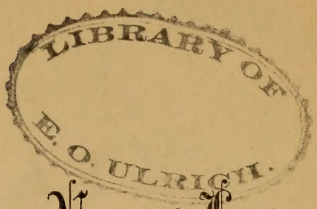

SMITHSONIAN INSTITUTION
THE LIBRARY

TWENTY-SIXTH ANNUAL REPORT

ON THE



New York State Museum of Natural History,

BY

THE REGENTS OF THE UNIVERSITY

OF THE

STATE OF NEW YORK.

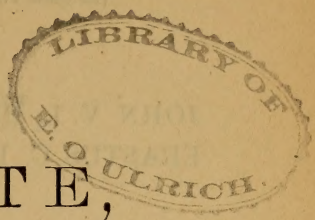
[EX-OFFICIO TRUSTEES OF THE MUSEUM.]

TRANSMITTED TO THE LEGISLATURE MAY 2, 1873.

ALBANY:
THE ARGUS COMPANY, PRINTERS.
1874.

STATE OF NEW YORK.

No. 109.



IN SENATE,

May 2, 1873.

TWENTY-SIXTH ANNUAL REPORT

ON THE

STATE MUSEUM OF NATURAL HISTORY, BY THE REGENTS OF THE UNIVERSITY OF THE STATE OF NEW YORK.

UNIVERSITY OF THE STATE OF NEW YORK:

OFFICE OF THE REGENTS,
ALBANY, *May* 2, 1873.

To the Hon. JOHN C. ROBINSON,
President of the Senate:

SIR.—I have the honor to transmit the Twenty-Sixth Annual Report on the State Museum of Natural History, by the Regents of the University.

I remain, very respectfully,
Your obedient servant,
JOHN V. L. PRUYN,
Chancellor of the University.

REGENTS OF THE UNIVERSITY.

[*Ex officio* Trustees of the State Museum of Natural History.]

JOHN V. L. PRUYN, LL.D., CHANCELLOR.
ERASTUS C. BENEDICT, LL. D., VICE-CHANCELLOR.

EX-OFFICIIS.

JOHN A. DIX, LL.D., GOVERNOR.
JOHN C. ROBINSON, LIEUTENANT-GOVERNOR.
G. HILTON SCRIBNER, SECRETARY OF STATE.
ABRAM B. WEAVER, SUPERINTENDENT OF PUBLIC INSTRUCTION.

PROSPER M. WETMORE.
ROBERT G. RANKIN.
GEORGE W. CLINTON, LL.D.
LORENZO BURROWS.
ROBERT S. HALE, LL.D.
ELIAS W. LEAVENWORTH, LL.D.
J. CARSON BREVOORT.
GEORGE R. PERKINS, LL.D.
ALEXANDER S. JOHNSON, LL.D.
GEORGE W. CURTIS, LL.D.
WM. H. GOODWIN, D.D., LL.D.
FRANCIS KERNAN, LL.D.
OSWALD OTTENDORFER.
JOHN L. LEWIS.
HORATIO G. WARNER, LL.D.
HENRY R. PIERSON.
MARTIN I. TOWNSEND.

SAMUEL B. WOOLWORTH, LL.D., SECRETARY.
DANIEL J. PRATT, ASSISTANT SECRETARY.

STANDING COMMITTEE OF THE REGENTS, SPECIALLY CHARGED WITH THE CARE OF THE STATE MUSEUM.

1873.

THE GOVERNOR.
THE SECRETARY OF STATE.
MR. CLINTON.
MR. LEAVENWORTH.
MR. BREVOORT.
MR. JOHNSON.
MR. PIERSON.

DIRECTOR OF THE STATE MUSEUM.

JAMES HALL, LL.D.

ASSISTANTS IN THE MUSEUM.

R. P. WHITFIELD, IN GEOLOGY AND PALÆONTOLOGY.
J. A. LINTNER, IN ZOÖLOGY.
CHARLES H. PECK, IN BOTANY.
CHARLES E. HALL, GENERAL ASSISTANT.
CHARLES CALLAWAY, SPECIAL ASSISTANT IN DISTRIBUTION.

REPORT.

To the Honorable the Legislature of the State of New York:

The Regents of the University, as Trustees of the State Museum of Natural History, respectfully submit this their Twenty-sixth Annual Report:

The condition of the Museum in its collections and their arrangement has been much improved during the last year. Valuable additions have been made, especially to the Zoölogical Department. Among these are a group of the Buffalo (male, female and a calf), and a male and female Elk—animals formerly inhabiting this State, but not now found within its limits. These were killed, the former in Nebraska, and the latter in Montana, and in size and beauty have rarely been excelled. The Trustees of the Museum gladly availed themselves of the opportunity of obtaining them, which will probably hereafter be rare. They were secured through Professor Ward, of Rochester, whose skill in this line of work is most favorably known to naturalists. A skeleton of the Buffalo has also been obtained, and that of the Elk is in the course of preparation.

The other additions, both by gift and purchase, appear in the catalogue hereto annexed.

The specimens in Mineralogy, nearly all of this State, are being mounted, catalogued and re-arranged. This Department is receiving the special attention of the Director, and it is confidently expected that it will soon compare favorably with the other departments. It ought to contain the best specimens of every mineral found in the State. Several private collections are now offered for sale, the purchase of which is very desirable, as they would add greatly to the value and perfection of the collection. The want of means has alone prevented the Trustees from obtaining them.

The report of the Botanist presents the most gratifying evidence of his industry, and with the collections which he has made, embracing many species not before found in the State, constitutes a valuable contribution to Botanical science.

The report of the Director exhibits the general condition of the Museum. Appended to it are descriptions of the Bryozoa and Corals of the Lower Helderberg Group.

The visit of the Director during the past year to many of the museums of Europe, will be of great value to his work in this Museum. To his abilities and zeal and to that of his assistants, the Trustees bear the most willing testimony.

Respectfully submitted in behalf of the Regents.

JOHN V. L. PRUYN,
Chancellor.

REPORT ON THE STATE MUSEUM.

CONTENTS.

	Page.
Report of the Director	5
Additions to the Museum during the year 1872	17
List of Iron Ores in the Economic Collection of the N. Y. State Museum	27
Record of Borings of Gardner Oil Well No. 3, at East Shamburg, Pennsylvania	31
Report of the Botanist. C. H. Peck	35
Descriptions of Bryozoa and Corals of the Lower Helderberg Group: By James Hall	93
Entomological Contributions—No. 3: By J. A. Lintner	113

REPORT OF THE DIRECTOR.

ALBANY, *January*, 1873.

To the Honorable the Board of Regents of the University of the State of New York:

GENTLEMEN.—I have the honor to present herewith the following report upon the condition of the State Museum of Natural History, with a brief statement of the additions made to the collections, and the work done in the several departments.

The collections already arranged in the Museum are in good condition, and I confidently expect that the rearrangement of the entire mineralogical collection, already commenced, and of a portion of the geological collection, will be completed within the ensuing year.

A list of additions to each of the departments will be found appended to this report.

ADDITIONS AND DONATIONS TO THE MUSEUM.

The increase in the Zoölogical Department, by donation, has been less than in some former years. The continuation of the series of the Mollusca of Long Island, by Messrs. Sanderson Smith and Temple Prime, requires especial notice and deserves our thanks. Such collections of the local fauna are of far more importance than all the miscellaneous collections which can be made. This collection now numbers one hundred and twenty-one species, and is arranged in the west end of the hall on the third floor, in a case especially devoted to the *Invertebrata* of the State of New York.

In the Botanical Department we have recorded ten contributors; and among the species of plants thus acquired are a considerable number which are new, and a larger number which are new to the State. Appended to this report will be found a list of the names, with the number of species sent by each contributor.

The special report of Mr. Peck in this department will present in detail the result of his labors. The large number of species added to the list shows very conclusively that we are far from possessing a complete knowledge of our Flora, and offers a strong argument in favor of the continuance of these investigations.

I have elsewhere communicated my views upon the necessity of continuing this department, and also for a special increase of the Museum appropriation to cover this subject and that of Entomology.

In the departments of Geology and Mineralogy we have received donations from sixteen individuals; a list of these specimens is appended to this report. A collection of rocks, minerals and fossils, received from Mrs. Van Rensselaer, through Mr. T. L. Harison, Secretary of the Agricultural Society, deserves especial notice.

The additions in this department, by purchase and by field collections, will be noticed below. The collections in Geology, Mineralogy and Palæontology have been greatly increased during the past year, and the bulk or quantity of material acquired is greater than ever before in a single year.

We have received donations to the Library from individuals and societies to the number of twenty-two, and several important works have been added by purchase. A list of these will be found accompanying the report.

The *Illustrations Conchyliologiques*, by Chenu, purchased some time since, have been bound in four large folio volumes, and placed in the Library. Two other important works have been placed in the Library, pending purchase, which is subject to the approval of the Regents.

The Library is still quite in its infancy, and we greatly need more of the current scientific publications, as well as important standard works on science.

A list of several miscellaneous objects presented to the Museum will be found appended.

Some relics of the late civil war, which were contained in the Simms' collection purchased by the Legislature in 1870, and directed to be sent to the State Museum, have been, by permission of the Adjutant-General of the State, transferred to the Bureau of Military Statistics, as a more appropriate place for their custody. They are represented in the Simms' catalogue by the following numbers:

35	124	165	191	209
49	125	166	192	212
65	146	172	204	219
67	147	173	205	221
79	158	174	206	223
81	159	186	207	228
103	161	187	208	232
117	162	188	208bis.	

A duplicate list of these articles, with a receipt for the same, was given by Miss Elizabeth Dempsey, in charge of the B. M. S., and is placed on file in the Museum.

The Gebhard Collection.

The Legislature of the State, by an appropriation of $3,500, authorized the purchase of the collection of Mr. John Gebhard, of Schoharie. This collection is mainly a local one, consisting chiefly of the fossils of the Schoharie Valley formations; and the minerals of the water-lime formations, and the calcareous minerals of the Schoharie caves.

There were also some specimens in Zoölogy which will be found enumerated under the list.

The collection is contained in one hundred and twelve (112) boxes and fifteen barrels. It will afford a large number of duplicate specimens, which may be made available either in exchanges, or for the collections contemplated for distribution.

It is on many accounts important that we have means provided for arranging and labeling this collection, which will require much time and labor. It is, moreover, important that this work be done while I can supervise it, as there are no labels accompanying the specimens; a general label on the outside of each box indicates a formation only, while, in some instances, the box contains specimens from two or more formations.

Some of the boxes of fossils have been opened to obtain specimens for study and comparison, and other boxes to obtain the Ball's Cave specimens for exhibition in the cases. The contents of these boxes not so appropriated have been ticketed (Gebhard coll.) and placed in drawers in the back room, conveniently arranged for examination.

The Van Rensselaer Collection.

This collection of rocks, minerals and fossils was received at the Museum in a bad condition, having been loosely placed in boxes and barrels and long exposed to the dust and dampness of a cellar. The collection has been cleaned, and the specimens wrapped and packed in *twenty-one* boxes, properly labeled and temporarily stored in the basement, awaiting the rearrangement of the miscellaneous mineralogical collection of the Museum, when the better specimens will be incorporated and the remainder set aside for distribution. The fossils are chiefly European, and of Jurassic, Cretaceous and Tertiary formations.

Unfortunately there are no labels of name or locality with the minerals, and neither name, locality or formation with the fossils, and it will be only from knowledge of similar specimens of minerals or of similar fossils that we can assign locality or formation.

With additional assistance in the Museum, we shall be able to distribute and arrange this collection during the present year.

FIELD WORK AND INVESTIGATIONS.

Mr. Andrew Sherwood has been pursuing his investigations along the outcrop of the Catskill and Chemung groups, and collecting fossils from both these formations. At the time of this writing, his report of work done has not been received.

Messrs. G. B. Simpson and J. W. Hall have been temporarily employed in collecting fossils, chiefly Lamellibranchiata, from the shales of the Hamilton group, in the eastern central portion of the State. The collections thus acquired are of great importance both to the Museum and for the Palæontology of the State.

Mr. Hicock, of Amsterdam, has likewise been temporarily employed in collecting from the Trenton Limestone, with a view to supply some deficiencies in the Museum collections. Both in the Trenton Limestone and Hudson River group, the Museum collections require great improvement; but the process of collecting from these rocks is slow and often very disappointing in the results.

I have already made a special communication to the Secretary of the Board of Regents in regard to some important and valuable collections from the Trenton Limestone.

With the conclusion of Mr. Sherwood's labors, I hope to be able to present a corrected geological map of the southern counties of the State, which will materially aid in the construction of a revised geological map of the State, which I heretofore proposed to prepare.

The Director is able to report, as collections made by himself, a series of specimens illustrating a section of the beds composing the Paris Basin; fossils of the Devonian of Ferques in France; and of Refrath in Germany; collections, especially of corals, from the Wenlock Limestone, and some of the more characteristic fossils of the Ludlow formation, from localities in England.

GENERAL WORK OF THE MUSEUM.

In December, 1871, the Commissioners of the Land Office authorized the construction of certain new cases which had long been

needed; and these were completed about the end of July, 1872. Last year I had hoped to report these cases as completely occupied before this time; but my own ill-health, compelling a suspension of work for a time, has prevented the completion of the rearrangement proposed.

In the mean time I will here state what has been done towards making use of our improved facilities.

The Herbarium has been transferred to the new cases provided for it, together with the recent extensive collections of Fungi and Lichens, made by the Botanist. The "Beck Collection" remains in its original case, while the vacated case will be appropriated to extra-limital species, received through exchange or donation. The Herbarium now embraces at least twice as many species as it numbered five years ago, and is in a greatly improved condition. Many of the flowering plants, which were indifferently represented, have been illustrated by better specimens. From the care taken in securing the collection, it is believed to be now entirely free from insect depredation. The value of the Herbarium is attested by the frequent recourse to it by students for the purpose of determinations or study. In the collections made by the Botanist there are large numbers of duplicates, which, when labeled, will be highly valuable for exchange or for distribution to educational institutions; and many of these being species first described by our Botanist, their value is thus greatly enhanced.

In the new case adjoining the Herbarium has been deposited the Entomological collection of Mr. Lintner; this consists of above five thousand specimens, carefully prepared and well preserved, illustrative of the several orders of the Insect fauna of New York. Of these the Lepidoptera are classified, and the greater portion accurately labeled; affording facilities to students and institutions for determination of their collections.

The special care which Botanical and Entomological collections absolutely require for their proper preservation forbid that they should be freely exposed to the thousands who frequent the Museum; but access to them may always be had by the student or appreciative visitor, upon application at the Director's room.

Many of the new drawers in the back room have been appropriated to the purposes for which they were designed. Twenty-eight deep drawers have been occupied with duplicate botanical specimens. That portion of the Pickett collection which has been opened and

not arranged for the collection, has been classified in seventeen drawers. In other drawers have been placed the foreign minerals of the Emmons' collection, portion of the Simms' collection, minerals for distribution, contents of boxes left by former custodians and for a long time stored in the basement, etc. These drawers (nearly three hundred in number) afford excellent means for the convenient arrangement of material.

First Floor.

As very important additions have been made to the Palæontological and Geological departments during the past year, changes in method of arrangement became necessary. The addition of the four vertical cases upon the north side will afford the means of a rearrangement of all the Middle and Upper Silurian collections of the wall cases; a change which has long been imperatively required. This reorganization will be accomplished in a few weeks, and before this report will have been communicated to the Legislature.

At the east end of the room a platform has been erected on which is placed a fine series of the Gilboa collections of PSARONIUS (fossil tree-ferns), consisting of a large mass of the root-bed, portions of six trunks and specimens of the surrounding rock containing parts of the stems. As now arranged, they present a very attractive display of these interesting fossils.

Second Floor.

The necessity of extensive changes in the arrangement of this floor has long been recognized, and only deferred in consideration of other requirements seemingly more imperative. The three areas allotted to the large Mammalia proved too extensive for our means of occupying them. That the unoccupied space might be used, a plan was at first devised by which the Mammalian remains might be concentrated in one central area, leaving ample surrounding space for the additional cases which were to be brought into the room. Accordingly the Mastodon skeleton was dismounted, and that of the Megatherium and Megaceros brought to their assigned positions, when it became evident that the conformation of the building presented insuperable objections to the proposed plan.

As the next best arrangement, this disposition of the large central area was dispensed with; the fossil Elk (Megaceros) has been placed in the western area with the Mastodon skeleton and all the remains of

Mastodon and fossil Elephant belonging to the Museum. The casts of the Megatherium and Schistopleurum, with the head of the Dinotherium, and the skull and tusks of the Mammoth (*Elephas ganesa*) have been placed together in the eastern area. The cast of the Mososaurus has been placed in one of the wall cases, where it can be seen to much better advantage than in its former position; the other casts of fossils remain nearly as they were, in the wall cases.

This rearrangement of the larger and heavier material of the Second Floor has left the central area free for table cases, and given a larger amount of floor not previously well occupied. In this area we have arranged a series of four cases containing the collections of American Jurassic, Cretaceous and Tertiary formations. A second series of four cases contains the collection of European fossils from the Palæozoic, Mesozoic and later formations.

There still remains unoccupied three-fifths of this space for which we have no proper cases; but for the present we shall occupy this space with such cases as we have, some of which will be temporarily filled with mineral specimens; and in others I propose to begin the arrangement of a collection of fossils in *zoological order*, without reference to geological age. Such a collection is essential to the completion of the plan of the Museum originally proposed by me, and will be of great interest and utility to the student.

The rearrangement of the mineral collection of the State, on this floor, has been commenced and considerable progress made. For its completion we need shelving and tablets in order to a proper display of the collection.

Third Floor.

The Reigen collection of Mazatlan Mollusca has been rearranged in a new case provided for it. The present case* has allowed the removal of that portion of the collection heretofore contained in drawers, and its entire exhibition under glass. The adjustment of the glass tablets, upon which the specimens are mounted, in a case of different proportions from those to which they were originally fitted, so as to present a proper generic and family grouping, involved much labor. As now arranged, the collection offers to the ordinary observer a more attractive appearance, and to the student a better opportunity for study, than was possible in the separate cases. The

* This case contains sixty-seven square feet more than the table cases previously occupying the same position.

order of arrangement adopted by Mr. Carpenter has been in every respect preserved, the collection being simply adapted to the larger case.

The collection of New York Mollusca, which (exclusive of additional species contained in the suite below mentioned) embraces about one hundred and seventy of marine, land and fresh-water species, has been transferred from drawers beneath the Gould shells, and placed in the new case at the west end of the room. This case is intended eventually for the Invertebrata of New York; at present some of the Smithsonian contributions of shells will be arranged in one portion of it.

The collection of Long Island Mollusca, types of the list of Messrs. Smith and Prime, given in Vol. IX of "Annals of the Lyceum of Natural History of New York," the donation of which has been mentioned in the last report, has also been arranged in this case, where, in accordance with the very proper request of the donors, it will be kept as a distinct collection. The further contribution by these gentlemen of additional species embraced in their list, an acknowledgment of which appears in the present report, has also been incorporated with the above, thus increasing the number of species to one hundred and twenty-one. I take pleasure in announcing the promise of a similar collection of the Mollusca of Staten Island, by Mr. Sanderson Smith, typical of his lists in the Annals of the Lyceum.

A small number of New York Crustacea, taken from duplicate alcoholic specimens of the Museum, with a few species recently obtained, have been treated with preservative solutions, which it is believed will permit of their permanent display as dry specimens. In this condition they have been placed in trays in the case of Invertebrates, where their forms can be more easily comprehended than when seen through the refraction of a fluid medium, and in the unnatural position assumed in glass jars.

Some Lepidopterous larvæ have been prepared as a commencement of a representation of the class of Insects; also a few of the Myriopoda; but these have not yet been placed on exhibition.

In the upright portion of the Invertebrate case, the alcoholic collection of New York Fishes, removed from wall cases at the south corner of the room, has been temporarily arranged. Its classification is that adopted by De Kay in his Zoölogy of New York. In this case are also placed some fishes received from the Smithsonian Insti-

tution not belonging to the New York fauna, together with some other contributions from foreign sources.

In the wall cases vacated by the removal of the fishes, and in the large case at the east end of the room, the highly instructive collection of skeletons, recently prepared for the Museum by Prof. Ward, of Rochester, has been arranged. It embraces twenty specimens of Mammals, ten of Birds, eleven of Fishes, and nine of Reptiles—in all fifty specimens, representing forty-five species in the New York fauna. The present disposition of this collection is not a fully satis factory one, but is as favorable as the means at our command will permit. It is hoped that this valuable series may be hereafter materially extended until we have representatives of all the Mammals mounted, and also of the other classes, in order to illustrate structure and affinities.

Preliminary Work on Field Collections.

During the past three years collections have been accumulating from the field work of the Director and Assistants, which have not been properly cared for; and as such collections would be comparatively valueless without proper marking and recording, additional assistance has been employed for this work. At the present time we have over 330 trays or drawers, of 20×24 inches, filled with specimens which have been cleaned, assorted and ticketed; a large part of the work having been done during the past year. There are also more than 100 boxes of fossils, the greater part of which have been cleaned, ticketed and repacked; the better specimens having been selected for study in the palæontology, and arrangement in the State Museum. There are still a considerable number of boxes of specimens of our field collections which require to be cleaned, ticketed and arranged after the manner of the others.

I have here enumerated the most important work done in and for the Museum during the past year. The minor details, requiring daily attention and much time in such an institution, cannot be recorded.

Shelving, Drawers and Cases added to the Museum.

In order that the Regents of the University may have a more clear conception of what has been done in the Museum since it was placed in the hands of the present Director, I will here enumerate the *additions* in case and drawer space since that period.

On the main floor, we have added in the hall 159 feet in length of shelf room for the economic collection.

In the office room or Library the Botanical cases are of *four times* the capacity of 1866. The book-cases have more than five times their former capacity.

In the south room, adjoining the Library, we have added three drawer cases of thirty-eight feet linear extent by eight feet high, containing one thousand and sixty-two square feet of drawer area, and cases of shelves for storing books, trays and material for use in the Museum, of the capacity of three hundred and five cubic feet.

On the first floor, table cases for geological series, under glass, 351 square feet of area.

Drawers under glass cases, 114 square feet of area. Cases added to the Palæontological series, 129 square feet.

Vertical cases on north side of room, giving an area of glass front of about 160 square feet. Shelves for economic collections, iron ores, etc., eighty-nine feet length. Platform for fossil trunks of *Psaronius*, thirty-three feet area.

On the second floor, we have added the old cases of the Mazatlan collection from the floor above, making 120 feet area. Platform for skulls and bones of the Mastodon, etc., forty-two feet area. We have added vertical cases, giving 200 feet of glass front, and also added to the floor room 832 feet of area by closing two openings into the room below. These two areas now give space for all the large Mammal skeletons and casts of similar objects.

On the third floor, we have replaced the Mazatlan cases by one containing an area of 187 square feet, or sixty-seven square feet more than the old one. We have the cases of the Gould collection of shells, 368 square feet area; drawers under these cases of 1,568 square feet area. Cases at west end of room for Invertebrata, 220 square feet area; drawers beneath these cases, 700 square feet. Shelf room for fishes, 136 feet in length. Case at east end of room, 105 square feet area. On the north side four vertical cases, giving an area of glass front 169 square feet, for the collection of recent radiata.

Within a few weeks nearly the whole of the space above mentioned, with the exception of the drawers, will be fully occupied; a small area only in the Invertebrate case will remain.

The drawers will be gradually filled as the collections shall be arranged and distributed.

In regard to the future, we have only a comparatively small space on the second floor where new cases can be erected.

I believe the present arrangement and the proposed rearrangement of some parts of the collections, already begun, will present them in as condensed a form as is practicable for a Museum, which must, in some degree, be made acceptable as a popular resort.

An increase in the collections is a necessary condition of vitality in the organization of the Museum; and for some time to come these additional collections must, for the most part, be consigned to drawers or store-rooms. These, however, can be made available for study, and can with great facility be transferred to cases for exhibition at any future time.

I am, very respectfully,

Your obedient servant,

JAMES HALL.

ADDITIONS TO THE MUSEUM FOR THE YEAR 1872.

I. TO THE ZOOLOGICAL DEPARTMENT.

I. By Donation.

From Hon. J. Lee Tucker, West Laurens, N. Y.

Tooth of horse (supposed by the donor to be fossil, but probably recent).

From J. P. Thomas, Supt. Albany Rural Cemetery.

Cygnus mansuetus (Domestic Swan) of Europe.

From Wm. Newcomb, Johnsonville, N. Y.

Chordeiles popetur Bonap. ♀ (Night Hawk).

From Wm. Newcomb, M. D., Cornell University.

Anastoma ringens Lam., from the Tocantine District, Brazil.

From Temple Prime, New York.

Fifteen additional species (106 species previously reported) of the suite of type specimens of the Mollusca of Long Island, of the list of Sanderson Smith and Temple Prime, given in the Annals of the Lyceum of Nat. Hist. of N. Y., vol. IX, 1870, viz.:

Lucina strigilla Stimp.	Coney Island.
Mactra similis Say	East Hampton.
Machœra costata Gould	East Hampton.
Mya arenaria Linn	Greenport.
Eulima oleacea Kurtz & Stimp	Greenport.
Chemnitzia producta Stimp	Greenport.
Chemnitzia bisuturalis Stimp	Lloyd's Harbor.
Natica pusilla Say	Greenport.
Buccinum plicosum Menke	Greenport.
Columbella Gouldiana Agas	Greenport.
Pleurotoma cinerum Kurtz & Stimp	Greenport.

Actæon punctostriata Stimp..... Lloyd's Harbor.
Helix cellaria Mull..... Astoria.
Pupa corticaria Say..... Huntington.
Vertigo ovata Say..... Centreport.

II. By Purchase.

From the GEBHARD COLLECTION.

Shell of Galapagos turtle (*Testudo elephantopus*).
Carapace of snapping turtle (*Chelydra serpentina* Schw.).
A pair of moose horns (*Cervus alces* Linn.).
An elk horn (*Cervus Canadensis*).
Two pairs of horns of red deer (*Cervus Virgineanus Gmel.*).
A horn of red deer imbedded in a tree trunk.
Skull and horns of mountain sheep (*Ovis montana*).
Skull and horns of common sheep (*Ovis aries*).
Vertebræ and other bones of rattlesnake (*Crotalus durissus* Linn.).

II. TO THE BOTANICAL DEPARTMENT.

From Miss M. L. WILSON, Buffalo, N. Y.

Eight species of Lichens.

From H. GILLMAN, Detroit, Mich.

Three species Flowering Plants and two of rare Ferns.

From S. N. COWLES, Otisco, N. Y.

Two species of Flowering Plants, one of them new to the State.

From J. S. MERRIAM, New York city.

Six species of Plants, five of them new to the State.

From E. C. HOWE, M. D., Yonkers, N. Y.

Six species of Plants, five new to the State.

From H. W. YOUNG, Aqueboque, L. I.

Nine species of Plants, four new to the State and six new to the Herbarium.

From E. S. MILLER, Wading River, L. I.

Twenty-two species of Plants, three new to the State and five new to the Herbarium.

From H. Willey, New Bedford, Mass.

Twenty-six species of Lichens, seven of which are new to the State.

From W. R. Gerard, Poughkeepsie, N. Y.

Fourteen species of Fungi, twelve new to the State and five new species.

From Hon. G. W. Clinton, Buffalo, N. Y.

Twenty-eight species of Plants, nearly all Fungi, and all new to the State; nine are new species.

III. TO THE GEOLOGICAL AND MINERALOGICAL DEPARTMENTS.

I. By Donation.

From. Col. T. J. Parker, Gowanda, N. Y.

Sandstone from the Chemung Group, containing *Spirifera verneuilii.*

From L. W. Nichols, Troy, N. Y., through T. L. Harison.

Specimens of *Buculites ovatus* Say and of *Cyprina* —— *?* from Cretaceous beds on the Missouri river in Dakota.

From Charles Van Benthuysen, Albany, N. Y.

Infusible material resulting from the reduction of Split Rock Iron Ore, taken from the Corning Blast Furnace in January, 1872.

From W. C. H. Sherman, Newburgh, N. Y.

Polished Iron Ore (Slikensides), from the Forest-of-Dean Mine.

From Wm. H. Bogart, Aurora, N. Y.

Orthoceratites, from the Hamilton Group, Aurora, N. Y.

From Louis Ballin, Albany, N. Y.

Calcareous tufa, from the Hartz mountains, near Elrich, Prussia.

From Benj. Ruffner, Carlyle, Clinton Co., Ill.

Block Coal, from a deposit covering one thousand acres to the depth of fourteen to twenty-one feet, in Lincoln county, Missouri.

From Mrs. Jeremiah Van Rensselaer, through T. L. Harison, Esq.

A collection of Minerals, Rock Specimens, Fossils, etc., made by Dr. Jeremiah Van Rensselaer.

From D. MINTHORN, Watertown, N. Y.

Granites from quarries at Gouverneur, N. Y.

From AMASA J. PARKER, Jr. Albany, N. Y.

Two blocks of cannel coal from Pennsylvania, containing plant mains.

From GEO. R. HOWELL, N. Y. State Library.

Crystallized Pig-iron, from the Franklinite Iron Ore, Franklin furnace, Sussex county, N. J.

From HENRY A. HOMES, N. Y. State Library.

Feldspar, Shinnecock Hills, Suffolk county, N. Y.; Magnetite, locality——? Red Oxide of Zinc; a concretion of singular form, Arkansas; Spirifera, from Lower Carboniferous limestone; a fragment of Star-fish, from the Upper Silurian; *Protaster Miltonii*, Herefordshire, England.

From N. M. CASE, Albany, N. Y.

Hematitic Iron Ore, from the Blair Mines, near Newton, N. J.

From the ENGINEERS OF THE E. R. BRIDGE.

Surface Slate, from Ela's quarry, Lisbon, Grafton Co., N. H.

Gneissoid Granite; Bed-rock from the Pier, New York side of the East River bridge; blasted eighty-two feet below high water. Plane of stratification in situ, about 70°.

From WALTER PRIMMER, Glenville, N. Y.

A stalagmitic aggregation of particles from the sawing of steel rails at the Bessemer Works, Troy, N. Y.

II. By Purchase.

Sixty-nine specimens, in bottles, of rock formation and the accompanying oil, obtained at stated depths from the surface to the bottom (923 feet) of the Gardner well, No. 3, at Shamburg, Penn. (See record accompanying this report.)

IV. TO THE LIBRARY.

I. By Donation.

From the SOCIETY.

Sitzungs-Berichte der naturwissenschaftlichen Gesellschaft Isis in Dresden. Nos. 7–12. July–December, 1871.

From the Society.

Bulletin de la Société Impériale des Naturalistes de Moscou. Tome XL, No. 4, 1867; Tome XLI, No. 4, 1868; Tome XLIII, Nos. 3 et 4, 1870; Tome XLIV, Nos. 1, 2, 3 et 4, 1871; Tome XLV, No. 1, 1872. Moscou, 1867–72. 6 octavo pamph.

Nouveaux Mémoires de la Société Impériale des Naturalistes de Moscou. Tome XIII, Livraison III. Moscou, 1871. Quarto pamph.

From the Society.

Catalogue de la Bibliothèque de la Société Impériale des Sciences Naturelles de Cherbourg. 1870. Pamph., 8vo., pp. 46.

From the Society.

Schriften der Koniglichen Physikalisch–okönomischen Gesellschaft zu Konigsberg. Zehnter & Eilfter Jarhgangs, 1869, 1870. Quarto.

From the Author, through Prof. James Hall.

I. Réapparition du genre Arethusina *Barr.* (une planche).

II. Faune Silurienne des Environs de Hof, en Bavière (une planche). Par Joachim Barrande. Decembre, 1868. Pamph., 8vo., pp. 110.

Défense des Colonies, III. Etude générale sur nos étages G—H avec application spéciale aux environs de Hlubocep, près Prague. Par Joachim Barrande. Paris, Mars, 1865. Pamph., 8vo., pp. 367.

From the Author, through J. C. Brevoort.

Monographie des Poissons de Cuba compris dans la sous-famille des Sparini. Par Felipe Poey. Salem, 1872. Pamph., 8vo., pp. 171-184 of Annals of the Lyceum of Nat. Hist. of N. Y.

Genres des Poissons de la faune de Cuba appartenant à la famille Percidæ. Par Felipe Poey. Pamph., 8vo., pp. 27–79 of Vol. X of Ann. Lyc. Nat. Hist. N. Y.

From the Society.

Bulletin de la Société des Sciences Historiques et Naturelles de L'Yonne. Années, 1871, 1872; 25^{e} vol., 26^{e} vol. Paris, 1872, 1873.

From the Society.

Bericht über die Thätigkeit der St. Gallischen naturwissenschaftlichen Gesellschaft während des Vereinsjahres, 1871–72. St. Gallen, 1872.

From the AUTHOR.

Descriptions of new species of Crinoidea from the Carboniferous rocks of the Mississippi valley. By James Hall. [From the Jour. Bost. Soc. Nat. Hist., January, 1861.] Pamph., 8vo., pp. 261–328, with 7 photographic plates.

Descriptions of new species of Crinoidea from investigations of the Iowa Geological survey. Preliminary notice. By James Hall. Albany, February, 1861. Pamph., 8vo., pp. 18.

Descriptions of some new species of Crinoidea and other Fossils from the Lower Silurian strata of the age of the Hudson River Group and Trenton Limestone. By James Hall. November, 1866. Pamph., 8vo., pp. 17, 2 plates.

Descriptions of some new species of Fossils from the shales of the Hudson River Group, in the vicinity of Cincinnati, Ohio. By James Hall. October, 1871. Pamph., 8vo., pp. 8, 2 plates.

Notes on some new or imperfectly known forms among the Brachiopoda, etc. By James Hall. March, 1871. Reprinted with Explanation of Figures, March, 1872. Pamph., 8vo., pp. 8 with a plate.

Reply to a "Note on a Question of Priority." By James Hall. August, 1872. Pamph., 8vo., pp. 5.

On the Silurians of the United States. By Prof. James Hall. From the Geological Magazine [London], Vol. IX, No. 11. November, 1872. Pamph., 8vo., pp. 4.

From the AUTHORS.

Descriptions of new species of Fossils from the vicinity of Louisville, Kentucky, and the Falls of Ohio, from the collection of Dr. James Knapp, of Louisville. By James Hall and R. P. Whitfield. May, 1872, June, 1872 (two papers). Pamph., 8vo., pp. 7, pp. 13.

Descriptions of new species of Fossils from the Devonian rocks of Iowa, with a preliminary note on the formations. By James Hall and R. P. Whitfield. Albany, July, 1872. Pamph., 8vo., pp. 21, plates 4.

From Hon. EZRA CORNELL, Ithaca. N. Y.

The Cornell University Register, 1871–72. Ithaca, 1872. Pamph., 12 mo., pp. 132.

From T. L. Harison, Albany, N. Y.

Transactions of the N. Y. State Agricultural Society. Vol. XXX, 1870. Albany, 1872.

From the Smithsonian Institution.

Annual Report of the Board of Regents of the Smithsonian Institution, for the year 1870. Washington, 1871.

From Brig.-Gen. Albert J. Meyer, Chief Signal Officer, U. S. A.

Three copies of the tri-daily War Department Weather Map, and three copies of the tri-daily Bulletin, for May 22d, 1872.

From Alfred T. Turner, Boston, Mass.

Auditor of Accounts' Annual Report of the Receipts and Expenditures of the City of Boston and the County of Suffolk. Eight Volumes, for the following years: 1860–61, 1861–62, 1863–64, 1866–67, 1868–69, 1869–70, 1870–71, 1871–72.

From the Regents of the University.

Catalogue of the New York State Library, 1872. Subject–Index of the General Library. Albany, 1872.

Fifty-third and Fifty-fourth Annual Reports of the Trustees of the New York State Library. Albany, 1871 and 1872. Pamphlets.

Meteorological Observations made under instructions from the Regents of the University at sundry stations in the State of New York, from 1850 to 1863 inclusive. Prepared by Franklin B. Hough. Albany, 1872. Quarto.

From the Author.

Report of the Botanist [of the N. Y. State Museum]. Charles H. Peck. Albany, 1872. Pamph., 8vo., pp. 111, plates 6.

From the Author.

Entomological Contributions. By J. A. Lintner. Albany, 1872. Pamph., 8vo., pp. 90, plates 2.

Entomological Contributions, No. 2. By J. A. Lintner. Albany, 1872. Pamph., 8vo., pp. 66.

From Henry Gallien, Albany, N. Y.

Annual Reports of the Comptroller of the State of New York for the years 1865–1872. Eight pamphlets.

From the AUTHORS.

Remarks on the Genera Trimerella, Dinobolus and Monomerella. By Thomas Davidson, F. R. S., F. G. S., etc., and William King, Sc. D. From the Geological Magazine [London], Vol. IX, No. 10. October, 1872. Pamph., 8vo., pp. 4.

From E. R. DE TRAUTVETTER, Directeur.

Bulletin de la Jardin Impérial de Botanique, St. Pétersbourg. Tome 1, 1871. Pamph., 8vo., pp. 164.

II. By Purchase.

The American Journal of Science and Arts. New Haven, Conn., 1872. Third Series. Vol. III, Nos. 13, 15, 16, 17, 18; Vol. IV, Nos. 20, 22, 23, 24.

The American Naturalist. Salem, Mass., 1872. Vol. VI.

United States Railroad and Mining Register. Philadelphia, 1872. Vol. XVI. Folio.

Gazetteer of the State of New York. By Franklin B. Hough, A. M., M. D. Albany, 1872. 8vo.

Über Cystideen eingeleitet durch die entwicklung der eigenthümlichkeiten von *Caryocrinus ornatus* Say. von Leopold von Buch. Berlin, 1845. Pamph. Quarto, pp. 28, plates 2.

Essai sur le Système Silurien de L'Amerique Septentrionale. Par F. de Castelnau. Paris, 1843. Quarto, pp. 56.

Archives du Muséum d'Histoire Naturelle, publies par les Professeurs–Administrateurs de cet Etablissement. Tomes 1–10. Paris, 1839–1861. 10 vols., quarto.

Nouvelles Archives du Museum d'Histoire Naturelle, etc. Tomes, 1–7. Paris, 1865–1871. 7 vols., quarto.

Manuel de Conchyliologie et de Paléontologie Conchyliologique par Le Dr. J. C. Chenu. Paris, 1859 and 1862. 2 vols., octavo.

Traité de Paléontologie Végétale on la Flore du Monde Primitif dans ses Rapports avec les Formations Geologiques et la Flora du Monde Actuel, par W. Ph. Schimper. 3 vols. (one unpublished), avec un Atlas de 100 Planches. Paris, 1869–1872. Quarto.

V. MISCELLANEOUS.

From T. R. RAWLSON, Albany, N. Y.

A portable foot-stove or fire-pan, formerly used in churches before the introduction of heating apparatus.

From Wm. J. McAlpine, Albany, N. Y.

Sectional portion of a pine water-pipe, taken up from Broadway, Albany, opposite the Delavan House, in a remarkable state of preservation, after a burial of nearly one hundred years.

From John L. Coon, Albany, N. Y.

Piece of an Elm Tree which stood upon the site of the New Capitol at Albany; and piece of a horse-chestnut tree which stood on the present site of Geological and Agricultural Hall.

LIST OF IRON ORES IN THE ECONOMIC COLLECTION OF THE N. Y. STATE MUSEUM.

1. Magnetic Iron Ore. A block, $14 \times 9 \times 9$ in. Smith Ore Bed, Moriah, Essex county, N. Y.
2. Magnetic Iron Ore. A mass, $18 \times 7 \times 12$ in. Fort Ann, N. Y., near Comstock's Landing. From Lewis H. Roe, Westport, N. Y.
3. Franklinite. A mass, $16 \times 8 \times 7$ in. Essex county, N. J. Donor unknown.
4. Magnetic Iron Ore. A mass, $16 \times 12 \times 15$. New Bed, Moriah, N. Y. From Sherman, Witherbee & Co.
5. Magnetic Iron Ore, with Feldspar. A block, $17 \times 8 \times 8$ in. French Mountain, Warren county, N. Y. From J. L. & A. Randall, Albany.
6. Magnetic Iron Ore, with Feldspar. A block, $8 \times 9 \times 9$ in. French Mountain, Warren county, N. Y. From J. L. & A. Randall, Albany.
7. Magnetic Iron Ore. A block, $13 \times 9 \times 10$ in. Adirondack Mines, Essex county, N. Y.
8. Magnetic Iron Ore. A block, $14 \times 9 \times 8$ in. Adirondack Mines, Essex county, N. Y.
9. Magnetic Iron Ore. A block, $15 \times 4 \times 5$ in. Adirondack Mines, Essex county, N. Y.
10. Magnetic Iron Ore. A block, $9 \times 5 \times 8$ in. Old Bed, Moriah, Essex county, N. Y.
11. Hornblende, etc. A piece of veinstone, $12 \times 10 \times 15$ in. Cheever Ore Bed, Port Henry, Essex county, N. Y. Collection of Prof. James Hall.

