Donations to the Museum and Library were announced.

George H. Vibert, of Rockport; Francis A. Langmaid, of Salem, were elected Resident Members. Henry Davis, of McGregor, Iowa, was elected a Corresponding Member.

MONDAY, DECEMBER 9, 1867. Regular Meeting.

Vice President GOODELL in the chair.

The chairman alluded to the arrangements for a meeting on every Monday night during the winter.

Letters were read from, — Prof. J. S. Newberry, Columbia College (Nov. 25); John C. Wetmore, Essex, Mass.; Howard Challen, Philadelphia; Dr. E. Diffenbaugh, Philadelphia; Prof. E. D. Cope, Philadelphia (Nov. 27); Dr. A. C. Foote, University of Michigan, Ann Arbor, Mich.; A. L. Babcock, Sherborn, Mass. (Nov. 29); Dr. I. P. Trimble, State Entomologist of New Jersey, Newark, N. J.; New England Glass Co., Boston (Nov. 30); M. C. Cooke, Secretary Quekett Microscopical Club, London (Dec. 1); Dr. E. W. Hubbard, Tottenville, Staten Island; Robert Howell, Nichols, N. Y.; Samuel R. Carter, Paris Hill, Me.; Prof. Alex. Winchell, University of Michigan (Dec. 4); Prof. J. S. Newbury, Columbia College; Prof. S. Tenney, Vassar College (Dec. 5); H. Willey, New Bedford, Mass. (Dec. 6); Prof. S. F. Baird, Smithsonian Institution (Dec. 7).

Mr. Putnam read by title the following communication from Mr. H. WILLEY, of New Bedford.

AMERICAN LICHENOGRAPHY.

It is proposed in this sketch to give a brief account of such works on the subject of Lichens published in this country as have fallen under the writer's observation. The study of this branch of botany, interesting as it is, is confined to a few, who labor under great disadvantages, from the scattered nature of what has been published by our own writers, and the absence of a complete American Lichenography, brought up to the present state of knowledge, and based on the modern views of the science. Several interesting local catalogues have, however, been published, and Professor TUCKERMAN'S valuable Synopsis, published in 1848, gave a full and accurate view of the Lichen flora of the northern part of the continent, so far as known at that time. But very much has been discovered since then, and the use of the microscope has imparted an entirely new aspect to the science. A fresh impulse would doubtless be given to the study, and many botanists would engage in the investigation of the Lichen flora of our country, so vast, and as yet so imperfectly explored, could they

have the assistance of such a work. The want, we hope, will not long remain unsupplied.

ACHARIUS, the father of Lichenology, as he has been styled, published numerous American Lichens in his *Lichenographia Universalis*, Göttingen, 1810; and *Synopsis Lichenum*, Lund, 1814. Swartz, in his *Lichenes Americani*, Norimberg, 1811, one number only of which was published, gave an account of twenty-five American species, mostly from the West Indies. He mentions two New England species, *Parmelia colpodes* and *P. congruens*, the latter of which, however, is unknown to our Lichenists, and the plant described is probably only a form of some other plant.

The *Flora Virginica* of GRONOVIUS, Leyden, 1739, in which the plants collected by Clayton are described, mentions a few Lichens. But to come to American publications.

The *Index Floræ Lancastriensis*, by MUHLENBURG, Vol. III. of the Transactions of the American Philosophical Society, Philadelphia, 1793, contains a list of thirty Lichens, concluding with the remark, "*et alii multi novi.*" All these were probably included in his *Catalogus Plantarum Americæ Septentrionalis*, Philadelphia, 1818. He gives the name of 184 species, arranged according to the Acharian System, eighteen of which are noted as new. There are no descriptions of the plants, but according to Professor Tuckerman in the Boston Journal of Natural History, they are described in the sixth edition of Eaton's Manual, 1833, a work which the present writer has not seen.

Professor TORREY, in his *Catalogue of Plants growing spontaneously within Thirty Miles of the City of New York*, Albany, 1819, enumerates sixty species of Lichens, and gives their stations. There are no new species in his list.

In the *American Journal of Science*, Vol. VI, p. 105, Professor TORREY describes, under the name of *Usnea fasciata*, the plant called in Tuckerman's Synopsis, *U. sphacelata* R. Br., and since, *U. aurantiacoatra* Jacq.

The next publication is HALSEY'S *Synopsis of the Lichens near New York*, published in 1823 in Vol. I. of the Annals of the Lyceum of Natural History. This is a valuable catalogue, enumerating 176 species, with their stations, and giving brief descriptions, with colored figures of four species. Nine are new, of which descriptions are furnished by Schweinitz. Halsey alludes to a promised work on Lichens by Schweinitz, but this was never given to the public.

The *Catalogue of Animals and Plants of Massachusetts*, in Professor HITCHCOCK'S Report on the Geology, Botany, and Zoölogy of that State, was published separately at Amherst in 1835. It gives 116 Lichens as occurring in Massachusetts.

