136.	<i>Empidonax obscurus</i> (SWAINS.).	Aspen woods below the pine region.
*137.	<i>Ceryle alcyon</i> (L.).	Chiefly valley portions and parks.

No.	Species.	Centre of abundance during breeding season.
*138.	Chordeiles popetue (VIEILL.), <i>var.</i> HENRYI Cass.	Valleys, foot-hills and parks.
*139.	Antrostomus Nuttalli AUD.	Chiefly valleys and foot-hills; open places.
*140.	Panyptila melanoleuca BAIRD.	Rocky cliffs, chiefly in the mountains. Limestone precipices preferred.
*141.	Trochilus Alexandri BOURC. and MULS.	Green River district, or western slope only? up to the parks.
*142.	Selasphorus platycercus (SWAINS.).	Chiefly the parks.
143.	Geococcyx Californianus (LESS.).	
*144.	Picus villosus (L.), <i>var.</i> HARRISII Aud.	All wooded places.
145.	Picus pubescens (L.), <i>var.</i> GAIRDNERI Aud.	Lower edge of pine region.
146.	Picoides tridactylus (L.), <i>var.</i> DORSALIS Baird.	Pine region near the upper edge.
147.	Sphyrapicus varius (L.).	
*148.	Sphyrapicus varius , <i>var.</i> NUHALIS Baird.	Aspens just below the pine region.
*149.	Sphyrapicus thyroideus (CASS.)	Pine region.
150.	Centurus Carolinus (L.).	
151.	Melanerpes erythrocephalus (L.).	
*152.	Melanerpes torquatus (WILS.).	Foot-hills and valley streams.
*153.	Colaptes auratus (L.), <i>var.</i> MEXICANUS Swains.	All wooded places.
*154.	Speotyto cunicularia (MOL.), <i>var.</i> HYPOGÆA Bonap.	Artemisia plains and foot-hills.
155.	Glaucidium passerinum (L.), <i>var.</i> CALIFORNICUM ScL?	
*156.	Bubo Virginianus (GM.), <i>var.</i> ARCTICUS Swains.	All wooded portions.
157.	Scops asio (L.), [<i>var.</i> MACCALLI Cass. ?].	
*158.	Otus vulgaris (FLEM.), <i>var.</i> WILSONIANUS Less.	Willow thickets along streams.
159.	Falco communis GMEL., <i>var.</i> ANATUM Bonap.	Rocky places in vicinity of water.

No.	Species.	Centre of abundance during breeding season.
*160.	Falco lanarius L., var. <i>POLYAGRUS</i> Cass.	Rocky cañons and open plains.
161.	Falco columbarius LINN.	
162.	Falco Richardsonii RIDGW.	
*163.	Falco sparverius L.	All timbered places.
*164.	Circus cyaneus (L.), var. <i>HUDSONIUS</i> L.	Marshes, chiefly in the valleys.
*165.	Nisus fuscus (GM.).	Lower wooded districts.
?166.	Nisus Cooperi (BONAP.).	
*167.	Nisus Cooperi (BONAP.), var. <i>MEXICANUS</i> Swains.	With <i>N. fuscus</i> .
168.	Astur palumbarius (L.), var. <i>ATRICAPILLUS</i> Wils.	
*169.	Buteo Swainsoni BONAP.	Everywhere; breeds chiefly among scattered aspens in parks and scrub oaks on foot-hills.
*170.	Buteo borealis (GM.), var. <i>CALURUS</i> Cass.	Everywhere.
*171.	Archibuteo ferrugineus (LICHT.).	
172.	Archibuteo lagopus (BRÜNN.), var. <i>SANCTI-JOHANNIS</i> Gm.	
*173.	Aquila chrysaëtus L., var. <i>CANADENSIS</i> L.	Rocky portions of the mountains.
174.	Haliaëtus leucocephalus (BRISS.).	Vicinity of rivers and lakes.
175.	Pandion haliaëtus (L.), var. <i>CAROLINENSIS</i> Gm.	With <i>H. leucocephalus</i> .
*176.	Cathartes aura (L.).	Everywhere below the pine region.
*177.	Zenædura Carolinensis (L.).	Everywhere below the pine region.
*178.	Meleagris gallopavo L.	
*179.	Canace obscura (SAY).	Pine region and parks.
*180.	Bonasa umbellus (L.), var. <i>UMBELLOIDES</i> Douglas.	Pine region.
*181.	Centrocercus urophasianus (BONAP.).	Artemisia plains.
*182.	Pediocaëtes phasianellus (L.), var. <i>COLUMBIANUS</i> Ord.	Rye grass meadows.
*183.	Lagopus leucurus SWAINS.	Alpine summits.

No.	Species.	Centre of abundance during breeding season.
184.	Grus Americanus (L.).	
*185.	Grus Canadensis (L.).	Marshy meadows, chiefly in valleys.
*186.	Ardea herodias L.	Lower portions.
187.	Demiegretta ——sp.?	
*188.	Botaurus lentiginosus STEPH.	Lower portions.
*189.	Ibis guarauna (GM.).	Marshes of valleys.
*190.	Ægialitis vociferus (L.).	Streams below the pine region.
*191.	Ægialitis montanus (TOWNS.).	
192.	Charadrius pluvialis (L.), <i>var. VIRGINICUS</i> Borch.	
193.	Gallinago gallinaria (GM.), <i>var. WILSONII</i> Temm.	
194.	Macrorhamphus griseus (GM.).	
195.	Pelidna alpina , <i>var. AMERICANA</i> Cass.	
196.	Actodromus maculatus (VIEILL.).	
197.	Actodromus Bairdii COUES.	
198.	Actodromus minutilla (VIEILL.).	
199.	Ereunetes pusillus (L.).	
*200.	Symphemia semipalmata (GM.).	Streams or marshes of valleys and parks.
201.	Gambetta melanoleuca (GM.).	
202.	Gambetta flavipes (GM.).	
*203.	Rhyacophilus ochropus (L.), <i>var. SOLITARIUS</i> (Wils.).	Valleys and parks.
*204.	Tringrides hypoleucus (L.), <i>var. MACULARIUS</i> (L.).	With <i>R. solitarius</i> .
205.	Actiturus Bartramius (WILS.).	Prairies and meadows, chiefly east of the mts.
*206.	Numenius longirostris WILS.	Meadows of valleys.
*207.	Recurvirostra Americana GM.	Marshes, chiefly in the vicinity of alkaline ponds.
*208.	Himantopus nigricollis VIEILL.	With <i>R. Americana</i> .
*209.	Phalaropus Wilsonii SAB.	Ponds of val. portions.
210.	Rallus Virginianus L.	
*211.	Porzana Carolina VIEILL.	Marshes of parks and valleys.
*212.	Fulica Americana GM.	Ponds, chiefly in valleys.

No.	Species.	Centre of abundance during breeding season.
213.	Cygnus Americanus SHARPLESS.	
*214	Branta Canadensis (L.).	Secluded lakes.
215.	Branta Canadensis (L.), var. HUTCHINSII Rich.	
*216.	Anas boschas L.	Ponds and marshy mead. chiefly in the valleys.
217.	Anas obscura GM.	
218.	Dafla acuta (L.).	With <i>A. boschas</i> .
*219.	Nettion Carolinensis (GM.).	
*220.	Querquedula discors (L.).	
*221.	Querquedula cyanoptera (VIEILL.).	
*222.	Spatula clypeata (L.).	
*223.	Chaulelasmus streperus (L.).	
*224.	Mareca Americana (GM.).	
225.	Aix sponsa (L.).	
226.	Fulix marila (L.).	
227.	Fulix marila (L.), var. AFFINIS Forst.	
228.	Fulix collaris (DONOV.).	
229.	Aythya Americana (EYTON).	
230.	Aythya vallisneria (WILS.).	
231.	Bucephala Americana (BON.).	
232.	Bucephala albicola (L.).	
*233.	Erismatura rubida (WILS.).	
234.	Mergus merganser L., var. AMERICANUS Cass.	
235.	Lophodytes cucullatus (L.).	
*236.	Pelecanus erythrorhynchus GM.	
237.	Larus — sp?	
238.	Larus Delawarensis ORD.	
*239.	Sterna Forsteri NUTT.	
240.	Hydrochelidon fissipes (L.).	
241.	Colymbus glacialis L., var. TORQUATUS Brünn.	
242.	Podiceps auritus (L.), var. CALIFORNICUS Herrm.	
243.	Podylimbus podiceps (L.).	

*The ducks and other *Natatores* nearly all breed in the same localities.

NOTES ON THE SPECIES IN THE PRECEDING CATALOGUE.

11. *SIALIA MEXICANA*. I have not seen specimens of this species from the Rocky Mountains, and do not know whether they present any features of a geographical race different from that found on the Pacific coast. On the eastern base of the Sierra Nevada, I obtained specimens without a trace of brown on the back, and with that of the breast divided into two isolated patches—one on each side—by a blue “isthmus,” connecting the blue of the throat and that of the abdomen.

16. *LOPHOPHANES INORNATUS*. In this species the difference between Pacific coast and Rocky Mountain specimens is very marked, the former being much browner than the latter; but there being no difference in proportions, or other respects, the differentiation scarcely amounts to that of a race.

24. *CATHERPES MEXICANUS*, var. *CONSPERSUS* Ridgway. See *Am. Nat.*, vol. vii, No. 10, Oct., 1873, p. 603.

57. *HESPERIPHONA VESPERTINA*, var. *MONTANA* Ridgway. See “*Birds of California*,” I, p. 175. Two specimens from Mr. Charles Douglas, of Waukegan, Illinois, collected at the latter place in the winter of 1873 (January or February), are perfectly typical examples of this southern race, the characteristic features of which are the absence of the white spots on tail feathers, tail-coverts and primaries, and much narrower yellow frontlet than in the northern form. In this case we see, as in that of *Chrysomitris psaltria*, an instance of increased melanism to the southward.