12. Magnetic Iron Ore. A block, 12×10×10 in. Locality and donor unknown.

13. Magnetic Iron Ore. A block, 12×9×11 in. Port Dunk, near Fort Ann, N. Y. From Sanford R. Potter, Fort Edward, N. Y.

14. Magnetic Iron Ore. A block, 11×9×11 in. Port Dunk. From Sanford R. Potter, Fort Edward, N. Y.

15. Magnetic Iron Ore. A block, 13×11×5 in. Port Dunk. From Sanford R. Potter, Fort Edward, N. Y.

16. Magnetic Iron Ore. A block, 14×7×8 in. Port Dunk. From Sanford R. Potter, Fort Edward, N. Y.

17. Banded Gneiss. A block, 15×7×13 in. Essex county, N. Y. Collection of Prof. James Hall.

18. Magnetic Iron Ore. A block, 8×6×6 in. Locality and donor unknown.

19. Magnetic Iron Ore. A block, 13×9×8 in. Cheever Ore Bed, Port Henry, N. Y. From the Cheever Ore Bed Company.

20. Magnetic Iron Ore. A mass, 17×11×9 in. Locality and donor unknown.

21. Magnetic Iron Ore. A mass, 13×9×8 in. Locality and donor unknown.

22. Magnetic Iron Ore. A block, 13×6×10 in. Old Bed, Moriah, Essex county, N. Y. From Sherman, Witherbee & Co.

23. Magnetic Iron Ore. A block, 11×7×7 in. Clinton county, N. Y. From Hon. Smith M. Weed, Plattsburgh, N. Y.

24. Red Hematite. A block, 15×13×6 in. Clinton, Oneida county, N. Y.

25. Magnetic Iron Ore. A mass, 21×17×11 in. From Thomas H. Oram, Superintendent of Forest-of-Dean Iron Ore Company, Fort Montgomery, Orange county, N. Y.

26. Polished Iron Ore. Slickensides. Two pieces, 15×12 and 13×10. Lake Superior Mine, Marquette county, Mich. From Lewis H. Morgan, Rochester, N. Y.

27. Slate Iron Ore. A block, $10 \times 3 \times 10$ in., with piece of accompanying rock, 15×12 in. Lake Superior Mine, Mich. From L. H. Morgan, Rochester, N. Y.

28. Specular Iron Ore. A block, $19 \times 5 \times 11$ in. Washington Mine, Lake Superior. From L. H. Morgan, Rochester, N. Y.

29. Granular Iron Ore. Two blocks, $13 \times 6 \times 11$ and $9 \times 3 \times 7$ in. Lake Superior Mine, Mich. From L. H. Morgan.

30. Slate Iron Ore. Two blocks, $7 \times 4 \times 8$ and $12 \times 5 \times 5$ in. Champion Mine, Marquette county, Mich. From L. H. Morgan.

31. Magnetic Granular Iron Ore. A mass, $15 \times 11 \times 11$ in. Washington Mine, Marquette county, Mich. From L. H. Morgan.

32. Magnetic Granular Iron Ore. A block, $14 \times 7 \times 11$ in. Champion Mine, Mich. From L. H. Morgan.

33. Silicious Iron Ore. A block, $22 \times 13 \times 17$ in., striped with red jasper, weighing about four hundred pounds. Marquette county, Mich. Collection of Prof. James Hall, in 1870.

34. Magnetic Iron Ore. A block, $9 \times 9 \times 8$ in. Champion Mine, Marquette county, Mich. Collection of Prof. James Hall, 1870.

35. Specular Iron Ore. A block, $16 \times 8 \times 5$ in. Same locality and vein as No. 34. Collection of Prof. James Hall, 1870.

36. Magnetic Iron Ore. A block, $12 \times 7 \times 5$ in. Cheever Bed, Moriah, Essex county, N. Y. Collection of Prof. James Hall, 1873.

37. Magnetic Iron Ore. A block, $10 \times 9 \times 13$ in. Cheever Ore Bed, Port Henry, Essex county, N. Y. From the Cheever Ore Bed Company.

38. Magnetic Iron Ore. A block, $10 \times 6 \times 5$ in. Hussy and Howe Iron Mine, Ferrona, Clinton Co., N. Y. From Herman Veeder, Agt.

39. Hematitic Iron Ore, with imbedded quartzite. A mass, $24 \times 8 \times 7$ in. Salisbury, Conn. From W. R. Whittlesey, Lakeville, Conn.

40. Hematitic Iron Ore. A mass, $12 \times 12 \times 7$ in. Locality and donor unknown.

41. Silicious Hematitic Iron Ore. A mass, $13 \times 10 \times 6$ in. Essex county, N. Y., four miles south of Moriah Corners. From Eliphalet Hall.

RECORD OF BORINGS OF GARDNER OIL WELL NO. 3 AT EAST SHAMBURG, PENNSYLVANIA.

Depth in Feet: from	to		No. of Sample.
		Surface rock pulverized, found in irregular masses of	1
		from one to a thousand pounds each	2
Surface.	16	Earth	3
16	50	Bluff sand-rock with crevices from 1 inch to 6 inches,	4
50	85	Do	5
85	120		6
120	132	Blue sand-rock containing a heavy water-course	7
132	195		8
195	199	A hard flint-shell, known as top of mountain sand	9
199	210	Mountain sand-rock	10
210	215	Slate rock	11
215	227	First sand-rock	12
227	240	Do	13
240	251	Do	14
251	263	Do	15
263	274	Do	16
274	290	Do	17
290	320		18
320	342		19
342	351		20
351	410		21
410	430		22
430	465	Second sand-rock (cased well and shut off fresh water),	23
465	490		24
490	565		25
565	686	Red rock	26
686	710	Third sand-rock	27
710	770		28
770	783	"Blue Monday"	29
783	800		30

Depth in Feet: from	to		No. of Sample.
800	830	Fourth sand-rock. Lubricating oil rock. (See No. 50),	31
830	881	.....	32
881	884	Hard shells	33
884	897	.....	34
897	900	.....	35
900	907	Fifth sand-rock. Yellow pebbles and slate.....	36
907	921	Do. Black oil rock. (Bottle No. 51)...	37
921	944	Slate	38
944	945	Sixth sand-rock. Bl. slate and pebble. Green oil rock,	39
945	948	Pebble rock.....	40
948	951	Do	41
951	955	Do	42
955	957	Do	43
957	959	Do	44
959	961	Do	45
961	966	Do	46
966	972	Gray sand-rock.....	47
972	980	Do	48
944	980	Pebbles selected from 6th sand-rock.....	49
800	830	Lubricating oil from 4th sand-rock. See No. 31....	50
900	921	Black oil from 5th sand-rock. See Nos. 36 and 37..	51
944	980	Green oil from 6th sand-rock See Nos. 39 to 48 inc.,	52

The remainder of the specimens are from the Day well at Shamburg, and are, with the exception of No. 69, all samples of 5th and 6th sand-rock. This is one of the best sand-rocks in the oil regions, being of an unusual thickness and coarseness.

863	872	Fifth sand-rock	53
872	875	Do.....	54
875	881	Slate	55
881	888	Pebble shell, top of 6th sand-rock.....	56
888	893	Gray sand-rock	57
893	899	Pebble	58
899	904	Do.....	59
904	907	Do	60
907	915	Do	61
915	917	Do	62

Depth in Feet: from	to		No. of Sample.
917	928	Do	63
928	932	Do	64
932	934	Do	65
934	936	Do	66
936	939		67
939	951		68
890	923	Sixth sand-rock from Walter Thompson's well No. 1, on James McCray's farm, Petroleum Center, which produced oil at the rate of 500 barrels per day for one hundred consecutive days.	69

REPORT OF THE BOTANIST.

S. B. Woolworth, LL. D.,

Secretary of the Board of Regents of the University:

Sir.—Since the date of my last report, specimens of two hundred and eighty-two species of plants have been mounted and placed in the Herbarium of the State Museum of Natural History, of which two hundred and sixty-seven were not before represented therein. A list of the specimens mounted is marked (1).

Specimens have been collected in the counties of Albany, Cayuga, Columbia, Greene, Lewis, Delaware, Onondaga, Otsego, Rensselaer, Ulster, Schoharie and Wayne. These represent two hundred and sixteen species new to the Herbarium and one hundred and four species new to science. The latter are all fungi. A list of the species collected is marked (2). It will be seen that this list is but little less than the corresponding one of the preceding year, while the number of new species detected is even greater. These results, I apprehend, are entirely due to the character of the season just past, it having been one unusually favorable to the production of fungoid plants.

Specimens of forty-eight New York species, new to the Herbarium and not among my collections of the past season, have been contributed or obtained by naming specimens for correspondents. These added to the collected species make the whole number of additions two hundred and sixty-four. A list of the contributors and their contributions is marked (3).

Classified Tabular Statement.

		New to the Herbarium.	New to Science.
Plants collected	Flowering plants	1	.....
	Ferns	1	.....
	Lichens	4	.....
	Fungi.....	210	104
Total.....		216	104
Plants contributed..	Flowering plants	11	.....
	Characeæ.....	2	.....
	Lichens	10	.....
	Fungi.....	25	7
Total.....		48	7
Collected and contributed.....		264	111

New species with their descriptions, previously unreported species, new stations of rare plants, etc., are given in a section marked (4).

The plan of making colored sketches of the fleshy fungi to accompany the dried specimens has been continued. The number of species and varieties figured is sixty-five.

It has been my purpose to test the edible qualities of the most promising of our wild plants as opportunity might occur, and also to prove by experiment those fungi already reported in books as edible. Having found some thrifty young plants of the giant Solomon's Seal, *Polygonatum giganteum*, it occurred to me that they might be of some value as an article of food. The succulent character of the plant and its botanical relations suggested the mode of preparation for the table. It was the same as that usually employed in the preparation of the asparagus plant. As might have been expected, the flavor of the plant, when cooked, closely resembled that of asparagus. It does not appear to me to be at all inferior to asparagus as an article of food, and it only remains to determine whether it can be cultivated with equal facility and profit before pronouncing this indigenous plant to be of equal value with the introduced asparagus plant.

It is with pleasure that I record the vermilion Hygrophorus, *Hygrophorus miniatus*, as edible. It is a valuable addition to our list of esculent species, as it has not hitherto been classed among

those fit for food. Having made trial of it, I do not hesitate to say that in tenderness of substance and agreeableness of flavor it stands in the first rank. The only thing that detracts from its value is its small size, it being usually scarcely more than one inch in breadth, though under favorable circumstances it sometimes attains a diameter of three inches. Its bright red color and brittle substance make it a fungus easily recognized. It is abundant in the North woods, the favorite habitat of many of our valuable species.

Among the culinary vegetables held in high esteem among the Chinese, says Dr. Hance, is one called by them *Kau sun*, or "cane shoots," which consists of the white solid base of the stem of a grass, *Hydropyrum latifolium*, closely related to our Indian rice, *Zizania aquatica*. It is said by the writer to be one of the most agreeable and nicest of vegetables, and to possess a peculiar richness and delicacy of flavor. He also suggests an examination of our similar American plant to see if it may not yield a similar valuable product.

My investigations, instituted in accordance with this suggestion, were not rewarded by the desired discovery. The nearest approach to it that was found is a tender white basal part in the young offshoots or suckers of the main stem. This tender portion is palatable, and, like its Chinese relative, bears some resemblance in its flavor to boiled green corn, but the quantity produced is too insignificant to be of any value. The main stems are fibrous and hollow to the base.

Having had occasion to visit the celebrated Montezuma marshes in quest of botanical specimens, I could not view with indifference the enormous growth of luxuriant herbaceous vegetation that covered this extensive area of marsh land. Rushes and sedges, reed-grasses and flags, from six to ten feet high, and that too in dense, wide-spreading patches, could not fail to impress the mind with the belief that the capacity of the soil of these marshes for the production of plants is truly wonderful. Enriched as it has been by the deposition of ages and by the decay of crop after crop of marsh vegetation, its present productions are an indication that there lie stored up here elements of wealth more precious than mines of gold. The simple question is, how can they be made available? If the ordinary method of drainage is not practicable, might not a system of dyking and siphon drainage be adopted with advantage? If no system of drainage can be made profitable, and we must wait for the slow processes of nature to bring about the desired result, may not more that is

valuable be secured from the marsh even in its present condition than is now obtained? It is true, some of the firmer places are used as pasture ground for cattle, some of the finer sorts of sedges and grasses are cut and shipped to the New York market to be used as bedding for horses, and a large supply of flag leaves is annually gathered. But in all these ways an extremely small part of the produce of the marshes is utilized. So very many tons of rank vegetation are annually left to rot on the ground that it seems almost wasteful. I would suggest the propriety of instituting a series of experiments with a view to establish the value of some of the grasses which constitute such a large part of the vegetation of the marsh. Especially promising are the Indian rice, *Zizania aquatica*, and the reed-grass, *Phragmites communis*. These might be found, if cut early, to be equal or even superior in value to corn fodder, and the seeds of the former are almost sure to be a good grain for the fattening of fowls. Having established the value of these grasses, it would seem to be but a trifling matter to increase their quantity to such an extent that they might be harvested with profit.

The unusual destruction of vegetation in some localities last winter, and especially of hardy evergreens, has been a theme of considerable comment. It is not my purpose to discuss the various theories that have been advanced in explanation of the unusual occurrence, but simply to record a few interesting cases that have fallen under my own observation.

In a certain locality, in the town of Sand Lake, there is a group of young pines, some of the trees being red pine, *Pinus resinosa*, and some white pine, *Pinus strobus*. None of the former were affected, but the latter had many of their branchlets winter-killed, thus indicating that the former is a more hardy tree than the latter.

The hilly region in the eastern part of Rensselaer county has for many years furnished the Albany market with a plentiful supply of wild blackberries, *Rubus villosus*, and wild raspberries, *Rubus strigosus*. Last summer the crop of the former was an entire failure, the briers being winter-killed, but of the latter there was an ordinary yield, thus indicating that the raspberry is more hardy than the blackberry.

A young white-pine, standing in an opening between two clumps of trees, in such a position as to receive the full force of the strong north-west winds, had many of its branchlets on this exposed side killed, while those on the opposite side of the tree were comparatively

unharmed. This indication of the destructive agency of the cold winds was not in other cases so clearly shown.

In some instances terminal twigs of hemlocks, *Abies Canadensis*, had their leaves brown and discolored as if winter-killed, but the twigs themselves retained their vitality and in June had commenced to put forth new shoots as if nothing had happened. Grape-vines supposed dead, in some cases sprouted at or near the roots and sent up new shoots which grew with unparalleled vigor.

(1)

SPECIES OF WHICH SPECIMENS HAVE BEEN MOUNTED.

NOT NEW TO THE HERBARIUM.

Claytonia Caroliniana *Mx.*
Cornus Canadensis *L.*
Lappa off. *var.* tomentosa *Gray.*
Betula lutea *Mx.*
Acnida cannabina *L.*
Scirpus Torreyi *Olney.*
Equisetum palustre *L.*
Phegopteris poly. *var.* multifida.
Agaricus arvensis *Schæff.*
Clavaria juncea *Fr.*
Puccinia Peckiana *Howe.*
P. Waldsteiniæ *Curt.*
P. Ast. *var.* purpurascens.
Microsphæra penicillata *Lev.*
M. Friesii *var.* castanea *C.-P.*

NEW TO THE HERBARIUM.

Sesuvium pentandrum *Ell.*
Pyrus communis *L.*
Lythrum alatum *Pursh.*
Utricularia striata *Lec.*
U. purpurea *Walt.*
Rumex Patientia *L.*
Arceuthobium pusillum *Pk.*
Spiranthes graminea *Lindl.*
Eleocharis Robbinsii *Oakes.*
Scirpus Clintonii *Gray.*
Rhynchospora macrostachya.
Dicranum palustre *Brid.*
Orthotrichum sordidum *S. & L.*
O. Peckii *S. & L.*
O. pusillum *Mitten.*
Leucodon julaceus *Hedw.*
Hypnum Peckii *Aust.*
Lejeunia hamatifolia *Dumort.*
Parmelia Borreri *Turn.*
P. colpodes *Ach.*
Placodium elegans *Lk.*
Theloschistes candelarius *L.*
Gyalecta Pineti *Fr.*
G. cupularis *Schær.*
Pannaria nigra *Nyl.*
P. tryptophylla *Ach.*
P. crossophylla *Tuck.*
Lecanora rubina *Vill.*
L. Hageni *Ach.*
Biatora russula *Mont.*
B. decolorans *Hoffm.*
Rinodina ascociscana *Tuck.*
Myriangium Curtisii *B. & M.*
Verrucaria rupestris *Schrad.*
Arthonia spectabilis *Flot.*
A. lecideëlla *Nyl.*
Collema pulposum *Ach.*
C. cyrtaspes *Tuck.*
C. pycnocarpum *Nyl.*
Endocarpum arboreum *Schw.*

Agaricus russuloides *Pk.*
A. illinitus *Fr.*
A. decorosus *Pk.*
A. multipunctus *Pk.*
A. rutilans *Schæff.*
A. hordus *Fr.*
A. virescens *Pk.*
A. fallax *Pk.*
A. sinopicus *Fr.*
A. succosus *Pk.*
A. myriadophyllus *Pk.*
A. pelianthinus *Fr.*
A. debilis *Bull.*
A. subcæruleus *Pk.*
A. roseocandidus *Pk.*
A. roridus *Fr.*
A. pterigenus *Fr.*
A. olivarius *Pk.*
A. gracillimus *Weinm.*
A. albocrenulatus *Pk.*
A. Acericola *Pk.*
A. discolor *Pk.*
A. pallidomarginatus *Pk.*
A. putrigena *B. & C.*
A. saccharinophilus *Pk.*
A. hirtosquamulosus *Pk.*
A. squamosus *Fr.*
A. hiascens *Fr.*
A. silvaticus *Schæff.*
Coprinus variegatus *Pk.*
Hygrophorus chlorophanus *Fr.*
Marasmius umbonatus *Pk.*
M. semivelutipes *Pk.*
M. languidus *Fr.*
Lentinus hæmatopus *Berk.*
L. vulpinus *Fr.*
L. tigrinus *Fr.*
Boletus vermiculosus *Pk.*
B. castaneus *Bull.*
B. affinis *Pk.*
B. separans *Pk.*
Boletus modestus *Pk.*
Polyporus picipes *Pk.*
Merulius lacrymans *Fr.*
Hydnum strigosum *Swartz.*
Craterellus cæspitosus *Pk.*
Thelephora pedicellata *Schw.*
Clavaria rufescens *Schæff.*
C. clavata *Pk.*
Tremella albida *Huds.*
T. colorata *Pk.*
Stereum frustulosum *Fr.*
Corynites Ravenelii *Berk.*
Cryptosporium Scirpi *Pk.*
Gelatinosporium abietinum *Pk.*
G. betulinum *Pk.*
Sphæronema cæspitosum *Pk.*
S. truncatum *Fr.*
S. minutissimum *Pk.*
S. pallidum *Pk.*
S. Magnoliæ *Pk.*
Acrospermum compressum *Tode.*
Sphæropsis Platani *Pk.*
S. linearis *Pk.*
S. quercina *Pk.*
S. Pericarpii *Pk.*
S. Malorum *Berk.*
Hendersonia Robiniæ *West.*
H. Sambuci *Pk.*
Diplodia Lignicola *Pk.*
D. petiolaris *Pk.*
D. valsoides *Pk.*
Darluca filum *Cast.*
Septoria salicina *Pk.*
S. ochroleuca *B. & C.*
S. acerina *Pk.*
S. mirabilis *Pk.*
Dinemasporium Graminum *Lev.*
D. Herbarum *Cooke.*
Micropera Drupacearum *Lev.*
Cheirospora botryospora *Fr.*
Stilbospora Staphyleæ *Schw.*

Cytispora fugax *Fr.*
C. chrysosperma *Fr.*
Torula alnea *Pk.*
Sporidesmium moriforme *Pk.*
Rœstelia aurantiaca *Pk.*
Æcidium Convallariæ *Schum.*
Æ. Gerardiæ *Pk.*
Æ. Calthæ *Grev.*
Æ. crassum *Pers.*
Uredo Ledicola *Pk.*
Gymnosporangium Juniperi *Fr.*
G. clavipes *C. & P.*
Urocystis occulta *Preuss.*
U. pusilla *C. & P.*
Cystopus cubicus *Str.*
Puccinia obtecta *Pk.*
P. arundinacea *Hedw.*
P. linearis *Pk.*
P. Polygonorum *Lk.*
P. angustata *Pk.*
P. Lychnidearum *Lk.*
P. variabilis *Grev.*
P. pulchella *Pk.*
P. Myrrhis *Schw.*
P. Prunorum *Lk.*
P. Menthæ *Pers.*
P. Caricis *DC.*
P. Lobeliæ *Gerard.*
Uromyces triquetra *Cooke.*
U. Euphorbiæ *C. & P.*
U. Sparganii *C. & P.*
U. pyriformis *Cooke.*
Protomyces Erythronii *Pk.*
Gymnosporium arundinis *Cd.*
Stilbum tomentosum *Schrad.*
Atractium flammeum *B. & R.*
Fusarium lateritium *Nees.*
F. roseum *Lk.*
Illosporium roseum *Fr.*
Periconia Azaleæ *Pk.*
Streptothrix abietina *Pk.*
Macrosporium Chartarum *Pk.*
Clasterisporium caricinum *Schw.*
C. pedunculatum *Pk.*
Oidium simile *Berk.*
O. monilioides *Fr.*
Cladosporium epiphyllum *Nees.*
Zygodesmus fuscus *Cd.*
Z. olivaceus *B. & C.*
Ascophora Mucedo *Tode.*
Myrothecium Fungicola *Pk.*
Uncinula circinata *C. & P.*
U. Ampelopsidis *Pk.*
U. macrospora *Pk.*
U. Clintonii *Pk.*
U. flexuosa *Pk.*
Microsphæra diffusa *C. & P.*
M. extensa *C. & P.*
M. densissima *Schw.*
M. Hedwigii *Lev.*
M. Dubyi *Lev.*
M. holosericea *Lev.*
M. pulchra *C. & P.*
Sphærotheca Castagnei *Lev.*
S. pruinosa *C. & P.*
Podosphæra biuncinata *C. & P.*
Erysiphe Martii *Lk.*
Eurotium Herbariorum *Lk.*
Onygena equina *Pers.*
Geoglossum simile *Pk.*
G. glutinosum *Pers.*
Vibrissea Truncorum *Fr.*
V. lutea *Pk.*
Peziza vesiculosa *Bull.*
P. lacerata *C. & P.*
P. subochracea *C. & P.*
P. Resinæ *Fr.*
P. nigrella *Pers.*
P. theleboloides *A. & S.*
P. leucoloma *Reb.*
P. badia *Pers.*
P. stercorea *Pers.*

Peziza nivea *Fr.*
P. coronata *Bull.*
P. Kalmiæ *Pk.*
P. Solenia *Pk.*
P. vincta *C. & P.*
Helotium epiphyllum *Fr.*
Bulgaria inquinans *Fr.*
Patellaria indigotica *C. & P.*
Nodularia Acericola *Pk.*
Cenangium seriatim *Fr.*
C. Cephalanthi *Schw.*
Dothidea Kalmiæ *Pk.*
D. crystallophora *B. & C.*
Stictis radiata *Fr.*
Rhytisma lineare *Pk.*
R. Andromedæ *Fr.*
Rhytisma Ilicis-Canadensis *Schw.*
Hysterium commune *Fr.*
H. petiolare *Fr.*
H. tortile *Schw.*
H. ilicinum *De Not.*
Hypocrea gelatinosa *Fr.*
Nectria inaurata *B. & Br.*
Torrubia ophioglossoides *Tul.*
Xylaria filiformis *A. & S.*
X. acuta *Pk.*
Hypoxylon vernicosum *Schw.*
H. atropurpureum *Fr.*
Melanconis elliptica *Pk.*
Diatrype discreta *Schw.*
D. betulina *Pk.*
Diatrype Cercidicola *B. & C.*
Valsa Colliculus *Wormsk.*
V. ambiens *Fr.*
V. stellulata *Fr.*
V. thelebola *Fr.*
V. quaternata *Fr.*
V. truncata *C. & P.*
V. Alni *Pk.*
V. Platani *Schw.*
Sphæria moriformis *Tode.*
S. Coptis *Schw.*
S. Petiolorum *Schw.*
S. Kalmiarum *Schw.*
S. Ramulicola *Pk.*
S. lilacina *Schw.*
S. leucoplaca *B. & R.*
S. bombarda *Batsch.*
S. Vaccinicola *Schw.*
S. Fraxicola *Schw.*
S. salicella *Fr.*
S. rubella *Pers.*
S. eccentrica *C. & P.*
S. hirsuta *Fr.*
S. melanostyla *Fr.*
S. Pezizula *B. & C.*
Sphærella spleniata *C. & P.*
Venturia pulchella *C. & P.*
V. orbicula *C. & P.*
V. compacta *Pk.*
Hydrodictyon utriculatum *Ag.*
Nostoc commune *Vauch.*

(2)

PLANTS COLLECTED NEW TO THE HERBARIUM.

Pycnanthemum pilosum *Nutt.*
Asplenium montanum *Willd.*
Pannaria rubiginosa *Ach.*
Biatora rivulosa *Ach.*
Verrucaria rupestris *Schrad.*
Collema tenax *Sw.*
Agaricus Friesii *Lasch.*
A. fuscosquameus *Pk.*
A. felinus *Pers.*
A. oblitus *Pk.*
A. ponderosus *Pk.*
A. rubicundus *Pk.*
A. æstuans *Fr.*
A. flavescens *Pk.*
A. leucocephalus *Krombh.*
A. laterarius *Pk.*
A. Limonium *Pk.*
A. thujinus *Pk.*
A. fumidellus *Pk.*
A. Hebeloma *Pk.*
A. lacunosus *Pk.*
A. connexus *Pk.*
A. albissimus *Pk.*
A. maculosus *Pk.*
A. Truncicola *Pk.*
A. subzonalis *Pk.*
A. Gerardianus *Pk.*
A. niger *Schw.*
A. conigenus *Pers.*
A. coloreus *Pk.*
A. miratus *Pk.*
A. echinipes *Lasch.*
A. rugosodiscus *Pk.*
A. cyaneus *Pk.*
A. granularis *Pk.*
A. byssisedus *Pers.*
A. fuscofolius *Pk.*
A. foliomarginatus *Pk.*
Agaricus Herbarum *Pk.*
A. nephrodes *B. & C.*
A. fulvotomentosus *Pk.*
A. stellatosporus *Pk.*
A. cerasinus *Pk.*
A. callistus *Pk.*
A. expansus *Pk.*
A. coprinoides *Pk.*
A. bellulus *Pk.*
A. geminellus *Pk.*
A. discomorbidus *Pk.*
A. phyllogenus *Pk.*
A. diminutivus *Pk.*
A. Howeanus *Pk.*
Coprinus insignis *Pk.*
C. angulatus *Pk.*
Cortinarius sphærosporus *Pk.*
C. porphyropus *A. & S.*
C. claricolor *Fr.*
C. longipes *Pk.*
C. lilacinus *Pk.*
C. modestus *Pk.*
C. Clintonianus *Pk.*
C. torvus *Fr.*
C. lignarius *Pk.*
C. nigrellus *Pk.*
C. pulcher *Pk.*
Lepista cinerascens *Bull.*
Paxillus strigosus *Pk.*
P. panuoides *Fr.*
Hygroph orus purus *k.*
H. eburneus *Bull.*
H. Cossus *Fr.*
H. virgatulus *Pk.*
H. borealis *Pk.*
Lactarius regalis *Pk.*
L. Gerardii *Pk.*
Russula consobrina *Fr.*

Russula sordida *Pk.*
Marasmius Viticola *B. & C.*
M. cæspitosus *Pk.*
M. longipes *Pk.*
M. glabellus *Pk.*
M. straminipes *Pk.*
Panus strigosus *B. & C.*
Lenzites vialis *Pk.*
Boletus piperatus *Bull.*
B. pallidus *Frost.*
B. chrysenteron *Fr.*
B. ampliporus *Pk.*
Polyporus griseus *Pk.*
P. cæruleoporus *Pk.*
P. flavidus *Pk.*
P. splendens *Pk.*
P. humilis *Pk.*
P. rhipidius *Berk.*
P. maculatus *Pk.*
P. aurantiacus *Pk.*
P. conchifer *Schw.*
P. ferruginosus *Fr.*
P. Armeniacus *Berk.*
P. sanguinolentus *Fr.*
P. attenuatus *Pk.*
P. violaceus *Fr.*
Hexagona carbonaria *B. & C.*
Cyclomyces Greenii *Berk.*
Hydnum confluens *Pk.*
H. ferruginosum *Fr.*
Sistotrema confluens *Pers.*
Grandinia coriaria *Pk.*
Thelephora Willeyi *Clinton.*
Stereum tenerrimum *B & R.*
S. radiatum *Pk.*
Corticium bicolor *Pk.*
C. leucothrix *B. & C.*
Clavaria fistulosa *Fr.*
Tremella frondosa *Fr.*
Exobasidium Azaleæ *Pk.*
E. Andromedæ *Pk.*
Lycoperdon separans *Pk.*
L. pedicellatum *Pk.*
Aethalium Ferrincola *Schw.*
Spumaria alba *DC.*
Diderma crustaceum *Pk.*
D. Mariæ-Wilsoni *Clinton.*
D. farinaceum *Pk.*
Didymium connatum *Pk.*
D. furfuraceum *Fr.*
D. farinaceum *Fr.*
Physarum cæspitosum *Pk.*
P. pulcherripes *Pk.*
Angioridium sinuosum *Grev.*
Craterium leucocephalum *Ditm.*
C. obovatum *Pk.*
Stemonitis herbatica *Pk.*
Arcyria nutans *Fr.*
Trichia reniformis *Pk.*
Licea cylindrica *Fr.*
Perichæna flavida *Pk.*
Sphæronema Magnoliæ *Pk.*
Pestalozzia Pezizoides *De Not.*
Bactridium flavum *Kze.*
Uromyces Sparganii *C. & P.*
U. pyriformis *Cooke.*
Æcidium Lycopi *Gerard.*
Æ. Hydrophylli *Pk.*
Stilbum ramosum *Pk.*
Ceratium porioides *A. & S.*
C. hydnoideum *A. & S.*
Myrothecium Fungicola *Pk.*
Helicoma Mulleri *Cd.*
Aspergillus glaucus *Lk.*
A. fuliginosus *Pk.*
Polyactis fascicularis *Cd.*
Oidium fulvum *Lk.*
Fusisporium roseolum *Steph.*
Pilacre faginea *B. & Br.*
Mucor inæqualis *Pk.*
Microsphæra Russellii *Clinton.*
M. densissima *Schw.*

Microsphæra Dubyi *Lev.*
Erysiphe Euphorbiæ *Pk.*
Peziza hesperidea *C. & P.*
P. subochracea *C. & P.*
P. lacerata *C. & P.*
P. vincta *C. & P.*
P. Dehnii *Rabh.*
P. assimilis *C. & P.*
P. pulverulenta *Libert.*
P. crocitincta *B. & C.*
P. violacea *Pers.*
P. unicisa *Pk.*
P. albumina *C. & P.*
P. corrugata *C. & P.*
Helotium rugipes *Pk.*
H. macrosporum *Pk.*
H. thujinum *Pk.*
H. gracile *C. & P.*
H. Limonium *C. & P.*
Elaphomyces granulatus *Fr.*
Hysterium macrosporum *Pk.*
H. sphæroides *A. & S.*
H. exaridum *C. & P.*
H. maculare *Fr.*
H. angustatum *A. & S.*
H. typhinum *Fr.*
Torrubia capitata *Fr.*
Hypocrea alutacea *Fr.*
Hypomyces polyporinus *Pk.*
Nectria Ribis *Tode.*
N. coccinea *Fr.*
N. Celastri *Schw.*
N. balsamea *C. & P.*
N. Apocyni *Pk.*
N. mycetophila *Pk.*
Diatrype platystoma *Schw.*
D. bullata *Fr.*
D. Tocciæana *De Not.*
D. moroides *C. & P.*
Melanconis stilbostoma *Tul.*
Valsa bicincta *C. & P.*
Lophiostoma magnatum *C. & P.*
L. turritum *C. & P.*
Eutypa Acharii *Tul.*
Sphæria canescens *Pers.*
S. staphylina *Pk.*
S. Desmodii *Pk.*
S. viridicoma *C. & P.*
S. mutans *C. & P.*
S. Semen *C. & P.*
S. subconica *C. & P.*
S. fuscella *B. & Br.*
S. maculæformis *Pers.*
S. Sarmentorum *Fr.*
S. racemula *C. & P.*
Massaria bufonia *Tul.*

(3)

CONTRIBUTORS AND THEIR CONTRIBUTIONS.

Miss M. L. Wilson, Buffalo, N. Y.

Usnea trichodea *Ach.*
Alectoria Fremontii *Tuck.*
Ramalina tenuis *Tuck.*
Cladonia muscigena *Schær.*
Lecanora Hageni *Ach.*
Gyalecta Pineti *Fr.*
Buellia turgescens *Nyl.*
Strigula Feei *Mont.*

H. Gillman, Detroit, Mich.

Tanacetum Huronense *Nutt.*
Anemone multifida *DC.*
Vaccinium myrtilloides *Hook.*
Aspidium Lonchitis *Sw.*
A. fragrans *Sw.*

S. N. Cowles, Otisco, N. Y.

Chenopodium polyspermum *L.*
Panicum agrostoides *Spreng.*

J. S. Merriam, New York City.

Sesuvium pentandrum *Ell.*
Helianthus angustifolius *L.*
Hiracium murorum *L.*
Utricularia purpurea *Walt.*
Æcidium Uvulariæ *Schw.*
Æ. Nesææ *Gerard.*

E. C. Howe, M. D., Yonkers, N. Y.

Chara Hedwigii *Ag.*
C. hispida *L.*
Delesseria Leprieurii *Mont.*
Puccinia curtipes *Howe.*
Pestalozzia Pezizoides *De Not.*
Uncinula spiralis *B. & C.*

H. W. Young, Aquebogue, L. I.

Helianthus angustifolius *L.*
Utricularia resupinata *Greene.*
Scirpus debilis *Pursh.*
Cyperus Grayii *Torr.*
Hypericum Canadense *L.*
Rhynchospora nitens *Vahl.*
Panicum amarum *Ell.*
Andropogon Virginicus *L.*
Sparganium sim. *v.* androcladum.

E. S. Miller, Wading River, L. I.

Reseda luteola *L.*
Drosera filiformis *Raf.*
Galactia mollis *Mx.*
Desmodium lævigatum *DC.*
Potentilla recta *Willd.*
Myriophyllum tenellum *Bigel.*
M. amb. *var.* limosum *Gr.*
Oldenlandia glomerata *Mx.*
Aster concolor *L.*
Tilia Am. *var.* pubescens *Gr.*
Hypericum Can. *var.* major *Gr.*
Utricularia minor *L.*
U. resupinata *Greene.*
U. intermedia *Hayne.*
Rhynchospora nitens *Vahl.*
R. macrostachya *Torr.*
Scirpus subterminalis *Torr.*
Eleocharis rostellata *Torr.*
E. melanocarpa *Torr.*
Eragrostis poæoides *Bv.*
Eleusine Indica *Gært.*
Botrychium simplex *Hitch.*

H. Willey, New Bedford, Mass.

Cetraria Fendleri *Tuck.*
Sticta fuliginosa *Ach.*
Pannaria Petersii *Tuck.*
P. brunnea *Sw.*
P. rubiginosa *Ach.*
Collema cladodes *Tuck.*
Lichina confinis *Ag.*
Synalissa phylliscina *Tuck.*
S. phæococca *Tuck.*
Biatora ostreata *Hoffm.*
B. rub. *var.* inundata *Fr.*
Agyrium rufum *Pers.*

Buellia Elizæ *Tuck.*
B. alboatra *Schær.*
B. vernicoma *Tuck.*
B. dyalita *Nyl.*
B. myrmecina *Fr.* [*Tuck.*
Lecanactis pr. *var.* chloroconia
Opegrapha demissa *Tuck.*
Arthonia dispersa *Nyl.*
A. tædiosa *Nyl.*
Staurothele circinata *Tuck.*
Sagedia oxyspora *Nyl.*
Verrucaria pinguicula *Mass.*
V. pyrenophora *Ach.*

W. R. GERARD, Poughkeepsie, N. Y.

Nyctalis asterophora *Fr.*
Puccinia Lobeliæ *Gerard.*
Æcidium Nesææ *Gerard.*
Æ. Lysimachiæ *Lk.*
Æ. Clematitis *Schw.*
Uredo Caryophyllaceæ *Johnst.*
Periconia calicioides *Fr.*
Uncinula spiralis *B. & C.*
U. parvula *C. & P.*
Peziza chrysoplithalma *Gd.*
Hypomyces Van Bruntianus *Gd.*
Xylaria Graminicola *Gerard.*
Lophium mytilinum *Fr.*
Sphæria Sarmentorum *Fr.*

Hon. G. W. CLINTON, Buffalo, N. Y.

Torilis anthriscus *Gært.*
Agaricus silvaticus *Schæff.*
Polyporus Gordoniensis *B. & Br.*
Hexagona carbonaria *B. & C.*
Hydnum sulphureum *Schw.*
Thelephora Willeyi *Clinton.*
Diderma Mariæ-Wilsoni *Clinton.*
Phoma brunneotinctum *B. & C.*
Diplodia vulgaris *Lev.*
Excipula Equiseti *Pk.*
Dinemasporium acerinum *Pk.*
Bactridium flavum *Kze.*
Æcidium album *Clinton.*
Perenospora parasitica *Pers.*
Oidium megalosporum *B. & C.*
O. fulvum *Lk.*
Uncinula spiralis *B. & C.*
U. flexuosa *Pk.*
Microsphæra Russellii *Clinton.*
M. Dubyi *Lev.*
Peziza hesperidea *C. & P.*
P. theleboloides *A. & S.*
Colpoma juniperinum *C. & P.*
* Seirosporium Mohrii *Clinton.*
Hypocrea contorta *Schw.*
Xylaria grandis *Pk.*
Valsa centripeta *Fr.*
Massaria bufonia *Tul.*

* *Seirosporium Mohrii* Clinton in litt.

Cups scattered, sessile, slightly concave, margined, black; asci clavate; paraphyses very slender, filiform; spores linear, nearly colorless, closely 25–35 septate, .004–.005 in. long.

Bark of trees. Hawaii Island. Coll. H. Mann.

(4)

PLANTS FOUND GROWING SPONTANEOUSLY IN THE STATE AND NOT BEFORE REPORTED.

Potentilla recta *Willd.*

Ridge near Wading River, Long Island. *E. S. Miller.*

Torilis anthriscus *Gært.*

Buffalo. *G. W. Clinton.* Introduced.

Helianthus angustifolius *L.*

Salt marsh, Peconic river. *H. W. Young.* New Lots, Long Island. *J. S. Merriam.*

Utricularia resupinata *Greene.*

Ponds, Wading River. *Miller, Young.*

Pycnanthemum pilosum *Nutt.*

Near Savannah, Wayne county.

Chenopodium polyspermum *L.*

Brewerton, Onondaga county. *S. N. Cowles.*

Rumex Engelmanni *Ledeb.*

Mouth of Peconic river, L. I. *Young.*

Rhynchospora nitens *Vahl.*

Wading River. *Miller, Young.*

Panicum amarum *Ell.*

Indian island at the mouth of Peconic river. *Young.*

Long Island seems to be the northern limit of several plants having a southern range.

Asplenium montanum *Willd.*

Rocky precipices. New Paltz, Ulster county.

This is probably its most northern station, and at present its only known locality in the State. The credit of its discovery here belongs, I believe, to *Mr. H. Denslow.*

Chara hispida *L.*

New Baltimore, Greene county. *E. C. Howe.* A single specimen.

Chara Hedwigii *Ag.*

New Baltimore. *Howe.*

Pannaria Petersii *Tuck.*

Rocks. Trenton Falls and Glen's Falls. *H. Willey.*

Pannaria rubiginosa *Ach.*

Trunks of trees. Shandaken, Ulster county.

Collema tenax *Sow.*

Rocks. Helderberg mountains.

Collema cladodes *Tuck.*

Rocks. Trenton Falls. *Willey.*

Lecanora Hageni *Ach.*

Rocks. Niagara Falls. *Miss M. L. Wilson.*

Gyalecta Pineti *Schrad.*

Mossy ground. Arcade. *Miss Wilson.* Shawangunk mountains. *C. F. Austin.*

Biatora rivulosa *Ach.*

Rocks and stones. Worcester, Otsego county. The specimens are sterile.

Buellia turgescens *Nyl.*

Old wood. Buffalo. *Miss Wilson.*

Lecanactis premnea var. chloroconia *Tuck.*

Bark of hemlock trees. Ithaca. *Willey.*

Staurothele circinata *Tuck.*

Rocks. Trenton Falls. *Willey.*

Verrucaria pinguicula *Mass.*

Rocks. Trenton Falls. *Willey.*

Verrucaria pyrenophora *Ach.*

Rocks. Trenton Falls. *Willey.*

Verrucaria rupestris *Schrad.*

Rocks. Watkins' Glen, Schuyler county.

Agaricus Friesii *Lasch.*

Woods. Fort Edward. *Howe.* Worcester, Otsego county, and Memphis, Onondaga county.