In NUTTALL's Catalogue of Plants collected on the Pacific Coast by Wyeth, in the Journal of the Philadelphia Academy, Vol. VII, a new lichen is described under the name of *Borrera Columbiana*, which he remarks resembles *Lichen vulpinus* Linn., found on the Columbia River. It is also noticed in Tuckerman's Enumeration, 1845 (under *Parmelia*), but not since.

HOOKER'S *Flora Boreali-Americana*, London, 1840, though not published in this country, may be mentioned here, as giving, according to Professor Tuckerman, "besides a general survey of the Lichens of that region, and descriptions of new species, many remarks illustrative of the economy and the uses of these plants. . . . The part which includes the Lichens is as valuable to the student of these plants in this country as in England."

We come now to the writings of the distinguished botanist, who has done more than any other in this country to advance the knowledge of our Lichens, and from whom we have still much to expect, Professor EDWARD TUCKERMAN, of Amherst. In 1835, he read before the Boston Society of Natural History, *An Enumeration of some Lichens of North America*, published in Vol. II. of its Proceedings. Three further enumerations were published in Vols. III. and V. of the same work, from 1843 to 1847. In the last, the whole number of known North American Lichens is stated to be 165. These papers derive great interest from the fact that they contain the first special notices of the alpine Lichen Flora of the mountains of Vermont and New Hampshire. In the last he remarks that "127 species and four permanent varieties have been enumerated, and their stations given; of which fifty were not previously included in the United States Flora." He proceeds to give an account of the systematic arrangement of the Lichens up to that period, as developed in the writings of Linnæus, Acharius, Fries, and others, mentioning also the catalogues of Muhlenburg, Torrey, Halsey, and Hitchcock, above noticed, and concludes with some remarks on the uses of Lichens. Professor Tuckerman's remarks on the various plants he notices are full of interest, and marked by that caution and discrimination which characterize the accurate observer and the philosophical mind, and which he has so ably manifested in his later and more difficult and profound studies.

In *Observations on some interesting Plants of New England*, published in the American Journal of Science, in 1843, Professor TUCKERMAN mentions two Lichens, *Cetraria Tuckermanii* (which, however, has not held its place as a distinct species), and *Solorina saccata*. This last has not been published as occurring in New England, but the present writer has found it in Pittsfield.

In 1845, appeared *An Enumeration of North American Lichens*, by Professor TUCKERMAN, published at Cambridge. This little work con-

tains an Essay on the Natural Systems of Oken, Fries, and Endlicher, followed by a Preliminary View of the Structure and General History of Lichens, and an Enumeration of North American Lichens, arranged according to the Friesian system, giving the generic characters, but no descriptions of the species. The list contains 238 species, but the author remarks that it is incomplete.

His valuable *Synopsis of the Lichens of New England, the other Northern States, and British America*, was published at Cambridge in 1848. It was and remains as yet the only full enumeration, with descriptions, of North American Lichens, but is partially supplemented in writings subsequently to be noticed. Its great value lies in the excellent descriptions from Fries, on whose system it is based, and to the general principles of which the author still adheres. It enumerates and describes 295 species, of which about twenty are here first described.

LEA'S *Catalogue of the Plants of Cincinnati*, Philadelphia, 1849, gives a list of fifty-three species of Lichens, arranged by Professor Tuckerman. AGASSIZ'S *Lake Superior*, published in 1850, contains a *List of Lichens* collected in that region, including seventy-one species, also arranged by Professor Tuckerman.

The American Journal of Science for 1858 and 1859, contains two *Supplements to the Enumeration of North American Lichens*, of the same author. Sixty-six species, mostly new, from the Pacific coast, Cuba, the Southern States, and New England, are mentioned and described. In the latter of these the spore-character is for the first time noticed. In 1860, he contributed to the Proceedings of the American Academy of Science and Arts (Boston), Vol. V, *Observations on North American and other Lichens*, giving a review of the genera *Physcia* and *Pyxine*. These observations were continued in Vols. V. and VI. of the same work, published in 1862 and 1864. In them the author shows that he had fully kept pace with the advance of the science, which by the application of the microscope to the study of the internal structure, and the development of the spores of Lichens, had assumed an entirely new aspect since the era of the older Lichenists, who studied and wrote withhout the aid of that instrument, now indispensable to all who would make any certain progress in Lichenology, and which, while it opens new difficulties, adds greatly to the fascinating interest of the study. The last two of these papers are mostly occupied with descriptions of the Lichens collected in Cuba by Mr. Wright, though quite a number of New England and other continental plants are mentioned and described for the first time.

Professor TUCKERMAN also described the Lichens brought home by the Wilkes Exploring Expedition, published in 1861, and accompanied by admirable drawings of new species. The number of species mentioned is 104, of which four are new.