64. *LOXIA CURVIROSTRA*, var. *MEXICANA*. Though this is the resident form on the high mountains of Colorado, the var. *Americana* no doubt occurs in winter. I obtained the latter in the East Humboldt Mountains in September, and it was then common there. *L. leucoptera* was also common at the same time, and a beautiful male was seen about the middle of August on that range, leading to the suspicion that the species may breed on the higher portions of the Rocky Mountains and justifying the belief that it will at least be found in winter on the mountains of Colorado.

66. *LEUCOSTICTE TEPHROCOTIS*, var. *AUSTRALIS* Allen. This form was first noticed by Mr. Allen in the “*American Naturalist*,” and subsequently in the “*Bulletin of the Museum of Comparative Zoology*,” as cited below. Its synonymy and characters are as follows:—
Leucosticte tephrocotis, var. *Australis* ALLEN.

Leucosticte tephrocotis ALLEN, Am. Nat., vi, No. 5, May, 1872. *Ib.*, Bull. Mus. Comp. Zool., vol. iii, No. 6, p. 177.

CH. Similar to var. *tephrocotis*, but without any gray on the head, the red of the abdomen and wing-coverts bright carmine, instead of dilute rose color, and the bill deep black, instead of mostly yellow. Prevailing color umber brown (more earthy than in *tephrocotis*) becoming darker on the head, and approaching to black on the forehead. Nasal tufts white. Wings and tail dusky, the secondaries and primaries skirted with paler; lesser and middle wing-coverts, and upper and lower tail-coverts, broadly tipped with rosy carmine, producing nearly uniform patches. Abdominal region with the feathers broadly tipped with bright carmine or intense crimson, this covering, nearly uniformly, the whole surface. Bill and feet deep black.

Male (original No. 963, Mt. Lincoln, Colorado Territory, July 25, 1871; J. A. Allen). Wing, 4·20; tail, 3·10; culmen, ·45; tarsus, ·70; middle toe, ·60.

Female (No. 960, same locality, etc.). Wing, 4·00; tail, 3·00. Colors paler and duller, with the red almost obsolete.

Hab. Mt. Lincoln, Colorado. Breeding above the timber line (Allen).

70. CENTRONYX BAIRDII (Aud.) = C. OCHROCEPHALUS Aiken. Mr. Aiken has collected a second specimen of this bird at the same locality where the first one was procured, in El Paso Co. This one, collected May 6, 1873, being in spring plumage is so decidedly intermediate between Audubon's original type of *C. Bairdii* (in worn, faded midsummer dress) and the autumnal specimen which Mr. Aiken characterized as *C. ochrocephalus* (Am. Nat., vol. vii, No. 4, p. 236) that there is every probability of all three specimens being the same species in different seasonal stages. Mr. Aiken is not to blame for describing his first specimen as a new species, for he, not having an opportunity to compare it with the original *C. Bairdii*, trusted the identification of the specimen to me, and at my suggestion described it as new, the great difference between the two specimens warranting, in my opinion at the time, a specific separation.

The last specimen collected by Mr. Aiken is in my collection (No. 2,141). Its measurements are as follows:—wing, 2·80; tail, 2·10; culmen, ·45; tarsus, ·80; middle toe, ·60. "Length, 5·62; extent, 9·04. Legs and lower mandible, flesh color; upper mandible, horn color, the tip lighter; toes and claws dusky." No. 1,266, Aiken's Coll., El Paso Co., Colorado, May 6, 1873.

Dr. Elliott Coues, the naturalist of the Northern Boundary Survey, in charge of Commissioner A. Campbell, has taken during the past summer, but since Mr. Aiken's captures, about seventy specimens of

this species along the northern border of Dakota, in the neighborhood of the head waters of the Souris River. For a very interesting article in this connection the reader is referred to the "American Naturalist," vol. vii, Nov., 1873, p. 695.

I am also informed by letter from Mr. H. W. Henshaw, the naturalist of the government exploring expedition in New Mexico and Arizona, in charge of Lieutenant George M. Wheeler, U. S. Engineer Corps, that he has collected about thirty specimens during the course of their summer's explorations, in southeastern Arizona and western New Mexico. This species cannot, therefore, be longer considered one of the rare birds of North America.

71. COTURNICULUS PASSERINUS, var. PERPALLIDUS Ridgway. See Coues' Key, p. 137.

79. JUNCO HYEMALIS, var. AIKENI Ridgway. See Am. Nat., vol. vii, No. 10, p. 615; Oct., 1873.

84. POOSPIZA BELLII, var. NEVADENSIS Ridgway.

CH. Like *P. Bellii*, but much larger and all the colors paler; purer ashy above, with very distinct streaks on the back. Wing, 3.20 (instead of 2.50); tail, 3.20 (instead of 2.50); culmen, .35; tarsus, .76.

HAB. Entire area of the Middle Province of the U. S.; east to Green River, Wyoming; northward resident to-beyond the parallel of 40°.

87. SPIZELLA PALLIDA. The possibility of *S. pallida* Swain. and *S. Breweri* Cass. being regional modifications of the same species is rendered very doubtful by two facts, viz.: (1), that they have been taken together at the same locality, and (2) that intermediate specimens have not been seen. Mr. Allen collected numerous typical examples of both forms at Cheyenne, yet his collections did not contain a single specimen which could not be referred immediately to one or the other. *S. pallida* replaces *S. Breweri* in Lower California, thus having a somewhat remarkable range, exactly paralleled, however, by that of *Zonotrichia leucophrys*, which is abundant at the cape to the exclusion of var. *gambelii*.

91. PASSERELLA ILIACA (L.), var. SCHISTACEA Baird. Though no specimens intermediate between *iliaca* and *schistacea* have yet been found, Dr. Cooper has recently (Nov., 1872) collected, at Saticoy, California, a specimen which combines about equally the characters of *iliaca* and *Townsendii*. The latter grades into *schistacea* through Fort Tejon specimens.

98. For a synopsis of the genus *Cardinalis*, see Am. Nat., vol. vii, No. 10, p. 618; Oct., 1873.

102. PIPILO FUSCA (Swains.), var. MESOLEUCA Baird. That the *P. fusca* of Swainson and the *P. mesoleuca* of Baird are not exactly the same bird is proven by a comparison of Mexican examples with specimens from the Colorado Province of the U. S. (See Coues' Key, p. 152.)

100. PIPILO ERYTHROPHTHALMUS (Sw.), var. MEGALONYX Baird. On p. 117 of his "Ornithological Reconnaissance," Mr. Allen remarks in relation to the black Pipilos that "in Mexico, *P. megalonyx* is well known to grade through *P. macronyx* into *P. maculatus*." This is a great mistake, for though *megalonyx* certainly does run into *maculatus*, the latter is the southern extreme of differentiation in the species, *P. macronyx* being a widely distinct species, about as nearly related to *P. chlorura* as to the forms of *erythrophthalmus*.

103, 104 and 105. EREMOPHILA ALPESTRIS (L.), vars. "CORNUTA" Wils., OCCIDENTALIS McCall, and CHRYSOLÆMA Wagl. These are three geographical races of one species, which become mingled in the course of their migrations. Var. *cornuta*, most like true *alpestris* of Europe, and indeed hardly distinguishable, breeds in the northern portions of the eastern region from Hudson's Bay to Illinois; var. *occidentalis* is a pallid, white-throated form which breeds on the northern plains; var. *chrysolæma* is a resident southern or subtropical form, of smaller size, longer bill and much deeper colors. All three become mixed in winter.

106. DOLICHONYX ORYZIVORUS, var. ALBINUCHA Ridgway.

CH. Similar to eastern specimens, var. *oryzivorus*, but the black more intense and uniform, the nuchal patch immaculate creamy-white, or very pale ochraceous; scapulars and lower rump pure white, not tinged with ashy, and upper part of the rump scarcely tinged with ash. Wing, 3·90-4·10; tail, 3·10; culmen, ·55-·60; depth of bill, ·30-·35; tarsus, 1·10; middle toe, ·85-·90.

Hab. Missouri Plains and Rocky Mountains, west to Ruby Valley, Nevada; Salt Lake Valley.

115. QUISCALUS PURPUREUS, var. ÆNEUS Ridgway. In his "Key to North American Birds," Dr. Coues is at fault in several respects in his statements regarding the purple grackles of the United States. Of the present form, Dr. Coues remarks (p. 161):—

"*Obs.* The *Quiscalus æneus*, lately described as a new species by Mr. Ridgway, appears to be based upon a special plumage of *Q. purpureus*; and since it does not prove to be confined, as its describer believed, to any particular region, I should judge it not entitled to rank as a geographical variety." Both of these remarks need correction. In the first place, my *Quiscalus æneus* was based upon a form

which was distributed, as its habitat was then known, over the entire region between the Alleghany and Rocky Mountains, and also the interior of British America, besides the eastern portion of the latter country, and southward to Maine. Not a single specimen had then, nor has since, been seen from any part of this vast extent of territory, which approached in characters the form peculiar to the southern Atlantic states — *Q. purpureus*. The latter was at that time supposed to extend northward to Nova Scotia; this mistake being brought about by the entire want of specimens from the New England states. Abundant material since received from all points along the Atlantic coast, however, shows that only *Q. æneus* is found from New York City and Long Island northeastward, and that it is only as far north as northern New Jersey and eastern Pennsylvania that *purpureus* extends, except as a straggler. Even at Washington, D. C., *æneus* is by no means rare, but, strange to say, when mixed with *purpureus*, still retains its own characteristics. In the parks of that city I have seen pairs of both species walking tamely about on the grass, *but never saw the two forms paired together*, and could even distinguish the two by their different appearance and actions before I was near enough to distinguish by coloration. The proportionate numbers of the two at Washington are about one pair of *æneus* to fifty or seventy-five pairs of *purpureus*. Nearer the coast, and especially farther southward, east of the Alleghanies, the former disappears altogether. My present view is, that *æneus*, *purpureus* and *aglæus*, are three climatic, or geographical races, of one species; at least they are descended from one primitive stock; *purpureus* is intermediate between the two opposite extremes or most widely differentiated forms, *æneus* and *aglæus*, but more so in habitat than in characters, for while *purpureus* passes by a gradual transition into *aglæus* through specimens from northern Florida, *æneus* is almost abruptly separated, and, even when associated geographically, preserves its own distinctive characters with such unusual uniformity that it is a question whether it is not already differentiated beyond the "varietal stage."