Our specimens do not agree strictly with the description of the species. The stem is not scaly and the odor is scarcely perceptible

unless the plant be cut or wounded or until it is dried. The outer or lower surface of the annulus is scaly.

AGARICUS (LEPIOTA) FUSCOSQUAMEUS *Peck.**

Pileus hemispherical or convex, rough, with numerous erect pointed blackish-brown scales; lamellæ close, white, free; stem equal, thickened at the base, hollow or stuffed with a cottony pith, floccose, brown; spores .0003 × .00014 of an inch.

Plant 2–3 inches high, pileus 1.5–2 inches broad, stem 3 lines thick.

Ground in woods. Croghan, Lewis county. September.

AGARICUS FELINUS *Pers.*

Ground in woods. Croghan and North Elba. August and September.

Fries, in his Epicrisis, unites this species with *Ag. clypeolarius*, and indeed in our specimens there is no external mark whereby the one may be separated from the other except the darker color of the scales in *Ag. felinus*. But this difference is so strongly supported by the much smaller spores (.00028 × .00016 in.) that I am constrained to follow Persoon in considering this plant distinct from *Ag. clypeolarius*. *Ag. fuscosquameus* may be separated from it by its stouter habit, bulbous stem and more narrow spores.

AGARICUS (LEPIOTA) OBLITUS *Peck.*

Pileus fleshy, convex or expanded, subumbonate, smooth or obscurely squamose from the breaking up of the veil, viscid, alutaceous, inclining to tawny, the umbo generally darker; lamellæ crowded, free, whitish or yellowish, some of them forked; stem equal or slightly tapering upward, smooth at the top, floccose, viscid, hollow or containing a cottony pith; annulus obsolete; spores .00016 × .00012 in.

Plant 2′–3′ high, pileus 2′–3′ broad, stem 3″ thick.

Ground in frondose woods. Lowville, Lewis county. September.

AGARICUS (ARMILLARIA) PONDEROSUS *Peck.*

Pileus thick, compact, convex or subcampanulate, smooth, white or yellowish, the naked margin strongly involute beneath the slightly viscid persistent veil; lamellæ crowded, narrow, slightly emarginate, white inclining to cream color; stem stout subequal, firm, solid, coated by the veil, colored like the pileus, white and furfuraceous above the annulus; flesh white; spores nearly globose, .00016 in. in diameter.

* The species to which the author's name is appended have been published in the *Bulletin of the Buffalo Society of Natural Sciences*, vol. I, pp. 41–72.

Plant 4′–6′ high, pileus 4′–6′ broad, stem about 1′ thick.

Ground in woods. Copake, Columbia county. October.

The veil for a long time conceals the lamellæ and finally becomes lacerated and adheres in shreds or fragments to the stem and margin of the pileus.

Agaricus (Tricholoma) rubicundus *Peck.*

Pileus convex, then expanded or centrally depressed, viscid, slightly tomentose on the margin when young, smooth or sometimes with a few scales either on the disk or on the margin, red; lamellæ close, white becoming spotted with red, some of them forked; stem firm, equal, solid, slightly pruinose, white often stained with red; spores .00028 × .00016 in.

Plant 3′–5′ high, pileus 3′–5′ broad, stem 6″–8″ thick.

Ground in woods. New Scotland, Albany county. October.

The plant is rarely cæspitose. The thin cuticle is separable. The color is suggestive of species of Russula.

Agaricus (Tricholoma) flavescens *Peck.*

Pileus firm, convex, often irregular, dry, smooth, sometimes cracking into minute scales on the disk, white or pale yellow, minutely tomentose on the margin when young; lamellæ close, floccose on the edge, white or pale yellow; stem firm, solid, often unequal, central or eccentric, colored like the pileus; spores subglobose, .0002 in. in diameter.

Plant cæspitose, 2′–3′ high, pileus 2′–3′ broad, stem 4″–6″ thick.

Old pine stumps. Bethlehem and North Greenbush. October.

Agaricus (Tricholoma) lacunosus *Peck.*

Pileus convex or expanded, dry, lacunose, densely furfuraceous, bright golden-yellow; lamellæ subdistant, white, the interspaces sometimes veiny; stem firm, solid, equal or slightly tapering downwards, scaly or furfuraceous, colored like the pileus.

Plant 1′–2′ high, pileus 1′ broad, stem 1″ thick.

Fallen branches and decaying wood. Savannah. August.

The colors are well retained in the dried specimens. The lacunæ of the pileus give it a somewhat reticulated appearance.

Agaricus (Tricholoma) laterarius *Peck.*

Pileus convex or expanded, sometimes slightly depressed in the center, pruinose, whitish, the disk often tinged with red or brown, the thin margin marked with slight subdistant, short, radiating ridges; lamellæ narrow, crowded, white, prolonged in little decur-

rent lines on the stem; stem nearly equal, solid, white; spores globose, .00018 in. in diameter.

Plant 3′–4′ high, pileus 2′–4′ broad, stem 3″–5″ thick.

Ground in woods. Worcester. July.

The ornamentation of the margin of the pileus is a convenient mark of specific distinction.

AGARICUS (TRICHOLOMA) LIMONIUM *Peck.*

Pileus thin, broadly convex or expanded, smooth, yellowish; lamellæ crowded, narrow, not forming decurrent lines on the stem, lemon yellow; stem tapering downwards, smooth, striate, radicating.

Plant 3′–4′ high, pileus 2′–3′ broad, stem 3″–4″ thick.

Ground in woods. Worcester and Croghan. July and September.

The lemon yellow color, especially distinct in the lamellæ, and the tapering root-like prolongation of the stem characterize this species.

AGARICUS LEUCOCEPHALUS *Krombh.*

Ground in woods. Croghan. September.

This plant is sometimes cæspitose. Its stem is narrowed at the base into a tapering root-like prolongation.

AGARICUS (TRICHOLOMA) FUMIDELLUS *Peck.*

Pileus convex, then expanded, subumbonate, smooth, moist, dingy white or clay-color clouded with brown; lamellæ close, subventricose, whitish; stem equal, smooth, solid, whitish; spores .00018 × .00015 in.

Plant 2′–3′ high, pileus 1′–2′ broad, stem 2″–3″ thick.

Ground in woods. New Scotland. October.

The disk is generally darker than the margin. The pileus becomes paler in drying. The stem splits easily.

AGARICUS (TRICHOLOMA) THUJINUS *Peck.*

Pileus convex or centrally depressed, smooth, hygrophanous, pale alutaceous, the margin generally irregular, wavy or lobed; lamellæ crowded, thin, abruptly emarginate, alutaceous; stem slightly thickened at the top, smooth, hollow, concolorous, whitish-villous at the base.

Plant 2′ high, pileus 2′ broad, stem 2″–3″ thick.

Swampy ground, under arbor-vitæ, *Thuja occidentalis.* Memphis. August.

Agaricus (Tricholoma) Hebeloma *Peck.*

Pileus broadly conical or subcampanulate, obtuse, thin, hygrophanous, striatulate and brown, with a darker disk when moist, grayish when dry; lamellæ broad, rounded behind and deeply emarginate, yellowish; stem equal, hollow, smooth, pallid; spores .00028 × .00016 in.

Plant 1′ high, pileus 6″ broad, stem scarcely 1″ thick.

Ground in woods. Worcester. July.

This plant so closely resembles some species of the subgenus Hebeloma in general appearance, that, in the absence of the spores, it might easily be mistaken for a species of that subgenus.

Agaricus (Clitocybe) connexus *Peck.*

Pileus thin, convex or expanded, subumbonate, clothed with a minute appressed silkiness, white, the margin sometimes faintly tinged with blue; lamellæ crowded, narrow, white inclining to yellowish; stem equal or tapering downwards, solid, whitish.

Plant 2′–3′ high, pileus 2′–3′ broad, stem 2″ thick.

Ground in woods. Croghan. September.

The lamellæ sometimes terminate rather abruptly and are not strongly decurrent, hence it might easily be mistaken for a Tricholoma. The margin of the pileus is sometimes marked with slight ridges as in *Ag. laterarius.* The odor is weak but aromatic and agreeable.

Agaricus (Clitocybe) albissimus *Peck.*

Pileus convex or expanded, dry, smooth, soft, pure white; lamellæ close, short-decurrent, white, some of them forked at the base; stem equal, smooth, solid, white.

Plant growing in rings, 2′–3′ high, pileus 2′–3′ broad, stem 2″–3″ thick.

Ground in woods. Croghan. September.

The pure white color and soft texture is retained in the dried specimens.

Agaricus (Clitocybe) maculosus *Peck.*

Pileus convex, centrally depressed, smooth, marked with numerous watery spots when moist, yellowish-white, with slight short radiating ridges on the margin; lamellæ crowded, narrow, long-decurrent, pallid or yellowish, some of them forked; stem slightly thickened at the base, smooth, stuffed or hollow, colored like the pileus.

Plant 2′–3′ high, pileus 1.5′–2′ broad, stem 2″–3″ thick.

Ground in woods. Croghan. September.

The watery spots of the pileus resemble those of *Ag. marmoreus*. They often disappear as the plant becomes dry.

AGARICUS (CLITOCYBE) TRUNCICOLA *Peck.*

Pileus thin, firm, expanded or slightly depressed in the center, smooth, dry, white; lamellæ narrow, thin, crowded, adnate-decurrent; stem equal, stuffed, smooth, often eccentric and curved, whitish.

Plant 1′ high, pileus 1′ broad, stem 1″ thick.

Trunks of frondose trees, especially maples. Croghan. September.

AGARICUS (CLITOCYBE) SUBZONALIS *Peck.*

Pileus thin, centrally depressed or subinfundibuliform, marked with two or three obscure zones, with a slight appressed silkiness, pale yellow; lamellæ close, narrow, equally decurrent, some of them forked, pallid or yellowish; stem equal, slightly fibrillose, stuffed, pale yellow.

Plant 2′ high, pileus 2′–3′ broad, stem 2″–4″ thick.

Ground in woods. Croghan. September.

AGARICUS (CLITOCYBE) GERARDIANUS *Peck.*

Pileus thin, funnel-form, hygrophanous, striatulate when moist, brown, rough with scattered blackish points; lamellæ decurrent, close, a little paler than the pileus, some of them forked; stem rather long, flexuous, smooth, stuffed, concolorous, white at the base.

Plant 2′–3′ high, pileus 8″–12″ broad, stem .5″–1″ thick.

Sphagnous marshes. Sandlake, Rensselaer county. New Paltz. June.

This is related to *Ag. ectypoides*, but it is much more slender and fragile, with a different habitat and without the fibrous radiating lines on the pileus of that species.

AGARICUS NIGER *Schw.*

Decaying wood. Helderberg mountains.

AGARICUS CONIGENUS *Pers.*

Fallen pine cones. Croghan and New Scotland. September.

AGARICUS (COLLYBIA) COLOREUS *Peck.*

Pileus convex, subumbilicate, slightly fibrillose, hygrophanous, yellow, sometimes tinged with red, the margin exceeding the

lamellæ ; lamellæ moderately close, emarginate, yellow ; stem equal, smooth, hollow, sometimes eccentric, yellow.

Plant 1′–2′ high, pileus 8″–12″ broad, stem 1″ thick.

Decaying wood. Croghan. September.

Agaricus (Mycena) miratus *Peck.*

Pileus thin, campanulate, umbilicate, smooth, striate, cinereous ; lamellæ close, narrow, slightly uncinate, whitish ; stem long, filiform, smooth, whitish, radicating, villous at the base.

Plant about 2′ high, pileus 3″–4″ broad and high.

Among fallen leaves. Center, Albany county. October.

This species may be known by the umbilicate pileus and its long striæ which extend to the umbilicus.

Agaricus echinipes *Lasch.*

Fallen leaves. Center. Oct.

Agaricus (Omphalia) rugosodiscus *Peck.*

Pileus thin, convex, then expanded, smooth, hygrophanous, striatulate when moist, brown, rugulose-wrinkled on the disk, the thin margin often wavy ; lamellæ narrow, close, arcuate, decurrent, white ; stem equal, short, smooth, hollow, often curved, whitish.

Plant 1′–1.5′ high, pileus 6″–12″ broad, stem .5″ thick.

Rotten trunks in woods. Worcester and Croghan. July and September.

The pileus varies from umbilicate to slightly umbonate. The odor and taste of radishes is sometimes perceptible.

Agaricus (Entoloma) cyaneus *Peck.*

Pileus convex, dry, minutely scaly, brown or brownish-violaceous ; lamellæ whitish, then tinged with flesh-color ; stem equal or slightly thickened at the base, hollow, scaly and violaceous toward the top ; spores angular, .00033 × .00025 in.

Plant 2′ high, pileus 1′– 1.5′broad, stem 1″ thick.

Decaying wood and old mossy logs in woods. Pine Hill and Worcester. June and July.

It is probable that the violaceous hue becomes obsolete with age.

Agaricus (Pluteus) granularis *Peck.*

Pileus convex, then expanded, subumbonate, rugose-wrinkled, sprinkled with minute blackish granules, varying in color from yellow to brown ; lamellæ rather broad, close, ventricose, free, whitish, then flesh-colored ; stem equal, solid, pallid or brown,

usually paler at the top, velvety with a short close plush; spores subglobose, about .0002 in. in diameter.

Plant 2′–3′ high, pileus 1′–2′ broad, stem 1″–2″ thick.

Old logs in woods. Pine Hill and Worcester.

The granules form a sort of plush which is more dense on the disk of the pileus and its wrinkles than on the margin. The species is related to *Ag. nanus*, but is larger and has a different stem.

AGARICUS BYSSISEDUS *Pers.*

Rotten wood. Sterling, Cayuga county. August.

AGARICUS (LEPTONIA) FOLIOMARGINATUS *Peck.*

Pileus convex, umbilicate, scabrous on the disk, bluish-brown, the disk a little darker; lamellæ broad, subdistant, plane, whitish, then flesh-colored, the edge entire and colored like the pileus; stem smooth, equal, solid below, with a small cavity above, concolorous.

Plant 1′–2′ high, pileus 6″–10″ broad, stem .5″ thick.

Ground and decaying wood in groves. Maryland, Otsego county. July.

It is related to *Ag. serrulatus.*

AGARICUS (NOLANEA) FUSCOFOLIUS *Peck.*

Pileus thin, conical or campanulate, papillate, smooth, hygrophanous, dark-brown and striatulate when moist, grayish-brown and shining when dry; lamellæ ascending, rather close, narrowed toward each end, brown; stem equal, stuffed, smooth, concolorous, with a white mycelium at the base; spores irregular, nucleate, .00033 × .00025 in.

Plant 1′ high, pileus 3″–6″ broad, stem .5″ thick.

In woods on old logs. Maryland. July.

AGARICUS (CREPIDOTUS) HERBARUM *n. sp.*

Pileus thin, at first resupinate, with the margin incurved, clothed with white down, at length somewhat reflexed, less downy, the thin margin spreading; lamellæ narrow, not crowded, diverging from a naked lateral or eccentric point, white, then tawny; spores slightly curved, .00028 × .00014 in.

Pileus 2″–4″ broad.

Dead stems of herbs. North Greenbush. October.

The pileus is attached by white, webby filaments.

Agaricus nephrodes *B. & C.*

Decaying wood. Worcester. July.

Our specimens are mostly spathulate, resembling in shape *Ag. petaloides.*

Agaricus (Crepidotus) fulvotomentosus *n. sp.*

Pileus dimidiate or reniform, sessile, clothed with numerous small tomentose tawny scales; lamellæ close, free, the edge white; spores elliptical, .0003 × .0002 in.

Pileus about 1′ in diameter.

Decaying wood. Savannah. August.

Agaricus (Pholiota) cerasinus *Peck.*

Pileus broadly convex, smooth, hygrophanous, watery-cinnamon when moist, yellow when dry; lamellæ close, emarginate, yellow, then cinnamon color; stem solid, equal, often curved, furfuraceous at the top; annulus slight, fugacious; flesh yellow; spores elliptical, rough, .0003 × .0002 in.

Plant cæspitose, 2′–4′ high, pileus 2′–4′ broad, stem 2″–4″ thick.

Old prostrate trunks of trees in woods. Sterling. August.

When fresh it has a strong amygdaline odor.

Agaricus (Hebeloma) stellatosporus *Peck.*

Pileus convex, dry, rough, with numerous squarrose or erect scales, brown; lamellæ pallid, becoming brown; stem equal, scaly, concolorous; spores subglobose, rough with little nodules, .0003 in. in diameter.

Plant 2′ high, pileus 1′ broad, stem 1″ thick.

Ground in woods. Croghan. September.

This plant bears a close resemblance to *Ag. mutatus*, but the persistent scales and rough spores distinguish it.

Agaricus (Hebeloma) griseoscabrosus *Peck.*

Pileus hemispherical or convex, dry, rough with appressed fibres and scales, cinereous, the margin whitish when young; lamellæ close, broad, whitish when young, then ochraceous-brown; stem firm, equal or slightly tapering downward, solid, fibrillose or slightly scaly, subconcolorous; spores smooth, .00035 × .0002 in.

Plant gregarious, 1.5′–2′ high, pileus 6″–10″ broad, stem 1″–1.5″ thick.

Ground in woods. Bethlehem. October.

Agaricus (Naucoria) bellulus *Peck.*

Pileus thin, moist, convex, smooth, bright watery-cinnamon; lamellæ crowded, narrow, emarginate, yellow, becoming darker with age; stem equal, hollow, generally curved, smooth, reddish-brown; spores .0002 × .00014 in.

Plant 1′ high, pileus 6″–12″ broad.

Decaying hemlock trunks in woods. Lowville and Sandlake. September.

It is sometimes cæspitose. It is rare to find a specimen in which the lamellæ do not have a stained or spotted appearance as if bitten by some small insect.

Agaricus (Naucoria) geminellus *Peck.*

Pileus convex, even, dry, firm, yellowish-red, the margin paler; lamellæ crowded, emarginate, pale yellow; stem equal, smooth, containing a white pith or a small cavity, colored like the pileus; flesh white; spores .00033 × .0002 in.

Rotten wood. Croghan. September.

This plant is closely related to the preceding one, being of the same size and habit, but differing in color and in the size of the spores. As in that species the lamellæ are spotted as if bitten by insects.

Agaricus (Naucoria) discomorbidus *Peck.*

Pileus thin, convex or expanded, smooth, slightly viscid, reddish-brown or dull chestnut color; lamellæ narrow, crowded, minutely serrulate, white or pallid, then brownish; stem equal, stuffed, smooth, slightly mealy at the top, white; flesh white; spores nucleate, .0004 × .00025 in.

Plant 2′–3′ high, pileus 1′–1.5′ broad, stem 1″–2″ thick.

Ground in woods. Croghan and Copake. September and October.

In the dried specimens the disk has a dark discolored appearance as if beginning to decay, whence the specific name.

Agaricus (Galera) expansus *Peck.*

Pileus submembranaceous, expanded or centrally depressed, viscid, plicate-striate on the margin, brownish-ochre, sometimes tinged with yellow and pink hues; lamellæ close, attached, ferruginous; stem long, equal, hollow, slightly pruinose, faintly striate, yellow; spores .00045 × .00028 in.

Plant 3′–4′ high, pileus 1′ broad, stem 1″ thick.

Decaying wood. Sandlake and Memphis. August.

Agaricus (Galera) callistus *Peck.*

Pileus thin, expanded, subumbonate, smooth, viscid, striatulate on the margin, olivaceous or ochraceous, the umbo bright chestnut color; lamellæ thin, close, ventricose, attached to but easily separating from the stem, yellowish, becoming bright ferruginous; stem equal, hollow, pruinose, yellow; spores .00035 × .0002 in.

Plant 1′–1.5′ high, pileus 6″–10″ broad, stem .5″ thick.

Exsiccated water holes in swampy woods. Croghan. September.

This is one of the prettiest Agarics known to me. In the dried specimens the lamellæ are white on the edge and the pileus has assumed a dull metallic green color.

Agaricus (Galera) coprinoides *Peck.*

Pileus membranaceous, soon expanded, often split on the margin, plicate-sulcate to the small even disk, yellowish, inclining to ochre; lamellæ close, slightly rounded behind, concolorous; stem equal, hollow, minutely hairy-pruinose, white; spores .00028 × .0002 in.

Plant 1′ high, pileus 6″ broad, stem .5″ thick.

Grassy ground. Sterling. August.

The structure of the pileus is like that of some of the smaller Coprini.

Agaricus silvaticus *Schæff.*

Buffalo. *Clinton.* I have seen dried specimens only, but they appear to belong to this species.

Agaricus (Psalliota) diminutivus *Peck.*

Pileus expanded or centrally depressed, sometimes with a slight umbo, dry, alutaceous, the disk rosy-brown and spotted with small appressed silky scales; lamellæ close, thin, free, ventricose, brownish-pink, becoming black; stem equal or slightly tapering upward, stuffed with a whitish pith or hollow, smooth, pallid; annulus thin, persistent, white; spores .0002 × .00015 in.

Plant 1.5′–2′ high, pileus 1′–1.5′ broad, stem 1″–2″ thick.

Ground in woods. Croghan. September.

Sometimes the whole pileus is colored reddish-brown. The flesh is quite brittle.

Agaricus (Stropharia) Howeanus *Peck.*

Pileus convex, then expanded, fragile, smooth, subumbonate, yellowish; lamellæ close, thin, rounded behind, eroded on the

edge, whitish, becoming ferruginous-brown; stem smooth, hollow, slightly thickened at the base; annulus thin, fugacious, sometimes adhering to the margin of the pileus; flesh white; spores .00033 × .0002 in.

Plant 3′–4′ high, pileus 2′–3′ broad, stem 2″–4″ thick.

Ground. Center. June.

The surface of the pileus sometimes cracks into areas. The taste is bitter. The color of the spores is not a decided brown, and the plant might, with almost equal propriety, be referred to the subgenus Pholiota.

AGARICUS (HYPHOLOMA) PHYLLOGENUS *Peck.*

Pileus firm, convex, sometimes slightly umbonate, hygrophanous, reddish-brown when moist, alutaceous when dry; lamellæ plane, broad, close, brown, white on the edge; stem equal, fibrillose, stuffed or hollow, spreading out at the base into a thin flat disk; spores pale-brown, subglobose, .0002 in. in diameter.

Plant 8″–12″ high, pileus 2″–4″ broad, stem .5″ thick.

Fallen leaves in woods. Worcester. July.

This is a very small but distinct species, remarkable for the disk-like base of the stem by which it is attached to the leaves on which it grows.

COPRINUS INSIGNIS *Peck.*

Pileus campanulate, thin, sulcate-striate to the disk, grayish fawn color, the smooth disk sometimes cracking into small areas or scales; lamellæ ascending, crowded; stem hollow, slightly fibrillose, striate, white; spores rough, .0004 × .00028 in.

Plant 4′–5′ high, pileus 2′–3′ broad, stem 3″ thick.

About the roots of trees in woods. Worcester. July.

The species is remarkable for its rough spores. In size and general appearance it bears some resemblance to *C. atramentarius.*

COPRINUS ANGULATUS *Peck.*

Pileus submembranaceous, hemispherical or convex, plicate-sulcate, the disk smooth; lamellæ subdistant, reaching the stem, whitish, then black; stem equal, smooth, whitish; spores compressed, angular, subovate, .0004 × .00033 in.

Plant 1′–2′ high, pileus 6″–12″ broad, stem .5″ thick.

In woods. Croghan. September.

The specific name has reference to the angular character of the spores. These in shape have some resemblance to a very blunt arrow-head, they being slightly excavated on each side of the base

and gradually narrowed toward the very obtuse apex. This and the preceding species are described from dried specimens, they being respectively taken at the time of collecting for forms of *C. atramentarius* and *C. silvaticus.*

CORTINARIUS (MYXACIUM) SPHÆROSPORUS *Peck.*

Pileus convex, smooth, very viscid, pale ochraceous; lamellæ close, nearly plane, slightly emarginate, whitish, then cinnamon; stem tapering upward, solid, floccose, viscid, subconcolorous, white at the top; flesh white; spores nearly globose, about .0003 in. in diameter.

Plant 2′–4′ high, pileus 2′–3′ broad, stem 3″–5″ thick.

Ground in woods. Croghan. September.

CORTINARIUS (PHLEGMACIUM) LONGIPES *Peck.*

Pileus convex or expanded, slightly fibrillose, viscid, yellowish or pale ochraceous; lamellæ close, plane, brownish-olivaceous, then cinnamon; stem long, slightly fibrillose, tapering upwards, whitish.

Plant 6′ high, pileus 2′–3′ broad, stem 4″ thick.

Ground in woods. Croghan. September.

CORTINARIUS CLARICOLOR *Fr.*

Ground in woods. Croghan. September.

CORTINARIUS PORPHYROPUS *A. & S.*

Ground in woods. Copake. October.

This plant is readily known by the purplish or lilac tints it assumes where bruised or wounded.

CORTINARIUS (INOLOMA) LILACINUS *Peck.*

Pileus firm, hemispherical, then convex, minutely silky, lilac color; lamellæ close, lilac, then cinnamon; stem stout, bulbous, silky-fibrillose, solid, whitish, tinged with lilac; spores nucleate, .0004 × .00025 in.

Plant 4′–5′ high, pileus 3′ broad, stem 4″–6″ thick.

Low mossy ground in woods. Croghan. September.

This is a rare but beautiful plant, allied to *C. alboviolaceus*, from which it may be distinguished by its stouter habit, deeper color and bulbous stem. In the young plant the bulb is much broader than the undeveloped pileus that surmounts it.

CORTINARIUS (INOLOMA) CLINTONIANUS *Peck.*

Pileus convex or expanded, with a few appressed silky fibrils, reddish-brown, more or less tinged with gray; lamellæ close, dull-

violaceous, then cinnamon; stem solid, silky-fibrillose, tapering upwards, concolorous, violaceous at the top; spores .0003 × .00025 in.

Plant 2′–3′ high, pileus 1′–2′ broad, stem 2″–3″ thick.

Ground in woods. Croghan and New Scotland. September and October.

CORTINARIUS (INOLOMA) MODESTUS *Peck.*

Pileus convex or expanded, subfibrillose, even or slightly rugose-wrinkled, alutaceous; lamellæ close, nearly plane, pallid, then cinnamon; stem bulbous, subfibrillose, hollow, or with a white pith, concolorous; flesh white; spores .00033 × .00025 in.

Plant 2′ high, pileus 1′–1.5′ broad, stem 2″ thick.

Ground in woods. Croghan. September.

It is distinguished from the preceding species by its paler color, more bulbous stem and by the entire absence of violaceous tints in the lamellæ.

CORTINARIUS (TELAMONIA) LIGNARIUS *Peck.*

Pileus smooth, hygrophanous, dark, watery-cinnamon when moist, paler when dry; lamellæ close, thin, concolorous, when young concealed by the copious white webby veil; stem equal, silky-fibrillose, hollow or with a whitish pith, subannulate, with a dense white mycelium at the base; spores .00028 × .0002 in.

Plant subcæspitose, 1′–2′ high, pileus 8″–12″ broad, stem 1″ thick.

Rotten wood. Catskill mountains. June.

CORTINARIUS TORVUS *Fr.*

Ground in woods. Maryland and Worcester. July.

CORTINARIUS (TELAMONIA) NIGRELLUS *Peck.*

Pileus at first conical, then convex or expanded, obtuse or subumbonate, minutely silky, hygrophanous, blackish-chestnut when moist, paler when dry; lamellæ close, narrow, emarginate, brownish-ochre, then cinnamon; stem subequal, silky-fibrillose, pallid, often flexuous; annulus slight, evanescent; spores .00028 × .00016 in.

Plant 2′–3′ high, pileus 1′–2′ broad, stem 2″–3″ thick.

Mossy ground in woods. New Scotland. October.

When moist the pileus has the color of boiled chestnuts, when dry, of fresh ones. The incurved margin of the young pileus is whitened by the veil. The lamellæ are darkest when young. The taste is unpleasant, resembling that of *Ag. melleus.*

Cortinarius (Hygrocybe) pulcher *Peck.*

Pileus conical, then broadly convex, umbonate, often irregular, hygrophanous, ochraceous, shining and sometimes striatulate, when moist, pale-ochraceous when dry; lamellæ subdistant, broad, emarginate, uneven on the edge, ochraceous; stem equal, solid, subflexuous, silky-fibrillose, whitish or pale ochraceous; spores .00033 × .0002 in.

Plant gregarious, 2′ high, pileus 1′–1.5′ broad, stem 1″–2″ thick.

Ground in wood. New Scotland. October.

Lepista cinerascens *Bull.*

Ground in pine woods. Croghan. September.

Our specimens were scarcely mature and the margin of the pileus shows no striations and therefore they are referred to this species with some hesitation.

Paxillus strigosus *Peck.*

Pileus convex, or expanded, dry, brittle, strigose with scattered stiff hairs, whitish; lamellæ close, narrow, subdecurrent, whitish, then pale cinnamon color, some of them forked; stem equal, solid, pruinose, concolorous; spores brownish-ochre, subglobose, .00018 in. in diameter.

Plant 2′ high, pileus 1′–1.5′ broad, stem 1″–1.5″ thick.

Ground among fallen leaves in woods. Croghan. September.

The young plant might readily be taken for a species of Clitocybe. It is at best an aberrant species, midway between Lepista and Paxillus, differing from the former in its highly colored spores and from the latter in its distinct, not anastomosing, lamellæ. Owing to the very brittle character of the pileus the lamellæ are not easily separated from it. The hairs of the pileus are either erect or appressed.

Hygrophorus purus *n. sp.*

Pure white and very fragile; pileus at first conical, then expanded and cupulate from the recurving of the thin margin, very viscid, often irregular; lamellæ subdistant, broad, ventricose, emarginate, with a slight decurrent tooth; stem smooth, subflexuous, hollow, very viscid; spores .0003 × .0002 in.

Plant 3′–6′ high, pileus 1′–2′ broad, stem 2″–3″ thick.

Ground in open woods. Croghan. September.

It is related to *H. ceraceus*, but besides its different color it is much more fragile.

HYGROPHORUS EBURNEUS *Bull.*

Ground in open woods. Bethlehem and North Greenbush. October.

The whole plant is pure white when fresh, but in drying the lamellæ assume a cinnamon-brown hue.

HYGROPHORUS COSSUS *Fr.*

Ground in open woods. North Greenbush and New Scotland. October.

The disk of the pileus is tinged with red or brown and the lamellæ retain their white color in the dried state.

HYGROPHORUS VIRGATULUS *n. sp.*

Pileus convex or expanded, viscid when moist, minutely virgate with innate blackish fibrils, whitish with a brownish disk; lamellæ distant, arcuate-decurrent, white; stem solid, viscid, equal or tapering downwards, with a few small white floccose scales at the top.

Plant subcæspitose, 2′–4′ high, pileus 1′–2′ broad, stem 2″–3″ thick.

Ground in open woods. North Greenbush. October.

The lamellæ change color in drying as in *H. eburneus.*

HYGROPHORUS BOREALIS *n. sp.*

Pileus thin, convex or expanded, smooth, moist, white, sometimes striatulate; lamellæ arcuate-decurrent, distant, white; stem smooth, equal or tapering downwards, stuffed, white.

Plant 2′ high, pileus 8″–12″ broad, stem 1″ thick.

Ground in woods. Croghan and Copake. September and October.

The species is related to *H. niveus* but the pileus is not viscid.

LACTARIUS REGALIS *Peck.*

Pileus convex, deeply depressed in the center, viscid when moist, often corrugated on the margin, white tinged with yellow; lamellæ close, decurrent, whitish, some of them forked at the base; stem stout, short, equal, hollow, smooth; taste acrid; milk sparse, white, quickly changing to sulphur-yellow; spores .0003 in.

Plant 4′–6′ high, pileus 4′–6′ broad, stem 1′ thick.

Ground in woods. Croghan. September.

This interesting plant rivals *L. piperatus* in size and closely resembles it in general appearance; but the viscid pileus and sparse milk quickly changing to yellow, as in *L. chrysorrheus*, clearly distinguish it.

LACTARIUS GERARDII *Peck.*

Pileus expanded or centrally depressed, dry, rugose-wrinkled, often with a minute umbo or papilla, sooty-brown, the thin spreading margin sometimes wavy or irregular; lamellæ broad, distant, decurrent, white, the interspaces uneven; stem equal, solid, colored like the pileus; flesh and spores white; taste mild; milk white, unchangeable.

Plant 3′–5′ high, pileus 2′–4′ broad, stem 4″–6″ thick.

Ground in woods and groves. Poughkeepsie. *Gerard.* Albany and Croghan. September.

In the color of the pileus and stem this species is like the large form of *L. fuliginosus*, but its real relationship is with *L. distans*, from which it is separated by its color and its longer equal stem, characters which may prove to be only varietal.

RUSSULA SORDIDA *Peck.*

Pileus firm, convex, centrally depressed, dry, sordid white, sometimes clouded with brown; lamellæ close, white, some of them forked; stem equal, solid, concolorous; spores globose, .0003 in.; taste acrid; flesh changing color when wounded, becoming black or bluish-black.

Plant 4′–5′ high, pileus 3′–5′ broad, stem 6″–12″ thick.

Ground under hemlock trees. Worcester. July.

It resembles *L. piperatus* in general appearance. The whole plant turns black in drying.

RUSSULA CONSOBRINA *Fr.*

Ground in open woods. Davenport, Delaware county. Worcester.

Our specimens are very variable in color, but the prevailing hues are green, olivaceous and purple.

NYCTALIS ASTEROPHORA *Fr.*

Decaying fungi. Poughkeepsie. *Gerard.* Mr. G. remarks that thus far this plant has appeared each alternate season.

MARASMIUS VITICOLA *B. & C.*

Fallen branches. Worcester. July.

This plant is not limited to grape vines in its habitat.

MARASMIUS CÆSPITOSUS *Peck.*

Pileus fleshy, convex, even, brown with a lilac tint, the thin margin exceeding the lamellæ; lamellæ close, free, somewhat united with each other at the stem, narrowed outwardly, white; stem

subequal, sometimes compressed at the top, stuffed or hollow, pruinose.

Plant cæspitose, 1′–2′ high, pileus 6″–10″ broad.

On a birch stump in woods. Richmondville, Schoharie county. June.

Sometimes the pileus is irregular and the stem eccentric.

MARASMIUS LONGIPES *Peck.*

Pileus thin, convex, smooth, finely striate on the margin, tawny-red; lamellæ not crowded, attached, white; stem tall, straight, equal, hollow, pruinose-tomentose, radicating, brown or fawn color, white at the top.

Plant 2′–5′ high, pileus 4″–6″ broad, stem .5″ thick.

Among fallen leaves in woods. Savannah and Bethlehem. August and October.

The tall, straight, slender stem is the characteristic feature of this plant.

MARASMIUS GLABELLUS *Peck.*

Pileus membranaceous, convex, then expanded, distantly striate, often uneven on the disk, dingy ochraceous; lamellæ broad, distant, unequal, free, ventricose, whitish, the upper margin and the interspaces venose; stem corneous, equal, smooth, hollow, shining, reddish-brown or chestnut, whitish at the top, mycelio-thickened at the base.

Plant 1′–2′ high, pileus 6″–10″ broad, stem .5″ thick.

Fallen leaves in woods. Worcester and Croghan. July and September.

The color of the pileus approaches that of *M. campanulatus*, but it is generally paler and tinged with brown.

MARASMIUS STRAMINIPES *Peck.*

Pileus membranaceous, hemispherical or convex, smooth, striate, whitish; lamellæ distant, unequal, attached, white; stem corneous, smooth, shining, filiform, inserted, pale straw color.

Plant 1′–2′ high, pileus 1″–3″ broad.

Fallen leaves of pitch pine, *Pinus rigida.* Center. October.

The pale yellow stem becomes pallid in the dry state and is sometimes tinged with brown at the base.

PANUS STRIGOSUS *B. & C.*

Decaying wood of deciduous trees. Croghan. September.

It is remarkable for its large size and the dense hairy covering of the pileus and stem.

Lenzites vialis *Peck.*

Pileus coriaceous, sessile, dimidiate or elongated, sometimes confluent, obscurely zoned, subtomentose, brown or grayish-brown, the margin cinereous; lamellæ thin, abundantly anastomosing, pallid, cinereous-pruinose on the edge when fresh.

Pileus 6″–12″ broad.

Old railroad ties. North Greenbush and Center. October.

This is not as bright colored as *L. sepiaria*, nor so distinctly zoned; the lamellæ are closer, thinner and more anastomosing, forming pores toward the outer margin almost as in the genus Polyporus.

Boletus piperatus *Bull.*

Ground in open woods. Lowville and Bethlehem. September and October.

Boletus chrysenteron *Fr.*

Ground in open woods. Worcester and Memphis. July and August.

Boletus pallidus *Frost.*

Pileus soft, viscid when moist, smooth, pale alutaceous; tubes plane, attached, sometimes slightly depressed around the stem, small, subangular, pale yellow, slightly changing color when wounded; stem subequal, smooth, solid, pallid; spores .00045 × .00022 in.

Plant 2′–5′ high, pileus 2′–4′ broad, stem 4″–6″ thick.

Ground in woods. North Greenbush. August.

It is allied to *B. scaber*, from which its plane yellowish tubes and smooth stem will separate it.

Boletus ampliporus *Peck.*

Pileus broadly convex or expanded, sometimes slightly umbonate, dry, squamulose-tomentose, pinkish-brown; tubes convex, attached or slightly decurrent, very large, angular, compound, yellow; stem equal, solid, yellowish-brown, paler at the top and marked by the decurrent walls of the tubes; flesh whitish tinged with yellow, unchangeable; spores pale ochraceous with a greenish tinge, .00035 × .00016 in.

Plant 3′–5′ high, pileus 3′–4′ broad, stem 3″–6″ thick.

Low mossy ground in woods. North Elba and Sandlake. August and September.

Formerly I erroneously referred this plant to *B. subtomento-*

sus, from which it differs in its more tomentose pileus, larger tubes, smaller spores and smoother stem.

Polyporus cæruleoporus *Peck.*

Pileus fleshy, broadly convex, subtomentose, moist or hygrophanous, brown; pores short, angular, decurrent, grayish-blue; stem central or eccentric, solid, colored like the pileus, sometimes tinged with the color of the pores; flesh white.

Plant gregarious or subcæspitose, 2′ high, pileus 1′–2′ broad, stem 2″–3″ thick.

Moist shaded banks. Copake. October.

The peculiar color of the pores is a characteristic feature in this species. It and the three following species belong to the section *Mesopus*.

Polyporus griseus *Peck.*

Pileus fleshy, firm, convex, often irregular, smooth or with a minute appressed silkiness, dry, gray; pores small, short, unequal, somewhat angular, pallid, the mouths white; stem central, thick, short, concolorous; flesh pinkish-gray.

Plant 2′–3′ high, pileus 3′–5′ broad, stem 6″–10″ thick.

Shaded banks, Copake. October.

The pores are sometimes decurrent and the walls or dissepiments are thickened on the edge.

Polyporus flavidus *Peck.*

Pileus fleshy, tough, depressed or funnel-form, smooth, rarely a little villous on the disk, zonate, yellow with darker bands, the margin sometimes lobed and wavy; pores short, minute, angular, yellow; stem central, solid, slightly tapering downwards, smooth, subconcolorous.

Plant 3′–5′ high, pileus 2′–4′ broad, stem 3″–4″ thick.

Ground in woods. Worcester. July.

Polyporus splendens *Peck.*

Pileus thin, coriaceous, expanded, subumbilicate, slightly zonate, silky, with close radiating fibers, shining, dark ferruginous when moist, tawny ferruginous when dry, the margin deeply fimbriate; pores small, angular, short, subconcolorous; stem slender, equal, tomentose, concolorous.

Plant 1′ high, pileus 6″–10″ broad, stem .5″–1″ thick.

Much decayed stumps. Center. August.

This is smaller, thinner, brighter colored and more shining than

P. perennis to which it is related. The pores are not at all decurrent and the pileus is nearly horizontal. The umbilicus, when present, is very small.

Polyporus humilis *Peck.*

Pileus soft, smooth, spathulate, suborbicular or reniform, white; pores small, subrotund, white; stem lateral, thick, rather long, externally soft and elastic, within firm, whitish, sometimes becoming brown.

Plant 1′–2′ high, pileus 8″–12″ broad, stem 2″–3″ thick.

Half buried sticks and branches in open woods. Sterling. August.

The thick stem, with its soft spongy external coating and hard rigid center, is a peculiar character.

Polyporus rhipidius *Berk.*

Old logs and stumps in woods. Sterling. August.

Without an examination of the hymenium, this might easily be taken for *Panus stipticus.*

Polyporus maculatus *n. sp.*

Pileus of a cheesy consistence, broad, flattened, sometimes confluent, sessile or narrowed into a short stem, slightly uneven, white or yellowish-white, marked with darker zones and watery spots; pores minute, subangular, short, whitish, sometimes tinged with brown; flesh white.

Pileus 4′–6′ broad, 6″–8″ thick.

Prostrate trunks of trees in woods. Worcester. July.

In texture and shape this species is related to *P. sulphureus*, but the pores are smaller than in that species. The plants are sometimes cæspitose, sometimes single. The spots in the dried specimens have a smooth depressed appearance.

Polyporus aurantiacus *n. sp.*

Pileus soft, thin, sessile, dimidiate, sometimes confluent, fibrous-tomentose, obscurely zoned, orange color; pores small, angular, acute, unequal, at length lacerated, pallid inclining to orange; flesh tinged with orange, obscurely zoned.