The next work of this author is *The Lichens of California, Oregon, and the Rocky Mountains, so far as yet known.* Amherst, 1866. The object of this work is, in the words of the author, "to show at the beginning of careful exploration, exactly what is known of the Lichen Flora of the west coast south of Vancouver's Island, and of the great western system of mountains within the same range of latitude." He also alludes briefly to his present views of system, which will be more fully developed in a work on *The Genera of North American Lichens*, in course of preparation, the appearance of which, we trust, will not long be deferred. This catalogue enumerates 184 species, of which about eighteen are new. An appendix gives descriptions of nine other new species, four of which are from New England.

Following this is *The Lichens of the Hawaiian Islands*, in the Proceedings of the American Academy of Science and Arts, 1867, comprising the Lichens collected by Mr. Mann, together with those previously known. It contains 130 species, of which seven are new.

The Geological and Natural History Survey of North Carolina, Part III, Botany, by Rev. M. A. CURTIS, D. D., Raleigh, 1867, contains a list of 217 lichens of that State, with brief indications of their stations. A note from the author says: "The list was arranged by Professor Tuckerman some seven or eight years ago. His present views are different." Professor Tuckerman desires it to be understood that he declines to acknowledge it, being made up of an old list, with changes and additions which he was not permitted to see.

In a paper in the *American Naturalist* for April, 1868, Professor TUCKERMAN discusses the question, Can Lichens be identified by chemical tests? and expresses himself inclined to the negative opinion.

To complete the record of Professor TUCKERMAN'S labors, we have to mention *Lichenes Americæ Septentrionalis exsiccati*, Cambridge, 1847–1855, a valuable collection of specimens of about 150 species of North American Lichens, and *Caroli Wright Lichenes Insulæ Cubæ curante E. Tuckerman*, Boston, 1864, a collection of the Lichens of Cuba, which, as we have above mentioned, are described in the *Observations.*

OLNEY'S *Catalogue of Rhode Island Plants*, published in Vol. I. of the Proceedings of the Providence Franklin Society, Providence, 1846, contains a short and incomplete list of Lichens, comprising twenty-four species. Among them are *Calicium tympanellum* Ach., and *Borrera ciliaris* Ach.; but it is doubtful whether the plants thus named were genuine specimens.

DARLINGTON'S *Flora Cestrica*, third edition, Philadelphia, 1853, contains a list of Lichens of Chester county, arranged by Dr. Michener, with descriptions condensed from Tuckerman's Synopsis. It enumerates 105 species, of which the author says: "About twenty were never

before published in this country, one half of which are entirely new."

The *Journal of the Essex Co. Natural History Society*, Vol. I, No. 2, 1839, at page 96, contains a notice of *Cladonia uncialis*, var. *reticulata* (the *C. Boryi* of Tuckerman's Synopsis), by JOHN L. RUSSELL, with notices of six other New England Lichens. The same plant is farther noticed in No. 3 of the same Journal, at page 125, together with *C. gracilis*, var. *elongata*.

In the *Proceedings of the Essex Institute* are the following notices of Lichens, all by Mr. Russell:

Vol. I, p. 15, mention of some lichens occurring in Brattleborough and on Mansfield Mountain, Vt. Among them are *Parmelia ostreata* Fr., *Coniocybe furfuracea* Ach., and *C. pallida* Fr., not previously noticed as occurring in this country.

Vol. I, p. 188, description of the new genus and its as yet solitary species *Hydrothyria venosa* Russ., *Verrucaria maura* Wahl., *Sphæromphale atra* Russ., and *Verrucaria perpusilla* Russ. These last two Mr. R. now considers as doubtful.

Vol. II, p. 35, mention is incidentally made of the occurrence of *Parmelia* [*Pannaria*] *brunnea* Sw., first found in this country by Mr. Oakes.

Vol. II, p. 134, *Some Notes on the Cryptogamic Vegetation of the Azores*, contains notices of forty-five species of Lichens, collected by Thomas W. Higginson.

The *New American Cyclopædia*, Vol. X, contains a good general article on Lichens, also by Mr. RUSSELL.

A note in the *American Naturalist* for October, 1867, by the present writer, mentions the occurrence of *Biatora lucida* Fr. in the White Mountains (Berlin Falls). But *Verrucaria margacea* Wahl., is there erroneously mentioned as having occurred to him in Vermont.

The *Annals of the Botanical Society of Canada*, contain the following notices of Lichens:

Vol. I, p. 49, abstract of a paper entitled, *What to Observe in Canadian Lichens*, by W. LAUDER LINDSAY, read Feb. 15, 1851.

Vol. I, p. 78, *A List of Plants collected on the South and East Shores of Lake Superior, and on the North Shore of Lake Huron in* 1860, by ROBERT BELL, mentions seven lichens, all common.

Vol. I, p. 81, a paper on *The Economical Uses of Sticta pulmonaria*, by N. T. DRUMMOND.

A Provisional Catalogue of Canadian Cryptogams, by DAVID A. P. WATT, published in Vol. II, No. 5, of *The Canadian Naturalist*, October, 1865, enumerates 156 species of Lichens, arranged after the Acharian system, but without indication of stations or localities.