123. PERISOREUS CANADENSIS, var. CAPITALIS Baird.

CH. (61,084, Henry's Fork, Wyoming Ter.; F. V. Hayden.) Above fine light bluish plumbeous, becoming much lighter on the anterior portion of the back; tertials, secondaries, wing-coverts, primaries and tail feathers passing into whitish terminally, forming on the latter quite broad and distinct tips. A nuchal patch of a tint slightly darker than the back, and separated from the latter by the hoary whitish of the anterior dorsal region. Whole of the head, except the nuchal patch, with the anterior lower parts, as far as the breast, pure white; rest of the lower parts ashy-white, becoming gradually more ashy

posteriorly. Wing, 5·80; tail, 6·00; culmen, 1·00. *Young* (18,440, Ft. Benton, April 23, J. A. Mullen). Generally ashy plumbeous, with a decided bluish cast to the wings and tail; orbital region, lores, forehead and nasal tufts blackish; crown, a broad space below the eye, from the bill across the auricular, with the middle of the abdomen, pale hoary ash. Wings and tail as in the adult.

Hab. Rocky Mountains north of New Mexico.

The three very well marked climatic races of this species may be defined as follows:

A. Dusky nuchal hood reaching forward to, or to in front of, the eyes; sooty plumbeous black.

1. White frontal patch narrower than the length of the bill, blending gradually with the blackish of the crown. Upper parts umber brownish. *Young.* Entirely plumbeous-brown, the feathers of the crown bordered with paler. Beneath paler. Wing, 5·50; tail, 5·40; culmen, ·90; depth of bill, ·30. *Hab.* Northwest coast, from the Columbia to Alaska. *Var. obscurus.**

2. White frontal patch much broader than the length of the bill; abruptly defined, with a convex outline, against the dusky of the occiput. Upper parts dull plumbeous. *Young.* Entirely uniform dark plumbeous. Wing, 5·25; tail, 5·80; culmen, ·95; depth of bill, ·35. *Hab.* British America, from the Yukon district of Alaska to Maine and Labrador. *Var. Canadensis.*

B. Dusky nuchal hood confined to the nape, and bluish plumbeous.

3. White frontal patch covering the whole pileum, and melting gradually into the plumbeous of the nape; upper parts hoary plumbeous, inclining to bluish-ash. *Young.* Bluish plumbeous, inclining to ashy-white on the crown and cheeks. Wing, 6·00; tail, 6·00; culmen, 1·00; depth of bill, ·31. *Hab.* Rocky Mountains of the United States. *Var. capitalis.†*

141. The *STELLULA CALLIOPE* Gould is also likely to occur on the western slope of Colorado. I found it as far east as the East Humboldt Mountains in eastern Nevada.

146. *PICOIDES TRIDACTYLUS* (L.), var. *DORSALIS* Baird. The American three-toed woodpeckers are clearly referrible to the

* *Perisoreus Canadensis*, var. *obscurus* Ridgway, MSS.

† *Perisoreus Canadensis*, var. *capitalis* Baird, MSS.

European species (*P. tridactylus* L.). The latter has two well-marked climatic races — a large, very light colored northern one (var. *crissoleucus* Brandt) and a smaller, darker southern one (var. *tridactylus* L.). The former has the back white longitudinally, somewhat like our var. *dorsalis*, but differs very decidedly in other respects. One is hardly justified in saying that “all the species of this genus are unquestionably modified derivatives of one circumpolar stock” (see Coues, Key, p. 194); and the statement that “the American seem to have become completely differentiated from the Asiatic and European” is equally objectionable. A comparison of *dorsalis* and *Americanus* with the Old World forms, shows plainly that the amount of differentiation scarcely comes up to the qualifications of a difference of race. A comparison of *arcticus* with the rest also shows that bird to possess every requirement of an independent, and truly distinct species.

149. SPHYRAPICUS THYROIDEUS (Cass.). Though this species is not given in Mr. Allen's list, he nevertheless collected it in Colorado, but the specimen being in immature plumage was identified as *S. nuchalis*.

155. GLAUCIDIUM (PASSERINUM, var. CALIFORNICUM?). Not having seen the specimens of the pygmy owl collected by Mr. Aiken in Colorado, I cannot say positively that they belong to this species. They are quite as likely to be *G. ferrugineum*, which was collected in Arizona by Lieut. Charles Bendire, U. S. A. (See Am. Nat. vi, 370, and Coues' Key, p. 206.)

178. MELEAGRIS GALLOPAVO. Mr. Aiken has not informed me whether the Colorado bird is var. *gallopavo*, extending northward along the mountains, or the eastern form (var. *sylvestris*) reaching westward to the mountains by following the wooded valleys of the rivers across the plains. It is most likely, however, to be the former.

187. DEMIEGRETTA sp? This is probably the *D. Ludoviciana*. See ALLEN, Bull. Mus. Comp. Zool., Vol. iii, No. 6, p. 153.

237. LARUS sp.? This gull is probably the *L. argentatus*, var. *Californicus*, which I found breeding very abundantly at Pyramid Lake, Nevada, and less numerously at Great Salt Lake, on Carrington Island.

It is difficult to see Dr. Coues' reasons for referring this form to *Delawarensis*, since it has no points at all in common with the latter species, from which it is perfectly distinct, though clearly referrible to *argentatus*.

REGULAR MEETING, MONDAY, NOV. 17, 1873.

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 Mary J. Safford Blake, Boston, Nov. 6; Samuel A. Drake, Boston, Nov. 12; A. P. Hamblet, Oct. 22; C. H. Higbee, Boston, Nov. 11; T. Morong, Ipswich, Nov.; Edward Palmer, Cambridge, Oct. 2; W. S. Perry, Geneva, Nov. 3, 11; C. P. Preston, Danvers, Nov. 10; John L. Robinson, Wenham, Nov. 15; A. Stevens, North Andover, Oct. 28; John A. Vinton, Winchester, Nov. 5, 15; Ashbel Woodward, Franklin, Conn., Nov. 3; William H. Yeomans, Columbia, Conn., Sept. 22; Cincinnati Public Library, Oct. 31; New York Genealogical and Biographical Society, Nov. 15; Wisconsin State Historical Society, Nov. 11; U. S. Dep't Agriculture, Washington, Nov. 12; U. S. Naval Observatory, Washington, Nov. 3.

The LIBRARIAN reported the following additions:—

By Donation.

BALLARD, JOSEPH, of Boston. Account of the Poor Fund and other Charities held in trust by the Old South Society of Boston. 1 vol. 8vo.

BEMIS, LUKE, of West Chester, Pa. Historical Sketches of Plymouth, Luzerne Co., Pa., by H. B. Wright. 1 vol. 8vo.

DIKE, MRS. JOHN, HEIRS OF THE LATE. Newton's Works. 5 vols. 8vo. Miller's Retrospect. 2 vols. 8vo. Evangelical Magazine. 1 vol. 8vo. Sermons by S. Worcester, D.D. 1 vol. 8vo. Sentiments on Resignation. 1 vol. 12mo. Life of Miss Anthony. 1 vol. 8vo. Letters on Early Rising. 1 vol. 12mo. South-Side View of Slavery. 1 vol. 12mo. Sermons by E. Thayer. 1 vol. 12mo. Review of the Mexican War. 1 vol. 12mo. Letters and Papers of the late Rev. Thomas Scott, D.D. 1 vol. 12mo. Family Prayers. 1 vol. 12mo. Force of Truth. 1 vol. 18mo. Scripture Promises, by S. Clark. 1 vol. 12mo. The Family Instructor. 1 vol. 12mo. Moral Sketches by H. More. 1 vol. 16mo. Chalmers' Works. 3 vols. 12mo. Salem Directories for 1837, 1842, 1846, 1851, 1855. 5 vols. 16mo. Monthly Anthology. 1 vol. 8vo. Beauties of the Spectator. 1 vol. 12mo. Boston Almanac, 1844. 1 vol. 16mo. Questions of Scripture Biography. 3 vols. 16mo. Land of Canaan. 1 vol. 12mo. Almanacs, 39. The Christian World, 91 nos. The Panoplist, 29 nos. The American and Foreign Christian World, 58 nos. Missionary Herald, 75 nos. The Home Missionary, 47 nos. African Repository, 64 nos. Miscellaneous pamphlets, 50.

UNKNOWN. Memoirs of the Marstons of Salem. 8vo pamph.

U. S. NAVAL OBSERVATORY, of Washington, D. C. Washington Astronomical Observations, 1851-1852. 1 vol. 4to. Astronomical and Meteorological Observations, 1870. 1 vol. 4to. Catalogue of Stars, 1845-1871. 1 vol. 4to. Washington Observations for 1870, Appendix. 1 vol. 4to. Washington Zones, 1846-1849. 3 vols. 4to.

J. P. Franks, of Salem, was elected a resident member.

BULLETIN
OF THE
ESSEX INSTITUTE.

VOL. 5. SALEM, MASS., DEC., 1873. No. 12.

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

REGULAR MEETING, MONDAY, NOV. 17, 1873.

[Continued.]

MR. F. W. PUTNAM presented the following communication:—

ON SOME NEW FORMS OF AMERICAN BIRDS.*

BY SPENCER F. BAIRD AND ROBERT RIDGWAY.

THE following diagnoses conclude a series commenced in the October number of the "American Naturalist," and are believed to be all the undescribed North American land birds known to the authors at the present time. A more detailed account of them is given in our "History of North American Birds," soon to be issued by Little & Brown, Boston.

Leucosticte tephrocotis, var. *australis* ALLEN.

Leucosticte tephrocotis ALLEN, Amer. Nat., vi, May, 1872. IB. Bull. Mus. Comp. Zool., iii, No. 6, pp. 121, 162 and 177.

Leucosticte tephrocotis, var. *australis* ALLEN. (Ms. name on labels.)

*Continued from the October number of the "American Naturalist," Vol. vii, 1873.