Pileus 1′–2′ broad, pores about 1″ long.

Old logs in woods. Richmondville. July.

Related to *P. biformis.*

Polyporus conchifer *Schw.*

Decaying wood. Buffalo. *Clinton.* Lowville.

Polyporus ferruginosus *Fr.*

Prostrate trunks of trees. Niagara Falls. *Clinton.* Sterling. August.

It sometimes spreads to the extent of several feet.

Polyporus violaceus *Fr.*

Prostrate trunks of spruce trees, *Abies nigra.* Croghan. September.

Our specimens are somewhat doubtfully referred to this species. They are not at all violet, but dark red or liver color. This in old specimens changes to a tawny or cinnamon hue and the dissepiments become thin. The plant has a white byssoid margin.

Polyporus sanguinolentus *Fr.*

Rotten logs in woods. Savannah and Croghan. August and September.

Polyporus Gordoniensis *B. & Br.*

Decaying wood. Buffalo. *Clinton.*

Polyporus Armeniacus *Berk.*

Old railroad ties. North Greenbush. October.

Polyporus attenuatus *Peck.*

Resupinate, effused, very thin, separable from the matrix, pinkish-ochre, the margin whitish; pores minute, subrotund, with thin acute dissepiments.

Prostrate trunks of deciduous trees. Croghan. September.

The pores are scarcely visible to the naked eye.

Cyclomyces Greenii *Berk.*

Mossy bank by the side of an old wood road. Sterling. August. A single specimen.

In our plant the pileus is top-shaped or obconic and not at all undulated lobed or zoned, but we hesitate to characterize a new species on the single specimen found and therefore refer it provisionally as above.

Hexagona carbonaria *B. & C.*

Decaying wood. Portage. *Clinton.* Worcester. July and October.

Not without doubt are our specimens referred to this species. Although agreeing in color with authenticated specimens received from Dr. Curtis, the pores are larger and the plant is not always resupinate.

HYDNUM CONFLUENS *n. sp.*

Pileus thin, tough, expanded or slightly depressed, sometimes confluent, zonate, slightly fibrous-tomentose, hygrophanous, dark brown when moist, drab brown when dry; spines slender, 1″–2″ long, grayish-violet; stem short, surrounded below by a dense mycelioid tomentum spores subglobose, .00012 in. in diameter.

Plant 2′–3′ high, pileus 2′–3′ broad.

HYDNUM SULPHUREUM *Schw.*

Decaying wood. Buffalo. *Clinton.*

HYDNUM FERRUGINOSUM *Fr.*

Half buried sticks and stems of herbs. Center. October.

SISTOTREMA CONFLUENS *Pers.*

Shaded banks. Copake. October.

In our specimens the pileus is not at all villous, but I am disposed to regard our plant as nothing more than a smooth variety. It is scarcely to be expected that a rigid agreement should always be found to exist between our fungoid plants, modified as they often are by local causes, and the brief descriptions too often drawn up from dried specimens only or from these and the few hasty notes of collectors. The describer, especially of our fleshy species, ought also to be the collector and the observer of them in their native haunts.

GRANDINIA CORIARIA *Peck.*

Effused, membranaceous-tomentose, separable from the matrix, under side and margin tawny-yellow, upper side and minute crowded granules greenish or dingy olivaceous; spores globose, rough, .0003 in. in diameter.

Forming patches 1′–3′ in diameter on old scraps of leather in damp places. Greenbush. August.

It is a very distinct but apparently a very rare species.

THELEPHORA WILLEYI *Clinton.*

Pileus infundibuliform, thin, smooth, obscurely zoned, white, the margin entire or laciniately toothed and lobed; hymenium smooth, concolorous; stem central, equal or slightly tapering downwards, solid, white.

Plant 1′–1.5′ high, pileus 6″–12″ broad, stem .5″–1″ thick.

Ground in woods. Buffalo. *Clinton.* Lowville. September.

Sometimes the pileus is split on one side down to the stem. The species is dedicated to *Mr. H. Willey*, a most active and enthusiastic lichenist.

STEREUM TENERRIMUM *B. & R.*

Mossy ground. Indian Lake and Croghan. September and October.

I have seen no description of this species, and depend, for the correctness of the determination, upon a comparison of our specimens with authenticated ones received from the late Dr. Curtis.

STEREUM RADIATUM *Peck.*

Rusupinate or slightly reflexed, suborbicular or effused, blackish-brown; hymenium uneven, marked with thick corrugations or ridges radiating from the center, cinnamon color.

Old hemlock logs. Catskill mountains. June.

CORTICIUM LEUCOTHRIX *B. & C.*

Under surface of pine chips. Bethlehem. October.

CORTICIUM BICOLOR *Peck.*

Thin, membranaceous, flaccid, smooth, separable from the matrix, under surface greenish-yellow, upper surface white.

Rotten wood. Center. October.

CLAVARIA FISTULOSA *Fr.*

Catskill mountains. October. A single specimen.

TREMELLA FRONDOSA *Fr.*

Old stumps. Buffalo. *Clinton.* Savannah. August.

EXOBASIDIUM AZALEÆ *Peck.*

Gall subglobose, often lobed or irregular, succulent, fleshy, solid, smooth, pale green or glaucous, becoming pruinose; spores oblong, straight or curved, obscurely uniseptate, white, .0006–.0008 in. long.

Terminal on living branches of the pinxter plant, *Azalea nudiflora*, transforming the flower buds.

North Greenbush and New Scotland. May and June.

These fungus galls are usually from one to two inches in diameter and appear cotemporaneously with the blossoms of the shrub they inhabit. They are known in some localities by the name "May apples" and not being unpleasant to the taste they are sometimes eaten by voracious school boys. Upon attaining their full size they soon become dusted by the white spores which are borne upon the apices of minute filaments projecting slightly from the whole surface of the gall.

Exobasidium Andromedæ *Peck.*

Gall usually flattened or somewhat cup-shaped, more or less lobed, hollow, the cavity containing shreds of loose soft cottony filaments, smooth, pale green or green varied with red, paler and pruinose with age; spores narrow, oblong, simple, often curved near one end, white, .0007–.0009 in. long.

Lateral or rarely terminal on living branches of *Andromeda ligustrina*, transforming the leaf buds. Center. May and June.

Sometimes the dried blackened galls of the preceding year are found adhering to the branches in company with the new crop. The loose shreddy substance contained in the cavity of the gall is found by microscopic examination to be composed entirely of coarse irregular jointed filaments.

Smaller but similar galls have been seen on a species of Vaccinium at Center and one has been received from Florida, but I have not yet fully determined the characters of these. *Exobasidium Vaccinii* Woronin, occurs in Europe on *Vaccinium Vitis-Idæa*. It is perhaps worthy of remark that thus far these peculiar fungus galls have been observed on Ericaceous plants only.

Æthalium Ferrincola *Schw.*

Iron rails of railroads. Worcester and Schenevus. July.

Geaster Bryantii *Berk.*

Ground. Schoharie.

Lycoperdon pedicellatum *Peck.*

Subpyriform, whitish, the outer peridium persistent, forming dense angular spinose processes which are smaller toward the base of the plant; capillitium and spores greenish ochre or dingy olivaceous, the latter pedicellate, smooth, .00016–.00018 in. in diameter, the pedicel three to five times as long.

Plant about one inch in diameter.

Ground and rotten wood. Croghan and Center. September and October.

In shape this plant resembles the ordinary form of *L. pyriforme*, but the outer peridium is more coarse and shaggy than in that species.

Lycoperdon separans *n. sp.*

Subglobose, sessile, white, the outer peridium forming dense pyramidal substellate warts which easily separate from the membranaceous inner one; capillitium and spores dingy olivaceous, the latter globose, smooth, .00016 in. in diameter.

Ground in pastures and grassy places. Worcester. July.

SPUMARIA ALBA *DC.*

Incrusting sticks and twigs near the ground. Croghan. September.

DIDERMA CRUSTACEUM *Peck.*

Effused or circumambient, crowded, sessile, subglobose, smooth, white, outer peridium crustaceous, like the shell of some small egg, the inner delicate, appearing cinereous to the naked eye, iridescent under the microscope; columella none; spores globose, black, .0005 in. in diameter.

Fallen sticks and leaves under arbor-vitæ. Memphis. August.

DIDERMA MARIÆ-WILSONI *Clinton.*

Scattered or crowded, sessile, subglobose, smooth, white or pinkish-white, outer peridium crustaceous, like the shell of some small egg, within at the base brownish-pink, inner peridium delicate; columella subglobose, rugulose, slightly colored; spores globose, blackish-brown; .0004 in. in diameter.

Fallen leaves, sticks, moss, etc. Buffalo. *Clinton.* Memphis, Center and Sandlake. August and October.

DIDERMA FARINACEUM *Peck.*

Effused or circumambient, crowded, sessile, subglobose, plumbeous when moist, becoming white rugulose and farinaceous when dry; spores globose, brown, black in the mass, .0004 in. in diameter.

Creeping over mosses and investing fern stems in low woods. Croghan. September.

The moisture from the fresh plant stains white paper lead color.

DIDYMIUM CONNATUM *Peck.*

Peridium depressed or subglobose, cinereous, furfuraceous, stipitate; stems mostly connate at the base, tapering upward, longitudinally wrinkled, whitish or cream color; spores subglobose, black, .0004 in. in diameter.

Decaying fungi. Portville. September.

The subfasciculate mode of growth is characteristic of this species.

DIDYMIUM FURFURACEUM *Fr.*

Rotten wood. Worcester. July.

After the breaking up of the peridium, minute portions of it are seen adhering to the flocci. The spores are globose, smooth, .00033 in. in diameter.

Didymium farinaceum *Fr.*

Fallen pine leaves. Center. October. Also on mosses. North Elba. August.

Physarum pulcherripes *Peck.*

Peridium globose, variable in color, ochraceous, gray, brown or black; stem slender, equal or slightly tapering upward, vermilion; spores globose, brown, .00033 in. in diameter.

Rotten wood. Richmondville and Worcester. July.

The bright color of the stem is quite conspicuous notwithstanding the small size of the plant.

Physarum cæspitosum *Peck.*

Peridia aggregated in tufts or clusters, crowded, sessile, smooth, brown or blackish-brown; spores dingy ochre, smooth, globose, .00025 in. in diameter.

Rotten wood. Greenbush. August.

Angioridium sinuosum *Grev.*

Dead stems of herbs and grass. Center. October.

Craterium leucocephalum *Ditm.*

Fallen leaves. Croghan and North Elba. August and September.

Craterium obovatum *Peck.*

Peridium obovate, rugose-wrinkled, glabrous, lilac-brown; flocci whitish; stem colored like the peridium; spores smooth, globose, black, .0005–.0006 in. in diameter.

Rotten wood bark and fallen leaves. Center, Sandlake and Croghan. August and September.

The peridium varies in shape from subglobose to oblong pyriform, but the prevailing form is obovate. The operculum is not distinctly shown, the peridium often appearing to be irregularly ruptured at the apex, so that possibly the species may have to be referred to Physarum.

Stemonitis herbatica *Peck.*

Densely fasciculate; capillitium slender, cylindrical, brown when moist, ferruginous-brown when dry; stem black, arising from a membranaceous hypothallus, penetrating to the apex of the capillitium; spores globose, .0003–.00035 in. in diameter.

Plant 2″–3″ high, growing on living leaves of grass and herbs. Albany. June.

The color of this plant is almost the same as in *S. ferruginea* but the spores are much larger, surpassing even those of *S. fusca.* The habitat is peculiar.

ARCYRIA NUTANS *Fr.*

Rotten wood. Richmondville. July.

TRICHIA RENIFOMIS *Peck.*

Peridia gregarious or clustered, sessile, subglobose or reniform, small, brown ; flocci few, short, sparingly branched ; spores globose, minutely echinulate, yellow-ochre, sometimes tinged with green, .0005 in. in diameter.

Dead bark of striped maple, *Acer Pennsylvanicum.* Portville. September.

LICEA CYLINDRICA *Fr.*

Rotten wood. Worcester and Croghan. July and September.

PERICHÆNA FLAVIDA *Peck.*

Yellow throughout ; peridia crowded, clustered, sessile, variable in size and shape, shining ; flocci few, short, subnodulose, obtuse, sparingly branched ; spores globose, echinulate, .00045 in. in diameter.

Mosses. Sandlake. August.

The mature peridia are sometimes wrinkled at the top. The bright golden yellow color renders the clusters conspicuous.

PHOMA BRUNNEOTINCTUM *B. & C.*

Inside of chestnut burrs. Buffalo. *Clinton.*

SPHÆRONEMA MAGNOLIÆ *n. sp.*

Perithecia scattered, erumpent, black, with a long firm spine-like ostiolum a line or more in length ; spores broadly elliptical or subglobose, often with a single nucleus, colored when mature, .0004 in. long.

Dead branches of the cucumber tree, *Magnolia acuminata.* Portville. September.

It has almost exactly the size and appearance of *S. spina*, but the spores constitute a distinguishing character.

DIPLODIA VULGARIS *Lev.*

Dead branches of locust trees. Buffalo. *Clinton.*

EXCIPULA EQUISETI *n. sp.*

Perithecia minute, scattered, flattened, black, furnished with a few long straight black bristles; spores straight, nearly cylindrical, colorless, .00035–.0004 in. long.

Dead stems of Equisetum. Buffalo. *Clinton.*

DINEMASPORUM ACERINUM *Peck.*

Perithecia small, pezizoid, black, hispid with short straight scattered black hairs; spores unequally elliptical, .0003 in. long, the bristle at each end scarcely one-third the length of the spore.

Dry maple wood. Buffalo. *Clinton.* April.

In *D. Robiniæ* the spores are shorter and the bristles longer than in this species.

PESTALOZZIA PEZIZOIDES *De Not.*

Bark of dead grape-vines. Fort Edward. *Howe.* North Greenbush. October.

BACTRIDIUM FLAVUM *Kze.*

Rotten wood. Buffalo. *Clinton.* Savannah and Croghan. August and September.

PUCCINIA LOBELIÆ *Gerard.*

Sori minute scattered or confluent, tawny-brown, spores oblong-elliptical, slightly constricted at the septum and easily separating into two parts, pale, .0013–.0016 in. long; pedicel short or obsolete.

Lower surface of leaves of *Lobelia syphilitica.* Poughkeepsie. *Gerard.*

The fragile spores are peculiar.

PUCCINIA CURTIPES *Howe.*

Leaves of *Saxifraga Pennsylvanica.* Yonkers. *Howe.*

UROMYCES PYRIFORMIS *Cooke.*

Leaves of sweet flag, *Acorus Calamus.* New Baltimore. *Howe.* Watkins and Montezuma marshes. September.

UROMYCES SPARGANII *C. & P.*

Sori minute, oblong, crowded, black, spores pyriform or oblong-pyriform, about .001 in. long; pedicel colored, shorter than or equal to the spore in length.

Both sides of leaves of Sparganium. Buffalo. *Clinton.* Montezuma marshes. September. New Baltimore. *Howe.*

UREDO CARYOPHYLLACEARUM *Johnst.*

Leaves of Cerastium. Poughkeepsie. *Gerard.*

ÆCIDIUM LYSIMACHIÆ *Lk.*

Leaves of *Lysimachia quadrifolia.* Poughkeepsie. *Gerard.*

ÆCIDIUM ALBUM *Clinton.*

Spots none; peridia scattered, short, white, the margin subentire; spores subglobose, white, about .0008 in. in diameter.

Lower surface of leaves of *Vicia Americana.* Buffalo. *Clinton.*

ÆCIDIUM LYCOPI *Gerard.*

Spots yellow; subiculum more or less thickened; peridia short, scattered or crowded, margin crenate; spores pale yellow.

Leaves, stems and petioles of *Lycopus Europæus.* Poughkeepsie. *Gerard.* Buffalo. *Clinton.* New Paltz. June.
It appears to be closely related to *Æ. Compositarum.*

ÆCIDIUM UVULARIÆ *Schw.*

Leaves of *Uvularia sessilifolium.* New Lots, L. I. *Merriam.*

ÆCIDIUM HYDROPHYLLI, *Peck.*

Spots small, few, yellow with a pale greenish border; subiculum thickened, whitish; peridia few, generally crowded, short, the margin subcrenate; spores bright yellow or orange; spermogonia central, on the opposite side.

Lower surface of leaves of *Hydrophyllum Canadense.* Catskill mountains. June.

CERATIUM HYDNOIDES *A. & S.*

Rotten wood in shaded places. Greenbush and Worcester. June and July.

CERATIUM PORIOIDES *A. & S.*

Decaying prostrate trunks of trees. Richmondville. July.

STILBUM RAMOSUM *Peck.*

Head subglobose whitish or pale yellow; stem thick, smooth, branched, white above, pallid or brownish below, sometimes creeping and sending up branches at intervals; spores minute, oblong.

Dead larvæ of insects buried in rotten wood. Sterling. September.

Myrothecium Fungicola *n sp.*

Receptacle small, white-margined, the disk black or greenish-black; spores oblong, about .0002 in. long.

Decaying fungi. North Greenbush.

Helicoma Mulleri *Cd.*

Dead bark of poplar branches. North Greenbush. October.
The flocci vary somewhat from those of the European plant.

Aspergillus glaucus *Lk.*

Vegetable substances in damp places. Albany.

Aspergillus fuliginosus *Peck.*

Creeping flocci white, septate, fertile flocci erect, not septate, crowned with a globose head which is rough with projecting processes; spores globose, sooty black, smooth, .00016 in. in diameter.

Rice paste and other vegetable substances. Albany.
Spores were taken from the paste and planted on apple, on which a new crop was raised.

Polyactis fasciculatis *Cd.*

Dead stems of Polygonum. Greenbush. May.

Peronospora parasitica *Pers.*

Leaves of *Cardamine rhomboidea.* Buffalo. *Clinton.*

Oidium megalosporum *B. & C.*

Rotten wood. Buffalo. *Clinton.*
This species is remarkable for its very large globose spores.

Oidium fulvum *Lk.*

Rotten wood. Buffalo. *Clinton.* Savannah. August.

Fusisporium roseolum *Steph.*

Decaying potatoes. Sandlake. June.

Pilacre faginea *Fr.*

Old stumps and logs of beech. Maryland. July.

Mucor inæqualis *n. sp.*

Fertile flocci simple or once or twice divided, white; sporangia globose, at first white, then bluish-black or brownish-black; spores somewhat angular, subglobose, very unequal in size, .0002–.0005 in. in diameter.

Decaying squashes. Albany. October.

UNCINULA SPIRALIS *B. & C.* (*U. Americana* Howe.)

Leaves of grape-vines. New Baltimore. *Howe.* Buffalo. *Clinton.* Poughkeepsie. *Gerard.*

The very long appendages distinguish this from *U. Ampelopsidis.*

UNCINULA FLEXUOSA *Pk.*

Leaves of horse chestnut, *Æsculus Hippocastanum.* Buffalo. *Clinton.*

The wavy-flexuous appendages are peculiar to this species, and with its more numerous spores separate it from *U. adunca* to which it is sometimes referred.

UNCINULA PARVULA *C. & P.*

Leaves of the hackberry, *Celtis occidentalis.* Poughkeepsie. *Gerard.* September.

MICROSPHÆRA RUSSELLII *Clinton.*

Amphigenous; mycelium arachnoid, evanescent; appendages 8–18, very long, flexuous, colored, paler toward the tips which are simple or one to three times divided; sporangia ovate, 4–8; spores 4, elliptical, .0007–.0008 in. long.

Leaves and petioles of the yellow wood sorrel, *Oxalis stricta.* Buffalo. *Clinton.* North Greenbush. October.

The scanty mycelium and colored appendages separate this species from *M. holosericea.*

MICROSPHÆRA DUBYI *Lev.*

Leaves of honeysuckle, *Lonicera parviflora.* Buffalo. *Clinton.* New Baltimore. *Howe.* Croghan. September.

MICROSPHÆRA DENSISSIMA *Schw.*

Fallen oak leaves. Saratoga. October.

This is a very distinct species, forming definite orbicular patches of dense white filaments.

ERYSIPHE EUPHORBIÆ *Peck.*

Mycelium thin; conceptacles small, .0035 in. in diameter; appendages few, long, flexuous, colored; sporangia broadly ovate, 3–4; spores 3–4, large, .001 × .00065 in.

Leaves of *Euphorbia hypericifolia.* Greenbush. October.

The mycelium occurs on both sides of the leaf, but conceptacles were observed on the lower surface only.

PEZIZA HESPERIDEA *C. & P.*

Among fallen leaves. Goat Island, where it was first found. *Clinton.* Savannah. August.

Peziza unicisa *n. sp*

Cup large, thin, split on one side to the base, sessile or with a short stem, externally rugulose, minutely pulverulent under a lens, yellow, within pale yellow slightly tinged with pink; spores elliptical, usually containing two nuclei, .0005–.0006 in. long.

Ground in woods. Croghan. September.

The cups are about two inches broad. The species is related to *P. onotica.*

Peziza violacea *Pers.*

Burnt ground in woods. Worcester. July.

Peziza subochracea *C. & P.*

Dead stems of *Rubus odoratus.* Adirondack mountains. July.

Peziza lacerata *C. & P.*

Dead stems of *Rubus odoratus.* Adirondack mountains. July.

Peziza vincta *C. & P.*

Decaying wood. Sandlake. October.

Peziza crocitincta *B. & C.*

Decaying wood. Poughkeepsie. *Gerard.* North Greenbush. October.

This seems to be the same as *P. Chlora* Schw.

Peziza Dehnii *Rabh.*

Leaves and stems of living *Potentilla argentea.* Bethlehem. June.

Peziza pulverulenta *Libert.*

Fallen leaves of pine trees. New Scotland. June.

Peziza assimilis *C. & P.*

Dead stems of *Aster puniceus.* West Albany. May.

Peziza theleboloides *A. & S.*

Spent hops. Buffalo. *Clinton.*

Peziza albumina *C. & P.*

Cups soft, orbicular or contorted, soon becoming nearly plane, whitish, then pallid, depressed in the center when dry, margin elevated; stem very short, rather thick, concolorous; asci cylindrical; spores sausage shaped, .0003 in. long.

Decorticated sticks. North Greenbush. October.

It resembles, in color and texture, fragments of the albumen of a cocoa nut. The cups are cracked and fissured in drying. In its soft substance it approaches the section *Mollisia*.

PEZIZA CORRUGATA *C. & P.*

Subgregarious; cups subglobose, then expanded and nearly plane, black, the margin elevated; hymenium corrugated, elevated in the center when dry, attached to the matrix by delicate radiating fibrils; asci subclavate; spores narrowly fusiform, two to three nucleate, .0006–.0008 in. long.

Decaying wood. North Greenbush. November.

It is allied to *P. compressa*. The spores probably become triseptate.

PEZIZA CHRYSOPLITHALMA *Gerard.*

Damp earth among mosses. Poughkeepsie. *Gerard.*

HELOTIUM RUGIPES *n. sp.*

Cups concave, then expanded, sometimes with a small dimple or umbilicus in the center, externally brown, yellowish in the dried state; disk greenish-brown, sometimes yellowish; stem short, tapering downwards, rugose-lacunose, the wrinkles extending upwards on the cup; asci slender, cylindrical; spores uniseriate, uniseptate, elliptical, .0003 × .00015 in.

Rotten wood. Worcester. July.

The cups are 2″–4″ broad. In the dried specimens before me the hymenium has retained its greenish-brown hue.

HELOTIUM THUJINUM *n. sp.*

Cup smooth, subsessile, concave or nearly plane, orange, externally a little paler; spores globose, .0003 in. in diameter.

Fallen branchlets of arbor vitæ, *Thuja occidentalis*. Lowville. September.

HELOTIUM MACROSPORUM *n. sp.*

Cups at first nearly closed, then expanded and slightly concave, whitish, externally furfuraceous; stem short, rather thick; spores oblong, containing a single large nucleus, .001–.0012 in. long.

Decaying wood of beech trees. Worcester. July.

The plant changes to a light brown in drying. The long spores suggest the specific name.

HELOTIUM GRACILE *C. & P.*

Ochraceous; cups plane, then convex, immarginate, rather thin, externally slightly paler; stem slender, equal, brownish toward the base, about as long as the diameter of the cup; asci cylindrical; spores cylindrical or subfusiform, obtuse at the extremities, two to three nucleate, .0007–.0008 in. long.

Stems of herbs. Center. October.

In size and habit it resembles *P. cyathoidea*, but the cups are never closed.

HELOTIUM LIMONIUM *C. & P.*

Lemon yellow, externally paler; cups plane or slightly convex, immarginate, at first externally delicately farinaceous; stem slender, equal, not longer than the diameter of the cup; asci cylindrical; spores cylindrical, obtuse at each end, curved or straight, .0003 in. long.

Stems of herbs. Center. October.

ELAPHOMYCES GRANULATUS *Fr.*

Under ground in pine woods. Maryland and Croghan. July and September.

HYSTERIUM SPHÆRIOIDES *A. & S.*

Leaves of Labrador tea, *Ledum latifolium*. Sandlake.

HYSTERIUM MACULARE *Fr.*

Leaves of leather leaf, *Cassandra calyculata*. Sandlake. August.

HYSTERIUM TYPHINUM *Fr.*

Dead leaves of *Typha latifolia*. Guilderland. May.

HYSTERIUM EXARIDUM *C. & P.*

Fallen leaves of sheep-laurel, *Kalmia angustifolia*. Sandlake. June.

HYSTERIUM ANGUSTATUM *A. & S.*

Bark of deciduous trees. Sandlake.

HYSTERIUM MACROSPORUM *n. sp.*

Perithecia longitudinally striate; spores crowded, oblong, colored, triseptate, .0016–.002 in. long.

Decorticated pine wood. North Greenbush. November.

COLPOMA JUNIPERINUM *C. & P.*

Bark of juniper trees, *Juniperus Virginiana.* Buffalo. *Clinton.* Also on balsam trees. Adirondack mountains.

TORRUBIA CAPITATA *Fr.*

Pine woods, growing from *Elaphomyces granulatus.* Maryland and Croghan. July and September.

HYPOCREA ALUTACEA *Fr.*

Fallen leaves in woods. Croghan. September.

HYPOCREA CONTORTA *Schw.*

Among mosses on decaying wood. Buffalo. *Clinton.*

HYPOMYCES POLYPORINUS *Peck.*

Perithecia minute, ovate or subconical, seated on a pallid subiculum, smooth, yellowish or pale amber; asci narrow, linear; spores fusiform, acuminate at each end, nucleate, .0006–.0007 in. long.

On *Polyporus versicolor.* Richmondville, Worcester and Croghan. July and September.

It seems a little remarkable that this species not before observed, should be found in one season in three distinct localities.

HYPOMYCES VAN BRUNTIANUS *Gerard.*

On *Agaricus.* Poughkeepsie. *Gerard.*

NECTRIA RIBIS *Tode.*

Dead currant stems. Bethlehem and Greenbush.

NECTRIA COCCINEA *Fr.*

Dead branches of water beech, *Carpinus Americana.* Greenbush. August.

NECTRIA CELASTRI *Schw.*

Dead stems of *Celastrus scandens.* Greenbush. May.

This is often accompanied by its Conidia, *Tubercularia Celastri* Schw.

NECTRIA BALSAMEA *C. & P.*

Bark of dead balsam trees, *Abies balsamea.* North Elba. August.

NECTRIA APOCYNI *Peck.*

Conidia. Subhemispherical or irregular, small, pale red; spores fusiform, straight, .0005–.0006 in. long.

Ascophore. Cæspitose or scattered, dull red; perithecia minute, pale ochraceous and subglobose when moist, dull red collapsed or laterally compressed and rough with minute whitish scales when dry; ostiola minute; spores biseriate, uniseptate, fusiform, usually constricted in the middle, nucleate, .00065–.0008 in. long.

Lower part of dead stems of Indian Hemp, *Apocynum cannabinum.* North Greenbush. October.

NECTRIA MYCETOPHILA *n. sp.*

Perithecia crowded or scattered, minute, smooth, subglobose, pale yellow when young, then pinkish-ochre; ostiola minute, papillate, distinct, darker colored; asci subclavate; spores oblong, simple, .0005 × .00016 in.

Decaying fungi. New Scotland. October.

XYLARIA GRANDIS *n. sp.*

Large, blackish-brown, irregular, obtusely pointed and rusty-brown at the sterile tip, abruptly narrowed at the base; central substance white; perithecia subglobose; spores subfusiform, pointed at each end, straight or slightly curved, .0008–.0009 in. long; stem branched, radicating, often greatly elongated.

Plant 3′–5′ high, heads 1.5′–3′ long, 8″–12″ thick.

Ground. Portage. *Clinton.*

The branching stem and pointed sterile apices of the clubs separate this from *X. polymorpha* which it also surpasses in size. The larger spores distinguish it from *X. digitata.*

XYLARIA GRAMINICOLA *Gerard in litt.*

Club slender, cylindrical, simple, at first greenish pulverulent, then blackish-brown, roughened by the prominent globose perithecia, tips sterile, acuminate; stem smooth, straight or flexuous, brown; spores uniseriate, unequally ellipitical, .0004 × .0002 in.

Plant about 2′ high, parasitic on the roots of languishing grasses. Poughkeepsie. *Gerard.*

It is allied to *X. Hypoxylon.*

EUTYPA ACHARII *Tul.*

Decorticated poplar. Helderberg mountains. May.

DIATRYPE PLATYSTOMA *Schw.*

Dead branches of maple trees. Tyre and Center. September.

DIATRYPE BULLATA *Fr.*

Bark of dead saplings. Tyre. September.

DIATRYPE TOCCIÆANA *De Not.*

Dead hazel and alder branches. Center and Sandlake. October.

DIATRYPE MOROIDES *C. & P.*

Dead branches of alders. Sandlake. September.

MELANCONIS STILBOSTOMA *Tul.*

Dead trunks and branches of white birch, *Betula populifolia.* Center. May.

VALSA BICINCTA *C. & P.*

Dead branches of butternut, *Juglans cinerea.* Greenbush. May.

VALSA CENTRIPETA *Fr.*

Dead alders. Buffalo. *Clinton.*

LOPHIUM MYTILINUM *Fr.*

Decaying wood. Poughkeepsie. *Gerard.*

LOPHIOSTOMA MAGNATUM *C. & P.*

Decaying wood. Tyre. September.

LOPHIOSTOMA TURRITUM *C. & P.*

Dead branches of willows. Sandlake. September.

SPHÆRIA CANESCENS *Pers.*

Rotten wood. Portville and Croghan. September.

SPHÆRIA SARMENTORUM *Fr.*

Dead vines of moonseed, *Menispermum Canadense.* Poughkeepsie. *Gerard.* North Greenbush. November.

SPHÆRIA MACULÆFORMIS *Pers.*

Fallen leaves of basswood, *Tilia Americana.* Helderberg mountains. May.

SPHÆRIA STAPHYLINA *Peck.*

Perithecia minute, black, covered by the epidermis which at length ruptures in a stellate manner or irregularly; spores biseri-

ate, colorless, constricted in the middle, three to five septate, .0009–.001 in. long, the two parts formed by the central septum unequal in diameter.

Dead twigs of *Staphylea trifolia*. Helderberg mountains. May.

Sphæria Desmodii *Peck.*

Perithecia scattered or seriately placed, minute covered by the epidermis which is pierced by the acute or narrowly conical ostiolum, black; asci clavate; spores biseriate, fusiform, colorless, quadrinucleate, .00035–.0004 in. long.

Dead stems of Desmodium. Garrisons. June.

Sphæria viridicoma *C. & P.*

Dead branches of beech. Sandlake. October.

Sphæria mutans *C. & P.*

Decaying wood. Tyre. September.

Sphæria Semen *C. & P.*

Fallen petioles of mountain ash, *Pyrus Americana*. Sandlake. September.

Sphæria subconica *C. & P.*

Dead stems of herbs. Greig. September.

Sphæria fuscella *B. & Br.*

Dead stems of raspberry, *Rubus strigosus*. Greenbush. June.

Sphæria racemula *C. & P.*

Dead stems of willow herb, *Epilobium angustifolium*. Adirondack mountains. July.

Massaria bufonia *Tul.*

Bark of white oak trees. Buffalo. *Clinton*. Poughkeepsie. *Gerard*. Greenbush. May.

The spores in our plant are a little smaller than in the European, being .0006–.0008 in. long.

NEW STATIONS OF RARE PLANTS, REMARKS AND OBSERVATIONS.

Sesuvium pentandrum *Ell.*

This plant, found by Mr. Merriam near East Hampton, L. I., and formerly considered a variety of *S. Portulacastrum*, is now believed to be distinct and our only northern species.

HIBISCUS MOSCHEUTOS *L.*

Montezuma marshes. It seems a little strange that this plant with its very large showy flowers should not be cultivated by florists and ornamental gardeners.

TILIA AMERICANA var. PUBESCENS *Gr.*

Wading River, L. I. *Miller.*

DESMODIUM LÆVIGATUM *DC.*

Manorville, L. I. *Miller.*

GALACTIA MOLLIS *Mx.*

Wading River. *Miller.*

GEUM ALBUM *Gmelin.*

Greenfield. Westchester county. *Howe.* This is a variety with very small bright golden yellow petals.

MYRIOPHYLLUM TENELLUM *Bigel.*

Wading River. *Miller.*

MYRIOPHYLLUM AMBIGUUM var. LIMOSUM *Gr.*

Wading River. *Miller.*

ACNIDA CANNABINA *L.*

Not uncommon in the valley of the Hudson river below Poughkeepsie. *Howe.*

TYPHA LATIFOLIA *L.*

The dried leaves of this species are sold for thirty or forty dollars a ton at the markets near the Montezuma marshes, but the allied species, *Typha angustifolia*, is regarded as worthless, the leaves of it not being salable.

NAIAS MAJOR *All.*

Seneca river near Savannah.

POGONIA PENDULA *Lindl.*

Woods near Savannah.

JUNCUS TRIFIDUS *L.*

Shawangunk mountains, Ulster county. This rush has heretofore been found in the State on the high summits of the Adirondack mountains only. This new station is remarkable not only for being much further south, but also at a much less altitude than

are the Adirondack stations. Indeed in the Ulster county locality, this plant with a northern range meets, on common ground, *Asplenium montanum*, a fern with a southern range.

Scirpus debilis *Pursh.*

Long pond near Wading River. *Young.*

Scirpus maritimus *L.*

Montezuma marshes. It occurs here in a small form, about a foot high, with the heads all sessile and involucral leaves two, one subtending the cluster of spikes, the other appearing like a prolongation of the stem. *Scirpus pungens* growing by its side very much surpasses it in hight.

Scirpus subterminalis *Torr.*

Wading River. *Miller.*

Andropogon Virginicus *L.*

Peconic river and Northville. *Young.*

Aspidium aculeatum var. Braunii *Koch.*

Abundant in the "Deep Notch" between Shandaken and Lexington. Eighteen species of ferns were observed in this locality, all except three of which had previously been noticed in "Stony Clove," a locality similar to this and but a few miles south of it. The three species are *Woodsia obtusa*, *Asplenium Trichomanes*, and *Osmunda cinnamomea*. These two localities together produce one-half the whole number of species of ferns that occur in the State.

Osmunda cinnamomea *L.*

A form was found on Pine hill, Ulster county, having the fertile frond leafy above.

Botrychium simplex *Hitch.*

Riverhead, L. I. *Miller.*

Fissidens grandifrons *Brid.*

Wet rocks. Chittenango Falls. *Clinton.* This at present is our most eastern known station of this interesting but sterile moss.

Didymodon luridus *Hornsch.*

Wet rocks. Chittenango Falls. As at Niagara Falls we here find this rare moss associated with *Fissidens grandifrons.*

Delesseria Leprieurii *Mont.*

Hudson river at Yonkers. *Howe.*

AGARICUS GALERICULATUS *Scop.*

Two well-marked varieties of this very variable species were observed the past season. One grows on the ground among fallen leaves. It has a dark-brown pileus, close lamellæ and a very long stem generally of a delicate pink color toward the top. It might be called var. *longipes.* The other grows under pine trees, has a broadly convex or expanded grayish-brown pileus and a short stem. It might be called var. *expansus.*

AGARICUS FIBULA *Bull.*

A form of a pale color with the center of the pileus and the upper part of the stem brown occurred on mossy logs in woods at Worcester and Croghan. July and September.

AGARICUS GEOPHYLLUS *Sow.*

The variety with the pileus of a beautiful lilac color occurs in Bethlehem. It is *Ag. affinis* Pers. and might appropriately be named var. *lilacinus.*

MARASMIUS VELUTIPES *B. & C.*

This with us is one of the most common species of the genus, occurring in all our woods and wooded swamps, but I have never been able to find it with an umbilicate pileus. Can it be that there are two forms, one northern with a convex pileus, the other southern with an umbilicate pileus? Or is our plant a distinct species, yet so nearly related to *M. velutipes* that the absence of an umbilicus is the only available mark of distinction? Our plant sometimes grows in lines or rows several feet in length.

BOLETUS PICTUS *Pk.*

This plant was erroneously described in a former report as "viscid when moist." Subsequent observations satisfy me that it is not viscid even in the moist state. *Boletus Spraguei* B. & C., since published, is a very closely related species, if indeed it be specifically distinct.

POLYPORUS BOUCHEANUS *Fr.*

The American plant commonly referred to this species is quite variable and has been a source of considerable perplexity. It has been ascribed by eminent mycologists to Polyporus, Favolus and Hexagona, and Fries in his Epicrisis places *P. Boucheanus* in the section Pleuropus, while Berkeley, in his Notices of N. A. Fungi, puts it in the section Mesopus, though he adds the remark that it is frequently pleuropous. I have seen very many American specimens of our so called *P. Boucheanus*, yet in but a single instance have I seen it with a central stem. There are three prominent points of disagreement between our plant and the description of *P. Boucheanus* in the Epicrisis. The stem does not become

brown at the base, "deorsum fuscescente," although closely adhering bits of bark sometimes give it such an appearance, the pores are not of an orange color, "dilute aurantiacis," and the pileus is not smooth then scaly, "lævi dein squamoso," though it is either smooth or scaly. The pores are generally decurrent, yet this prominent character is not mentioned in the description of Fries. In view of these discrepancies it seems almost certain that our plant ought to be regarded as a distinct species, but, in view of its variable character, I hesitate to separate it as such until I shall have had the opportunity of comparing it with authenticated European specimens of *P. Boucheanus.*

Gymnosporangium clavipes *C. & P.*

The protospores germinate at each end, the pedicel separating from the base about the time the filament protrudes from the lower or basal cell of the protospore. In *Podisoma Juniperi* the protospores germinate at the septum.

Æcidium Clematitis *Schw.*

Leaves of *Clematis Virginiana.* Poughkeepsie. *Gerard.*

In the preceding pages, when no name is added to the station or stations, the plant has been found therein by the writer. Dates signify the time of collecting the specimens, and therefore indicate to some extent the time of the occurrence of the plant. The single and double accent marks placed at the right of figures denote respectively inches and twelfths of an inch.

My warmest thanks are due to those Botanists who have kindly aided me by their generous contributions of specimens.

Most respectfully submitted.

CHAS. H. PECK.

Albany, *January 3d*, 1873.

DESCRIPTIONS OF BRYOZOA AND CORALS

OF THE LOWER HELDERBERG GROUP.

By JAMES HALL.

[The title of this paper (and also one upon the Bryozoa and corals of the upper Helderberg and Hamilton groups) was announced in the 20th Report on the State Cabinet of Natural History, the manuscript having been prepared sometime previously. Owing to imperative duties connected with the affairs of the museum, and the rearrangement of collections, these papers together with others, the titles of which were at that time or had been previously announced, have been postponed from time to time, until in some cases the occasion for their publication has passed.

The present paper was again communicated with the Report of 1872 (in January, 1873), but its publication has been delayed by the State Printer till 1874. Some of the papers which have been previously announced in the 18th, 19th and 20th Reports will appear in this and subsequent Reports of the State Museum of Natural History.]

Genus FENESTELLA *Lonsdale.*

Fenestella nervia *n. sp.*

Bryozoum forming funnel-shaped bodies, which are attached by their bases to foreign substances, often to the branches of ramose Bryozoans. Near the base the cup expands at an angle of about seventy degrees, spreading more rapidly above and becoming undulated or folded. Branches slender, approximate, about five in one-tenth of an inch, frequently bifurcating; sharply carinate on the outside, with a row of pores on each side of the carina, inside smooth or slightly granulose, not striate; dissepiments thickened, rounded, widening at their junction with the branches; surface on the same plane with the branches on the inner side of the frond, deeply sunken on the outer side. Fenestrules elongate, quadrangular on the outer

surface, rounded or sub-oval within, the length but little exceeding the breadth; appearing longer on the outer side, from the thickening of the dissepiment on the inner.

Pores rounded, three or four on each side of the fenestrule, distance from each other equal to or greater than their own diameter; in well preserved specimens they have a slightly upward direction, with the outer margin projecting. This feature is, however, seldom preserved, and the cells appear as slight protuberances with a central perforation.

This is an abundant form on weathered slabs of the shaly limestone of the Helderberg group, two miles north of Clarksville, Albany county, New York.

FENESTELLA PRÆCURSOR *n. sp.*

Bryozoum forming narrow, deep, funnel-form bodies, attached by their bases to foreign substances. Near the base the cup expands at an angle of not more than forty degrees, spreading more rapidly above. Branches slender, with few bifurcations below, the number increasing above. Outer surface with a series of cell pores on each side of a narrow, elevated carina, which widens above, forming another branch parallel with the principal one, and having a sharp crest with a line of obtuse nodes on each side, giving the appearance of a second range of cell pores. Inner surface of the branch rounded, marked by numerous small pustules which, when worn away, show openings into the interior tube, presenting the characters of the poriferous surface of Polypora. Dissepiments somewhat thickened, rounded, spreading at their junction with the branch, on the same plane in the inner side and not extending above the range of pores on the outside. Fenestrules varying from subquadrangular to elongate oval, about as wide as the breadth of the branches. Pores circular, three or four to each fenestrule, opening outwardly and slightly upwards, forming lobes on the sides of the branches. The obtuse nodes are arranged somewhat more closely than the pores, five nodes occupying a space equal to four pores. In much weathered specimens the nodes are often worn away so as to exhibit a small perforation, and in this condition they might be mistaken for another range of pores. In one specimen the wearing of the carina has left a groove between the ranges of pores.

Formation and locality.—On decomposed surfaces of the shaly limestone of the Lower Helderberg group, near Catskill, New York.

Fenestella crebripora *n. sp.*

Bryozoum forming frond-like expansions on the surface of weathered slabs, undulated or folded from the rapid increase of the branches from bifurcation; base not known. Branches slender, rounded and smooth on the non-poriferous side, not perceptibly striate: poriferous side of the branch carinate with a range of large, closely approximate pores on each side. Dissepiments slender, distant, widening at their junction with the branch, carinate on the poriferous side, and rounded on the opposite. Fenestrules elongate, quadrangular, wider than the branch, and their length often double their width. Pores large, often appearing polygonal on the surface but rounded within, from three to four in the length of a fenestrule: the partition walls narrow, often sharp on the outer edge, that on the inner side dividing the two ranges and forming the carina frequently tortuous. At the junction of the dissepiment with the branch, there is commonly a cell pore within the dissepiment and out of the line of the regular range; sometimes one in each axil, and in these cases the pores are triangular at the surface. Branches from three to four in a tenth of an inch: dissepiments one and a half to two in the same space.

This species is a somewhat coarser form than either of the preceding, with slender and more distant branches and dissepiments; and pores differing from those in size and position.

Formation and locality.—On weathered slabs of Lower Helderberg Limestone; Albany county, New York.

Fenestella Idalia *n. sp.*

Bryozoum forming broadly spreading cup-shaped bodies, attached by the base to other substances; celluliferous on the inside. Branches slender, very closely arranged, frequently bifurcating, longitudinally striate on the outer surface, striæ granulose, from three to five or six on each branch; inner surface of branches densely crowded with small slightly oval pores in two ranges, except for a short distance below each bifurcation, where the branch gradually widens and an intermediate range appears which divides at the bifurcation; a slight ridge often separates the rows of pores, but this is often obsolete. Dissepiments slender, striated on the inner surface; their distance from each other equal to or greater than the width of the branch; about four in the space of one-tenth of an inch. Fenestrules small, elongate elliptical, appearing quadrangular on the

outside. Pores circular or a little elongate, their margins elevated, projecting on the upper side into a slight roof-like covering over the pore. Branches about six in one-tenth of an inch.

This species is distinguished by the compact and closely arranged branches even when the striæ or asperate character of pores are removed. It is a much more delicate species than any of the preceding.

Formation and locality.—In shaly limestones of the Lower Helderberg group, at Schoharie, New York.

FENESTELLA SYLVIA *n. sp.*

Bryozoum forming large funnel-shaped fronds, with a small attached base, rapidly spreading and becoming much folded toward the outer margin. Branches very slender and closely approximate. Outer or non-poriferous side of the frond in well preserved specimens distinctly striated longitudinally. Dissepiments closely arranged, rounded, appearing nearly as strong as the branch on the outer side of the frond, angular on the opposite side. Fenestrules small, quadrangular on the surface, round or oval within, a little longer than wide. Pores minute, round, slightly elevated, three in the length of the fenestrule. About seven branches in the space of one-tenth of an inch, where there are no bifurcations; at the bifurcations sometimes ten in the same space; five to seven dissepiments in the space of one-tenth of an inch. The edge of the carina, between the ranges of pores, when well preserved, is slightly rugose or asperated.

This species resembles *F. nervia*, but has more slender and closely arranged branches, more frequent dissepiments and consequently smaller fenestrules and fewer pores.

Formation and locality.—In upper layers of the shaly limestones of the Lower Helderberg group, on Slingerland's farm, near Clarksville, New York.

Genus POLYPORA *McCoy.*

POLYPORA LILIA *n. sp.*

Bryozoum forming small fan-like fronds (not cup-shaped), attached by the base to foreign bodies. Branches small, irregular, anastomozing, connected at unequal distances by the dissepiments, poriferous on one side and obscurely striate on the other. Dissepiments very short, comparatively distant, widening at their junction with the branches. Fenestrules elongate-oval or elliptical, their length often

twice or more than twice their width. Pores distinct, rounded, their margins very slightly elevated, scattered on the wider but forming rows in the narrower parts of the branch; two, three or four in the breadth of the branch. On the dissepiment, near its junction with the branch, a single pore is often visible, but the dissepiments have not a poriferous character.

This beautiful species is the only true Polypora yet known in the Silurian strata of New York. It is easily distinguished from the associated Fenestella by the irregular mode in which the branches multiply, and by the greater number of pores, without dividing ridges. The poriferous side, as seen in the rock, has somewhat the appearance of *Retepora asperato-striata* of the Niagara limestone, except that it has a finer and more delicate structure, fewer pores, and the dissepiments are destitute of cells except at the extremity.

Formation and locality.—On weathered slabs of the Lower Helderberg limestone, at Schoharie and near Clarksville, New York.

Polypora elegans (?) *n. sp.*

Bryozoum growing in small, irregular and duplicating fan-shaped overlapping fronds, attached by the base to foreign substances. Branchlets slender, rounded, frequently and irregularly bifurcating and rapidly diverging. Dissepiments strong, two-thirds as thick as the branches and placed at irregular distances. Fenestrules a little longer than wide. Pores small, round or ovate, comparatively distant, with distinctly elevated margins; arranged in two series only, and alternating, one on each side of the branch, leaving a smooth or striated space between; the distance between the two ranges equal or nearly equal to the diameter of the pore with its margin. Surface between the pores, and also the dissepiments, striated with tortuous striæ. Opposite side not known.

This species is remarkable as having only two ranges of pores, although with all the other essential features of the genus Polypora.

Formation and locality.—In shaly limestones of the Lower Helderberg group, near Clarksville, Albany county, New York.

Genus HEMITRYPA *Phillips.*

The genus Hemitrypa of Phillips was established for a group of Fenestelloid bryozoans, which have unusually high ridges dividing the ranges of pores on the exterior of the frond, and the crests of the ridges connected by a series of dissepiments which are not unfrequently so much thickened laterally as to leave only small round

pores, which open into a series of radiating galleries formed by this covering between the branches; these galleries also communicate with the interior of the cup by the fenestrules of the inner layer. The cell pores are situated on the branches in the same relative position as in true FENESTELLA, and open into the galleries, or tubes. The inner portion of these bodies, if denuded of the exterior layer together with a portion of the ridges, would be in every respect like a true Fenestella.

There is but one species of this type yet known in the Lower Helderberg rocks of New York; and none in any of the older formations; others occur in the Hamilton group, and several in the precarboniferous rocks of the western States, one of which has been described by Dr. H. A. Prout as *Fenestella hemitrypa*, Trans. Acad. Nat. Sci. St. Louis, Vol. 1, p. 444, pl. 17, f. 4.

From FENESTELLA of the ordinary type, there is a somewhat regular gradation, through those with highly elevated intercellular ridges, to the type of HEMITRYPA; and in *F. præcursor*, herein described, we have a form so nearly intermediate that it is difficult to say to which genus it belongs. The highly elevated crests have along their sides a row of small pustules which if prolonged and continued across the spaces would form the characters of HEMITRYPA.

HEMITRYPA PRIMA *n. sp.*

Bryozoum forming narrow funnel-shaped bodies, the sides diverging at an angle of from thirty-five to forty-five degrees. Branches slender, round, contiguous, about five in the space of one-tenth of an inch; dissepiments frequent, two-thirds as wide as the branch and expanding at their junction. Fenestrules small, oval or ovate. Pores small, round, with elevated margins, about three to each fenestrule: distance between the inner and outer layers about equal to that between the branches. Outer surface of the cup divided into small rhomboidal openings by small slender filaments connecting the edges of the branches; usually a little depressed in the middle; about four to each fenestrule, nine or ten in the length of one-tenth of an inch.

Formation and locality.—On slabs of the Lower Helderberg limestone, Schoharie, New York.

Genus ICHTHYORACHIS *McCoy.*

ICHTHYORACHIS NEREIS *n. sp.*

Bryozoum plumose, slender, slightly flexuose; midrib flattened on the exterior surface, longitudinally striate, with a groove along the center; lateral branches short, rigid, obtusely pointed at the extremity, distance from each other equal to the width of the mid-

rib. Pores moderately large, in two ranges on the lateral branches, with three or more on the midrib (not fully determined).

Length of the longest specimen seven-tenths of an inch, imperfect at both extremities; width, including lateral branches, one-tenth of an inch, four of them in length equal to the entire width of the frond.

Formation and locality.—On limestone surfaces of the Lower Helderberg group, at Schoharie, New York.

Genus ESCHAROPORA *Hall.* 1847.

(Not *ESCHARIPORA D'Orb.* 1851.)

Escharopora tenuis *n. sp.*

Bryozoum growing in thin, elongate, narrow stipes, with parallel margins, and celluliferous on both sides. Cells arranged in longitudinal rows (eighteen rows counted in one specimen), the marginal rows largest; the cells of the outer row situated a little in advance of the next within it, and so on to the central row, where the order is reversed, so that the transverse rows of cells run obliquely downwards to the center from both margins. Cell apertures rhomboidal or obscurely hexagonal and opening upwards; the partitions between them sharp on their outer edges. The cells from the opposite sides of the stipe reach to the thin dividing epitheca in the center, and are inclined to the axis at a very low angle; the whole thickness of the stipe is seldom more than two-hundredths of an inch; breadth one-sixth of an inch. The longest stipe which we have seen is nearly three inches, gradually narrowing from the middle upward.

This species differs from all others of the type yet seen, in its great tenuity, differing extremely from those of the Trenton limestones which are often nearly as thick as wide.

Formation and locality.—In shaly limestones of the Lower Helderberg group; Albany and Schoharie counties, New York.

Escharopora nebulosa *n. sp.*

Bryozoum forming thin, flat, elongate expansions, celluliferous on both sides. Cell apertures quadrangular, length scarcely exceeding the width, in parallel rows of contiguous ranges slightly alternating with each other; longitudinal partition walls thin, rounded on the edges, transverse partitions more slender and usually not elevated to the same plane, rising from the central epitheca and gradually curv-

ing upwards and outwards. The surface of the frond is marked with distant, elevated spots or nebulæ, formed of cells which are a very little larger than the rest. Thickness of frond four-hundredths of an inch, width nearly half an inch; eleven of the longitudinal ranges of cells in the width of one-tenth of an inch and about eight pores in the same length.

This species differs from *E. tenuis* in its greater breadth, its nebulose surface and the proportionally shorter cell apertures, as well as in its more robust appearance.

Formation and locality.—In weathered blocks of the Lower Helderberg group, at Catskill creek, New York.

ESCHAROPORA LIRATA *n. sp.*

Bryozoum forming small ensiform bodies, gradually enlarging upwards from an obtusely pointed base; sides of the stipe convex, giving a lenticular transverse section. Cells in longitudinal parallel rows increasing in size with the width of the stipe: longitudinal partitions elevated (giving a lirate aspect to the surface), transverse partitions thin, deeply depressed. Cell apertures quadrangular, longer than wide. Length of stipe from half to three-fourths of an inch, greatest width about one-sixteenth of an inch, containing about eight rows of pores.

These forms may perhaps be only the bases, or young, of *E. tenuis*, the bases of that species having not been found with the specimens; but the objection to such a supposition is that these forms are not known to occur in the same strata where the others are most abundant, and are most common in beds from a higher level. They resemble the *E.* (*Phœnopora*) *ensiformis* of the Clinton group.

Formation and locality.—In the upper, shaly portions of the shaly limestones of the Lower Helderberg group, near Clarksville, New York.

Genus CALLOPORA *Hall.*

CALLOPORA HYALE *n. sp.*

Bryozoum growing in irregular foliate expansions, or incrusting other bodies. Surface marked by comparatively large, distant and irregularly disposed, circular or slightly oval cells with elevated margins. The intercellular spaces marked by very small, shallow, angular pits or depressions, sometimes three or four between adjacent cells; sometimes considerable areas destitute of these depressions, when the specimen presents much the appearance of a Trematopora.

In general appearance this species closely resembles *C. elegantula* of the Niagara group; but the cells are smaller and much more distant, while the cell margins of *C. elegantula* are never elevated; also the intermediate pits are larger and more distinct. It resembles in some degree *C. perelegans*, but the cells are less circular, the margins more strongly elevated, and the intercellular pits less distinct.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, at Schoharie, New York.

Callopora macropora *n. sp.*

Bryozoum forming slender, solid branches, with distant, widely diverging bifurcations; the branches seldom wider than a twentieth of an inch. Surface marked by comparatively large, elongate-oval or slightly angular cells. Intercellular spaces narrow, often only a narrow ridge, intercellular pits few, small and angular, never more than a single series so far as observed, and no spines have been seen on the cell margins.

This is a very distinct and well marked species, characterized by the large cells and slender branches. A single branch, apparently belonging to the same species, has been found in the Niagara group at Lockport.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, at Catskill creek, Greene county; near Clarksville, Albany county, and at Schoharie, New York.

Callopora venusta *n. sp.*

Bryozoum consisting of hollow branches, usually occurring flattened upon the surface of slabs; varying in width from a sixteenth to more than a fourth of an inch; their surfaces often nodose or tortuous. Inner surface of the tubes longitudinally striate and marked by strong concentric wrinkles. Cells small, longitudinally elliptical, not contiguous, their margins not distinctly elevated, though showing in some instances a well defined border. In well preserved specimens the cell margins are marked by short, obtuse spines, generally situated one on each side at the point of greatest diameter; occasionally there is also one at the upper or lower side. Intercellular spaces marked by one or more series of angular depressions or pits, which are sometimes almost as large as the true cells.

This species has much the general aspect of *C. elegantula* of the Niagara group, but the cells are much smaller, elongate instead of circular, and in the whole appearance is of a finer texture.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, on Catskill creek, New York.

CALLOPORA UNISPINA *n. sp.*

Bryozoum forming slender, solid branches, with distant bifurcations; the branches seldom more than a sixteenth of an inch in diameter. Cells small, somewhat crowded, usually triangular except at or near the bifurcation, where they become distorted; distant from each other about two-thirds of their own diameter. The intercellular space marked by small angular pits, with the ridges between sharply elevated, and rising into a short triangular spine at the basal margin of the true cells; giving to the branches under a magnifier a sharply asperate appearance.

The distinguishing feature of this species is the triangular cells with the single spine at the base of each.

Formation and locality.—In the shaly limestone of the Lower Helderberg group at Catskill creek, Greene county, and near Clarksville, Albany county, New York.

CALLOPORA PERELEGANS *n. sp.*

Bryozoum growing in strong, solid, tortuous branches, three-sixteenths of an inch, or more, in diameter. Cell apertures large, circular, with slightly elevated margins, somewhat irregularly disposed, distant from each other usually a little less than their own diameter. Intermediate spaces marked by comparatively large, polygonal pits, which frequently extend from cell to cell, making their length much greater than their breadth; the partition walls between the pits vertical, slightly flattened on the top. In a transverse section, the partitions across the intercellular spaces are strong and distant. Cell tubes smooth.

This exquisite species of Callopora is not equaled in beauty even by the *C. elegantula* of the Niagara group; it differs from that in the form of the intercellular pits, which in the *C. elegantula* are smaller, more numerous, and more equal in size.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, near Clarksville, Albany county, New York.

CALLOPORA HETEROPORA *n. sp.*

Bryozoum forming solid, comparatively slender branches, with numerous irregular bifurcations. Cell apertures small, elongate-oval, with frequent constrictions, which, in well preserved specimens, give

the border a somewhat lobed appearance; cells arranged irregularly and at distances varying from one-half to nearly twice their own length. Intercellular spaces marked by minute shallow pits, which are easily worn away, giving to the branches the appearance of Trematopora. In well preserved individual branches the intercellular pits are distinct, and the borders of the cells have small, short spines.

This is a common and variable species, occurring in branches of from three-hundredths of an inch to a line or more in diameter; the pores also vary in size and contiguity.

Formation and locality.—In the shaly limestone of the Lower Helderberg group, near Clarksville, Albany county, New York.

Callopora ponderosa *n. sp.*

Bryozoum growing in heavy, dense, irregular masses, formed by numerous accretions of growth; or in smaller masses, incrusting shells and other substances. Surface crowded with medium-sized circular cells, distant from each other about half their own diameter, margins not elevated above the surrounding surface. Intercellular spaces crowded with minute, deep, polygonal pits, in one, two, or sometimes three ranges; the small triangular spaces at the angles, between the cells and pits, are elevated and form short triangular spines.

This species somewhat resembles in surface characters the *C. elegans* of the Niagara limestone, but it is of finer texture, and the cells have not the tendency to form rows, so common in that species. It differs from *C. perelegans* in the smaller size of the pores, the more numerous and smaller intercellular pits, and in its mode of growth, which is always incrusting or in large irregular masses.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, at Schoharie, New York.

Genus TREMATOPORA *Hall.*

Trematopora rhombifera *n. sp.*

Bryozoum forming slender solid branches, with distant diverging ramifications; their surface marked by densely crowded, rhombic pores with narrow partition walls, carinate on their edges. Cells generally equal-sided, and arranged spirally around the branch, their vertical greater than their transverse diameter. The branches vary

in diameter from two-hundredths of an inch, to, rarely, a sixteenth of an inch.

In some well preserved examples of evenly weathered specimens a narrow groove or channel is seen passing from the upper and lower angle of the cells on to the surface, nearly uniting with that from the cells above and below, which may sometimes pass entirely over, leaving a double carina between the lines of pores; but this feature has been seldom observed.

This species is closely allied in some points to *T. regularis*, with which it is often associated, but differs essentially in the arrangement of the pores; that species having pores in longitudinal lines with an elevated ridge between, while in this species they are always spirally arranged; in worn specimens the difference is less distinctly seen.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, near Clarksville, Albany county, and at Schoharie, New York.

TREMATOPORA SIGNATUS *n. sp.*

Bryozoum forming slender, tortuous branches, seldom more than four-hundredths of an inch in diameter; bifurcations frequent, widely divergent. Surface marked by comparatively large polygonal pores, rather longer than wide, with partition walls carinate on the surface in unworn specimens, but frequently flattened from weathering or other causes, and in this condition the pores appear circular. In the angles formed by the junction of three or more pores are often seen minute pits, similar in appearance to the intercellular pits in Callopora, but which are probably the commencement of additional pores.

This is a clearly distinct and easily recognized species. It has much the appearance of a minute species of Striatopora and the form of cell apertures, their upward direction, radiating from the center of the branch, their angular outline and large size, would seem to ally it with that genus; but no trace of the characteristic striæ can be seen. It is closely allied to *T. constricta* from which it can be distinguished by the larger and angular pores as well as by the numerous intercellular pits of that species.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, at Schoharie, New York.

TREMATOPORA CONSTRICTA *n. sp.*

Bryozoum forming hollow bifurcating branches, generally about an eighth of an inch in diameter, rarely nearly twice these dimen-

sions: surface of branches smooth, having a worn appearance. Cell apertures small, round or slightly elongate, distant from each other once and a half to twice their own diameter; with a narrow depressed space surrounding the aperture; intercellular spaces smooth or but slightly channeled. On smooth silicified specimens the dermatic film, covering the intercellular spaces, is often thin and translucent, with the appearance of opercula caused by the refraction of light from the small cavities beneath. Inner surface of the branch-tubes transversely wrinkled and obscurely striated longitudinally by the recumbent portion of the cell tubes.

Formation and locality.—On weathered surfaces of the shaly limestones of the Lower Helderberg group, near Clarksville, Albany county, New York. (Rather abundant.)

Trematopora corticosa *n. sp.*

Bryozoum growing in long, irregular, solid branches, with distant ramifications, which are often more than an inch apart, and diverging at an angle of about ninety degrees; diameter of branches one-eighth of an inch or less. Cells numerous, elongate-ovate, sometimes elongate-hexagonal, deeply impressed. Intercellular spaces strongly elevated, forming roughened ridges between the cells, like the miniature roughened bark of a tree.

This species is easily recognized by the rough surface and distant, widely-diverging branches. It is not very abundant.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, near Clarksville, Albany county, New York.

Trematopora densa *n. sp.*

Bryozoum growing in solid, ramose branches, an eighth of an inch or less in diameter; their surface closely covered by small polygonal cells, with narrow, flattened interspaces. Cells rising from the center of the branch and rapidly diverging to the exterior; cell apertures various in size and irregular in position. Intercellular spaces solid on the exterior, cellulose within; the surface at the angles between the adjacent cells elevated, rising into small node-like tubercles.

In general aspect this species has the appearance of a small finely marked Chætetes; but where broken so as to show the hollow tubes and cellulose intertubular space, its character as a Trematopora is clearly marked. In size and general appearance it has some resemblance to *T. corticosa*, but is easily distinguished by the smaller and less elongate cells, and less elevated intercellular substance.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, at Catskill creek, Greene county, New York.

TREMATOPORA PONDEROSA *n. sp.*

Bryozoum growing in heavy masses, consisting of lamellar accretions; surface structure consisting of comparatively large pores, distant from each other about their own diameter; margins of pores elevated, often extending over and constricting their apertures, especially on the posterior margin, and forming elevated hood-like projections. Intercellular area depressed or channeled, but destitute of pits or other markings. Under-surface of the lamellæ with radiating striæ, and marked by strong concentric wrinkles. In vertical section the intercellular substance is seen to be strongly vescicular, the partitions dome-shaped, and the cell tubes with frequent constrictions.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, at Catskill creek, Greene county, New York.

TREMATOPORA MACULOSA *n. sp.*

Bryozoum growing in irregular foliate or incrusting masses; cells approximate with depressed spaces between; apertures hooded in some stages of growth. Surface of frond studded with numerous comparatively large maculæ on which the cells are more sparsely arranged. Intercellular tissue strongly vesiculose seen in a vertical section. Under surface of frond strongly corrugated.

This species differs from *T. ponderosa* in the spots on the surface, in the mode of growth (in distorted or explanate fronds), and in the more strongly corrugated epithecal crust of the inferior surface.

Formation and locality.—In shaly limestone of the Lower Helderberg group, on Catskill creek, Greene county; and near Hudson, New York.

TREMATOPORA REGULARIS *n. sp.*

Bryozoum forming very slender, solid branches, with frequent, widely-diverging bifurcations; diameter of branches seldom more than three-hundredths of an inch. Cells elongate-oval, in longitudinal rows and in quincunx order, between the rows of cells the space is often elevated into a longitudinal ridge, with finely serrated crest in well-preserved specimens.

This species is often abundant on the surface of weathered slabs. The slender branches and regular arrangement of cells distinguish it; while the ridges are frequently worn away leaving a smooth

surface between the rows of cells. Well preserved specimens from Catskill creek show a short spine at the lower end of the cell aperture; a feature not observed in other localities.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, near Clarksville, Albany county, New York.

PALESCHARA *Nov. Gen.*

Bryozoum parasitic, or free, forming incrustations upon the surfaces of other fossils, or in independent frondose expansions. Surface with polygonal cellules, separated by thin solid walls; without evidence of rays or transverse septa.

The mode of growth is not dissimilar from that of a recent Flustra in its earlier stages, but the cells are less regularly arranged and the whole has a stronger and firmer aspect.

Paleschara incrustans *n. sp.*

Bryozoum growing in flustra-like expansions, incrusting shells and other bodies; sometimes more than an eighth of an inch in thickness from additions of growth. Cell apertures moderately large, polygonal; five to seven in the space of one-tenth of an inch; walls thick, their margins elevated at the angles of the cell apertures into obtuse projections, which are not sufficiently long to be characterized as spines. Sometimes the surface exhibits maculæ of larger cells; but this feature is obscure.

The general expression of this Bryozoan is that of a Flustra; the the cells are very similar to some forms of Chætetes; but no transverse partitions have been discovered.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, near Clarksville, Albany county, New York.

Paleschara bifoliata *n. sp.*

Bryozoum growing in broad, spreading fronds, or thin expansions, celluliferous on one or both sides, with an epithecal crust forming the base of the cells. The same or similar epithecal expansions may be found incrusting other substances. Surface of the frond covered with small, closely arranged, slightly elevated maculæ, formed of larger cells, with thicker walls than those dividing the ordinary cells. Cells polygonal, often slightly-elongated hexagons, in undulating or tortuous lines or irregularly disposed; cells rectangular to the plane of the frond or slightly inclined; without transverse plates, walls thin.

Maculæ distant from each other two to three times their own diameter. Thickness of the frond two to three-hundredths of an inch when single; width in one specimen more than an inch and a half. Seven to nine cells in one-tenth of an inch between the maculæ.

This species resembles some of the so-called Chætetes of the Hudson river formation of Cincinnati, Ohio. In the cell arrangement and the maculæ it may be compared with *C. pavonia* of D'Orb.; but the expansions are never so thick as in that one, though sometimes occurring double.

Formation and locality.—In the shaly limestone of the Lower Helderberg group, Schoharie, New York.

Genus CERAMOPORA *Hall.*

CERAMOPORA MACULATA *n. sp.*

Bryozoum growing in thin disc-like expansions, incrusting shells and other bodies, or free; with a wrinkled epithecal crust beneath; flat or depressed on the upper side. Disc covered with larger and smaller polygonal pores, the larger ones forming maculæ at irregular distances, and often formed by the union of two or three smaller cells. The cells radiate from the center, their apertures directed towards the margin of the disc, a little elongate, with the walls slightly elevated at the angles, forming angular projections. In small specimens the apertures are more elongate; and in the very young condition, where the cells are just forming on surfaces, they are extremely elongate with the posterior portion of the aperture hooded, and having an indistinct radiation from each of the maculæ. This character becomes obscured in older specimens from the bending upwards of the cells in the process of growth.

Discs from one-fourth of an inch to one inch and a half, or more, in diameter; the thickness in larger specimens an eighth of an inch. Between the maculæ about five cells occupy a tenth of an inch.

This species resembles *C. imbricata* of the Niagara limestone, but differs in the less distinctly hooded apertures, the maculæ more obscure and less strongly divided and radiate, and it also grows much larger.

Formation and locality.—In shaly limestones of the Lower Helderberg group, near Clarksville, Albany county, and at Schoharie, New York.

Ceramopora (Berenicea) maxima *n. sp.*

Bryozoum of a depressed convex form, composed of cells which radiate from the center of the disc, and open laterally, inclined at an angle of about forty-five degrees to the plane of the disc near the center, and becoming more prone as they approach the margin. Cell apertures irregularly hexagonal, somewhat elongated from the projection of the anterior or lower margin; diameter of the opening about one-twentieth of an inch; cell walls thick, obscurely striate inside, their margins at the angles of the cells prolonged in a spine-like process. Under surface unknown.

The single specimen found, measures nearly three-fourths of an inch in diameter. It has the general features of those Palæozoic species usually referred to Berenicea, but is much larger than the usual size of those. It resembles a Michelina with very small pores; but on examination its characters are more of a Bryozoan, especially the projections at the angles of the cell walls.

Formation and locality.—In the shaly limestone of the Lower Helderberg group, at Schoharie, New York.

VERMIPORA *Nov. Gen.*

Bryozoum growing in ramose branches, which are composed of small cell tubes, growing upon each other side by side, without intertubular or cellulose substance, and destitute of rays, or transverse partitions within the tubes. Tubes rising from the center of the branch, gradually diverging, and opening upwards on the exterior surface; each tube forming the apex of the branch at the time of its origin, and giving place to succeeding cells in its diverging outward.

The Bryozoans referred to this genus are ramose branches, formed by the union of serpula-like tubes, cemented upon each other, their apertures directed upwards and opening on the side of the branch, increasing in size with the increased diameter of the branch. There are no new cells formed by interstitial additions, the increased size of branch being dependent on the increased size of the tubes themselves. In a transverse section the appearance is of a bundle of compressed tubes, cemented together; the floor of the outer ones being formed by the exterior walls of the two just beneath it, and between which it has been formed. Of this peculiar type of Bryozoans we know yet of but two species, one of which is in the Upper Helderberg limestone.

Vermipora serpuloides *n. sp.*

Bryozoum growing in strong ramose branches, with widely-diverging bifurcations: branches often one-fourth of an inch in diameter, rapidly decreasing in size at the bifurcations, composed of long, slender tubes, which gradually diverge from the axis to the exterior of the branch. Tubes flexuose, compressed, smooth on the exterior, or with corrugations of growth; gradually increasing in size upward. Apertures opening rectangularly to the axis (when entire), their greatest diameter about three hundredths of an inch, and with about an eighth of an inch of their length exposed, on branches which are one-fourth of an inch in diameter.

Formation and locality.—In limestone of the Lower Helderberg group, at Schoharie, New York.

Genus AULOPORA *Goldf.*

Aulopora Schoharlæ *n. sp.*

Cells tubular, elongate, cylindrical or gradually enlarging to the aperture, frequently budding in a direct line, including an angle of about eighty degrees, varying somewhat in different specimens: apertures large, circular, opening upward, or directed slightly forward; walls thin, not striate within; exterior of the tubes smooth or with transverse wrinkles of growth. Length of cell tubes about one-fourth of an inch; diameter of aperture five-hundredths of an inch; greatest diameter of tube one-third greater than that of the cell apertures; diameter of the posterior extremity of tube equal to one-half that of the aperture.

This species is much smaller than that in the Hamilton group referred to *A. tubæformis* Gold.; it corresponds more nearly in size to *A. serpens* var. *minor* Gold., in *Petref. Germ.*, p. 82, pl. 29, f. 1 b.; but is larger than the figure; the extremities of the tubes are more unequal, and the mode of growth and bifurcation differ.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, at Schoharie, New York.

Genus CHÆTETES *Fischer.*

Chætetes Helderbergiæ *n. sp.*

Bryozoum growing in strong, ramose branches, or palmate fronds; the diameter of the branches sometimes five-eighths of an inch, and

the fronds several inches in length. Cell tubes polygonal, very long and slender, rising from the center of the branch and gradually curving outward to the surface; increased by interstitial additions; diameter of the cells at the surface of the branch about a hundredth of an inch. Transverse floors or partitions distant in the lower part of the tube, becoming more numerous towards the outer end, and near the surface the distance from each other is less than the diameter of the tube.

In well preserved silicified specimens the cell walls on the surface are comparatively thick, the margins slightly elevated at the junction of cells, but not spine-like, the young cells appearing in the angles; in the interior of the branches the cell walls are obliquely corrugated. No maculæ have been seen on the branches.

This is a beautiful and not uncommon species.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, at Catskill creek, near Clarksville, and at Schoharie, New York.

Chætetes sphærica *n. sp.*

Bryozoum growing in large convex or hemispherical masses, composed of cell tubes radiating from within and diverging more rapidly as they approach the surface of the mass. Tubes small, polygonal, increased by interstitial additions; transverse partitions three, four or more times the diameter of the tube; cell walls very thin and corrugated. The surface of the mass is marked by maculæ, situated about a fourth of an inch from centre to centre, composed of cells which are about twice the size of the intermediate cells; the addition of new cells mostly takes place within the maculæ. About eight of the intermediate cells occupy the space of a tenth of an inch.

This species grows in very convex masses of sometimes four or more inches in diameter. On cursory observation it has the appearance of *Favosites conica*, with which it is associated, but it is composed of smaller tubes which are destitute of intercommunicating pores, and the transverse plates are more distinct, while also the maculated surface distinguishes the species.

Formation and locality.—In shaly limestones of the Lower Helderberg group, near Clarksville, and on Catskill creek.

Genus FAVOSITES *Lam.*

Favosites Helderbergiæ *n. sp.*

Corallum growing in large, lenticular, depressed-convex or hemispherical masses, with a wrinkled epithecal surface on the under side

when perfect. Cell tubes averaging one-twentieth of an inch, polygonal, their inner surface showing evidence of a few strong longitudinal striæ; the walls rather thin, but greatly increasing by silicification; the sides perforated by a single row of medium sized pores communicating with the adjacent cells; transverse partitions numerous, one, two, or sometimes three in a space equal to the diameter of the tube, the margins bent downwards at the junction with the cell-walls, and often perforated in one of the depressions.

In many specimens, a few of the cell-tubes are larger than those surrounding them, measuring about one-sixteenth of an inch, with thicker walls, and being less angular. A single specimen from Coeymans' Landing has slightly larger tubes on one portion, while in all the rest the cells have the ordinary characters.

The longitudinal striæ seen on some silicified specimens are not constant, and are not seen on calcareous specimens, and may be a feature produced in the process of silicification.

This species differs from the Upper Helderberg form known as *F. basaltica* in the smaller tubes and more closely arranged partitions.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, near Clarksville, Albany county. It is here found weathered out from the rock and silicified, frequently in masses of a foot or more in diameter. Smaller specimens of what appear to be the same or a closely allied form occur at Cole's quarry, in Herkimer county, New York.

FAVOSITES CONICA *n. sp.*

Coral forming conical masses, flattened at the base, composed of moderately large, strongly diverging, polygonal cells, curving more abruptly towards the surface of the mass; dividing walls thin, perforated by large, round, intercellular pores in one, two, or sometimes three series: those series which consist of a single range have the pores vertical one above the other; in the series of two ranges, they generally alternate with each other; where there are a greater number, the pores are irregularly disposed: margins of pores are usually slightly thickened. Transverse partitions closely arranged, two or three in a distance equal to the diameter of the tube. Tubes very variable in size and shape, some being not more than four-hundredths of an inch in diameter, while many are an eighth of an inch; the larger cells are six or more sided, the smaller cells four or five sided, or triangular, a feature not common in Favosites; but the triangular cells are usually small and near the base and soon become pentagonal from the truncation of two of the angles.

The conical form of the specimens, and the inequality of the cells, distinguish this species from every other known Favosites. The specimens are usually from one inch to nearly three inches in diameter.

Formation and locality.—In the shaly limestone of the Lower Helderberg group, near Clarksville, Albany county, New York.

FAVOSITES? MINIMA *n. sp.*

Coral forming globose or compressed globose bodies, composed of minute radiating cells, about two-hundredths of an inch in diameter; having comparatively thicks walls which are perforated at regular distances by large pores, distant from each other less than the diameter of the tube, a single series on each face of the tube. Transverse plates rather closely arranged.

From the globular form of this small species and where the external characters are obscured by shale, it may be mistaken for the species of Astylospongia found in the same rocks. From the extreme tenuity of the tubes it presents the appearance of Chætetes, but partially decomposed specimens from Catskill creek show very beautifully the casts of the intercellular pores connecting the different tubes. The original cells were probably formed upon some foreign substance, but from their rapid growth and curvature they soon close around and form spherical bodies generally a little distorted. Specimens an inch and a half or less in diameter.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, near Clarksville, Albany county; and Catskill creek, Greene county, New York.

Genus MICHELINA *De Koninck.*

MICHELINA LENTICULARIS *n. sp.*

Coral forming small lenticular bodies, the lower surface the less convex, and covered with a strongly wrinkled epitheca; cells large and few, broadly campanulate, with narrow partition walls strongly marked by granulose or denticulate longitudinal striæ, the number varying with the size of the cell.

In a specimen of little more than three-fourths of an inch in diameter, there are about twelve cells, the larger ones somewhat more than three-tenths of an inch in diameter: the whole height of the specimen is about the same.

This is a very small species, seldom attaining a diameter of more than one inch. This character, with the large cells and their strongly granulose striæ, are distinctive features.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, near Clarksville, Albany county; and at Schoharie, New York.

Genus STRIATOPORA *Hall.*

STRIATOPORA ISSA *n. sp.*

Coral growing in strong ramose branches, with distant bifurcations; branches three-eighths of an inch or more in diameter. Cells rising from the center of the branch, rapidly increasing in size, and curving outward to the surface; apertures very unequal, polygonal, strongly striated on the inside, the number of striæ increasing with the size of the aperture; walls not very thick, perforated by large, round pores situated between the striæ, and increasing in number with the increase of striæ. The larger cell-apertures somewhat more than a tenth of an inch in diameter.

This is the most robust species of this genus yet noticed, and the cells are large in proportion. It is not a very common form, and is generally found in detached pieces on the weathered surfaces of blocks of limestone.

Formation and locality.—In limestones of the Lower Helderberg group.

Genus STREPTELASMA *Hall.*

STREPTELASMA (PETRAIA) STRICTA *n. sp.*

Cup narrowly turbinate, very gradually and regularly enlarging at an angle of about thirty degrees, straight or slightly curved except the small apex which is sometimes more abruptly bent. Exterior surface strongly and distinctly ribbed longitudinally, and marked with concentric, unequal undulations of growth: longitudinal ribs rounded, from forty-five to fifty-five on specimens, at a point where the diameter is half an inch; the increase of ribs or rays taking place usually at three distinct points, but sometimes only at two points. Interior of cup broad and deep, with thin sharp margin; the lamellæ not projecting into the cup until near the bottom, but forming low, rounded rays, a little stronger than those on the exterior.

In a slightly flattened specimen which is one inch by three-fourths of an inch in diameter at the margin, with length which has been about one inch and seven-eighths, the number of rays at the margin is fifty-five; about half of these reach to the center, the other half project only a little beyond the walls at the base of the cup.

The primary lamellæ are smooth on the edge, and strongly granulose on the sides below, and sometimes more or less twisted in their direction to the center, although generally direct; uniting and coalescing near the middle, forming an indistinct plate or vesiculose core, from an eighth to three-sixteenths of an inch in diameter; and in vertical section, sometimes showing an indistinctly defined vertical wall.

The secondary lamellæ strongly denticulate on the edge below the surface of the other lamellæ. Fosset obscure or obsolete.

This species is distinguished by the rigid straightness of its form, the strongly ribbed exterior, and the deep wide cup with undeveloped rays or ribs: and in these characters differs from both those of the Niagara group and also from those in the higher formations.

Formation and locality.—In the shaly limestones of the Lower Helderberg group, at Catskill creek, Greene county; near Clarksville, Albany county; at Schoharie, and at numerous other localities in New York.

INDEX

TO

LOWER HELDERBERG BRYOZOA AND CORALS.

	PAGE.
Aulopora Schohariæ	110
serpens v. minor	110
tubæformis	110
Callopora elegantula	101
heteropora	102
Hyale	100
macropora	101
perelegans	102
ponderosa	103
unispina	102
venusta	101
imbricata	108
Ceraramopora imbricata maculata	108
(Berenicea) maxima	109
Chætetes Helderbergiæ	110
pavonia	108
sphærica	111
Escharopora ensiformis	100
lirata	100
nebulosa	99
tenuis	99
Favosites basaltica	112
conica	112
Helderbergiæ	111
minima	113
Fenestella crebripora	95
Fenestella hemitrypra	98
Idalia	95
nervia	93
præcursor	94
sylvia	96
Hemitrypa prima	98
Ichthyorachis Nereis	98
Michelina lenticularis	113
PALESCHARA	107
Paleschara bifoliata	107
incrustans	107
Polypora elegans?	97
Lilia	96
Retopora asperato-striata	97
Streptelasma (Petraia) stricta	114
Striatopora Issa	114
Trematopora constricta	104
corticosa	105
densa	105
maculosa	106
ponderosa	106
regularis	106
rhombifera	103
signatus	104
VERMIPORA	109
Vermipora serpuloides	110

ENTOMOLOGICAL CONTRIBUTIONS—NO. III.

By J. A. LINTNER.

I. ON THE LARVA OF EUDRYAS UNIO HUBN. AND ALLIED FORMS.

On the 9th of September the larvæ of this moth were found feeding on *Epilobium coloratum* growing in a swampy portion of a pasture. About thirty individuals were collected during a few minutes search, two or three of the larvæ, in some instances, occurring on the same plant. They had nearly attained their maturity; some of their number, a day or two after their collection, buried themselves in the moist sand in which were inserted the plants upon which they were fed, and on the 16th a pupa was observed, partially extruded from the sand. Only four of the larvæ were carried through to their pupal change, it having been inconvenient to supply them with suitable food. The pupæ were kept during the winter in a moderately warm apartment, and on the 8th of April the first disclosed its imago.