CH. Differing from var. *tephrocotis* in having no gray on the head, the bill deep black, and the red an intense carmine; the latter, in high plumaged males, reaches forward, in a strong tinge, to the chin and cheeks. *Hab.* Mt. Lincoln, Colorado. Breeding above the timber line, at altitude of about 12,000 feet. (Types, ♂, No. 963, J. A. A.; ♀, No. 960, J. A. A., Mt. Lincoln, Colorado, July 25, 1871.)

Ammodromus maritimus, var. *nigrescens* RIDGWAY.

CH. Brownish black above, the outer edges of the dorsal feathers narrowly whitish. Beneath pure white, thickly streaked everywhere with black. Supra-loral spot and bend of wing bright yellow. Wing, 2·40; tail, 2·45; culmen, ·45; tarsus, ·90; middle toe, ·60. *Hab.* Southern Florida (Indian River). (Type, No. 1855, ♂ *ad.*, Indian River, Fla., Apr. 4, 1872. Mus. R. R.)

REMARKS.—We owe this new, and very remarkable, race to the indefatigable researches of Mr. C. J. Maynard, who procured a number of specimens. The form is a very striking and extreme example of the melanistic tendency to the southward.

Zonotrichia leucophrys, var. *intermedia* RIDGWAY.

CH. Resembling var. *Gambeli* of the Pacific coast, but colors purer and grayer, the dorsal streaks chestnut-brown instead of sooty-black, and the ash of the breast purer. *Hab.* Middle Province of the U. S., north to Alaska in the interior.

Poospiza Bellii, var. *Nevadensis* RIDGWAY.

CH. Like var. *Bellii*, but much larger, and the colors lighter and grayer, the back with very distinct streaks. *Hab.* Great Basin of the U. S., throughout its whole extent. (Type, No. 53, 516, ♂ *ad.*, West Humboldt Mts., Nevada.)

Dolichonyx oryzivorus, var. *albinucha* RIDGWAY.

CH. Nuchal patch pure white, or immaculate creamy white. Scapulars and lower back scarcely tinged with ashy. Black of the plumage more intense and uniform than in eastern *oryzivorus*. *Hab.* Plains of the U. S., from Missouri tributaries to eastern border of Great Basin. (Type, No. 1739, Mus. R. R., ♂ *ad.*, Ogden, Utah.)

Perisoreus Canadensis, var. *capitalis* BAIRD.

CH. Similar to *Canadensis*, but much lighter colored, and with the bill slenderer. The head wholly white, except the nape, which is plumbeous; plumbeous of the body of a fine ashy tint. *Young* more uniformly colored, but altogether paler than the corresponding age of *Canadensis*. *Hab.* Rocky Mountains of the U. S. (Types, No. 61,084, Mus. S. I., *adult*, Henry's Fork, Wyoming Ter. and No. 18,440, *young*, Fort Benton.)

Perisoreus Canadensis, var. *obscurus* RIDGWAY.

CH. Much darker than *Canadensis*, the head blackish to the forehead, which is only narrowly whitish. *Young* much darker than that of *Canadensis*. *Hab.* Northwestern coast, from Oregon to Alaska. (Types, No. 8,454, *adult*, Shoalwater Bay, Washington Ter., and No. 5,904, *young*, same locality.)

Cyanocitta ultramarina, var. *Arizonae* RIDGWAY.

CH. Similar to variety *sordida*, of eastern Mexico, but blue much paler and more greenish, the whole dorsal region decidedly ashy. *Hab.* Southern Rocky Mountain region of U. S. (Types, No. 18,279, *ad.*, Fort Buchanan, Arizona; and No. 8,469, *juv.*, Copper Mines, Arizona.)

Cyanocitta Floridana, var. *Sumichrasti* RIDGWAY.

CH. Most nearly resembling var. *Californica*, but the superciliary white streak nearly obsolete, and the wings and tail much longer. *Hab.* Table lands of Mexico, on the eastern side. (Type, No. 42,149, Orizaba, Mexico.)

Canace obscura, var. *fuliginosa* RIDGWAY.

CH. Most nearly resembling var. *obscura* (as distinguished from var. *Richardsoni*), but the colors much darker in shade, and the dark areas more prevalent. In specimens from the Sitka district the upper parts much washed with castaneous-rusty. *Hab.* Northwest coast, from Oregon to Sitka. (Types, No. 11,505, ♂ *ad.*, Cascade Mts.; No. 11,826, ♀ *ad.*, and No. 11,827, *juv.*, Chiloweyuck Depot, Washington Ter.)

Cupidonia cupido, var. *pallidicincta* RIDGWAY.

CH. Much smaller, and lighter colored than var. *cupido*. Upper parts about equally barred with pale grayish ochraceous and brownish-

dusky; beneath white, with faint, but sharply defined narrow bars of pale grayish brown. *Male* (No. 10,007, Prairies of Texas); Wing, 8·30; tail, 4·20; tarsus, 1·70; middle toe, 1·50. *Female* (No. 10,005, same locality); wing, 8·20. *Hab.* Southwestern prairies—Staked Plains?

Strix flammea, var. *Guatemalæ* RIDGWAY.

CH. In color resembling var. *flammea* of Europe, more than var. *pratincola* of North America, but more uniform above, and more coarsely speckled below. Wing, 11·30–13·00; tail, 5·30–5·90; tarsus, 2·55–2·95 (extremes of a series of thirteen specimens). *Hab.* Central America, from Panama to Guatemala.

Syrnium nebulosum, var. *Sartorii* RIDGWAY.

CH. Larger than the average of var. *nebulosum*, and the colors much darker and less tawny, being merely blackish sepia and clear white; face without the darker concentric rings of the North American form. Wing, 14·80; tail, 9·00. *Hab.* Eastern Mexico (Mirador). (Type, No. 43,131, ♀ *ad.*, Mirador; "pine region." Dr. C. Sartorius.)

REMARKS.—This form is very different from var. *fulvescens* (Sci. and Salv. P. Z. S., 1868, 58) from Guatemala. I have seen a specimen of the latter collected by Van Patten, and now in the Museum of the Boston Society. The var. *nebulosum* stands between the two, being intermediate in nearly all its characters.

Scops asio, var. *Floridanus* RIDGWAY.

CH. Much smaller than var. *asio* and more richly colored in the rufous plumage, the red prevailing on the lower parts, where it is much broken into transverse bars. Wing, 5·50–6·00; tail, 2·75–3·10. *Hab.* Florida. (Type, No. 5,857, Indian River, Florida.)

Scops asio, var. *enano* LAWRENCE. Ms.

CH. Small, like var. *Floridana*, but the colors different. Gray plumage like that of var. *asio*, but the mottling above much coarser, and the nape with a strongly indicated collar of rounded white spots, in pairs on opposite webs. The red plumage not seen. *Hab.* Eastern Mexico, south to Guatemala.

REMARKS.—This well-marked race is founded upon a specimen from Mexico in Mr. Lawrence's cabinet, and one from Guatemala in the Museum of the Boston Society. The two are alike in colors, but, as might be expected, the southern one is smaller. This form resembles very closely the *S. atricapilla* (Natt.)—Temm. Pl. Col. 145—but may be immediately distinguished by the strongly haired toes, they being perfectly naked in *S. atricapilla*.

Falco communis, var. *Pealei* RIDGWAY.

??? *Falco niger* GMEL. S. N., 1789, 270.

Falco polyagrus CASS. B. Cal. and Tex., pl. xvi (dark figure!).

CH. Entirely brownish-black, uniform above, faintly streaked with white below. No transverse bars on inner webs of tail feathers or primaries. Wings, 14·96–15·66; tail, 8·50; culmen, ·95–1·10; tarsus, 2·00; middle toe, 2·15–2·20. *Hab.* Northwest coast of North America, from Oregon to Sitka. (Types, No. 12,622, ♀ *ad.*, Oregon. Type of Cassin's figure above quoted! No. 45,814, ♀ *ad.* Sitka, Alaska.)

Falco columbarius, var. *Suckleyi* RIDGWAY.

CH. A miniature of *F. communis*, var. *Pealei*. Above, plain brownish-black, the tail tipped with white, but otherwise unmarked. Beneath pale ochraceous, broadly striped with sooty black. Wing, 7·35–8·56; tail, 5·25–5·75; culmen, ·56–·55; tarsus, 1·36–1·62; middle toe, 1·25–1·35. *Hab.* Northwest coast of N. Am., from Oregon to Sitka. (Types, No. 4,477. *Male*, Shoalwater Bay, W. T., and 5,832, *female* Fort Steilacoom. Based on series of six specimens.)

REMARKS.—This form represents the northwest coast region of heavy rains and dense forests, along with the black Peregrine (*F. communis*, var. *Pealei*) the *Bubo Virginianus*, var. *Pacificus*, *Scops asio*, var. *Kennicottii*, *Bonasa umbellus*, var. *Sabinei*, *Canace obscura*, var. *fuliginosa*, etc. The light-colored form of the interior is probably the *Falco Richardsonii* Ridgway (P. A. N. S., 1870, p. 145), which I am now disposed to refer to the same stock as *F. æsalon* and *F. Columbarius*. The latter two are certainly but geographical races of one species.

REGULAR MEETING, MONDAY, DEC. 1, 1873.

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

The SECRETARY announced the following correspondence:—

From Samuel L. Boardman, Augusta, Me., Nov. 18, 24, 28; E. W. Buswell, Boston, Nov. 19; C. H. Dall, Boston, Nov. 23; A. W. Dodge, Nov. 18; J. P. Franks, Nov. 20; George L. Gleason, Manchester, Nov. 5; Colman Harris, Nov. 14; C. H. Higbee, Boston, Nov. 24; Thomas Morong, Ipswich, Nov. 26; John Murdock, Cambridge, Nov. 24; A. V. Osborn, Waterville, N. Y., Nov. 25; C. A. Torrey, Boston, Nov. 15; U. S. Dep't of Agriculture, Washington, Nov. 17, 26. Vermont State Library, Nov. 18.

THE LIBRARIAN reported the following additions:—

By Donation.