The larva bears a strong resemblance to those of *E. grata* (Fabr.) and *Alypia octomaculata* (Fabr.) in shape, markings and colors. Its prominent features are its bands on each segment of white, black and orange (a single orange one occurring on the center of the segment), and a hump on the eleventh segment. A detailed description is as follows:

Head rounded, its diameter somewhat exceeding one-half that of the body, orange with black spots, of which there is an oblong one near the base of the clypeus, two semi-ellipsoidal ones surmounting its apex and a small quadrangular one on each side; a perpendicular row of five spots on each side of the clypeus of which the second superior one is the largest, a spot above the ocelli, and a row of three behind them. *Body* tapering regularly toward the head, from the eleventh segment, which is elevated in a hump. First segment white, with two transverse bands of black spots, and with two black bands only seen when extended. The abdominal segments have each three white and three black bands on each side of a central orange band. The orange band is the broadest; it is marked dorsally on its anterior

margin by two transversely elongated black spots resting on the black line margining it, and laterally by two geminate similar ones, of which the upper is the larger and the lower embraces the stigma; behind the lower margin of the stigmatic spot, centrally on the band is a small rounded black tubercle bearing a short hair; on the posterior margin of the band, resting on the bordering black line, are two subdorsal semi-elliptical black spots, forming with the two anterior spots a "trapezoid"; between these subdorsal spots are two or four black points, of which the two interior sometimes assume the form of a "dove-tail" medial process of the black band; the orange band extends downward to the black bases of the prolegs, midway between which and the stigmata, on or in range with the third black band, is an elongated hair-bearing black spot, and posteriorly another similar one, lower and running into the black bordering the prolegs. The white band preceding the orange is interrupted or greatly contracted on the medial line by an enlargement of the black band anterior to it, and is marked with a small piliferous black dot in front of the stigma. On the second and third segments the orange band is marked with a row of eight spots, of which the six superior are located in the middle of the band, and the two inferior coalesce with the black band margining it behind. On the eleventh segment the trapezoidal fuscous spots are of a well-defined oval form; above the stigma is another similar spot. On the twelfth segment the corresponding spots are round, and the trapezoid has its broadest side in front. The anal shield bears two spots centrally and five marginal ones, of which the medial one is elongated. On the sides of the larva a yellowish shade rests on the incisures. Ventrally, white and black interrupted bandings are observable on the abdominal segments when extended; the thoracic region is almost wholly white; on segments four and five the orange band is continued beneath, inclosing on the former four and on the latter six rounded black spots. The legs are dull yellow, tipped or edged on the two joints with black, and dotted with black interiorly. The prolegs are dull yellow, with a velvety black base, and with two lateral lines and three black spots (one small); the terminal pair have a black line outwardly and a cluster of black spots behind, which, as well as all of the black spots noticed in the above description, are piliferous, having the hair somewhat longer and stouter than in *grata*.

Length of the mature larva one inch and one-eighth; diameter three-sixteenths of an inch.

The larva has not, that I am aware of, been previously described, nor can I find any positive record of its observation. It seems to have occurred at Otisco, N. Y., for, in reply to some inquiries directed from that place to Mr. C. V. Riley, the answer is returned that "the Eudryas larva which feeds on *Epilobium coloratum*, or Purple-veined Willow-herb, is in all probability *E. unio* Hübner, although we cannot determine positively unless specimens are sent."* Harris, Fitch and Riley describe the moth, but were doubtless unacquainted with its larva; for Harris states his ignorance of it; and, although Dr. Packard asserts that Fitch has raised both *grata* and *unio* from the grape,† there is reason to believe that Dr. Fitch had assigned to *unio*, without any knowledge of its habits, the food-plant of which it was natural to suppose it would partake in common with its congener;‡ and Mr. Riley also probably includes it among his "blue caterpillars of the vine,"§ without personal observation, but from a reliance on the usual accuracy of the statements of Dr. Fitch.

At present we have no information of its having been found on any other plant than *Epilobium coloratum*. It is quite remarkable that two species, so closely allied, should have such dissimilar food-plants. The fact suggests an interesting inquiry, whether *unio* be confined to Epilobium, or if it occurs on other of the Onagraceæ, or even ranges to some other order. As *grata* is known to feed on Ampelopsis as readily as on the grape, it is not improbable that a careful examination, during the month of September, of the common evening primrose (*Œnothera biennis*), may be rewarded by a discovery of *unio* upon it.

Two other larvæ occur in New York, viz., *Alypia octomaculata* and *Psychomorpha epimenis* (Drury), which bear so strong a resemblance to the Eudryades, that the four are liable to be confounded, not only by the casual observer, but by the entomologist who may not have acquainted himself with their characteristic features.

Of *A. octomaculata*, Harris remarks,‖ "It resembles the larva of *Eudryas grata* in its colorings and markings so much, that, before I

* *The American Entomologist*, 1870, vol. ii, p. 59.

† *Proc. Essex Institute*, 1864, vol. iv, p. 27.

‡ *Third Report on the Insects of New York*, p. 81.

§ *Second Report on the Insects of Missouri*, 1870, p. 83.

‖ *Entomological Correspondence of Thaddeus William Harris, M. D.*, Boston, 1867, p. 116.

was acquainted with its manners, I have frequently taken the one for the other;" and again, when writing of *E. grata* (loc. cit. p. 138), he says: "The position of the larva in repose, with its head depressed, and the third and fourth segments arched upwards, give it a hunch-backed appearance; the attitude, disposition of the colors and the habitat, are similar to those of the larva of *Alypia octomaculata*."

Several of the larvæ of *P. epimenis*, sent to Mr. Riley by correspondents and also collected by himself from grape-vines, were referred by him, although with some doubt, to *A. octomaculata*,* and were figured in association with the imago in one of his plates. Subsequently he was able to rear *octomaculata* from its larva, which he figures and describes, correcting the first erroneous reference.† But in continuation of the confusion, the *epimenis* larva is now made to stand (with a reservation) for *E. unio*, the larval state of which was then unknown; and only in a following report does it find its true name and proper place beside the beautiful imago which it produces. I mention the above, not to reflect, in the slightest degree, upon Mr. Riley, whose able reports are conceded to be very valuable acquisitions to science, but as an illustration of the close resemblances existing among these larvæ. If they are capable of thus puzzling so accurate an observer, there certainly is need of faithful description, or at least a statement of prominent features and differences, that their identification, whenever met with, may not be a matter of doubt.

I regret that I have no memoranda, or material at hand, to enable me to institute a full comparison between the most nearly allied of these larvæ, viz., *octomaculata*, *grata* and *unio*. I have only at command two alcoholic examples of *unio*, three immature forms of *grata*, and one collected several years ago and labeled *grata* but which I believe to be *octomaculata*.

The comparative length of the hairs will, in all probability, prove a sufficient distinction between the last two. Harris (*Ent. Corr.*, p. 286,) describes the mature larva of *octomaculata*, taken July 16th, as transversely banded with orange and dotted with black, the dots being in two alternate rows, and all of them emitting distinct, long, whitish hairs. In a young larva found by him July 2d, between one-fourth and one-third of an inch long, the hairs were very distinct. Of *grata*, occurring abundantly on the grape-vine, August 10th, he

* *First Report on the Insects of Missouri*, 1869, p. 136.

† *Second Report on the Insects of Missouri*, 1870, p. 80.

writes (loc. cit., p. 306), "larva entirely naked;" and, on page 307, he institutes a comparison between the caterpillars of the Agaristiadæ, "which are sparingly covered with hairs," and those of Eudryas, "in which the caterpillar is not at all hairy." The two figures of *grata* given in the *Treatise on Insects Injurious to Vegetation*, represent the larva as hairless. Riley (*2d Rep. Ins. Mo.*, p. 80) says of *octomaculata*, "each spot or tubercle gives rise to a white hair," and of *grata* (l. c., p. 83), that it differs from the preceding by the hairs being less conspicuous. Of the latter species Mr. W. Saunders* states that "the bands are dotted with round black dots, from each of which arises a single short brown hair."

In the examples of the larvæ (about half-grown) of *grata* before me, the hairs do not exceed in length the breadth of the central band, and are noticeable only on close observation. In *octomaculata* they are quite long, equaling in length the diameter of the body, if we may refer to this species the description by Dr. Packard† of some larvæ collected by Mr. Putnam on the grape-vine, and deposited as *grata* larvæ in the Museum of Comparative Zoölogy at Cambridge. The description of the *grata* larva, given in the *Guide to the Study of Insects*, pp. 281–2, with its hump on the eighth ring, and each segment having across it a row of tubercles which give rise to three fascicles of hairs, evidently refers to some other form.

The following may be noticed as distinguishing features of these closely allied forms, which should serve to remove all occasion for confounding the two first mentioned with one another or with the Eudryades:

The larva of *Psychomorpha epimenis* (also a grape-vine feeder) has on each segment four white and four black bands (four-banded on a white ground), and is without the orange band which exists in the other three. The spots which conspicuously mark the others are obsolete in this. In Fig. 1 the larva is represented at *a*; *b* is an enlarged representation of one of the segments, and in *c* is given the marking of the hump on the eleventh segment. The male imago is shown in Fig. 2.

Fig. 1.

Fig. 2.

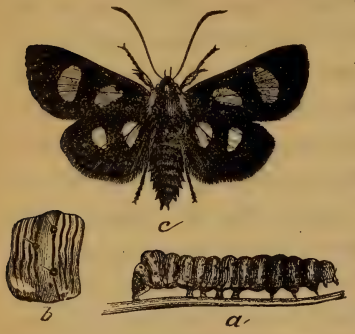
♂

* *First Ann. Rep. on the Noxious Insects of the Province of Ontario*, 1871, p. 35.

† *Notes on the Family Zygænidæ*, in Proc. Ess. Ins., vol. iv., p. 28.

The larva of *Alypia octomaculata* is marked on each segment with eight black bands (counting the two which border the broad central orange band), as shown in *a* of Fig. 3, and more distinctly in the enlarged view of one of the segments at *b*; from the black dots long white hairs are given out (represented too short in the figure), and below the stigmata, on segments four to nine, is a row of white spots, with a large white spot extending over the incisure of the tenth and eleventh segments. At *c*, a view is given of the imago of this species.

FIG. 3.



The larvæ of *Eudryas grata* and of *E. unio* have six black bands and a central orange one on each of the principal segments; they are without the white lateral patches, and have a prominent hump on the eleventh segment. A representation of the imago of *E. grata* is given in Fig. 4, for comparison with *octomaculata* and *epimenis*, and to illustrate the fact well known to those who have studied the larvæ of our Lepidoptera, that very dissimilar moths are frequently produced from larvæ closely resembling one another.*

FIG. 4.

I regret my inability to give, at the present, the differential features of *grata* and *unio*. At maturity they differ in size, *unio* being invariably the smaller. In markings they resemble one another so closely, that Mr. Riley, after a critical comparison of examples of *unio* which I had sent to him, with some examples of *grata* in his possession (probably alcoholic), writes me, that he finds the two species absolutely indistinguishable.

While specific differences may not be detected in alcoholic individuals, there is scarcely any doubt but that sufficient characters for their identification could be obtained from a comparison of the colors of the living forms. Having lately seen a large number of *grata* larvæ (at Portland, Me., in August, 1873), I may safely assert that the two species differ materially in their general aspect. While unable to state from recollection what these differentia are, I believe that *unio* will prove to be characterized by more prominently marked

* The figures illustrating this article are from the excellent drawings of Mr. C. V. Riley.

black bands laterally and ventrally, and by the yellowish shade resting on the incisures laterally.

It is possible that the minute description which Mr. Riley proposes shortly to give of *grata*, drawn from a large number of living larvæ, when compared with the detailed description which I have endeavored to give of *unio*, may develop such points of difference as will permit of the ready recognition of these two forms, peculiarly interesting from the close resemblance existing between them.

Since the above has been put in type, I have been able to compare my two examples of *E. unio* larvæ with six alcoholic examples of *E. grata*, and, as the result of such comparison, I am compelled to disagree with Mr. Riley as above quoted, for while the two are very similar in their ornamentation, yet I find such differences that (provided the features to be referred to prove constant in larger numbers) I would have no difficulty in selecting a single mature individual of either species from among a thousand of the other. Through the kindness of Mr. Riley, I am able to accompany this paper with an excellent figure from drawings made by himself of the larva of *E. grata*, and also (for the first time) a representation of the beautiful egg of this species. At *a* the larva is shown of its natural size; at *b*, one of the segments (the fifth) enlarged; at *c*, the ordinary ornamentation of the collar, differing in some examples by the addition of several (to the number of eight) central dots; at *d*, the usual marking of the hump on the eleventh segment; *e* represents the egg as seen from above, and *f* is a side-view of the same (natural size shown with the enlarged figures).

FIG. 5.

The following are the principal differences that I find in the two species:

Contracted by their preservation in alcohol, the two *unio* larvæ average in length 1.05 in.; the six *grata* 1.29 in. They differ in form, in that the latter presents much the more prominent hump on the penultimate segment, and is angulated at that point to a degree that were it a vertebrate, it would suggest the idea of its terminal portion dragging from having been broken at that point; in *unio* the hump is moderate and the peculiar angulated form, well represented in the figure, is not seen.

Unio is the more heavily marked with black, both in its bands

and spots. In none of the examples of *grata* are the black bands broader than one-half the width of the intervening white ones, while in one *unio* their average width is nearly double that of the white. The spots on the head are the same in position in both species, but are smaller in *grata*. In that species there are usually two distinct piliferous spots on the base of the clypeus; in two of my examples these are confluent, running together by slender projections in a broad V-form: in *unio* the two are united as a band across the clypeus. In *unio* a black spot, broadly rounded beneath, following the curved line of the ocelli, and tapering to a point above, incloses the four superior ocelli: this is not present in *grata*, but in two examples some of the ocelli are indistinctly annulated with black.

At *c*, in Fig. 5, the spots on the collar of *grata* are faithfully represented in position, but their size might have been slightly enlarged. In *unio*, the four spots of the anterior row are separate, but those of the posterior row, from their greater size as compared with *grata*, are confluent, except the two medial ones: in *grata*, these spots are separated by spaces varying from one diameter of a spot to two and one-half diameters.

The spots on the caudal hump of *grata*, shown at *d*, in the figure, are isolated, while in *unio* those in each row are connected by the black band to which they are united.

Similar comparisons might be instituted of all the other spots of the two species, but the above may indicate their differences. The feature which should serve better than any other to distinguish *unio* is the blackish coloring (its outline not permitting its designation as a stripe), above the prolegs and continued on the two following segments, the three piliferous spots above the prolegs being connected with it; this is entirely wanting in *grata*. It results, apparently, from the increasing breadth and coalescence of the black bands as they descend to the ventral region. In one of the examples, the ventral region of the proleg segments is essentially blackish, which feature was also observed in a number of the living larvæ, according to my recollection and that of Mr. Meske, who also collected the larvæ and bred from them several imagines.

The differential features above indicated are not entitled to the reliability that would attach to them, were they drawn from living examples; but should they prove to be sustained by future observations, there need be no necessity of failing in the determination of these species, when either may chance to be collected.

II. TRANSFORMATIONS OF SOME BOMBYCIDÆ.

Platysamia Cecropia (*Linn.*).

Two larvæ, measuring .45 in. in length (after, probably, their first molting), were found, July 13th, feeding on leaves of mountain ash (*Pyrus Americana*). The body was dull orange, bearing six rows of spines, four to six-branched at the tip. In the two dorsal rows the spines were black, except in front where they were orange, concolorous with the body; spines of the remaining rows wholly of a shining black. The eleventh segment, with but two spines, the tenth with four, the ninth with five, and the others with six each. On each segment two black dots between the spines, making them centers of squares of four dots. Head and legs, when the larvæ were first taken, of a dark red, subsequently changing to black.

After the second molting, they measured one inch in length and were of a yellow-green color. On the second and third segments superiorly, each, two globular-headed red tubercles with seven black bristles; on the seven following segments two dorsal rows of yellow tubercles, swollen apically, of which the two on the fourth segment are larger than the others and bear seven bristles each, while the following twelve have but five. On the eleventh segment, medially, is a single yellow tubercle with eight bristles; on each side of these yellow tubercles are oblong black spots. The two lateral rows of tubercles light blue and setiferous, and beneath these, on the three anterior segments, a black pointed tubercle. Head with two converging black lines. Legs with black tarsi, and prolegs each with a black spot exteriorly.

The subsequent moltings were not observed.

A captured *Cecropia* deposited over two hundred eggs, and from her body, after death, nearly a hundred were taken, most of which were of full size; the entire number was three hundred and five. In their longest diameter they measured one-tenth of an inch; in their shortest diameter .083 of an inch.

Callosamia Promethea (*Drury*).

A deposit of eggs hatched July 6th, laid nineteen days before. On the 14th the first molting occurred. Length of larva 35-100ths of an inch. Body pale green, with yellow bands bordered by black; rows of tubercles are apparent.

From having previously fed in companies of from twenty to thirty, there are now seldom more than six collected on a single leaf. A larva usually commenced eating into the leaf at a point in its margin, where it would be joined by others, cutting into the body of the leaf, until often the entire interior was consumed, leaving an unbroken margin (except at the entering point) of a breadth barely sufficient to serve as a support for the larvæ.

At the second molting, on the 20th of July, their length was six-tenths of an inch. Body light yellow-green, with black transverse interrupted markings; on the second and third segments each, two clubbed yellow tubercles and one on the eleventh; six rows of smaller black tubercles. Legs yellow, with a white spot.

August 1st, the larvæ molted for the third time. The subsequent molting was not noted. On August 9th, some of the colony commenced the construction of their cocoons, fifty-two days from oviposition, and thirty-three days from the disclosure of the larvæ.

A measurement taken of some eggs of *Promethea* gave for the diameters .077 and .063 of an inch. They are of a white color, with an ochreous-yellow spot on the upper side.

Actias Luna (*Linn.*).

From an oviposition of one hundred and eighty eggs, larvæ were developed on July 25th. Body pale green, with a brown lateral stripe and a dorsal one on the anterior segments, and with rows of tubercles bearing bristles. Head crossed with a brown stripe.

On July 30th, larvæ molted for the first time. Length three-eighths of an inch. Color pale green. On first segment four red-tipped tubercles; on the second and third two similar ones, and a medial one on the eleventh; the tubercles elsewhere on the body are yellow-tipped. The head is marked on front with four black spots forming nearly a square.

Second molting on August 3d. Length one-half an inch. The tubercles of the first, second and eleventh segments, above mentioned, are tipped with deep red, and have several hairs branching from them. The tubercles of the lower lateral row are also red with

hairs; those of the upper row green and without hairs. The yellow stripe of the side and the yellow bands marking the incisures now appear. The two superior of the four spots of the head are no longer seen. The larva, after its molting, consumes its exuvia.

Third molting on August 9th. Larva seven-eighths of an inch in length, with no material change in appearance from that presented in the preceding stage.

The fourth molting was on August 17th, developing all the features of the mature larva. Length one inch and one-fourth. Color a pale apple-green, shading darker below the stigmata; incisures yellow, and a yellow line on the upper margin of the substigmatal fold. Six rows of small pink warts, each with one or more black hairs. Scattered over the body are a few white hairs, some of which are of a clavate form. Anal shield brown, triangular, yellow bordered; anal plates brown, bordered anteriorly with yellow.

By the 31st of the month all of the larvæ had inclosed themselves in cocoons.

For several days prior to the disclosure of the moth, the pupa (which is fastened by its terminal hooks to some threads in the end of its cocoon) may frequently be heard in motion, as if rotating from side to side. When the time for its transformation has arrived, the pupal-shell is broken by the muscular force of the inclosed limbs and a wet spot appears on the end of the cocoon, indicating the point at which the moth is to emerge. A sound like gnawing is now heard, which is probably produced by the friction of the base of the fore-wings against the cocoon in the effort to force an opening. After these periods of activity, in which the motion is often sufficient to produce a considerable movement of the cocoon, intervals of quiet follow. The wet spot increases in size until its diameter about equals that of the body of the moth. At length the end yields, and the head of the moth is seen through the still connected threads. It partially withdraws itself, and then again resumes its effort to escape. After one or two more rests, the antennæ are protruded, shortly followed by the first pair of legs, when the moth rapidly disengages itself from the cocoon, usually emerging with its back downward, and quickly seeks some position where it can attach itself, with its small wet wings hanging downward over its back. The anterior wings are the first to expand; next the body of the posterior wings and last the tails. In about three hours' time the wings are fully expanded, and,

by a quick, muscular action, are folded over to their natural position against the surface on which it rests (if an extended one), and the insect has attained its full maturity.

In a search made for *Luna* cocoons beneath a number of hickories (*Carya alba*) at Schoharie, on May 9th, nine were found in a space of eight feet square. Of eight others collected at this time not more than one was found under a tree. The first imago from these cocoons emerged May 18th, a male, followed by three other males, after which females and other males appeared.

From the following record in my note-book, it would seem that the season of 1857 was very prolific in Luna moths at Schoharie:

"June 27th. Fine specimens of *Attacus Luna* are brought to me almost daily, most of which have been taken when the moths had but recently emerged and were resting on trunks of hickories. In three instances where seemingly fresh examples were pinned out of doors in the evening, males were found in the morning copulating with them."

"July 2d. In a walk of two hours, four females of *Attacus Luna* were found resting on trunks of hickories, at about two feet from the surface of the ground."

III. DESCRIPTIONS OF THE LARVÆ OF SOME BOMBYCIDÆ.

Parorgyia parallela *Gr.-Rob.*

The larva was taken at Schoharie during the month of June, 1859, feeding on the plum. It was tufted similar to that of *Orgyia leucostigma*, with mouse-colored feathered hairs; the pencils (from memory) were black. It made a thin cocoon July 5th, in which its hairs were loosely woven. The moth emerged July 21st. At rest, its wings slope like the roof of a house, and its front legs are extended, giving it an attitude like that of *Eudryas grata*.

On the 25th of July, of the same year, a female moth of this species was taken, which, after having been pinned, deposited a number of eggs from which ten larvæ were obtained.

The tufts and pencils of hairs marking the larvæ were developed at the second molting (date not noted).

In preparing for their third molting, they spun on the side of the box in which they were confined a thin web, somewhat larger in extent than their body, upon which they took position; their molting occurred two days thereafter. They continued resting in the same position for another day, when they commenced to travel slowly about the box, but refused to eat of any of the tender leaves which were placed in their path.

Two or three days later (October 1st) it was noticed that they had again resumed a fixed position on newly spun webs. As, without feeding and growth, another molting could not be impending, there was scarcely any doubt but that they were now commencing their period of hybernation, in accordance with their habit at this stage of their growth. This was evident a month later (November 5th) when they were found still maintaining their fixed position, but showing equal sensitiveness upon being touched to that manifested at the commencement of their rest. They were accordingly set aside in a cool room for their winter's repose.

With their heads closely appressed to the surface on which they rested, they presented the following features:

Length .18 of an inch. Body densely covered with light brown or fawn-colored hairs, short and even on the back and upper portion

of the sides, and lower down with a margin of longer and unequal ones, projecting also behind. On the anterior portion of the body dorsally, a semicircular dark brown brush-like tuft, convex in front, and slightly elevated above the surrounding hairs; on the posterior portion of the body (11th segment?) a similar round tuft of longer hairs. Two slender pencils of dark brown feathered hairs project in front of the head. Legs and prolegs light fawn-color. Ventral region black.

The attempt to carry the above larvæ through their hybernation met with the ill success that, in nearly every instance, attends similar experiments. In the spring they were found still fastened to their webs, but dead.

Apatelodes Angelica (*Grote*).

Head subrotund, dark brown, the clypeus and two lines on the front lighter brown. *Body* with the thoracic segments tapering; terminal segments tapering and flattened posteriorly; ventral region flattened; the anal legs projecting behind. Color of the body gray; numerous fine black linings, among which may be traced two forming a vascular stripe, and two similar lateral stripes on each side. On segment one, anteriorly, are four dorsal white lines, posteriorly black; segment two is black anteriorly, behind which are irregular black linings; segment three as the preceding one; on segments five to ten the dorsal black linings assume a V shape, the apex resting on the suture and inclosing centrally two yellow-green subelliptical spots, with a similar spot exterior to each within the superior lateral stripe.

From the first segment, long, whitish-brown hairs project over the head, nearly concealing it; from the middle of the second and third segments whitish hairs project forward, of which those on the latter segment are shorter and arranged somewhat in tufts, beneath which, when extended, some short stiff red hairs are seen; laterally below the stigmata are two rows of fascicles of white hairs of unequal length, mingled with a few longer brown ones, extended rectangularly with the body until to its middle, whence the remainder are directed backward; from the terminal segment white and brown hairs, of greater length than elsewhere on the body, project horizontally, brush-like, backward; short, whitish hairs are scattered sparsely over the body. (The larva escaped before its description could be completed, and the remainder is from memory). On the vascular line, on each segment, is a tuft of black hairs about .06 in. long, the

ends of which converge to a point. The prolegs project laterally, almost hidden by the hairs. Ventrally is a broad fuscous stripe.

Eight or ten of the larvæ were collected at Bath (near Albany) during the early part of September, feeding on ash (*Fraxinus*); also by Mr. Meske, at Sharon Springs, on lilac (*Syringa vulgaris*). When not eating, they usually occurred resting on and closely appressed to a twig. The first transformation to a pupa was on September 14th. The larva has a marked gastropachean aspect. It is now for the first time described.

Cœlodasys unicornis (*Sm.-Abb.*) *Pack.*

Larva taken August 3d, feeding on hazel (*Corylus Americana*).

Head large, ovate, green, with delicate red markings, and with two black stripes on its front, as shown in Fig. 6 at **B**. *Body* with the thoracic segments apple-green, with a double brown dorsal stripe extending from the head to a long, fleshy, red-tipped spine on the fourth segment, broadly forked at the tip and bearing two hairs as at **C**. Abdominal segments reddish-brown, with fine interrupted markings. On the eighth segment is a double setiferous hump, between which and the anterior spine **C** is a white elongated spot as in **F**, centrally constricted, and marked with pale red lines. On the eleventh segment is a smaller hump, between which and that on the eighth is a V-shaped white spot (**E**), opening posteriorly. Terminal segment without feet, forked, as at **D**, and usually elevated.

Fig. 6.

As the larva eats into the margin of a leaf, it extends its body along the excised portion following the curve, holding the edge between its feet, and in this position, from its color and peculiar outline, it can with difficulty be distinguished from the leaf.

The larva has also been found by me on choke-cherry (*Prunus Virginiana*), apple, and on plum (July 28th, one-half inch in length). This species has proved very difficult to rear, as it usually dies within the cocoon, before assuming the pupal state in the spring.

Platycerura furcilla *Packard.*

Larva eating the leaves of pine (*Pinus strobus*). Length at maturity one inch and five-eighths. *Head* round, of about the diameter of the body, red with conspicuous markings upon the front of lighter

red, somewhat in the form of a script *x*, and less distinct reticulations of the same. *Body* presenting a peculiarly mottled appearance from its irregular and broken stripes; its general color dull red; on each segment an irregular band of brighter red; a whitish vascular line within a broken gray stripe; a better defined lateral stripe just above the stigmata, within which, on each segment from the third to the eighth inclusive, are four black depressed spots arranged in a right angle, the upper three in line, the largest of which rests on the crown of the segment, with two behind it and one before; the substigmatal fold is white on the anterior portion of each segment and red on the remainder; rows of tubercles from which clusters of red hairs of unequal length proceed, which, on the anterior segments, incline to yellow; on the first, second, fourth and eleventh segments each, superiorly, are two pencils of red hairs nearly one-fourth of an inch in length, darker at the tips and slightly feathered. (These pencils made their appearance after the last molting.) Stigmata encircled with brown. Legs red.

In the accompanying illustration (Fig. 7) is represented the habit and attitude of the larva in feeding. With its terminal pair of legs clasping the leaves at the sheath, it extends its body along a leaf until it commences to bend, when, by detaching successively the first and following pairs of prolegs, it forces the leaf through its legs until its tip is held between them, in the attitude shown in the figure. When the leaf has been eaten from its tip downward, as far as the contracted segments of the larva will permit, it moves to another leaf, and feeds upon it after the same manner.

FIG. 7.

I have observed the same method of feeding in the nearly full-grown larvæ of *Ellema Harrisii* Clemens.

Two of the larvæ above described underwent their last molting September 17th (1859), and a larva farther advanced spun its cocoon beneath leaves lying in the bottom of its feeding cage. A second one spun up on September 25th. An imago emerged June 12th.

The above larvæ were collected at Schoharie. Examples have also been found on pine at Bethlehem, near Albany. It has not been hitherto described.

The imago is much more rare than the larva, and is seldom met with by the collector.

Dryocampa rubicunda (*Fabr.*).

Length of mature larva 1.70 inch. *Head* reddish-brown, with the ocelli on a lunate spot. *Body* cylindrical, apple-green, closely dotted with minute, whitish, acute granulations; a darker green, narrow, dorsal stripe, and broader subdorsal, lateral and stigmatal stripes, the stigmatal less distinct than the others. Segment one, with four black tubercles on the collar, the central ones transversely oval, the outer ones subtriangular; a spine in front of the stigma and another at the base of the leg. Segments two to eleven, with a substigmatal row of acute, prominent, black spines pointing backward; a lateral row of shorter ones on the inferior margin of the lateral stripe; a subdorsal row of still shorter ones on the superior margin of the subdorsal stripe, marked with whitish at base superiorly; a ventral row on and in range with the external basal portion of the legs and prolegs, those of the prolegs (segments six to nine) quite small, the other seven (segments one to five, ten and eleven) nearly as long as the substigmatal ones, except those on the terminal pair of legs, of which there are two on the base of each, which are quite minute. All of the above spines black, the three superior ones in range transversely on the anterior portion of the segment, and the substigmatal ones on the middle of the segment. In addition to the above, from the fourth to the twelfth segment inclusive, there is a row of whitish, black-tipped short spines on the inferior margin of the subdorsal stripe. Segment two has the two subdorsal spines replaced by two black, blunt, spinous horns one-eighth of an inch long, placed below the subdorsal stripe. The four superior spines of segment eleven, more prominent than the corresponding ones of the other segments. Segment twelve, with a slightly bifurcate spine on the dorsal line, the size of the lateral ones of the preceding segment; another in range with the stigmata, the size of the substigmatal ones, and having a small branch posteriorly; a small intermediate one ranging with the lateral line; another of the same size ranging with the substigmatal line; and a ventral one similar to and ranging with the ventral spines of segments ten and eleven, making nine spines on this segment, nearly ranging transversely. Anal shield triangular, margined externally with eight black spinules, of which the six anterior ones are short, the two terminal ones green

at base, larger and pointing backward. Stigmata black. *Legs* tipped with black, the anterior pair with a transversely subelliptical black spot on the base posteriorly, the second pair with a dot similarly placed.

The larva feeds on sugar maple (*Acer saccharinum*). It has been taken for several consecutive years at Schoharie, frequently, on a fence beneath a row of maples, during the latter part of July.

Some examples of the larvæ entered the ground for pupation on the 9th of August.

Tolype velleda (*Stoll*).

Larva at maturity, two and three-fourth inches long, four-tenths of an inch broad, exclusive of lateral fringes. *Head* small and flat, and nearly concealed beneath the two projecting tufts of the first segments. *Body* of a bluish-gray color above, with numerous faint paler longitudinal linings; on the third segment, superiorly, a black band, which is more conspicuous when the caterpillar is in motion; ventrally pale red. On each segment above are two warts, with short black hairs, of which the two on the third segment, anterior to the band, are more elevated. Some short, black and gray hairs, scarcely visible without a lens, are sprinkled over the body more abundantly at the extremities and on the sides. The lateral tufts, proceeding from warts nearly one-tenth of an inch long, are composed of light gray and a few black hairs of unequal lengths, the longest measuring one-fourth of an inch, and some ending in a fan-shaped tip.

When in repose, both extremities of the larva are closely appressed to the surface on which it rests.

The larva was taken July 23, 1861, feeding on elm. On its body were several parasitic eggs, white, acutely oval, and flat beneath, which were carefully removed with the point of a knife-blade. It did not eat after its capture, but remained nearly motionless, with but two or three changes of place, until the 26th, when it spun its cocoon, an inch and a half long and very flat, against the side of the box in which it was secured.

The imago, a female, was disclosed thirty-five days thereafter, on August 30th.

Another larva, found (in 1871) feeding on the leaves of a young apple-tree, made its cocoon on the 10th of July. The imago emerged August 14th, giving it a pupation of the same length as the preceding one.

IV. DESCRIPTIONS OF THE LARVÆ OF SOME NOCTUIDÆ.

Acronycta Americana *Harris MS.*

September 1st, found at Center, Albany county, N. Y., resting on the upper side of an oak leaf, a caterpillar of this species, differing in some particulars from the description given in the *Entomological Correspondence of T. W. Harris*, p. 313.

Head of larva dark brown, almost black. *Body* black, of a silky luster. On the dorsum, a series of thirteen subelliptical raised spots, their transverse length nearly equaling the diameter of the body, of a pale yellow color, orange at the ends, with a black depressed line dividing them on segments four to nine and eleven; these spots, with the exception of those on segments two, three, ten and twelve, have black spatulate bristles springing from a mamilliform base in the lateral orange portion of the spot; those of the first segment project over the head and are six in number (three on each side), of which the two anterior ones are .13 in. long, and the four posterior .28 in. long; on the abdominal segments they are two in number, .13 in. long; those on the eleventh segment measure .16 of an inch, and are directed posteriorly nearly in line with the body; those on the terminal segment are but .06 in. long, and consist merely of a slender stipe, seeming as if the spatulate tip had been broken off. These dorsal spots have also two short bristles anterior to the spatulate ones, and two additional ones on the spots not furnished with the spatulate bristles. Above the legs and prolegs a row of convex shining black crescents, giving out a few hairs; beneath, behind and above each stigma is an elevated glossy black spot, each with one or more short black hairs.

Length of the larva when at rest, from 1.15 in. to 1.25 in.

The larva above described did not produce its moth, nor am I able to obtain any information of it from any of my correspondents with whom I have communicated in relation to it. Mr. F. G. Sanborn, from whom was obtained the example figured by Packard,* informs me that the larva has been familiar to him for some years, but that

* *Guide to the Study of Insects*, p. 305, f. 236.

he has not been able to rear it to the imago. Mr. L. Trouvelot writes me that he had taken the larva several times, but had never been able to raise the imago. On one occasion he had found it in August, fully developed, on a willow bush growing on a stream, in the White Mountains. Mr. Packard states (loc. cit.) that it "is figured in the Harris Correspondence as *Acronycta acris?* var. Americana," but I do not find any reference to it in the Correspondence as *acris*. As the imago was bred by Harris (he states that it appeared June 28th), it may possibly be identified in the Harris collection.* It may, therefore, be presumed to have been correctly referred generically, for although the larva differs remarkably from all other known American forms of Acronycta, yet we may recall the great diversity existing among the European Acronyctas in their forms and especially in their garniture, perhaps exceeding that in any other genus. Some of these are described as having a few short, isolated, fine hairs; some have quite long, soft, silky hairs covering the entire surface; in others the body is adorned with long diverging pencils, and others present short, stiff, brush-like tufts. Guenée says of *ligustri* and *brumosa*, "on ne compte plus qu'un seul poil, et ce poil est chez l'*alni*, renflé à l'extrémité en manière de rame ou de massue." The hair mentioned in the last species is probably very similar to those which characterize the *Americana* Harr. MS., which I have designated as bristles, although (from memory) they are flattened and lack rigidity.

This species should not be confounded with *Apatela Americana* of Harris, which is *Acronycta hastulifera* (Sm.-Abb.) Guen., an entirely different insect.

*I have since received a communication from Mr. Sanborn, in which he writes me as follows:

"I visited Boston yesterday, and hunted up the species of Acronycta about which you inquire. It is in the Harris cabinet, together with its puparium, numbered 287 (new No). I cannot describe it from memory sufficiently well to enable you, in all probability, to identify it; but if you take an *A. occidentalis* Grote, and suffuse very darkly the inner third of the fore-wings, and deepen the tints of the costal spots, you will have a fair idea of it. It is totally unlike the *Americana*. It reminds one also of the figure of *Microcœlia vinnula* Grote, in the Proc. Ent. Soc. Phil., vol. II, pl. 9 [now *Acronycta vinnula* Grote; Bul. Buf. Soc. Nat. Sci., I, p. 78]."

The above comparisons of Mr. Sanborn should give a good idea of the imago, but I am unable to refer it to any species with which I am acquainted. Now that the preservation of the Harris specimen of the bred imago is known, we shall be able to ascertain what it is, although not in season, I regret, for the present publication.

The larva has also been taken at Schoharie, N. Y., September 9th, feeding on hickory, and by Mr. Meske, at Sharon Springs, N. Y., feeding on beech (*Fagus ferruginea*).

Acronycta morula *Gr.-Rob.*

The larva of this species was taken at Schoharie, N. Y., September 26th, at rest, on some threads spun over a scar on the trunk of a young apple tree, in which position, from its colors and markings, it could scarcely be distinguished from the bark. Length (mature) one inch and a half. *Head* black on the sides and top, and whitish in front, appressed to the stem when at rest. *Body* light brown, with a pale brown median line between two dark brown stripes which, on the middle of each segment, curve outwardly around a wart; on the fourth, seventh and eleventh segments these warts are larger and are bordered without with black; the lateral rows of tubercles are pale brown, with white hairs radiating from them; the hairs of the two lower rows are long, as are those which project over the head; the dorsal hairs, especially those on the warts, are short, appearing as if closely trimmed; above, and running backward from each stigma, is a dark brown dash; whitish dots, each bearing a hair, are sprinkled over the body. Legs black; prolegs greenish.

The habit of the caterpillar seems to be to rest on the bark during the day, after the manner of the Catocalas, feeding only at night.

It spun a thin cocoon, on the 20th of September, in an angle of a box beneath some pieces of bark. The imago emerged June 7th, (1861).

Ceramica picta (*Harris*).

Head small, rounded, pale red. *Body* conspicuously marked with three broad black stripes; the dorsal one is velvety black, with marginal indentations, two of which, near the posterior portion of each segment, are larger than the others; within the stripe, on the crown of the segment, are small, white, transversely oval spots, arranged in a square of four, or with one or two obsolete; between this stripe and the lateral one is a narrow stripe of gamboge-yellow. The lateral stripe is broad, with numerous transverse white markings, appearing blue by contrast with the black, breaking it into lines resembling IVNW, etc.; a regularity is traceable in these characters, for example, the stigmata of the central segments are situated in a semi-oval black spot in the base of a V character, followed by another V and

preceded by an inverted one (∧). On each side of the above stripe is a narrow gamboge-yellow one, of which the superior has a setiferous black spot within it near the hinder part of the segments, and the inferior one a corresponding spot but smaller, and a few others in its lower margin. Beneath this, a white stripe mottled with black spots and lines, among which is a black spot beneath a broad V over each proleg, and another nearly as large over the base of the anterior leg of the V. *Legs* and ventral region tawny-red. Length at maturity two inches.

Entered the ground October 12th (1859) for pupation. In 1857 the larvæ were found abundantly, feeding on turnip. About thirty were collected for rearing, but although they were carefully supplied with fresh leaves, they all died in their larval stage. In 1868 (September 19th) they occurred very abundantly at Schoharie, in a field of cut buckwheat, from which hundreds could have been easily collected. They were also found resting on willows and on various shrubs bordering the field.

The larva in confinement has been observed to eat with great rapidity and to rest frequently from feeding. It increases rapidly in size. Its peculiar markings and bright contrasting colors make it one of our most beautiful caterpillars.

Cucullia convexipennis *Gr.-Rob.*

Larva feeding on the leaves of the golden rod (*Solidago Canadensis*), nearly full-grown, measuring one inch and a half in length; ground color of the body shining black; on the first segment, a small black hump, in which are four short white marks and two white dots and a conspicuous oblong red mark; on the eleventh segment a larger black hump, and between the two a brick-red dorsal stripe; from the hump, extending over the anal segment, black, inclosing one red and eight small white spots. On the sides a broad yellow stripe, shading into white on its borders, and broken transversely by black lines into markings like the Roman letters NMIVW. Within the lower portion of this stripe are the stigmata, each resting on a black character running upward into a point and bearing at its apex a short black hair; a few other short hairs may be seen with a glass at several points on the body. Below the yellow band, on the substigmatal fold, is a narrow red stripe, of a darker shade than the dorsal one; above the yellow band are four delicate blue lateral lines, of which the lower one is not continuous. The ventral region is

yellow, divided in stripes by black lines and markings; whitish medially. Legs black.

The caterpillar is a very active feeder, eating at first the leaves, and subsequently, when nearly mature, the blossoms. It enters the ground for pupation, where it constructs an earth cocoon, the grains of which are spun together with silk, similar to that of *C. intermedia.** The imago escapes from its cocoon through a round opening made at one end. It is very alert in the breeding cage, rendering it difficult to pin it without the aid of chloroform. It has been captured by Mr. Meske, at Sharon Springs, N. Y., on the 21st of July.

Several of the larvæ were collected at Schoharie, in 1857, nearly mature, in the early part of October; taken also September 8th, 1859; and also September 1st, nearly full grown, feeding on the blossoms of *Solidago Canadensis*, and in 1873, on the same food-plant, in Albany.

Cucullia asteroides *Guenée.*

Head subrotund, flattened in front, green (shade of leaf of food-plant), with paler green reticulations; clypeus bordered with greenish-white, and a lateral curved spot of the same color in which are the five ocelli; labrum and palpi pale green; a few short white hairs.

Body subcylindrical, tapering moderately at the extremities, smooth, shining, with minute white hairs visible with a lens in the usual locations; conspicuously striped in green and yellow, as follows: ground color green; a broad dorsal stripe of bright yellow extending from the head to the anus, and a somewhat narrower substigmatal one of duller yellow, approaching orange, margined beneath with white; on the sides are five green stripes defined by six black lines, of which the stigmatal line is interrupted at and near the incisures, and so inflated upon the stigmata as sometimes to coalesce with the corresponding portions of the suprastigmatal black line; of the five green stripes, the second and fourth are of a yellow-green shade, the first (subdorsal) of a deep green, and the third and fifth of a paler hue. Ventral region with a median line of greenish-white, having two yellow-green lines on each side.

Legs and *prolegs* green, the terminal pair long and extending backward. Stigmata white, acutely elliptical, having their inferior half lying within the yellow substigmatal stripe.

* *Twenty-third Report on the N. Y. State Cabinet*, 1873, p. 214.

Length of larva at maturity two inches; diameter .22 of an inch. Taken at Albany, September 1st, feeding on Solidago.

Another larva, taken on the same food-plant, September 24th, was, in all probability, the same species, although presenting a marked difference in appearance from the one above described. The two superior lateral stripes were in this nearly black, especially on the abdominal segments, apparently resulting from the thickening of the bordering lines and the extension of the interior ones over most of the green ground.

The larva, when captured, was found to have attached to its surface a black oval parasitic egg-shell. It fed sparingly for several days, when it died, and was transferred to alcohol and placed in the State Museum collections.

Catocala —— *sp?*

Larva taken at Albany, N. Y., resting on the trunk of horse chestnut, June 6th. Length 2.25 inches, diameter on eighth segment .35 in., elongated, attenuated at the extremities, quite flat beneath when resting on a plane surface, bearing dorsally near the posterior margin of the eighth segment a moderately elevated broad wart directed backward, and having the posterior margin of the eleventh segment slightly raised and projecting backward in a hood-like form; the following demi-segment has also its margin similarly projecting, but in a less degree. *Head* .15 of an inch in diameter, subquadrangular, flattened, slightly bilobed, gray with lighter mottlings, surrounded laterally with a black band, which passes over the vertex and anterior to the eyes; the anterior portion of each lobe paler, projecting, bearing each two black points giving out a short black hair; a similar point on the cheek behind the band, and four microscopic ones on the paler bordering of the clypeus; clypeus depressed, nearly half the length of the head, slightly rounded at the apex, with a brown medial line, and (under a magnifier) six papillæ bearing each a short white hair; in front of the eyes two larger black papillæ with white hairs, and also some smaller ones behind the eyes; on each side of the apex of the clypeus is a conspicuous transversely elongated black spot. The collar bears superiorly a double row of four pale papillæ with black hairs.

Body with a few short white hairs laterally and a line of fleshy filaments ranging with the legs. At rest, the second and third segments are closely wrinkled, while segments four to ten are wrinkled

only on their posterior half. Ground color pale gray, with brown markings. Vascular line composed of brown dots. Subdorsal line brown, with its margins darker brown, the darker shade of which, on the posterior wrinkles of the segments, presents a maculate appearance. Laterally are irregular linings of brown dots, interrupted on the fourth segment, giving to that ring a whitish appearance by contrast. Trapezoidal spots (of Guenée) inconspicuous but discernible with a magnifier. Stigmata moderately oval, annulated with brown. Legs long, white, striped with pale brown, bearing a few white hairs. Prolegs long, gray; those of the eighth and ninth segments with a fuscous longitudinal line, and with a black line on the crown of each planta. Anal shield with a transverse row of four setiferous papillæ anteriorly, and four on its posterior curve, margined below with black. Ventral region conspicuously marked with a subelliptical black spot of about one-half the diameter of the body, on the posterior portion of each segment.

The larva was apparently full grown when captured. It refused the food which was offered it, not even tasting of the leaves, and died without undergoing transformation.

As so small a number of the larvæ of our numerous species of Catocalas have been described, the above description is presented in the hope that it may be identified by some collector.

V. NOTES ON SOME NEW YORK BOMBYCIDÆ.

In this and the following paper several notes are given which were made a number of years ago, a few of which are accompanied with their dates. It is with hesitancy that some of these notes, descriptive of larvæ, are presented. They are not offered as descriptions, being too incomplete to serve as such, but simply as contributions toward a knowledge of the natural history of our Lepidoptera, of which we possess, as yet, so little information, that the most simple fact observed in relation to them can hardly fail of being of sufficient value to entitle it to record and publication. Even if anticipated, its independent observation gives it confirmatory value, with perhaps the additional value of its occurrence under different conditions of locality, season, food-plant, etc.

Callimorpha Lecontii *Boisd.*

Larva feeding on spearmint (*Mentha viridis*). Length at maturity one inch; tuberculated, bearing fascicles of stiff hairs; dark brown, with yellow spots. It made a cocoon just beneath the surface of the ground July 1st, from which the moth emerged July 24th.

A number of the moths were captured July 28th, beside a small stream in a ravine where spearmint was growing abundantly.

An interesting *militaris* variety of this moth, a female, taken August 8th, lacks entirely the brown dorsal stripe on the abdomen. The thoracic mesial stripe is inconspicuous, and the brown costal and internal margins and the two cross lines of the primaries is limited to lines not exceeding one-twentieth of an inch in width; the spot resting on the median nervules is large.

In two other examples, a male and female, in lieu of the abdominal dorsal stripe is a series of brown spots resting on the anterior margin of the segment and extending three-fourths of its length, narrowing posteriorly; the spots narrower and less conspicuous in the ♀. On the secondaries, near their outer margin, are four brown spots in the ♀ (three in the ♂) of which the largest is transversely elongated, rests on the first median nervule (vein 2) and extends nearly to the median fold, in length equaling the space between the fold and vein

2; on each side of the submedian, nearer the margin than the preceding spot, is a very small and obscure one (in the ♂ the one before the nerve is absent); resting on the discal nervure (vein 5), and wholly within cell 5, is a small spot, slightly larger than the two last mentioned. The brown primaries have eight white spots, surrounded with brown, except the apical one and that at the internal angle, in which the white is continued on the costa and over the fringe; the two spots on the outer margin above the larger one at the internal angle, are quite small.

Arctia Arge (*Drury*).

Larva found in the road, on a warm and sunny day on the 25th of February.

Color dark brown, head and prolegs black, legs tawny. Body with three flesh-colored stripes, one dorsal and two lateral; substigmatal fold colored as the stripes; the hairs, proceeding from tubercles, are long, brown dorsally and tawny laterally; on the segments anteriorly is a small tubercle on each side of and near to the dorsal stripe, and a larger one on the posterior of the segment near the lateral stripe

The caterpillar fed sparingly, for a few days, on a cactus leaf, and commenced the spinning of a slight cocoon on the 1st of March, within which it transformed to a pupa on March 4th.

The moth emerged on the 23d, after a pupation of nineteen days.

Spilosoma virginica (*Fabr.*).

Head black. Body tawny-red, darker on the four anterior segments; a lateral row of broken, irregular black spots; a pale red line below the stigmata; from the tubercles long hairs proceed (the longest of which measure three-fourths of an inch) which are black on the first and second segment and on the sides of the two following, and red over the central and posterior portion of the body. Stigmata white. Exterior basal portion of legs black, the remainder red.

In another example, the hairs were yellow, the dorsal ones approaching to red; the body yellow, darker superiorly above the lateral maculated stripe; incisures superiorly, dusky. Head red. (Schoharie, 1859.)

An interesting sexual characteristic observable in the male of this species and in *S. acrea*, but not in *S. latipennis*, is the process given off by the subcostal nervure for the support of the frenulum, *clothed*

with black scales, and connected with a broader black spot resting on the costa.

Spilosoma latipennis *Stretch.*

This species is described and figured by Mr. Stretch,* "from one imperfect broken ♀ (wanting the body) received from Mr. James Angus, of West Farms, N. Y., without any definite locality attached to the specimen."

Its description (loc. cit.) is as follows: "♀, white. Head, thorax and patagia white. Eyes black. Palpi brownish, white beneath. Legs white, with the *coxæ* and *femora* of the anterior pair *bright pink* inwardly; tibiæ and tarsi of the same pair black inwardly, white outwardly. All the wings are pure silky-white, immaculate. The costa of the primaries is decidedly convex from the base to the apex. Expanse of wings, ♀, 1.75 in.; length of body, 0.70 inch."

In the collection of Mr. O. Meske is a ♂ and ♀ of this rare species, captured at Center, N. Y., June 19th, 1872. They show the following features in addition to those above mentioned: The antennæ are white above, black beneath, and with black pectinations of about the same length as in *S. virginica*. Compared with that species, the wings are thinner scaled; the thoracic hairs are longer and finer, readily floated in every direction by the breath, hiding the patagia; abdomen of the ♂ not carinated.

The femora in these are not "bright pink," but of a peculiar bright red shade, between an orange and a vermilion; the coxæ of the ♀ of a paler red, and of the ♂ of a yellowish-red with brown hairs superiorly beneath the head. Palpi of the ♂, white inwardly and black outwardly; the ♀ has only a few fuscous hairs outwardly. Expanse of wings of the ♂ 1.75 in.; of the ♀ 1.80 in. Length of the body of the ♂ .65 inch; of the ♀ .60 inch.

Mr. Grote informs me that a specimen of this species is in the collection of the Buffalo Society of Natural Sciences, which was captured in the vicinity of Buffalo.

Euchætes Oregonensis *Stretch.*

In the collection of Mr. O. Meske, of Albany, is an example of this species, a male, taken on the wing at Center, near Albany, on the 13th of June; another example, also a male, was taken by him in the same locality May 25, 1869, and is now in the cabinet of Mr. C. V.

* *Illus. Zyg.-Bomb. N. Amer.*, I, p. 133, pl. 6, f. 5.

Riley. I have critically compared the former with the description of the type,* and find it to agree in every particular, even to dimensions, so that there can be no doubt of their identity.

Mr. Stretch remarks: "For the type of this species I am indebted to the kindness of Lord Walsingham, who captured the single specimen above referred to in Oregon, during his recent trip to the Pacific coast. In form it approaches nearest to *E. egle*, from which it differs not merely in the color of the wings, but also by the slenderer abdomen and the bright yellow head. Were it not for these latter differences, it might be considered an albino of *E. egle*, though the typical form of that species is yet unknown from the Pacific coast."

I fully concur with Mr. Stretch in his recognition of this form, as distinct from *E. egle*. In addition to other important differences, in both of these eastern examples, the long, slender, cylindrical abdomen is in marked contrast with the short (from .4 in. to .5 in.), thick and conical form observed in the male of *E. egle*.

Of the albino form of *E. egle*, referred to by Dr. Packard † and Mr. Riley, ‡ and accepted by Mr. Stretch upon the testimony of "eastern entomologists," I have no knowledge. I believe that all such examples of "a white variety," will, on critical examination, resolve themselves into *E. collaris* (Fitch), or *E. Oregonensis*.

In consideration of this new habitat of *Oregonensis*, the name selected for it proves to be an unfortunate one; it also presents an argument against the derivation of specific names of insects from the locality of their first observation, especially while so small a portion of our continent has been thoroughly explored,§ our knowledge of geographical distribution so very limited, and the necessary comparison of our fauna with that of Europe not yet made.‖

* *Illus. Zyg.-Bomb. N. Amer.*, 1872–3, I, p. 187, pl. 8, fig. 7 ♂.

† *Proc. Ent. Soc. Phil.*, 1864, III, p. 108.

‡ *Third Rep. Ins. Mo.*, 1871, p. 133.

§ In a recent paper on the Phalænidæ of California, in which thirty-three new species are described, ten of the number bear the name of *Californiaria* or *Californiata*. It is hardly possible that all of these species will prove to be peculiar to that State or even to the Pacific slope, for more extended observations are continually showing us the identity of many of the species of the Pacific coast with those of the Atlantic States.

‖ The species described not long since as *Depressaria Ontariella* from Canadian examples, proves not only to be a common species in the State of New York, but identical with the *Tinea heracleana* of Europe, described by De Geer more than a century ago.

I shall be conferring a favor upon such entomologists as may not have seen the admirable work of Mr. Stretch,* above referred to, in commending it to their notice. Its design is "to furnish good colored illustrations of all the species of Zygænidæ and Bombycidæ found in North America, north of the Mexican boundary, with accompanying letter-press, in which it is intended to embrace everything of interest in relation to each species, which may have appeared in print, with such additional information as may be secured by the author from original sources."

The work is in course of publication, appearing in parts, of which about one-third of the contemplated number are now before the public, as will be seen from the transcript of its title-page herewith given. Volume I contains 242 pages octavo of letter-press, and ten plates, numbering 167 figures. Depicting, as they do, the two families in which are comprised the most beautiful forms, the greatest variety of pattern, the most artistic effects, and the richest coloring of our entire insect fauna, the plates are particularly attractive. The coloring, so far as we have the means of comparison, is very good, for the temptation to exaggeration, for the sake of effect, is not found in the material under representation.

The number of new species contained in this volume (twenty-six), the large number which are for the first time figured, and the very great convenience of a compilation, in a single work, of all that is at the present known of these interesting families, will render it indispensable to all who are engaged in the study of our American moths.

Enchætes collaris (*Fitch*).

A single example of this species has been taken by me at Center, N. Y., and is now in my collection, but without the date of its capture. It is a ♀, having an expanse of wings of 1.62 in.; length of body .48 in. It has also been received by Mr. Meske from Mr. E. L. Graef, of Brooklyn, L. I., labelled as *Spilosoma fulvicosta*, and reported as abundant in the neighborhood of Brooklyn.

This is undoubtedly the species which has been, by some, regarded as an albino form of *E. egle*. Mr. Stretch states† that "specimens, differing in nothing but somewhat inferior size [compared with the example described and figured by him], were forwarded from Penn-

* *Illustrations of the Zygænidæ and Bombycidæ of North America*, by RICHARD H. STRETCH, Vol. I, Part 1 to 9. [San Francisco, Cal.] July, 1872, to Dec., 1873.

† *Illus. Zyg.-Bomb. N. Amer.*, I, p. 188, pl. 8, f. 5.

sylvania by H. Strecker, Esq., in response to a request for the white variety of *E. egle*."

According to Dr. Packard, * "From the same brood of larvæ Mr. Shurtleff has raised both the typical form [of *E. egle*] and a white variety, which agrees well with Dr. Fitch's description of *Hyphantria collaris*."

If it were shown, as it is not, that the variety raised by Mr. Shurtleff was identical with the *H. collaris* of Fitch, still it would fail to prove specific identity of the two forms; before this could be established it would remain to be shown that the "brood of larvæ," from which they were obtained, was the product of a single deposition of eggs. In the event, which may be presumed frequently to occur, of two broods of congeneric larvæ feeding simultaneously on the same plant, the two might very easily become intermingled, and the liability to mingle would be increased in species closely resembling one another. Two such instances of association of larvæ of different species, which would seem to be explicable only through mistaken recognition of one another, have come under my observation, as follows:

In September, of 1869, I collected from a poplar (*Populus tremuloides*) at Bath, N. Y., two folded leaves filled with Ichthyura larvæ, to the number, probably, of sixty. From these I obtained, the following spring, nearly that number of *Ichthyura inclusa* Hübn., together with a single example of *Ichthyura vau* (Fitch), a species which I had not previously met with, but which Dr. Fitch represents as being more frequently taken in his vicinity than either *albosigma* or *Americana* [*inclusa*]. It is quite different from *inclusa*, and the two have not, I believe, been suspected of being the same.

In the other parallel instance, a group of perhaps fifty full grown larvæ of *Clisiocampa sylvatica* Harr., was observed at rest on the trunk of a maple tree in the door-yard of my residence at Schoharie, and scattered among them were several of the larvæ of *C. Americana* Harr. At this time, numbers of this latter species were traveling about on fences, walks and buildings, preparatory to their pupation.

From a company like either of the above, of forms with which we were not familiar, distinct species might be presented to us, with a claim for specific identity resting on the plausible ground of having been reared "from the same brood of larvæ."

I learn from Mr. C. V. Riley, that he has recently been breeding *E. collaris* from the larva, and that he finds it to be very distinct

* *Proc. Ent. Soc. Phil.*, 1864, III, p. 130.

from *E. egle*. His observations on the species will be given in his forthcoming (sixth) Annual Report.

Halisidota caryæ (*Harris*).

The cocoons of this moth were found at Schoharie, N. Y., during the fall of 1856, in large numbers, attached to the under-surfaces of stones, which had been thrown together in a pile extending for several rods along the borders of a wood. A thousand could easily have been secured in a few minutes of time. From one stone twenty-three cocoons were taken, from an area of about five by eight inches, of which fifteen were clustered in a space of fifteen square inches.

The cocoons were kept in a warmed room. An ichneumon emerged December 2d, and the first imago December 15th. A few only of the cocoons were ichneumonized.

Although the larva of this species is not rare, the moth is seldom taken by the collector. The exposed habitat of the cocoon, beneath stones, usually ensures its destruction during the winter months from some of the many predaceous enemies which resort to it for food. Numbers of the cocoons are met with in the spring, in localities where the larvæ abound, with an opening through the sides, and the debris of the pupa within. One that has survived the perils of its hybernation beneath a stone or piece of wood is of very rare occurrence.

Orgyia leucostigma (*Sm.-Abb.*).

A female imago of this species had emerged, August 4th, within its breeding cage standing in a large apartment about ten feet from an open door. At dusk (half-past seven o'clock) males commenced to fly in the room, and precipitate themselves against the gauze front of the cage, moving in every direction over its surface with legs, wings and antennæ in rapid motion, in a persistent effort to force an entrance in the cage. Several attempted to enter through the small crevice left by the imperfectly fitting door at the rear of the cage. Three or four moths were often on the gauze at the same time, whence they could be plucked with the thumb and finger. During the hour that this exhibition continued, forty moths were taken and pinned, from at least a hundred that entered the room.

The larvæ had been more abundant than usual during the season (of 1861, at Schoharie).

Empretia stimulea *Clem.*

On the 30th of August, two of the larvæ were received from Peekskill, N. Y., where they were taken feeding on Indian corn. September 1st, one of the larvæ spun up in its cocoon beneath a leaf.

The cocoon is oval in form, of a reddish-brown color, of a parchment-like texture, and measures .32 in. by .5 in. The imago was not obtained.

My efforts to rear the Cochlidiinæ have been attended with nearly as many failures as with the Ptilodontinæ. Mr. Meske has been quite successful in rearing these and many species usually regarded as quite difficult to mature, by the aid of a uniform supply of moisture during the period of pupation. The pupæ are placed on the surface of the ground, half filling a box, and covered with an inch or two of light moss. On the moss are laid strips of bibulous paper (ordinary blotting-paper is suitable), which, being dipped daily in water, supply the requisite quantity of moisture to keep the moss and ground in a moderately damp state, during the winter months, in a cool apartment. Later in the spring, with an increased evaporation, a second dipping of the paper during the day is required.

Phobetron pithecium (*Sm.-Abb.*).

A larva taken at Bath, near Albany, feeding on hazel (*Corylus Americana*). On September 16th, it spun its cocoon fastened to a twig on which it had been feeding, inserted in some damp sand, on the surface of which the cocoon rested. The cocoon is of an elliptical form, slightly-flattened on the sides, and measures three-tenths of an inch by four-tenths. Its exterior was wholly covered with grains of sand, and in its upper portion were interwoven some of the peculiar curved lateral appendages which impart so singular an aspect to the larva. A good representation of the larva may be found in the *American Entomologist*, vol. II, p. 25.

Another larva was brought to me on September 9th, feeding on pear leaves. It made its cocoon between two leaves September 12th.

The larva is recorded as feeding also on apple, plum, cherry, wild cherry, Siberian crab, white and red oak.

Lithacodes fasciola (*Her.-Sch.*) *Pack.*

Eight of the larvæ were taken during the early part of September, feeding on the leaves of a young plum-tree, three feet in height.

They were of a uniform green color, and without hairs or spines. Their small, oval, brown cocoons were spun between leaves.

A male and a female imago emerged on the 11th of May. They were found hanging from the top of the box inclosing them, with the body curved upward toward the head, so that the tip was directed perpendicularly to the surface on which they rested. This peculiar posture, frequently observed also in *Asopia farinalis*, did not appear to be owing to the inverted position on the box cover, for, on turning it carefully over in different directions without alarming the moth, no change of posture occurred.

The imago has been taken at Schenectady, N. Y., on July 3d, attracted by lights.

Nadata gibbosa (*Sm.-Abb.*).

Larva found on the ground; feeds on maple. Length at maturity 1.75 in.; diameter .35 in.

Head large, flattened in front, a shade of green darker than the body, ocelli black; mandibles yellow, with black on their inner edge. *Body* grass-green ventrally and laterally, and greenish-white dorsally; with paler granulations; smooth, segments rounded, and incisures deep; laterally a line of transversely elongate whitish spots. Anal shield rounded and yellow bordered. The larva is represented in Fig. 8.

FIG. 8.

Its pupation commenced September 20th, beneath a leaf fastened by some threads to the ground. The imago emerged June 1st. It is quite rare in this vicinity.

The following note probably refers to another example of the same species:

Caterpillar taken on a fence under a row of maples, October 20th; length one inch. Head apple-green, with yellow mandibles. Body yellow-green, with a yellow stripe on the side, and transverse interrupted markings of the same color. Anal plate apple-green, semi-elliptical, with yellow dots and border. Legs apple-green.

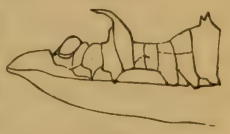
The head of the larva was abnormally large, perhaps from having recently molted, or possibly from parasitic attack. The season was too far advanced to permit of its being supplied with proper food, and it did not mature.

Notodonta ——— ?

Found, September 19, 1868, at Schoharie, feeding on willow, a remarkable looking larva, a figure of which is annexed. (Fig. 9.) The first horn-like projection is on the third segment, the second and longest on the fourth segment, the large bifid hump on the eighth segment, and a terminal one on the eleventh segment. The markings of the larva are exceedingly delicate in whitish and various shades of brown, finely reticulated. The long flexible horn of the fourth segment is capable of considerable motion, and is sometimes directed backward. The terminal segments are at times carried in an elevated position. When at rest, the central segments are contracted as represented in the figure, and its head and anterior segments are turned sideways. When extended in feeding it presents the appearance shown in outline in Fig. 10.

Fig. 9.

Fig. 10.



I have met with the larva on this occasion only. Without taking a description of it, I forwarded it to Prof. Glover, of the Agricultural Department at Washington, for figuring and description, and was informed by him that he had seen a single example of it, and had already given a representation of it in one of his plates. The imago was unknown to him.

Edema albifrons (*Sm.-Abb.*).

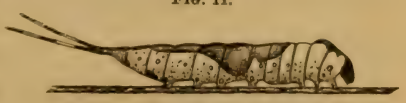
Late in November, twelve naked pupæ of this species were found lying in a cluster on some leaves beneath a stone. Kept in a warm room, the moths emerged between January 9th and February 11th, all during the night time.

The larva is described in the Harris Correspondence, p. 304.

Cerura borealis (*Boisd.*).

Mature larva feeding on willow, September 11th, represented in Fig. 11. Head small, red. Body apple-green, red dorsally from the fourth segment backward, reaching nearly halfway down the side on the sixth segment, and after a contraction expanding to the stigmata on segment seven, and thence contracting posteriorly; the red margined below with yellow. Anal extremity forked, and extensible

Fig. 11.



at pleasure in two long slender tail-like projections, annulated with red and green, and at their greatest extension disclosing a white ring.

Some young larvæ, collected August 22d on willow, apparently prior to their first molting, were found quite delicate to rear. Although furnished with fresh leaves twice a day, only one was matured by inclosing in its box the end of a twig of a growing plant. The larva is of slow growth, requiring about six weeks for it to mature.

The larva makes a flattened cocoon, three-fourths of an inch long, and quite firm in its texture, from the quantity of sawdust-like bits which it gnaws from the wood upon which its cocoon is placed and weaves together with its thread, excavating the wood, in some instances, to the depth of a tenth of an inch. Composed almost wholly of the gnawed material, and but slightly elevated above the surface, it is very liable to escape observation.

When engaged in the construction of its cocoon, the larva is very active, moving its head with remarkable rapidity. A cocoon was made August 22d, and two others September 1st.

Within a warmed room the imago has emerged April 1st and April 7th.

Telea Polyphemus (*Linn.*).

A female which mated June 18th–19th, deposited three hundred and fifteen eggs on the 19th. Of these, two hundred and seventy-eight produced their larvæ June 29th; fifteen died in the act of emerging from the shell; seventeen containing larvæ died within the shell, not fully developed, and five were probably unfertilized.

The eggs are round as seen from above, quite flattened on the upper and lower surfaces, white, with an intermediate brown band .04 in. broad, on which at two opposite sides is a small elongated white spot, and sometimes, between the two, an obscure whitish line.

From another bred example of the moth, two hundred and thirty-three eggs were deposited, and twelve additional were found within the abdomen, making two hundred and forty-five in all. The moth was somewhat dwarfed from its artificial feeding.

Actias Luna (*Linn.*).

As an illustration of the occasional extraordinary abundance, for a single season, of some of our usually rare insects, the following statement, made to me by Mr. Otto Meske, is worthy of record:

At about the commencement of his entomological studies, in 1864 or 1865, and not long after his arrival in this country, a fine specimen of the above moth was brought to him by a friend who had captured it at Sharon Springs, N. Y., where any desired number of the same, it was stated, could be collected. Charmed with the beauty of the "fair empress of the night," now for the first time seen by him, and desirous of procuring other examples for himself and for his European friends, as soon thereafter as his engagements permitted, he hastened to Sharon Springs. The day following his arrival there, he visited the hickory groves in the vicinity where the moth was represented as occurring. The season had too far advanced, by several weeks, (August) for the moth; but on almost every tree, pendant, fruit-like, from the lower branches, on leaves drawn downward by their heavy burden, were found one or more of the caterpillars—in their matured garb of transparent green enameled in dots of silver and pearl, so beautiful to the lepidopterist, and not unattractive to the unscientific eye. Sixty-four of the larvæ—the utmost capacity of his collecting case—were carried to his hotel, as a portion of the trophies of the morning ramble.

Cocoons were obtained from the entire number; for a readines to spin themselves up at any time, after their fourth molting, under the slightest provocation of a temporary withdrawal or an inferior supply of food, is a characteristic of the species (as has also been observed by European entomologists of *Aglia tau*); from this habit undoubtedly results the frequency with which crippled specimens of the moth are met with when artificially reared.

The following spring when the moths emerged, while they were hanging in profusion from curtains and from the walls about him, Mr. Meske proposed to Dr. Speyer, of Germany, with whom he was in correspondence, to send to him such a number of the cocoons as would serve to test the practicability of the acclimatization of the species in Germany; not doubting but that the ensuing season would be equally prolific with the preceding. Dr. Speyer was delighted in the prospect of so beautiful an addition to the insect fauna of Europe, and expressed himself as impatient to undertake the experiment. From that period to the present, although Mr. Meske has passed each intervening summer at Sharon, and brought from that superior collecting ground most valuable entomological contributions, not over a half dozen of the cocoons have been sent to Germany, toward the fulfillment of his promise; and in a letter lately received from

Dr. Speyer, after an enumeration of scores of our American Lepidoptera, of which he needs no more examples either for his cabinet or for study, he reminds Mr. Meske that his cabinet is still deficient in a perfect female Luna.

Hemileuca Maia (*Drury*).

A crippled imago emerged July 8th, 1872, being the first from a small number of larvæ carried to pupation the previous year. The usual white band on the upper surface of the primaries was interrupted in the middle; beneath it was continuous and broader than above. Upon opening its abdomen, one hundred and fifty-two eggs were obtained therefrom, of a uniform reddish-brown color.

On the 17th of July a second one (a male) emerged. September 7th, a third was observed just as it escaped from its puparium. It not being convenient to entrust it to the care of any one, and desirous of securing it in a perfect condition, I removed it, with the utmost care, to a small box, which I carried in my hand to the railroad train for which I was on the point of leaving. While in the cars, the box was held in position to subject it to as little motion as possible. When examined in the evening, after a three hours' ride, the moth was found with its wings dried but entirely unexpanded, and with its abdomen retaining the elongate form and sutural extension with which it emerged from the puparium. The motion of the cars had caused an entire arrest of its last stage of development.

I am informed by Dr. Hagen that this species was quite common, in 1872, at Detroit, Mich., and in Maine, where the caterpillar was observed feeding on *Spiræa salicifolia*, as noticed by Prof. S. Smith, at Norway, Me., in 1865. In Massachusetts it was not rare in its occurrence.

Gastropacha Americana *Harris.*

Larva feeding on birch (*Betula lenta*), August 18th, nearly mature, measuring two inches in length.

Body slate-gray, mottled with black, beneath flattened and greenish; on the sides, beneath the stigmata, a series of tufts of reddish hairs, three-sixteenths of an inch long; on the incisure of the second and third segments, a scarlet band superiorly, divided by a black line and black at the ends, only observed when the larva is extended or in motion; on the first segment, two small tubercles on each side, and one on each side of the following segments; from the tubercles

are given out tufts of gray hairs mingled with white ones which are clavate at the tip; the lateral fringe with numerous gray clavate hairs.

Legs black; prolegs ash-color, with a black spot between each pair.

The caterpillar made its slight cocoon between two leaves, enveloping it in a wool-like substance. Another example, occurring on maple, spun up between some leaves on September 12th.

It is quite liable to parasitic attack. A pupa which did not develop, was opened, and found to contain the puparia of nine Tachinæ.

Clisiocampa Americana (*Fabr.*).

Some larvæ of this species which made their cocoons on the 6th of June, completed their transformation and appeared as moths on July 6th.

Young larvæ have been observed, just disclosed from the egg-belt on the 18th of April.

(ZYGÆNIDÆ.)

Ctenucha virginica (*Charp.*).

Larva taken on grass, upon which it may be presumed to feed, as it has also been found thereon by Dr. Packard, in Maine. Head large, shining black. Body reddish-brown dorsally, darker shaded on the incisures, black laterally, with two light cream-colored stripes on each side; its short, brush-like fascicles of hairs proceeding from tubercles and nearly covering the body, are black on the back, and dusky and black intermingled on the extremities and sides; intermediate ones (?) ochre-yellow.

An imago was obtained June 4th from a cocoon found a few days previously, attached to the leaves of a cedar seedling, about two inches above the ground.

The cocoon is oval, .75 in. in length, composed of the hairs of the caterpillar, which are gray and black, and about one-fourth of an inch long, and, under a lens, show distinct feathering. Through the hairs could be seen the inclosed dark brown pupa.

The moth has frequently been observed in a grove of pines and cedars at Schoharie, in 1859. It is not readily alarmed when at rest, and its flight is slow and steady, permitting its easy capture. It was unusually abundant in 1861, at the same locality, being frequently seen about dwellings and in gardens. On the 23d of June numbers were observed in a ravine, beside a brook bordered with deciduous trees.

Scepsis fulvicollis (*Hübn.*).

Two males and two females of this usually rare species were collected at Bethlehem, Albany county, on September 14th, 1870, resting on or flying about the blossoms of *Solidago* at mid-day.

This accords with an observation of Doubleday:* "I took it in September, in Illinois, on flowers, especially on the different species of *Solidago*, flying by day." He also adds, "I took it in Florida by night; for they used to fly to my lamp. I do not remember to have taken one by day there."

I have only taken the species (and its allies) by day, and I know of no other instance of its capture at lights.

A perfectly fresh specimen was taken at Schoharie (the only instance, during several years, that it came under my notice there), resting on a window pane within a room which it had entered through an open door.

I have previously noticed the attractiveness of the *Solidago* to *Lycomorpha pholus* (Drury),† six individuals having been observed by me regaling themselves on the blossoms of a single plant, while a hundred or more could have been collected at the time from the same locality (a hill-side at Schoharie, August 16, 1859). Melsheimer states that the larva of this species is found on the lichens growing on the trunks of hickory trees.

* *Entomological Correspondence of T. W. Harris*, 1869, p. 122.

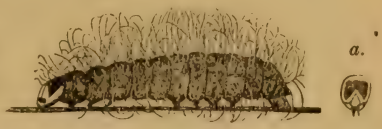
† *Twenty-third Ann. Rep. on the N. Y. St. Cab. N. H.*, 1873, p. 193.

VI. NOTES ON SOME NEW YORK NOCTUIDÆ, ETC.

Diphtera deridens *Guenée.*

Larva resembling an Arctia in form, somewhat narrowed anteriorly and broadest toward the posterior segments, as represented in Fig. 12. Head white, with black markings as seen at *a*. Body white, segments rounded, smooth, but from the points where in an Arctia the tubercles are located, soft white hairs, one-fourth of an inch long, radiate, as fine as the finest silk spun by caterpillars, which curve at their tips and interlace, entirely enveloping the body. Length at maturity, 1.25 in.; diameter at broadest portion, .25 in.

Fig. 12.



On September 4th, it made an oval cocoon, of uniform texture throughout, of fine silk.

On the 10th, it had undergone its pupal change; the dark-brown pupa could be distinctly seen through the delicate cocoon.

The imago was disclosed May 25th (1862).

Acronycta Americana *Harris MS.*

Since the printing of the notes on this species, on page 135 of this Report, I have been permitted to see colored figures of the larva and imago of *Acronycta alni* Linn. The larva, in its ground color, dorsal series of yellow spots, shape and comparative length of bristles etc., represents our larva so well, that, at the first glance, it might be taken for an accurate representation of it. It has the four long and two short bristles on the first segment, with none on the following two segments, as in ours. The single bristle shown in the figure on segments ten and eleven and the three on segment twelve, are probably inaccuracies of delineation through carelessness of the artist, as evidently are the placing of a bristle on each of the incisures of the sixth segment, and the location of several of the bristles elsewhere than in the lateral portions of the spots. The spots are shown as being marked with a number of irregular black lines, like Chaldaic letters, unlike the single, transverse, impressed line in our larva. In

the accompanying text the larva is said to be rare, and to feed on oak, willow and wild plum.

The imago is represented of the size and shape of wings of *A. psi* figured beside it (with which our *A. occidentalis* Grote was for a long time confounded), the discal spots are more deeply marked, and the inner third of the primaries is brown, conforming in these particulars to the features indicated by Mr. Sanborn, as noticed in the Harris specimen. Other marked features are, the brown of the internal margin continued as a median band across the wings, separating the discal spots, and a distinctly defined brown border on the white secondaries.

A. alni is figured in Wood's Catalogue of the Lepidoptera of Great Britain, pl. 14, fig. 314; and following it, as fig. 315, is *A. psi.*

From the above, I think it highly probable that our species will prove to be identical with *A. alni* of Europe; if not the same, it is certainly very closely allied to it.

The figure of *Acronycta funeralis* Gr.-Rob. (*Proc. Ent. Soc. Phil.*, vi, pl. 3, f. 8), resembles very closely that of *A. alni* above referred to, differing mainly in the diffused border of its inferiors, their fringe cut with black instead of simply dotted, and in the absence of the submarginal black streak of the superiors behind the cell. Mr. Grote informs me that he has seen *A. alni*, and that *A. funeralis* and also *A. connecta* Gr. (*Bull. Buff. Soc. Nat. Sci.*, I, p. 79) resemble it.*

Acronycta hastulifera (*Sm.-Abb.*).

Larva feeding on horse-chestnut; two inches long, covered with gray or light red hairs. Body cream-color, with two dark interrupted stripes on each side, and two on the back. Head, feet, anal seg-

* To the kindness of Mr. Sanborn I am again indebted for a second visit made by him to the Boston Soc. of Nat. Hist., in compliance with my request for a critical comparison of the Harris specimen of "*A. Americana*" with the description and figure of *A. funeralis* Gr.-Rob., and for information just received from him, that the two are, without doubt, the same species.

Now that both the larval and perfect stages of *A. funeralis* are described and figured, a satisfactory comparison may be made with *A. alni*, to determine the question of their identity which has arisen from the marked resemblance in the representations of their unique larvæ.

The *habitat* of *A. funeralis* is evidently quite an extended one. The larva has been taken by Mr. C. V. Riley, at Portland, Me., on elm (*Ulmus Americana*), and by Prof. Bessey, as Mr. Riley informs me, at Ames, Iowa. Mr. Grote's type is from Ohio.

ment, eleventh segment superiorly, and under side of body, black. Two dorsal pencils of black hairs one-third of an inch long, on the fourth segment, two on the sixth segment, and one on the eleventh; the pencils have a black spot at their base.

Another larva feeding on the linden (*Tilia Americana*) had the body pale green, with yellowish hairs dorsally and white laterally.

When confined in a box, the larva spins a firm cocoon in one of the angles, in which it interweaves bits of the material bitten from the space inclosed by the cocoon.

Harris describes the cocoon (*Apatela Americana*, in Insects of New England, second edition, p. 338) as having "the half-oval web of silk, intermixed with the hairs of its body." Of six cocoons constructed by larvæ collected by me, only one contained intermixed hairs.

The female moth has the upper surface of the wings darker, and the under surface less shining than in the other sex.

Acronycta oblinata (*Sm.-Abb.*).

Larva feeding on the blossoms of smart-weed (*Polygonum punctatum* Elliot), September 15th. Length one inch and one-fourth. Velvety black, with a tawny red substigmatal stripe. Segments with tubercles, from which clusters of short hairs radiate, which are red on the upper part of the first four and last two segments, and white on the intermediate ones; from the tubercles on the terminal segment, long hairs proceed. Stigmata white.

Spun a cocoon between some leaves which it drew together.

Agrotis tricosa *nov. sp.*

I have for some time had set apart in my collection, three distinct forms of "*Agrotis subgothica* Haworth." Now that Mr. Grote, in correction of some former determinations, has recently pointed out, beyond question, the true *Agrotis subgothica*, and shown it to be the species redescribed by Guenée as *A. jaculifera*, and has also described as *A. herilis* a second form which Guenée had regarded as a variety of the former (var. B, not A), it only remains in order to clear up the confusion so long existing among these forms, to indicate the third species, which is easily to be distinguished from the other two.

A. tricosa is between *subgothica* and *herilis*, approaching nearer to the former in its antennal pectinations, the general coloring of its

primaries, the pale subcostal nervure with brown linings, and in the form, color and marking of its orbicular. In size and in the dark coloring of its secondaries it is nearer to *herilis*.

It is readily distinguished from *subgothica* by its smoky-brown secondaries, broadly dark outwardly and paling gradually inwardly, in marked contrast with the distinctly brown-bordered white wings of that species, especially in the ♂. It has not the red reniform of *subgothica*.

Its most prominent differential features, compared with *A. herilis*, are the following: While the antennal structure is the same in the three species, in this the pectinations are stronger than in *herilis*. Both the subcostal and median nervures are pale gray, bordered with brown lines. The orbicular is concolorous with these nervures, more broadly open above, almost or completely uniting superiorly with the reniform, and with an interior brown line forming nearly a triangle, in continuation of the two lines bordering the subcostal; in *herilis* the orbicular is less open, approaching a U, and in some instances contracted above into a suborbicular form, and separated by some space from the reniform. It also differs from *herilis* in the acute extension of the internal tooth of the anterior median line, connecting with or nearly approaching the posterior median; in the interspaceal forked black rays behind the cell and between the median nervules; in the greater distance of the posterior median line from the reniform; in its less distinctly marked posterior median line (in *herilis* usually continuous and composed of interspaceal crescents); in its paler subterminal region; in its better defined subterminal line preceded by sagittate spots; in the distinct marginal black crescents interspaceally; in its paler costal region and general dark brown shade of the wing, instead of blackish; in its paler tegulæ, and collar less prominently marked with a transverse black line.

Material under examination in the above comparisons; *A. subgothica*, 17 ♂'s, 12 ♀'s; *A. tricosa*, 9 ♂'s, 5 ♀'s; *A. herilis*, 14 ♂'s, 5 ♀'s.

Measurements of the expanse of wings of the three species give the following results:

		Average.	Min.	Max.
A. subgothica.....	10 spec.	1.55 in.	1.37 in.	1.62 in.
A. tricosa	9 "	1.70	1.61	1.81
A. herilis	14 "	1.60	1.37	1.69

A. tricosa appears to be as abundant as it allies in this portion of the State, appearing contemporaneously with them. We have no knowledge of its occurrence, or of *herilis*, in England, where probably *subgothica* was alone introduced from this country. Dr. Boisduval reports *A. jaculifera* (*subgothica?*) among California collections.

The following is the synonymy of the above species:

Agrotis subgothica *Haworth.* Lepidop. Britan., 1810, Part —.
A. subgothica Stephens. Illus. Brit. Ent., 1829. Haust. II, p. 25, pl. 22, f. 3.
A. subgothica Wood. Illus. Cat. Lep. Ins. Gr. Brit., 1833-8, p. 36, pl. 9, f. 149.
A. jaculifera Guenée. Spec. Gen. Lep., 1852, V. p. 262, pl. 5, f. 4.
A. subgothica Fitch. 1st-2d Rep. Ins. N. Y., 1856, p. 314, pl. 3, f. 1.
A. jaculifera Riley. 1st Rep. Ins. Mo., 1869, p. 82, pl. 1, f. 11.
A. subgothica Grote: in Bul. Buf. Soc. Nat. Sci., 1873, I, p. 99.