- BUSWELL, E. W., of Boston. Miscellaneous pamphlets, 116.
 DEPARTMENT OF AGRICULTURE OF ILLINOIS. Transactions of, for 1872.
 MERRILL, CHAS. E., of New York. The Analytical Speller, by Edwards and Warren. 1 vol. 16mo. Miscellaneous Guide Books, 15.
 MORSE, E. S. Embryology of Terebratulina, by donor. 4to pamph. 1873.
 OSGOOD, C. S. Rules and Regulations of the School Committee of Salem, 1873. 1 vol. 8vo.
 PEYTON, JOHN LEWIS, of Jersey, Channel Island, England. Memoir of Wm. Madison Peyton, of Roanoke, by donor. 1 vol. 8vo. London, 1873.
 PUTNAM, F. W. The Politician's Register, by Benjamin Matthias. 1 vol. 12mo.
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PUBLISHERS. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Peabody Press. Salem City Post. Salem Observer. Silliman's Journal.

The PRESIDENT mentioned the recent decease of an old and highly esteemed member of the Institute, Hon. Benjamin F. Browne, of Salem, and suggested the appointment of a committee to take such notice of this event as may be deemed most appropriate; the preparation of a memoir for insertion in the publications, or otherwise, which was adopted.

The President, Messrs. A. C. Goodell, Jr., R. S. Rantoul, James Kimball and W. P. Upham were appointed on said committee.

Adjourned.



REGULAR MEETING, MONDAY, DEC. 15, 1863:

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

President WHEATLAND stated that the sad information which we had so recently received rendered it appropriate for the Institute to take some action in regard to the loss which it had sustained in the death of one of its most esteemed corresponding members, Professor LOUIS AGASSIZ, and after making a few interesting remarks, alluding to his own acquaintance with Prof. Agassiz, and the influence he exerted in the promotion of scientific research in this country, called on Dr. A. S. PACKARD, Jr., who submitted the following resolutions:—

WHEREAS, our corresponding member, Professor LOUIS AGASSIZ, has been suddenly taken from us, while in the ripeness of his years,

Resolved, That in his death our society has lost a valued and most distinguished member, who, from an early period in its history, took a deep interest in its progress.

Resolved, That American science has met with an irreparable loss in the death of one who, by his genius for original research, his organizing ability, his eloquence, conspicuous enthusiasm and untiring industry, has done more than any one else to elevate, dignify and advance science in our country, and kindle a zeal for the study of nature in the western world which will be felt for generations to come.

Resolved, That in bringing to this country, the land of his adoption, new modes of research, he has here inaugurated an original method of teaching science, which will have the happiest influence in raising up original investigators and elevating the standard of education in our colleges and common schools.

Resolved, That in his death Science, from his large and comprehensive way of looking at Nature, has lost one of its most gifted followers; Letters, a most graceful and persuasive writer, and Humanity, in his lifelong devotion to all that tends to elevate the race, one of its best types.

In these resolutions, Mr. President, continued Dr. Packard, I cannot express the sense of personal bereavement that I feel in the loss of a beloved teacher and most estimable man. In the death of one who was so outspoken in behalf of the claims of science, the younger naturalists of America have lost a staunch and fearless friend. More than any one else, Professor Agassiz, in season and out of season, urged the teaching of science in schools of all grades. He placed the methods of teaching natural history on a more natural basis, and to him we owe very largely the introduction of science-teaching into our schools and colleges. The example he has left us of untiring industry, of devotion to truth, and of loyalty to sound learning, is one we would perpetuate. His sympathy in the objects of our society was often expressed. His death is a loss to our commonwealth and our country, and in science to whom shall we look to fill the peculiar place he held?

Vice President F. W. PUTNAM seconded the resolutions, speaking substantially as follows:—

In me, Mr. President, these resolutions call up the deepest feelings. Well do I remember the first meeting I had with Prof. Agassiz, when in 1856 he visited the old rooms of the Institute for the purpose of examining the collection of turtles, as he was then engaged on his work on the Testudinata of North America. I shall never forget the pleasure which I experienced when showing our collection to the great naturalist, especially as that meeting was the occasion of my being so intimately associated with him for years afterwards. I should be recreant to my duty on this occasion did I not here publicly acknowledge my great indebtedness to my old master for the uniform kindness received from him and the valu-

able training which has enabled me to pursue my studies with the proper feeling of responsibility which every true naturalist must experience.

The teachings of Agassiz were thorough. His object was to prepare students for reliable work in the future, and his constant restraint upon them, preventing their publishing crude ideas, has been the cause of much misunderstanding regarding his method of teaching; but those who have passed through the drill never regret its enforcement.

The death of Agassiz is indeed a loss to American science; for to whom can we look as his successor in the minds of the people? It may be that his official positions can be readily filled; but who is there that will occupy, or is capable of occupying, the position which Agassiz has held in his relations to the science of the whole country?

It was his peculiar sphere to make science not only popular but respected as well, and it is to his great labors and peculiar adaptability for the work that we owe, more than to all other causes combined, the immense advances made in Natural Sciences in America during the last quarter of a century. But few men have done so much, or have had such power in influencing others in the cause of science as Agassiz. His name has been a household word, his fame and his kindness to all who loved science have brought students to him from all parts of the country, and his disinterestedness in his great work, combined with the enthusiasm with which he pursued it, has opened the purses of the rich and the treasury of the State to an extent unequalled in the annals of science. To wish, with him, has of late years been almost synonymous with to have; and well did he earn the right for it to be so. Working for the future of science in this country more than for his own immediate and personal

ends, he has been met by generous men who, appreciating his objects, have given him their support, and it is only by those who have not understood, or could not understand his great aims that he has been assailed. Yes, Mr. President, in moving the acceptance of the resolutions, proposed by one who also feels the obligation which all students of Agassiz must feel for the thoroughness of their training, I must express again that our loss is more than would ordinarily be the case, as our society had many ties uniting us with Agassiz. We can count six of our present or past active officers who have been brought up under his guidance, and his principles have thus become engrafted in our Institution, while the active interest he has always taken in our labors and the cordial aid that he has been ever ready to give our society, make his loss to us great and heartfelt. Personally I feel that a blank exists which words of mine cannot describe. Let us hope that the spirit with which our great master was imbued will inspire us with like enthusiasm for the fulfilment of our labors.

As a fitting tribute to the memory of Agassiz, and an acknowledgment of the indebtedness of the Institute for the aid and example he has given it, I propose that in addition to placing the resolutions which have been offered on our records, the Institute also place over the alcove containing our most important works in Natural History, the name of AGASSIZ.

Mr. Putnam was followed by Prof. E. S. MORSE, who was also once a pupil of Agassiz, Rev. E. S. ATWOOD, Rev. J. COIT, A. C. GOODELL, Jr., Esq., Hon. JAMES KIMBALL, and others, all of whom expressed their appreciation of the distinguished naturalist, and their sadness at his removal from the scenes of earth.

The resolutions were then unanimously adopted, ordered to be entered upon the records of the Institute, and the Secretary was instructed to forward a copy of them to the family of the deceased.



SPECIAL MEETING, TUESDAY, DEC. 16, 1873.

A SPECIAL meeting was held this evening to celebrate the centennial anniversary of the destruction of the tea in Boston harbor, Dec. 16, 1773.

Before proceeding to the special object of the meeting, the following persons, nominated at a previous meeting, were duly elected resident members:—

John M. Bradbury of Ipswich, and Augustus D. Small, Joseph P. Fessenden, Oliver Carlton, George D. Putnam, Mrs. Francis Cox, George M. White, Caroline C. West, Ella Worcester, Sarah E. Smith, Alice Browne, J. Warren Thyng, Walter A. Hanson, Annie A. Agge, M. H. Richardson, Thomas B. Thayer, T. Lyman Perkins, Lizzie H. Hanson, John G. White, Henry W. Perkins, Mrs. George D. Putnam, of Salem.

President WHEATLAND opened the exercises by reading from the "Essex Gazette," of the ante-revolutionary period, a contemporary account of the destruction of the tea, and also from an original document of 1770, with the autographs of citizens of Rowley, protesting against the tax and binding themselves not to use tea nor have any dealings with the importers thereof until the obnoxious act was repealed.

Hon. JAMES KIMBALL followed with an admirable paper, carefully prepared, and presenting much historical infor-

mation of a very interesting character, derived largely from original sources. He gave a brief but comprehensive review of the causes which led to the transaction commemorated, with graphic details of the proceedings and personal sketches of some of the actors. Among these was Mr. Kimball's grandfather, William Russell, the father of our well remembered citizen, Col. John Russell, and the grandfather of Prof. John Lewis Russell, recently deceased. William was very active among the Sons of Liberty and participated in the destruction of the tea. He was intimate with Edes & Gill, the printers of the Boston Gazette, and with the leading patriots, and wrote patriotic articles for the paper. He was a teacher on the site of the Mayhew school, which is probably the legitimate successor of that taught by Russell. He was a participant in the revolutionary struggle, and was an inmate of the notorious Mill Prison and the Jersey Prison Ship, where he suffered many privations and contracted the disease which occasioned his death not long after the declaration of peace. While a prisoner he wrote the following lines, which were read as illustrative of the feelings engendered by the events of the times:—

[crew!

Great Mars, with me, come now and view, this more than Hellish
Great Vulcan, send your thunder forth, and all their fields bestrew;
Rain on their heads perpetual fire, in one eternal flame;
Let black destruction be their doom, dishonored be their name;
Send mighty bolts to strike the traitors North and Mansfield dead,
And liquid fire to scald the Crown from Royal George's head;
Strike all their young posterity with one Eternal curse,
Nor pity them, no more than they have ever pitied us.

Mill Prison (Plymouth), England, Nov. 29th, 3 P. M., 1781.

WILLIAM RUSSELL.

When this was written Mr. Russell had been confined in prison nearly two years, on a charge of piracy, treason,

and rebellion, being taken prisoner on board the American Privateer Jason of Boston, John Manly, Esq., Commander.

The details presented by Mr. Kimball were listened to with close attention and profound interest. He exhibited a small portrait of the patriot in the costume of the period, and a tin tea caddy belonging to him, on which he had painted, after the disuse of tea, the inscriptions "COFFEE,"—"NO TEA," which are still visible. Mr. Kimball also exhibited several books and manuscripts of historic interest, among which were a writing book with the patriotic mottoes of Mr. Russell's day, and the orderly book of the Artillery company in service in or near Boston during the revolution. These relics were examined with much curiosity.

Vice President A. C. GOODELL, Jr., next made some remarks, and urged the Institute not to forget to observe, next year, the anniversary of the most important event of the ante-revolutionary period—which was really the initial act of the actual severance of our connection with the British crown—viz.: the proceedings which took place in our Court House here in Salem, in Oct., 1774, when the Great and General Court resolved itself into a PROVINCIAL CONGRESS.

Mr. Goodell exhibited a specimen of the veritable tea which caused the outbreak celebrated, and an antique teapot formerly in use in the Warner family of Ipswich (from which came our Salem Warners, esteemed citizens in past years), dating back to 1720. The tea was received from Mrs. Jonathan Perley, in whose family it was an heirloom, having come directly from Ezekiel Cheever of Saugus, one of the "Mohawks," who wore high-top boots at the time, and whose wife, on his return home, collected

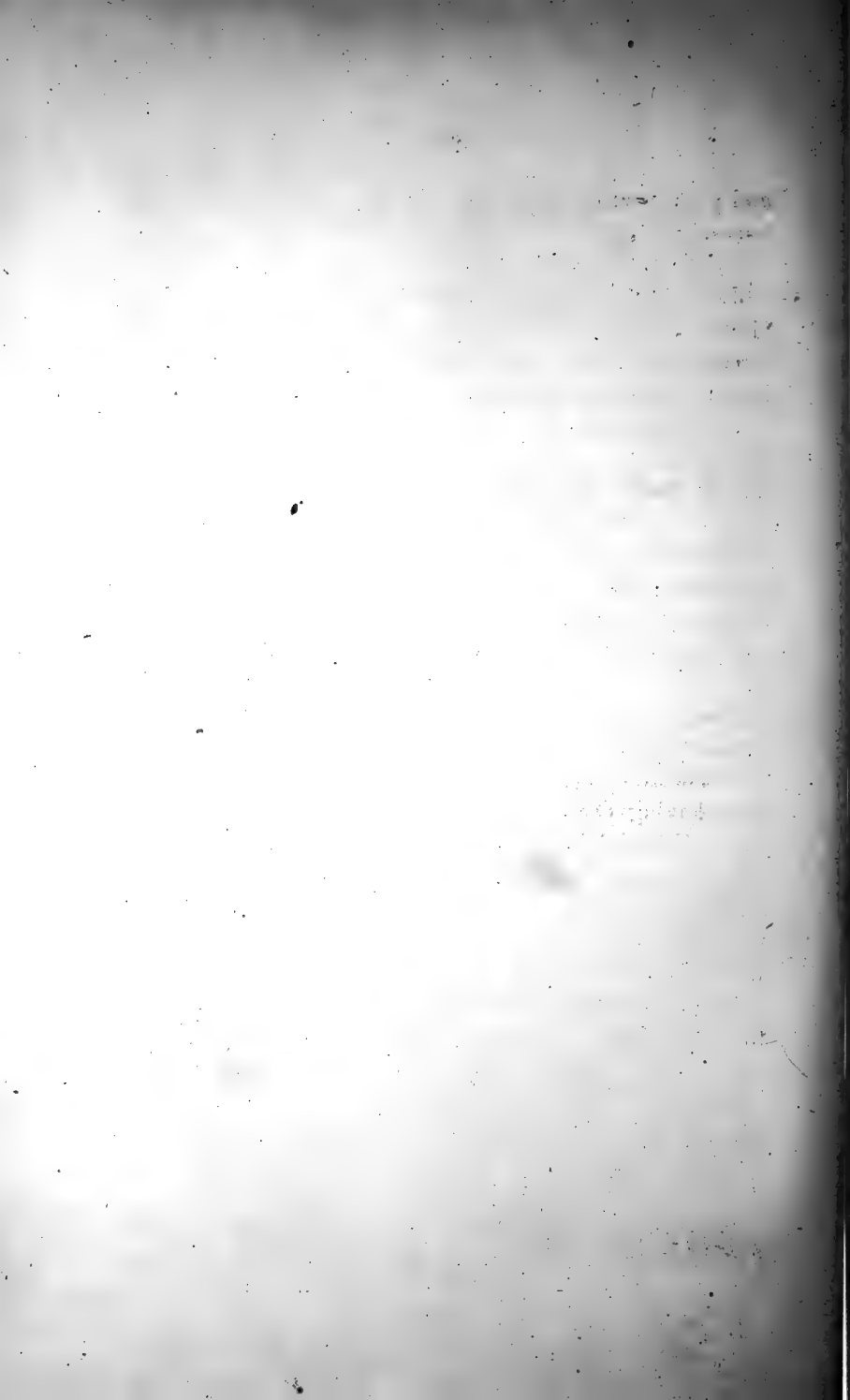
and preserved the tea which had lodged in the tops of his boots.

J. WINGATE THORNTON, Esq., of Boston, followed Mr. Goodell, and gave forcible reasons why Salem should take a particular interest in this celebration and the principles it illustrated and enforced.

He referred pertinently to Hugh Peters and Sir George Downing, former residents of Salem, and their influence on Cromwell and the Commonwealth of England, and reminded the audience that Downing, a graduate of the first class of Harvard College, lived on the site of Plummer Hall, and he had probably fitted for college, and his youthful voice often resounded, within hearing of the place where they were assembled.

The meeting then adjourned, and the company were invited to one of the ante-rooms, where refreshing draughts of tea were dispensed, two or three kinds of the fragrant herb having been generously furnished for the occasion by the Oriental Tea Company. Copies of a paper entitled the "Tea-cup," containing a graphic account of the destruction of the tea and its attendant circumstances, by the learned antiquarian, Dr. N. B. Shurtleff, of Boston, were also distributed.

The celebration was a success and gave great pleasure to those who participated in it.



BULLETIN

OF THE

ESSEX INSTITUTE,

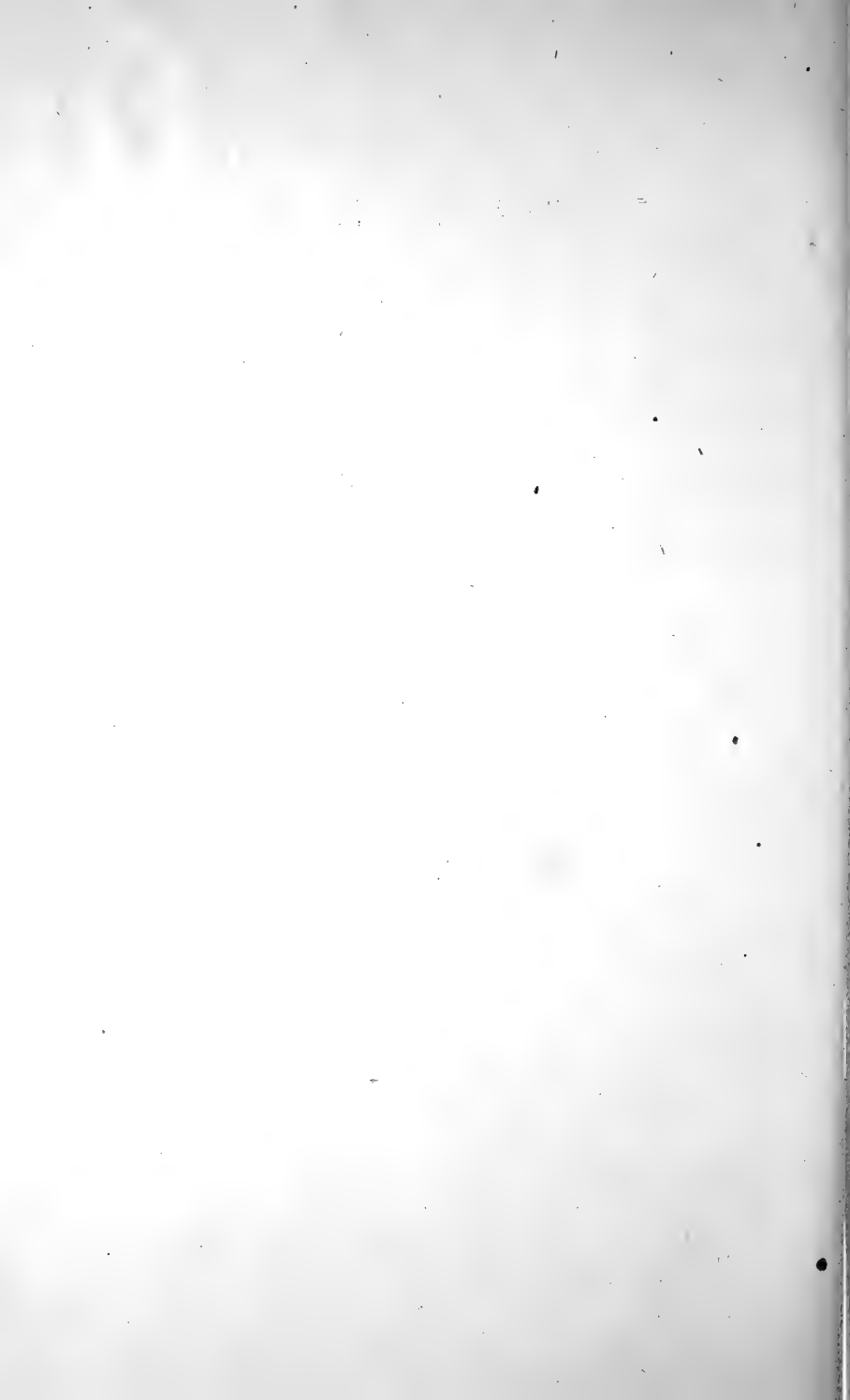
VOLUME VI.

1874.

SALEM, MASS.

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1875.



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BULLETIN

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. Cleaveland, 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 Philosophical 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 1843-1862 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. Taunton 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.

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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.

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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 unfailing 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-skippers, 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.

- BOLLES, 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. 8vo.
 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 lumpfish 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 Fitts 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 Phalanxida 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. 1874.
UPTON, JAMES. The Upton Memorial, by John A. Vinton. 1 vol. 8vo. Bath, Me. 1874.
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, 1864. 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. 1 vol. 8vo. 1873.

KONGLIGA VETENSKAPS-SOCIETETEN 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. 1 vol. 8vo.

LITERARY AND PHILOSOPHICAL SOCIETY OF LIVERPOOL. Proceedings, No. xxvii, 1872-73. 1 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. 1 vol. 8vo.

SENCKENBERGISCHEM NATURFORSCHENDE GESELLSCHAFT ZU FRANKFURT A M. Bericht, 1872-73. 1 vol. 8vo.

SOCIÉTÉ DE PHYSIQUE ET D' HISTOIRE NATURELLE, GENÈVE. Mémoires, Tome xxiii. 1 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 1, 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 Caspell'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 Neuchatel, Oct. 2; New York State Library, Feb. 9; New York Genealogical and Biographical Society, Feb. 14; 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. Memorials of the
ESSEX INST. BULLETIN. vi 3

Death of Washington. 2 vols. 8vo. Siege of Charlestown, 1780. 1 vol. 8vo. Siege of Savannah, 1779. 1 vol. 8vo. History of the Bills of Credit, by J. H. Hitchcock. 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. 8vo. Assembly Documents, 1843-44. 2 vols. 8vo. Digest of Claims, 1810-1858. 1 vol. 8vo. William's Register, 1834, 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.

NORTHEND, 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 séries, 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.

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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 mephitica. 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* (Coues 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 tridecem-lineatus*. 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 haunches, 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.

FELIDE.

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 mephitica*. 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 Novboracensis*.

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 mephitica*. 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 mice.

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. Mecham, of Ogden, Utah. Mr. Mecham 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. Meham'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. Meham, 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 mephitica. 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 (*Aplocerus 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 Harrisi*.** 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 Swedeborg 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 Gottingen, Jan. 21; Literary and Philosophical Society of Liverpool, Feb. 25; Die K. Bayerischen Akademie der Wissenschaften, Munchen, 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*.

WHITAKER, 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 IN KJÖBENHAVN *Tidsskrift, Anden Række, Andet and Tredje Bind, Fredje and Forste Haefte, 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. Sitzungsberichte, der Philos. Classe. Heft iv, v, 1872, Heft i, ii, iii, iv, 1873. 6 pamphlets, 8vo. Sitzungsberichte, der Math. Classe, Heft iii, 1872, Heft i, ii, 1873. 3 pamphlets, 8vo.
- KONGELIGE DANSKE VIDENSKABERNES SELSKAB IN KJÖBENHAVN. Oversigt, No. 1, 1873.
- MINNESOTA HISTORICAL SOCIETY. Annual Report of. 1873.
- NATURAL HISTORY SOCIETY OF MONTREAL. The Canadian Naturalist, Vol. vii. No. iv, 1874.
- 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 séries, 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. Hora Societatis Entomologica Russica, 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.

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 Athenæum, 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 18, 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. II, 1874.

DAWSON, SAMUEL, of Montreal, Ca. The Canadian Naturalist and Geologist, Vol. v. Vol. iii, n. 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 Miscellaneous, 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. 4to. 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, 1874.

MERRITT, LUCINDA F. The Shanghai Budget, Dec. 31, 1873, Jan. 8, 15, 22, 29, Feb. 5, 12, 19, 1874.

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

PALFRAY, C. W. The American Law Register, 14 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, 1874. 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. 4 vols. 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 Q. Dewy. 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 Lindsley. 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. 16mo. 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, 1854. 1 vol. 8vo. Transactions of the Illinois State Agricultural Society, 1867-8. 1 vol. 8vo. Miscellaneous pamphlets, 37.

WILLSON, E. B. Record of Unitarian Worthies for April, 1874. 8vo pamph.

By Exchange.

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

BOSTON PUBLIC LIBRARY. Bulletin for April, 1874.

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, aerial 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, *poséed*; 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 monosyllabic 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. Goëthe 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

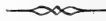
must render itself to the world and not be of a caste or mystery.

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 clumsy 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 *lagune* around them, and the vicinity and intercourse of the East.

The æsthetic 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

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 Saltonstall 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.

BULLETIN

OF THE

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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. Pettingell, 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
Sexdecimos,	67 Total of bound volumes, 540
Total,	540 Total of donations, 5,090

<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, 5,090
	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, \$54.88; Postage, \$18.58,	73 46
Insurance, \$40; Gas Fixtures, \$68.50,	108 50
Stationery, \$20.64; Printing, \$13.92; Collecting, \$4.05,	38 61
Sundries,	13 52
Cash to balance,	182 68
Amount carried forward,	\$7,183 64

Amount brought forward, \$7,183 64

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.

CALEB 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. Dimmick, 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, 1844, 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 pamph. 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, 1874, 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, 1863.
 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 Seances 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^d 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.

Rev. THOMAS MORONG, of Ipswich, gave a brief history of the public library in Ipswich, the gift of Augustine Heard, Esq., and paid a deserved tribute to the public spirit and generosity of its founder.

Mr. Heard, son of Hon. John Heard, was a native of Ipswich, and was born March 30, 1785. He was for many years a shipmaster and a tea merchant at Hong Kong, China, in which business he acquired a large fortune. He established the house of Augustine Heard & Co., in China, which has been continued by his nephews in his name and at present is one of the richest and most prosperous in the China trade.

After his retirement from business he gave much attention to benevolent objects, and for years it had been his intention to make some substantial gift to the place of his nativity. Finally it assumed the shape of a public library, which he thought would be most useful to his fellow citizens. With this purpose in view he planned the building which stands near by. It was completed in the autumn of 1868. Mr. Heard lived just long enough to see its completion and transfer it to the board of trustees* appointed by himself. He died at his residence in Ipswich, Sept. 14, 1868, aged 83 years, unmarried.

The building (50 by 40 feet) is two stories in height with a main room for books below and a reading room and a picture gallery above. It was dedicated to public use on Tuesday, March 9, 1869. Addresses were made on the occasion by George Haskell, chairman of the board of trustees, Rev. J. P. Cowles and Rev. Thomas Morong.

The land, building and library cost about fifty thousand dollars; to this Mr. Heard added a fund of ten thousand dollars, the income of which pays the running expenses, making the sum of sixty thousand dollars, which a gen-

* Trustees are Zenas Cushing, Joseph Ross and George Haskell.

erous donor bestowed upon the town as a free public library. As modest as he was generous, he forbade its being called after his own name; and so it is known only as the "Public Library of Ipswich." The use is open to all the inhabitants of Ipswich on very simple conditions.

Mr. Heard put in the building a library of thirty-five hundred volumes of well selected, standard works. To this number his heirs added after his death twenty-five hundred volumes, which, with about thirteen hundred volumes bestowed by another donor, make seven thousand, three hundred volumes, constituting the present library.

The only lack in this donation was the means of increasing the library and of replacing the books worn out, but this deficiency has been recently supplied by another son of Ipswich, Prof. Daniel Treadwell,* of Harvard University. Prof. Treadwell had long contemplated the erection of a public library in Ipswich, and had made a will to that effect, when he found himself anticipated by his friend, Mr. Heard. Accordingly he altered it and made his donations to the Heard library. By his death in 1872 the trustees† have come into the possession of funds amounting to about ten thousand dollars, which will eventually be raised by residuary legacies to nearly twenty thousand. In addition to this Prof. Treadwell bequeathed his library of about thirteen hundred volumes, a number of valuable oil paintings, copies of the old masters, various medals bestowed upon him for mechanical inventions, coins and models and all his manuscripts, to the library.

* Daniel Treadwell was born at Ipswich in 1791. Rumford Professor and lecturer on the application of the sciences to the useful arts in Harvard University from 1834 to 1845. Died at Cambridge, Feb. 27, 1872.

† The Trustees of the Treadwell fund are the Trustees of the Public Library, the pastor of the First Church and the master of the Grammar School, Ipswich. The latter two, at present, are Rev. Thomas Morong and Issachar Lefavour.

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; Augsburg, Naturhistorischer Verein, Feb. 20; Buffalo Historical Society, June 10; Boston Athenæum, 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, 1847. 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 Stience 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.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 6. SALEM, MASS., AUGUST, 1874. No. 8.

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

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 marmorea* 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.

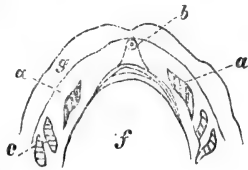
3. *Trachydermon albus* Lin.

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 fæces 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 dehiscent 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 1834 and President in 1860. He died Feb. 26, 1862.

† 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, 1803, 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, 1808-1846; d. at Andover, Aug. 24, 1854.

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, 103 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. 1, 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.

KONIGLICHE GESELLSCHAFT IN REGENSBURG. Flora, 1873. 1 vol. 8vo.

NATURFORSCHENDEN GESELLSCHAFT IN DANZIG. Schriften, Band iii, Heft ii, 1873.

NATURFORSCHENDEN GESELLSCHAFT IN ZURICH. 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, 1874.

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. Monatsschrift 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 Instituté 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 *Merimac* 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. Ilsley, 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. 4; 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.
- LSLEY, F. I., 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. 1860. The Story of a Working Man's Life, by F. Mason. 1 vol. 8vo. 1870.
- MERRITT, L. F. The Shanghai Budget, Mch. 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, 1783-1859, 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, Alnwick. Proceedings. Vol. vii, No. 1, 1873.
- BOSTON PUBLIC LIBRARY. Bulletin of. July, 1874.
- BOTANISK TIDSSKRIFT IN KJOBENHAVN. Tidsskrift. Vol. ii, pts. 2, 3. Journal De Botanique, 1872-3. 2 pamphlets, 8vo. 1874.
- IMPÉRIALE ACADEMIE 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 IN KJOBENHAVN. 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. 14; Samuel Hart, Hartford, Conn., Aug. 17; A. Lackey, 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. 12mo. 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. Dufief'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., 1869-70. 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, 14 numbers. European Agriculture and Rural Economy. 10 numbers. The Monthly Miscellany, 12 numbers. Western Quarterly Review, 25 numbers. American Repertory, 24 numbers. Christian Examiner, 93 numbers. American Journal of Science, 26 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, 38 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, 1861, 1864, 1866. 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. Palæozoic 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. 1839-73. 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 archæology, 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 archæologist, 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., 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874. 20 vols. 8vo. Catalogue of Conn. Volunteer Organizations, 1861-35. 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. 8vb.

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, 34.

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 "*Notholæna 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 boulder, and stated that hereafter, in all the publications of the Essex Institute, this boulder 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 Tocsin'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. Boon, 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 Linneéenne, Sept. 14; Kjobenhavn, det Kongelige Danske Videnskabernes Selskab, Sept. 7; New York Lyceum of Natural History, Oct. 12; New York State Library, Sept. 25; Somersetshire Archæological 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, 1824. 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. Solyman and Almena. 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, 1867, 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, 1874. 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's 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 4, 11, 18, 1874. Essex County Mercury, several numbers.
- PALFRAY, C. W. Miscellaneous pamphlets, 27.
- PUTNAM, F. W. Annual Report of the Indianapolis Board of Trade, Jan., 1874. Mineral, Manufacturing and Agricultural Resources of Indiana, by E. T. Cox, 1873.
- PUTNAM, GEO. G. Democratic Review, 12 vols. 8vo.
- ROBINSON, JOHN. Miscellaneous pamphlets, 300.
- SMITH, Prof. J. L., Louisville, Ky. Scientific Researches. 1 vol. 8vo. 1873.
- SPENCE, F. H. Catalogus Universitatis Brunensis, 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 (*Wahsatch and Uintah drainage, or eastern Basin drainage*).

- a. Salt Lake valley. b. Islands in the Great Salt Lake.
c. Parley's Park (Wahsatch Mountains).
d. Pack'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. *Hirundo horreorum*. Abundant.
6. *Progne subis*. Abundant.
7. *Petrochelidon lunifrons*. Abundant.
8. *Vireo gilvus Swainsoni*. Common.
9. *V. pusillus*. Common.
10. *Collurio Ludovicianus (excubitoroides ?)*. Common.
11. *Carpodacus frontalis*. Abundant.
12. *Chrysomitris 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 cærulea*. Common.
20. *Cyanospiza amœna*. Common.
21. *Pipilo erythrophthalmus Oregonus*. Common.
22. *Agelalus phœniceus gubernator*. Very abundant.
23. *A. tricolor*. Very abundant.
24. *Xanthocephalus icterocephalus*. 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. *Fulca 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 flossipes*. 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 aëdon 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 aëdon Parkmanni*. Common.
5. *Dendroica æstiva*. Abundant.
6. *Chrysomitris Lawrencei*. Common.
7. *Pipilo fusca crissalis*. Common.
8. *Cyanocitta Florida California*. 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 chrysaëtus 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 Florida* California. 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.

1. *Turdus Swainsoni ustulatus*.
2. *Junco hyemalis Oregonus*.
3. *Zonotrichia leucophrys intermedia*.
4. *Passerella iliaca megarhynchus*.
5. *Pipilo erythrophthalmus Oregonus*.
6. *Cyanura Stelleri frontalis*.
7. *Cyanocitta Florida* California.
8. *Sphyrapicus varius ruber*.

ROCKY MOUNTAINS.

- T. *Swainsoni*.
- J. *hyemalis annectens*.
- Z. *leucophrys*.
- P. *iliaca schistacea*.
- P. *erythrophthalmus megalonyx*.
- C. *Stelleri macrolopha*.
- C. *Florida* Woodhouseii.
- S. *varius nuchalis*.

* See Birds of Colorado, Bull. Essex Inst., v, Nov., 1873, p. 173.

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; Gottingen Die Konigliche 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., 1874. The Syrian Protestant College, 1874.

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 Athenæum, 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. 1849. Abstracts of Mass. School Returns, 1839-40, 1840-41, 1845-46. 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 KJÖBENHAVN. 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. 4to. 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, 1874. 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. 1874.

YALE COLLEGE. Catalogue of the Officers and Students in Yale College, 1874-5.

ZEITSCHRIFT FÜR DIE GESAMMTEN NATURWISSENSCHAFTEN IN BERLIN. Band ix, Neue Folge, 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 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 County 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 waieres 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 Waieres 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 waieres & I took a Constable with me then we found but one Waire. I have spent four days in the properest time of every last four years abovesaid. Sometimes I have pulled down seven Waieres 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 Coming 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 Petitioner 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^e cort, and generall seshions of the peace to Be holden at Salem for the county of Esex 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 pasing up the several brukes that leadeth to the several ponds. As spring pond, Long pond and seder pond. Acording to your honors order, I have taken All the cears I could And I hope to good efect By reason of the plenty of *cod* & *hadock* that have Byn this year. this was the fifth year that I have tacken ceare concerning sd fish passing up sd Brucks four days pr year I have Bin up sd Brucks And wherupon several weares and other in cumbrances one sd Brucks. I am informed that there is a brook that leadeth out of Ipswidg river to umphreys 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 Select men tooock of my rates on year But that is too small Amotes to four days waden up the Bruckes to the small ponds. That if your honors in your wisdom see fit to Allow Sumthng for the managmt in that mater your petitioner shall for ever pray.

Salem Jun y^e 21. 1726.

THOMAS RICH."

"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 Meunier, 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. *Brera'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,* 60 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. LIBBEX, 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 palisadoes, 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 archæology 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. Atwood 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 Bessom'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 archæological 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

ESSEX INSTITUTE.

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

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

hold 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 (*Amblyopsis spelæus* 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 *Hybodus 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 staurolite, 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. Hoadly, Hartford, Conn., Dec. 2; M. F. Jacob, South Hingham, Nov. 27, Dec. 2; Charles Phillips, Philadelphia, Nov. 26; 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; Brünn 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 Acalephæ of North America*. 2 parts, 4to. *Monographie des Poissons Fossiles Du Vieux Grés 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, Continens 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*, 100 numbers. *N. E. Farmer*, 105 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 Chaś. 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.
- KONIGLICH 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. GALEN. 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 archæological 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 archæology, 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

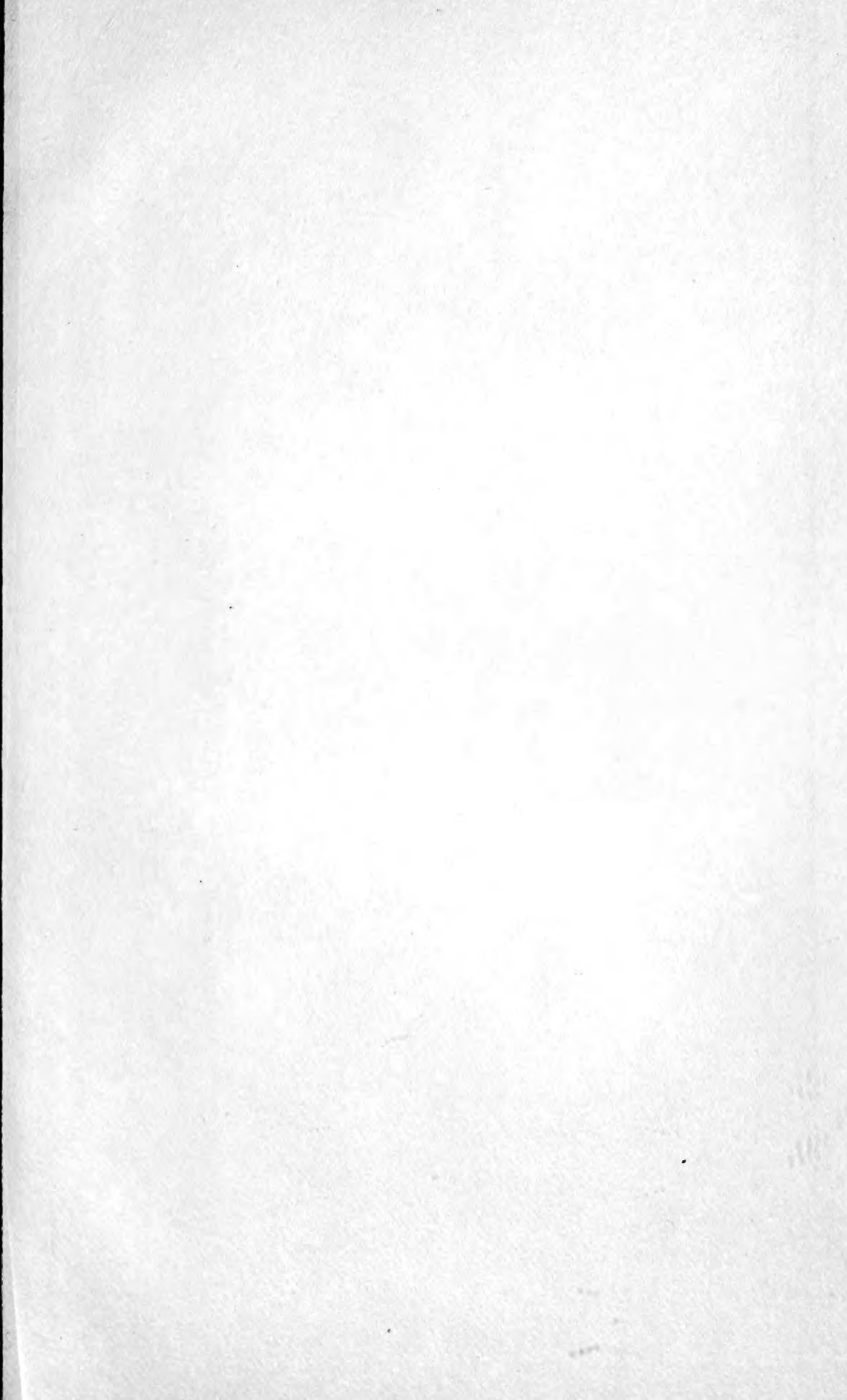
properly conducted until the condition and quality of the soil are accurately ascertained, and that which is valuable be improved, and that which is useless avoided. In no way can we avoid a wasteful expenditure of money in exploring the mining and mineral wealth of the land, except by such an investigation 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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Essex Institute, Salem, Mass.
Bulletin

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