Agrotis tricosa *nov. sp.*
A. jaculifera var. A. Guenée Spec. Gen. Lep., 1852, V. p. 262.
A. subgothica Riley. 1st Rep. Ins. Mo., 1869, pp. 81–2, f. 29 *b* (not *a*).
A. subgothica Packard. Guide Stud. Ins., 1869, p. 306, f. 238 (right hand fig.).

Agrotis herilis *Grote.*
A. jaculifera var. B. Guenée. Spec. Gen. Lep., 1852, V, p. 262.
A. herilis Grote: in Bul. Buf. Soc. Nat. Sci., 1873, I. p. 99.

Hadena lignicolor (*Guen.*) *Grote.*

A larva of this species was found lying in a cell beneath a stone, on the 18th of May. It changed to a pupa during the night. The imago emerged June 29th.

A number of examples of the moth have been taken by me, but I have never known it to occur abundantly.

Hadena adjuncta (*Boisd.*) *Grote.*

Caterpillar feeding on blossoms of golden rod (*Solidago Canadensis*). Length one inch and one-fourth. Body pale apple-green; a narrow vascular stripe bordered by darker green lines; on each segment superiorly, a semicircular dark-green line, concave anteriorly; fourth, fifth and eleventh segments, marked with olive-green, the last segment elevated in a hump; a pale green stigmatal line, giving off diagonally a line to the back of each proleg.

Buried in the ground for pupation, and made a cell just beneath the surface. Imago emerged April 2d. When disturbed, drops upon its back and lies motionless for several minutes. Schoharie, 1857.

Cucullia florea *Guen.*

Through the kindness of Mr. A. R. Grote, of Buffalo, I have had the privilege of examining a Cucullia, which he regards as the above

species. It is, unfortunately, in quite poor condition, having lost many of its scales, its fringes and its wings somewhat injured, etc. The single example from which Guenée's description was drawn, was also "assez mauvaise," and his diagnosis consequently is quite brief and incomplete. To add to the perplexity, Guenée gives us a figure (*Noctuélites*, II, pl. 7, f. 9) so entirely at variance with his description, in coloring, markings and size, that it can only serve to mislead.

The description (l. c., p. 134) is as follows: Primaries of the form of the preceding [*postera*, *asteroides* and *asteris*], of a uniform, deep bluish ash-gray, without a light or ferruginous shade, with the costa and the internal border blackish. The two median spots very vague, but distinguishable, surrounded and filled with blackish spots (groupes). Tooth of the internal border single, concolored, followed by an internal shade, surmounted itself by a straight blackish line. Extrabasilar line slightly visible, with rounded angles. Secondaries a little nacreous, with border broadly blackish, and with nervures deeper. 40 mm.

While the example before me does not wholly conform to the above description, the differences are such as may result from the imperfect condition of the specimen. It may, therefore, without much risk of error, be accepted as the *florea* of Guenée, now for the first time, it is believed, recognized in this country. The following are some of its features:

The primaries are bluish-gray, giving a very decided blue reflection when viewed obliquely. The costal margin seems as if it may have been suffused with blackish. The internal margin is blackish above a slender black line running from the basilar curve of the wing, to the outer margin. A black line, interrupted at the nervules, rests on the outer margin. There were apparently white and black submarginal streaks in the interspaces. The condition of the wings does not permit the tracing of the discal spots. The white mark (tooth) at the internal angle is crescentiform, preceded and followed by blackish, with the two black lines outwardly as above mentioned by Guenée, and as shown in his figure.

The secondaries are somewhat hyaline, tinged with brown, and with a lustrous brown border, quite narrowed toward the internal angle, and at the apex occupying nearly one-fourth of the wing. The veins are clothed with dark scales.

The tegulæ are gray, with a few intermingled black scales.

Wings beneath, a lustrous smoky-brown. The tuft supporting the frenulum is rust-red. There are no cellular lunules, and the marginal band of the secondaries is obsolete.

Expanse of wings 1.85 in.; length of body, .75 in. In the figure of Guenée, the alaric expanse is represented .28 in. in excess of that given in the description (40mm.).

This species seems to be the most rare of our Cucullias, the above example being the only one of which I have knowledge. *C. postera* appears to be nearly as rare. A single pair is in the collection of Mr. Meske, and, from their photographs, Mr. Strecker has identified an example in his possession, taken at Falls of Schuylkill, Philadelphia, Pa.

? Chariclea exprimens (*Walker*).

Caterpillar feeding on rose leaves; length one inch and one-eighth, head red, body green with yellow lateral stripes, along which a number of black spots are sprinkled. On the first segment, dorsally, are four black spots, on the second are two, and on the terminal (?) segment are four; these are of a larger size than the remaining ones, of which there are four on each of the other segments, forming a trapezoid in which the two anterior are considerably nearer the mesial line than the two posterior.

Taken August 4th, 1859, at Schoharie, and on the 7th August changed to an imperfect pupa, which did not develop.

It is believed to be identical with other larvæ from which *C. exprimens* has been reared.

Chamyris cerintha (*Treits.*).

From a cocoon made in an angle of a box, the moth emerged May 12th. When disturbed, it runs rapidly about the box, without taking wing. Upon suddenly opening the box, it has, in several instances, been observed to drop upon its back and lie in that position, with folded limbs, for several minutes, counterfeiting death.

It has been captured in the vicinity of Albany, and by Mr. Meske at Sharon Springs.

Plusia balluca (*Hübn.*).

A moth of the above species emerged from a cocoon July 6th (1861), which was taken about the 20th of June from a hop vine. The cocoon was attached to the under side of a leaf, and through its

thin and loose threads, like a spider's web, the white pupa could plainly be seen, with some black marks on its back. After the escape of the imago, the puparium was of a light horn color, with small black spots surrounding the stigmata and with black lines on the incisures of the four anterior dorsal segments, and with two black spots at the base of each wing-cover. The tongue-case projected above an eighth of an inch, over three of the abdominal segments. Anal spine short and straight.

This beautiful moth has been frequently taken at Schoharie, in some seasons not having been at all rare.

Plusia æroides *Grote.*

A moth of this species emerged from cocoon July 8th (1861). The larva was taken while sweeping some low plants of violets, etc. No description was made. It was of a delicate apple-green color, without hairs, with rather deep incisures. It is believed to have had some yellow markings upon it.

Scoliopteryx libatrix (*Linn.*).

The moth emerged August 3d, from a cocoon which had been found lightly spun within a willow leaf. There are probably two annual broods of this species, as I have taken it in the early part of May.

I learn from Dr. Speyer that the brief description which I have given of the larva in the 23*d Report on the State Cabinet*, p. 695, corresponds with the European form, and that they agree, also, in their habit of pupation.

Catocala parta *Guen.*

Larva found on the willow July 7th. It spun some leaves together, and twenty-two days thereafter the moth appeared.

Mesographe stramentalis *Hübn.*

Larva measuring from seven to eight-tenths of an inch in length. Head small, glossy black. Body spindle-shaped, slate-colored dorsally, dull green ventrally; on the dorsum are two rows of small white dots; just above the stigmata a broad yellow stripe, and whitish markings below the stigmata; collar glossy black; several rows of black tubercles having on two sides of most of them a white dot, and in each tubercle a short black hair.

The larvæ occur abundantly on leaves of the horse-radish, at Schoharie, during the latter part of October and first of November, living on the under surface, and consuming nearly the entire portion of the leaves except the principal ribs. When taken in the hand and held loosely, they usually succeed by their rapid contortions in dropping to the ground, and by their quick movements in finding a hiding place.

I have not obtained the imago from the above larva, but presume that it is correctly referred in the *Harris Correspondence*, page 322, to *Pionea eunusalis* Walker, which, according to Zeller,* is but one of the forms of the very variable *Pionea stramentalis* (Hübn.) Guen.

Zeller also claims that the genus Mesographe of Hübner was so well defined, that there was no propriety in the erection of the new genus Pionea from it by Guenée, and that consequently *stramentalis* should continue to be known as a Mesographe.

The moth appears to be as variable in this country as it is said to be in Europe.

Nematocampa filamentaria *Guenée.*

Larva found suspended by its thread from a maple tree (*Acer saccharinum*) on the 1st of July. It was placed in a box with some leaves to feed upon, and on the 4th it inclosed itself for its transformation, within three small pieces of a leaf which it had cut from the edge, and spun together with a few silken threads. The imago emerged on the 14th, after a pupation of ten days.

The larva is described in the *Harris Entomological Correspondence*, page 322, and a figure of the larva in the peculiar attitude which it assumes in repose, is given on plate 3, fig. 5.

Ennomos magnaria *Guenée.*

Larvæ feeding on lilac (*Syringa vulgaris*). Slight cocoons were spun between leaves August 29, and the moths appeared September 14th.

In the *Harris Entomological Correspondence*, page 320, the larva is recorded as feeding, in the months of August and September, on *Tilia*.

* *Beiträge zur Kenntness der nordamerik Nachtfalter*, 1872, p. 75.

Amphidasys cognataria *Guenée.*

Larva a looper, with ten feet; two inches in length. Head forked, light red. Body with two brown tubercles on the first segment; laterally, on the eighth segment, two transversely-elongate brown warts; on the eleventh segment, two small red warts on a brown patch; two white dots near the anterior portion of each segment dorsally, and two similar ones below the stigmata of the eleventh segment.

The larva feeds on maple. Entered the ground for pupation August 11th (1859). The imago emerged the latter part of May.

Abraxas ribearia *Fitch.*

Larvæ taken on currant bushes, buried in the ground for pupation July 4th. The first imagines appeared ten days thereafter.

Note on the Season of 1858.

Pyrameis Atalanta (Linn.) has been rare, last year quite abundant. *Pyrameis cardui* not observed, but abundant last year. *Pieris oleracea* (Harris) has abounded for two years, but, previous to that time, I had been able to collect but a single example. *Papilio Turnus* has been unusually numerous; early in the season it was as frequent as *Colias Philodice*, while two years previous not one specimen was observed throughout the entire season. Not one *Grapta interrogationis* has been seen, and a very few of *Grapta comma* or *G. Progne.* Not a single specimen of Catocala has been collected, while the previous year several species were obtained.

Note on the Season of 1859.

A very unfavorable season for collections, in marked contrast with the abundance of insect life the preceding year. Some of the most common Lepidoptera have not appeared at all, and others have only occasionally been seen. The following is a statement of the comparative abundance or absence of some of our Diurnals:

Abundant.	Few.	None.
Colias Philodice ...	Papilio Turnus	Papilio Troilus.
	Papilio Asterias.....	Pieris protodice.
Pieris oleracea.....	Danais Plexippus	Argynnis Myrina.
	Argynnis Aphrodite...	Argynnis Cybele.
	Argynnis Bellona.....	Grapta int'rogationis.

Abundant.	Few.	None.
Satyrus Alope ...	Grapta comma.....	Grapta J-album.
	Grapta Progne.....	Limenitis misippus.
Satyrus Nephele.	Melitæa tharos..	Limenitis Arthemis.
	Vanessa Milbertii	Limenitis Ursula.
	Vanessa Antiopa.....	Pyrameis huntera.
	Pyrameis Atalanta	Pyrameis cardui.
	Lycæna comyntas	Eudamus Tityrus.
	Chrysophanus Americana.	

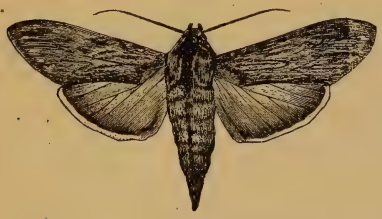
But one Catocala was observed during the season. Very few Noctuidæ were attracted by light on windows at night, except of the species of *Agrotis subgothica*, which occurred in great abundance.

VII. DESCRIPTIONS OF NEW SPECIES OF CUCULLIA.

Cucullia Speyeri *nov. sp.*

Palpi gray beneath, brown above. Front, with three transverse rows of projecting scales, gray at tips and black at base. Collar edged below with a sharply defined black line, pale gray in front, with a paler band just before its middle, bordered with lines of brown of which the posterior is the broader; when elevated, the apex and hinder part show brown hairs. Thoracic hairs brown. Tegulæ light gray, paler than the primaries, with a few scattered black scales near their superior margin as in *C. asteroides* Guenée. Abdomen acutely pointed in the male (Fig. 13), with long terminal hairs, and in the female (Fig. 14) ending with a long flattened tuft; whitish shading into gray terminally, more inclined to gray in the female, and in this sex interspersed with brown scales beneath; four brown dorsal tufts of about the size of those of *C. intermedia* Speyer; on the sides of the terminal segment of the female is a small spot of dull ochrey-yellow hairs, and a few projected from the incisure beneath. Tibiæ concolorous with the tegulæ, with a slender black line superiorly.

FIG. 13.



Primaries straight on costal margin, rounding to the apex as in the European *lucifuga* W.-V., and more curved than in *intermedia;* posterior margin slightly dentate, regularly sloping to the internal angle; interior margin nearly straight; breadth about equal to *intermedia*, exceeding *asteroides;* narrower and more acuminate in the male than in the female, as in all species of this genus; of a pale gray color, somewhat darker on the costal and internal margin and with a silvery reflection intermediately. Demi-line indicated by a short, very oblique black streak resting on the costa, bordered behind with white and a black dot nearer the base, above the subcostal nervure. Median transverse

FIG. 14.

lines black, relieved in front by pale gray, better defined and more acutely dentate than in *intermedia;* the anterior line five-toothed, obscurely geminate, the interior line more distinctly defined above the inferior portions of the subcellular teeth, the two subdorsal teeth obscure, the cellular tooth slightly overlapping the orbicular spot, the medial one bisected by the slender black basilar line, and the internal one quite acute; the posterior transverse line traceable only below the cell, except as obscurely continued in a whitish zigzag shade across the nervules, and marked in its inception by a short, oblique, black line, followed by a white dot resting on the costa just beyond the bifurcation of veins 6 and 7. Reniform spot indicated only in its lower portion by a black line proceeding (in the female) from near the origin of the first median nervule (vein 2), curving over veins 3 and 4 near their bifurcation, and terminating in the black streak in cell No. 4. Orbicular spot visible in its lower portion as a short, slightly curved black line above the median nervure, at the point of projection of vein 2, its outline doubtfully traceable with a lens, contracted from its normal quadrate form, as seen in *C. postera* Guen.,* to that of a figure 8, being almost bisected

*In *C. postera* (a ♂ and ♀ example), the "orbicular" spot is quadrate, resting above and below on the subcostal and median nervures, angularly concave interiorly and less angularly convex posteriorly; the interior and posterior margins are black, interrupted just above their middle, appearing as four short lines; interior of the spot gray, with two elongate quadrangular markings, of which one is above and the other below the cellular fold. In this species the "orbicular" is better defined than in any other of the species under my observation.

In *asteroides* (three ♂'s and three ♀'s), in the strongest marked male, the spot is not defined in outline, but is represented by three black dots beneath the subcostal and three above the median nervure; four additional black dots, in range with these, pertaining to the reniform (making two rows of five spots each), give to the discal region the punctuated appearance observed in the European species next noticed. In other examples, the middle one of the three lower spots is wanting, and in others the middle of the upper ones also; this more frequently in the female.

In *C. absynthii* Linn., of Europe (one ♂), the orbicular assumes a very interesting form, from which, together with corresponding characters in the reniform, it has received the name of *punctigera* (*Berl. Mag.*, III, 100), and *la pointillée* by Engramelle. It is composed of six black subquadrate spots, of which three lie in a row beneath the subcostal and three above the median nervure, the middle spot in each row surrounded with white scales which sometimes extend over a part or all of one or both of the contiguous spots.

In *asteris* W.-V. (three ♂'s, two ♀'s), the female has the spot four-punctated and of the normal form, with traces of the interior transverse lines. In the male, the marginal lines form the four oblique sides of a hexagon, with a trace of the superior transverse interior line only.

by the extended acute cellular tooth of the anterior median line, which in this species surpasses the same tooth in *intermedia* and its allies, and nearly equals that of *chamomillæ*. Nerves and nervules clothed with black scales, and faintly relieved by white ones; the latter bordered with white scales as they approach the margin, which are continued on the fringe, extending nearly one-half across it. In the interspace (cell 4), below the disco-central nervure (vein 5), a black line running from the outer margin of the reniform, half-way to the margin, whence its continuation may be traced, with a lens, beneath the interspaceal white streak; in cells 5 and 6 are indistinct black streaks beneath the white streaks, not reaching the margin; in cell No. 3, a short black streak extending from outer third of interspaceal streak to the margin; in cell No. 2 a corresponding black streak but shorter and broader; in cell No. 1 b, a black line, having a white streak before and behind it, extends from the marginal termination of vein 2, obliquely to the median fold, increasing in breadth before reaching it, where it runs into a black line resting on the fold, which is broadest at the point of contact and loses itself just before reaching the posterior median band; this oblique line is more prominent that in *intermedia*, *lucifuga* and *umbratica*, but less conspicuous than in *postera*, *asteroides* and *asteris*.* Terminal margin with an obsolete black line, interrupted by the nervules.

In *lucifuga* W.-V. (one ♂, one ♀), an arc of the superior and another of the inferior portions of the margin are visible, leaving the outline of the spot not defined.

In *intermedia* (four ♂'s and four ♀'s), close scrutiny with a lens reveals, in the more perfect specimens, a faint, fine, curved, black line above the median nervure, representing the inferior margin of the spot.

In *umbratica* Linn. (two ♂'s and four ♀'s), two dots, of which the outer one is sometimes elongated, mark the lower corners of the spot, visible in all the specimens. In the most distinctly marked female, two oblique lines below the subcostal, running the one outwardly and the other inwardly, indicate the superior portion of the spot.

In *chamomillæ* W.-V. (one ♂ and one ♀), the spot is reduced to two black dots, one at each end of a pale elongate spot beneath the subcostal.

In *convexipennis* Gr.-Rob. (one ♂ and two ♀'s), the spot is obsolete, having its position indicated only by two black dots beneath the subcostal; a third dot, and occasionally a fourth outside of these, pertain to the reniform.

In *lichnitides* Ramb., *lichnitis* of Guenée (two ♀'s), are two black dots above the median, and over these a semi-elliptical pale spot bordered with brown, deeper at the ends, lying between the subcostal and the cellular fold.

In *scrophulariæ* W.-V. (three ♂'s), the same features appear as in *lichnitides*, but not quite so well defined.

* The engraver has omitted these interspaceal black streaks from the figures, and failed to represent correctly the associated white ones.

Fringe squamose, long, equal in length to the space between veins 2 and 3 on the margin; basal third brown, and a narrow brown line through its middle; outer scales clavate, and, under a lens, white, centered with pale brown.

Secondaries abruptly rounding into the apex, which is slightly acute, less so than in *asteroides;* outer margin convex, excavate between the subdorsal and median nervules and prominently angulate on the submedian; in the male, white, hyaline, with a lustrous brown border, shading paler from the margin inwardly, broadest apically where it occupies one-sixth of the length of the wing, narrowing regularly to the internal angle, and terminating between the submedian and internal nervures. The subdorsal and median nerves and nervules with brown scales, which almost cover the nervules, especially in the subterminal region; the submedian with a marginal spot of a few brown scales. Fringe white, with a few pale brown scales on the superior half of the wing. In the female, wing whitish (smoky-white) basally and slightly hyaline; border a lustrous brown, of not quite so dark a shade as in *asteroides*, broader than in that species, about equal to *intermedia*, occupying nearly one-third of the wing apically, its inner margin tolerably well defined, and is continued indistinctly along the internal nervure nearly to the base: costal region also shaded with brown above the s. c. nervure and extending into the cell in the basilar region. The submedian and its branches more heavily clothed with brown scales than in the ♂. Fringe white, traversed with brown in its superior half.

Beneath, primaries lustrous pale brown, the costa gray basally, the ♀ with ochreous hairs supporting the frenulum. Secondaries without the discal spot, which is also lacking in *asteroides*, evident in *asteris* and conspicuous in *umbratica*, *lucifuga* and *intermedia;* white in the ♂ with brown scales in the costal and apical region and a few on the terminal margin; the terminal and subterminal regions give a creamy reflection in a certain light. In the ♀, more numerous brown scales costally, and with a lustrous brown border nearly as broad and as prominent as on the upper surface, traversed by the paler nervules.

Expanse of wings of ♂, 1.98 in.; of ♀, 2.07 in. Length of body, including anal tuft of ♂, 1 in.; of ♀, .95 in.

I take pleasure in naming this species after Dr. Speyer, in recognition of the study that he has bestowed on the perplexing species of

the genus, as shown in two excellent articles on some closely allied and for a long time confused European species, published in the *Stettiner Ent. Zeit.*, in 1858 and 1859; also in his valuable paper published in the same journal in 1870, and a translation given in the 23*d Ann. Report on the N. Y. State Cabinet*, but for which paper our *intermedia* might yet haye been regarded identical with the quite dissimilar *umbratica* of Europe.

The detection of this interesting species is due to the indefatigable zeal in collecting, of Mr. Otto Meske, of Albany, and to his ready perception of new Lepidopterous forms or features. A pair, in perfect condition, are in his cabinet, from which the above description is drawn, and, as they are the only examples which have come under my observation, it is probably quite rare. The female was taken by him, at Albany, on the 6th of June; the male was found at Sharon Springs, N. Y., on the 15th of August, at rest upon a fence, and was recognized, before being pinned, as differing from *intermedia*.

The description has been carefully drawn and extended, perhaps, to an unusual degree of minuteness, for the reason that the genus presents us with species which can only be separated from one another, in the imago state by very careful discrimination, and requiring for their identification, a faithful delineation of inconspicuous features. M. Guenée, in his *Species Général des Lépidoptères*, remarks, that in Cucullia "it frequently occurs that caterpillars the most different, it might almost be said, the most opposite, produce moths so very near, that it is only by great care that they can be distinguished." In remarking on *C. lucifuga* Rœsel, he says: "The *lucifuga* of Treitschke appears to me a *lactucæ;* that of Duponchel is a *chamomillæ;* that of Borkhausen seems an *umbratica*, as also those of Stephens and Esper." The greatest confusion has existed in regard to *C. blattariæ*, for, according to Guenée, the *caninæ* of Rambur and the *thapsiphaga* of Duponchel are identical with the true *blattariæ* of Esper; the *blattariæ* of Her.-Sch. is *thapsiphaga* Treitschke; the *blattariæ* of Boisduval is *scrophularivora* Rambur; the *blattariæ* of Duponchel is *prenanthis* Boisduval. *Thapsiphaga* figures as synonyms of three different species. *Umbratica* Linn. appears as *lactucæ* of Fabricius?, Hübner, Treitschke, Haworth and Stephens, the *lucifuga* of Esper and Borkhausen, and the *taneceti* of Stephens. *Lychnitis* Engramelle and *scrophulariæ* W.-V. so strongly resemble one another that several authors have believed them to be identical. Esper figures both as the same species, but according to Speyer, there can be no doubt

that they are distinct, he having reared numbers of the imagines of both species from larvæ presenting constant differential features. On the authority of the same author, the females of *lactucæ* and *umbratica* are with difficulty separable.

The genus is also very numerous in species. Guenée records forty-four European species. Up to the present, only five* American species had been described, but in all probability a number of others will hereafter be detected.

Of the species with which I am able to institute a comparison, *Speyeri* stands between *intermedia*, *lucifuga* (nearer to the latter in the gray and more distinct markings of the primaries) and *asteroides*. The female bears a stronger resemblance to *lucifuga* than does the male. In the white color and hyalescence of its secondaries, its abdomen and brown scales of the tegulæ, it approaches *asteroides*, but lacks the angulated white line near the internal angle characterizing that species, *asteris*, *postera*, *florea*, *convexipennis*, etc. The resemblance of the secondaries to those of *asteroides* is particularly marked, only that in the latter species the border is less conspicuous.

Having been informed by Mr. Herman Strecker, of Reading, Penn., that he had in his cabinet an undetermined Cucullia, near to *intermedia*, I submitted to him a photograph of the above species, requesting its critical comparison with the species in his possession. As these pages are passing through the press, I learn from him that the two are identical, and that he has two examples of it which were taken at Falls of Schuylkill, Philadelphia. It had also been taken, he states, near Reading, and it did not appear to be more rare in that vicinity than *intermedia*.†

* These are *asteroides* Guen., *postera* Guen., *florea* Guen., *intermedia* Speyer, and *convexipennis* Gr.-Rob. *Chamomillæ* W.-V. is credited by Walker to the State of New York and Hudson's Bay, but its occurrence in this country has not, that I am aware, been confirmed. A species described as *C. Yosemitæ* by Mr. Grote, has subsequently been stated by its author not to pertain to the genus.

Dr. Boisduval, in his *Lépidoptères de la Californie*, 1869, p. 89, credits the European *asteris* to California, erroneously regarding it as identical with *asteroides*, stating of it, "élevée de la chenille par M. Lorquin sur le *Solidago Canadensis*. M. Guenée en a fait une espèce à part sous le nom *d'Asteroides*." The two species differ so much in their features, that the above error could not have occurred if examples had been placed side by side for comparison.

† Through the kindness of Mr. Strecker, I am in the receipt of one of the above examples (a female), whereby I am able to verify his determination of the species. It conforms to the typical examples as above described, with the single exception that the anal tuft, instead of being flattened, is contracted to a point nearly as acute as in the male, although not so long.

A few copies of these papers have been accompanied by two photographic plates containing figures of all the species noticed in this paper, viz.: Plate I, *postera*, *asteris*, *asteroides*, *Speyeri* and *intermedia*, in each sex; Plate II, *lucifuga* ♂, *absynthii* ♂, *chamomillæ* ♂ ♀, *umbratica* ♂ ♀, *convexipennis* ♂ ♀, *scrophulariæ* ♂ and *lichnitides* ♀.

In consideration of the far greater accuracy ensured in the representation of the above species by the aid of photography than it is possible to attain by any other method, it is to be regretted that the expense of the production of such plates prevents their presentation in the entire issue of this Report.

Cucullia serraticornis *nov. sp.*

Antennæ biserrated; the serratures, which are less conspicuous at the base and tip, as seen from above, consist apparently of a row on each side beneath of conical projections, bearing rows of curved whitish cilia on their lateral margins beneath, which increase in length from the base to the apex. Palpi nearly horizontal, gray with brown scales, third joint short and rounded. Front gray with some black scales. Collar yellowish-brown below the prominent black transverse line; above gray with the usual paler line bordered with darker scales, and still darker ones on the upper margin of the collar. Tegulæ concolorous with the wings. Thorax fuscous; an abdominal series of similar colored tufts on the first four segments. Abdomen gray, paler basally.

Primaries straight costally or slightly concave from the folding over of the marginal nervure, gently curving to the apex, which is obtuse; outer margin entire, sloping moderately to the inner margin, which is long and nearly straight. Color pale ash-gray, darker on the inner margin. Anterior median line blackish, teeth acute, preceded by a white shade, beyond which some blackish lines almost geminate it. Posterior median line obsolete, except in cell 1 *b*, where it is bidentate; the teeth preceded by an elongate-oval, brown bordered white spot on the submedian fold, extending to the anterior median line; followed by a white angulated line (the "tooth" of the internal angle), from the concavity of which a black streak (the usual interspaceal streak of the internal angle) runs obliquely to the first median nervule (vein 2). Costal margin over the place of the orbicular, with a diffuse brown shade and two oblique brown streaks at the inception of the posterior median. Basilar line black, fine; a slen-

der black line on the internal margin. Reniform indicated by a row of black dots anterior to the discal cross-vein; orbicular only visible as a central pale shade and four outer brown dots. Nerves and nervules clothed with black scales; on the interspaces intermediately are brown scales, with a white streak centrally, beneath which, on the subterminal margin, are the usual black streaks in all the interspaces, the most conspicuous of which is that in cell 4 (farther removed from the margin than the others). Fringe white, cut with brown on each side of the nervules, opposite the interspaceal lines of brown scales; these brown ciliary scales of each interspace joined by a brown marginal line.

Secondaries acute, excavated opposite the cell, slightly dentate; white, hyaline. Nerves and nervules heavily marked with black scales, especially toward the margin; no distinct marginal border, but in place thereof the extreme margin is brown, with some brown scales extending a short distance therefrom, and farther in cells 1 *b* and 4; some brown scales on the costal nervure apically.

Beneath, primaries pale brown with an æneous reflection; a conspicuous brown spot on the discal cross-vein. Secondaries, with brown scales on the nerves and nervules and marginally as above, though less abundantly; sprinkled with brown scales costally, and in the cell above the fold; cellular fold and discal cross-vein above it broadly covered with brown scales, diffuse on the latter, giving a conspicuous cellular spot; these features seen in transparency from above.

Described from two ♂'s, differing materially in size; the larger and better specimen, from which the features are mainly drawn, measures two inches expanse of wings, length of body .86 in.; the other 1.70 in. expanse, length of body .72 in.

In addition to disparity in size, the two examples differ somewhat in shape of wings, those of the smaller being narrower and more acute, to the degree that the male usually varies from the female in the several species of this genus; yet the two examples are undoubted males, as is shown by their frenulum examination. In all other particulars, so far as they are traceable, the two are identical. They are unfortunately in poor condition, and the description above given may require correction.

Habitat, California. From Mr. James Behrens (No. 5), through Mr. Grote.

The species can at once be separated from all other described Cucullias, by its serrated antennæ (in the ♂), it being the only species known in which this form exists. Conforming in other respects to the typical forms of the genus, the simple difference of antennal structure does not seem to warrant its separation, but simply a modification of the generic diagnosis as given by Guenée; "to antennæ [usually] cylindrical and entirely smooth in both sexes." It may be recognized by the double interspaceal brown ciliary cuttings, the prominent cellular spot and the brown cellular line of the secondaries beneath, extending from the base to the discal cross-vein. The latter feature will probably be found to be less conspicuous in the ♀; it is feebly represented in one ♂ example of *C. intermedia* in my possession, and still more indistinctly in a ♂ of *C. lucifuga*.

In the presence of the "tooth" of the internal angle of the primaries, the hyalescence of the secondaries and general coloration, the species seems allied to *asteroides* and *florea*. I regret that I am unable to give a comparison of shape of wings, owing to the variation, as above stated, in the examples before me.

VIII. OBSERVATION OF SOME NEW YORK RHOPALOCERA FOR THE YEAR 1871.

A calendar of the occurrence of the Rhopalocera, upon the plan presented in the Report for 1870, was commenced for the following year, but was necessarily suspended early in the month of July, after the following records had been made:

Papilio Turnus *Linn*	May 30; June 1, 8, 16; July 7.
Papilio Troilus *Linn*	June 1, 8, 16.
Papilio Asterias *Drury*	May 19, 30; June 1, 8, 13.
Pieris rapæ (*Linn.*)	March 14; May 2, 12, 16, 23, 30; June 1; July 7.
Colias Pholodice *Godt*	May 2, 12, 16, 19, 23, 30; June 1, 8, 13, 16; July 7.
Danais Plexippus (*Linn.*)	June 1; July 7.
Argynnis Aphrodite *Fabr*	July 7.
Argynnis Cybele *Fabr*	June 13.
Argynnis Myrina (*Cram.*)	June 8, 13, 16; July 7.
Phyciodes tharos (*Drury*) *Hübn*	June 1, 8, 13, 16; July 7.
Phyciodes Batesii *Reak*	June 8, 16.
Charidryas Nycteis (*Doubl.*) *Scudd*	July 7.
Melitæa Phaeton *Fabr*	June 16; July 7.
Grapta J-album (*Boisd.-Lec.*)	June 1.
Vanessa Antiopa (*Linn.*)	May 2, 12, 16, 19, 30; July 7.
Limenitis misippus (*Fabr.*)	June 1, 8, 13, 16; July 7.
Neonympha Eurytus (*Fabr.*)	June 1, 8, 13, 16.
Thecla Irus (*Godt.*)	May 2, 12, 16, 19, 23, 30; June 8.
Thecla Augustus *Kirby*	May 2, 12, 16, 19.
Thecla Niphon (*Hübn.*)	May 2, 12, 16, 19.
Thecla Melinus (*Hübn.*)	May 12.
Thecla Edwardsii *Saund*	July 7.
Lycæna violacea *Edw*	May 12, 19.
Lycæna neglecta *Edw*	May 16, 19, 23, 30; June 1, 8, 16.

Lycæna comyntas (*Godt.*)	May 2, 12, 16, 19, 23, 30; June 1, 8; July 7.
Lycæna Scudderii *Edw*	May 30; June 8, 16; July 7.
Chrysophanus Americana (*Harr.*)	May 16, 19, 23, 30; June 1, 8, 13; July 7.
Thorybes Pylades *Scudd*	June 1, 8, 13, 16; July 7.
Epargyreus Tityrus (*Fabr.*)	May 30; June 8, 16.
Nisoniades Juvenalis (*Fabr.*)	May 12, 16, 19, 23, 30; June 8.
Nisoniades Persius *Scudd*	May 12, 16, 19, 23, 30.
Nisoniades Lucilius *Lintn*	June 1.
Nisoniades Martialis *Scudd*	May 16, 19, 23, 30; June 8, 16.
Nisoniades Ausonius *Lintn*	May 12.
Nisoniades Brizo *Boisd.-Lec*	May 2, 12, 19.
Nisoniades Icelus *Lintn*	May 19, 23, 30; June 8, 16.
Ancyloxypha Numitor (*Fabr.*) *Feld.*	June 13.
Amblyscirtes vialis (*Edw.*) *Scudd*	June 8, 16.
Ocytes metea *Scudd*	May 16, 19, 23, 30; June 8.
Atrytone Zabulon (*Boisd.-Lec.*) *Scudd.*	May 30; June 1, 8, 16, 13.
Polites Peckius (*Kirby*) *Scudd*	June 1, 8, 13.
Limochores Mystic (*Edw.*) *Scudd*	June 8, 13, 16.
Limochores bimacula (*Grote-Rob.*)	June 13.
Limochores Taumas (*Fabr.*)	June 13, 16; July 7.
Limochores Manataaqua *Scudd*	June 16; July 7.
Lerema Hianna *Scudd*	May 23, 30; June 8, 16.

IX. DATES OF COLLECTION OF SOME NEW YORK HETEROCERA FOR THE YEAR 1872.

Sphingidæ.

Sesia gracilis *Gr.-Rob*..... June 4.
Thyreus Abbotii *Swains*..... June 6.
Darapsa Chœrilus (*Cram.*)..... June 19, June 27.
Deilephila lineata (*Fabr.*)..... June 18.
Deilephila chamænerii *Harr*..... June 20.
Philampelus Pandorus (*Hübn.*)..... June 27.
Smerinthus geminatus *Say*..... June 8.
Smerinthus excæcatus (*Sm.-Abb.*), larva..... Oct. 5.
Daremma undulosa *Walk*..... June 1.
Sphinx chersis (*Hübn.*)..... June 27.
Sphinx drupiferarum *Sm.-Abb*..... June 19.
Sphinx kalmiæ *Sm.-Abb.*, larva on ash..... Sept. 24.
Sphinx Gordius *Cram*..... May 29, June 27.
Agrius eremitus *Hübn*..... June 27.
Agrius eremitus, larva on mint..... Sept. 24.
Ellema Harrisii *Clem.*, larva on pine..... Sept. 3, Sept. 19.

Ægeridæ.

Ægeria tipuliformis (*Linn.*)..... June 16, June 23.

Zygænidæ.

Scepsis fulvicollis *Hübn*..... Sept. 24.
Ctenucha virginica (*Charp.*)..... June 12.

Bombycidæ.

Euphanessa mendica (*Walk.*)..... July 8–July 21.
Hypoprepia miniata (*Kirby*)..... July 28.
Utetheisa bella *Hübn*..... Sept. 24.
Arctia arge (*Drury*)..... July 28.
Spilosoma virginica (*Fabr.*)..... May 30–June 29.
Orgyia leucostigma (*Sm.-Abb.*)..... July 9.
Parorgyia parallela *Gr.-Rob.*, larva on pine..... Sept. 24.

Ichthyura albosigma (*Fitch*), larva on poplar	Sept. 5,	Sept. 19.
Actias Luna (*Linn.*)	June 7,	June 12.
Platysamia Cecropia (*Linn.*)		July 2.
Hyperchiria Io (*Fabr.*)		June 12.
Eacles imperialis (*Drury*), larva on pine		Sept. 8.
Anisota senatoria (*Hübn.*)		June 14.
Anisota stigma (*Sm.-Abb.*), larva on oak		Sept. 24.
Tolype laricis (*Fitch*)		Sept. 6.

NOCTUIDÆ.

Acronycta occidentalis *Grote*	May 25,	June 29.
Acronycta oblinita (*Sm.-Abb.*), larva on smart-weed		Sept. 1.
Leucania pallens (*Linn.*)	June 7,	June 17.
Leucania unipuncta *Haworth*	June 6,	Aug. 31.
Micrococlia diphteroides *Guen*		June 25.
Hydrœcia nictitans (*Linn.*)	July 14,	July 28.
Hydrœcia lorea *Guen*	June 24,	July 11.
Hydrœcia sera *Gr.-Rob*	July 5,	July 14.
Hydrœcia immanis *Guen*		Aug. 25.
Nephelodes violans *Guen*		Sept. 6.
Hadena lignicolor (*Guen.*) *Grote*	July 4,	July 11.
Hadena arctica *Boisd*	June 27–	July 28.
Hadena dubitans (*Walk.*) *Grote*	July 7,	Aug. 19.
Hadena devastator (*Brace*) *Grote*	July 7–	Aug. 14.
Apamea iaspis *Guen*		July 7.
Apamea finitima *Grote*		June 17.
Celæna herbimacula *Guen*	June 17–	July 21.
Agrotis suffusa *W.-V*	June 17,	July 26.
Agrotis venerabilis *Walk*	Sept. 15,	Sept. 24.
Agrotis subgothica *Haworth*	July 21,	July 30.
Agrotis herilis *Grote*		Aug. 14.
Noctua clandestina *Harr*	July 4, July 14,	Sept. 23.
Noctua bicarnea *Guen*		July 14.
Noctua augur *Fabr*	July 4,	July 13.
Xanthia circillaris *Naturf*		Sept. 19.
Tæniocampa instabilis (*Ræs.*)	April 4,	May 8.
Aplecta herbida *W.-V*		July 7.
Hyppa xylinoides (*Guen.*)	Aug. 14,	Sept. 19.
Mamestra chenopodii (*Albin*)	May 29,	Aug. 14.
Xylina cinerea *Riley*	April 20, Aug. 4,	Sept. 26.

Xylina Bethunei *Gr.-Rob*	Sept. 5.
Cucullia intermedia *Speyer*	July 14.
Cucullia postera *Guen*	July 10.
Cucullia asteroides *Guen*	Aug. 12.
Cucullia asteroides, larva on Solidago	Sept. 7.
Cucullia convexipennis *Gr.-Rob.*, larva on Solidago	Sept. 7.
Chariclea exprimens (*Walk.*)	June 30.
Heliothis armigera *Hübn.*	June 29.
Melaporphyria immortua *Grote*	June 1.
Chamyris cerintha (*Treits.*)	June 19.
Erastria nigritula *Guen*	June 4, June 14.
Erastria carneola *Guen.**	June 4–Sept. 23.
Erastria muscosula *Guen*	June 24, July 8.
Leptosia concinnimacula *Guen.* †	May 16–May 29.
Placodes cinereola *Guen*	July 28.
Plusia precationis *Guen*	June 1, July 13, Aug. 8, Sept. 22.
Plusia simplex *Guen*	June 7, Aug. 14.
Plusia ærea (*Hübn.*)	June 28, Aug. 17, Sept. 30.
Plusia æroides *Grote*	July 7, July 14.
Plusiodonta compressipalpis *Guen*	July 19.
Deva purpurigera *Walk*	June 29.
Anomis xylina *Say*	Sept. 25.
Amphipyra tragopogonis (*Linn.*)	July 13.
Amphipyra pyramidoides *Guen*	Sept. 30.
Catocala ultronia *Hübn*	Aug. 4.
Catocala relicta *Walk*	Aug. 19.
Catocala concumbens *Doubl*	Sept. 5, Sept. 11.
Catocala amatrix *Hübn*	Sept. 5, Sept. 11.
Catocala cara *Guen*	Sept. 6, Sept. 19.
Catocala piatrix *Grote*	Sept. 6, Sept. 19.
Catocala desperata *Guen*	Sept. 11.
Catocala habilis *Grote*	Sept. 14, Sept. 19.
Catocala retecta *Grote*	Sept. 19, Sept. 24.
Catocala ilia *Cram*	July 15.
Catocala polygama *Guen*	July 13, July 18.
Catocala cerogama *Guen*	July 30.

* This species appears to have successive broods during the season, as it was observed on June 4, 24; July 17, 21, 28; August 5, 19; September 8, 19, 23.

† More abundant than previously observed, having been captured May 16, 21, 24, 26 and 29.

Drasteria erechtea (*Cram.*)	Sept. 1,	Sept. 23.
Euclidia cuspidea *Hübn*	May 21,	June 12,	Aug. 1.
Poaphila quadrifilaris *Hübn*	May 29,	June 4,	June 19.

PHALÆNIDÆ.

Eutrapela transversata (*Drury*)	July 24,	Aug. 3.
Sicya truncataria *Guen*	July 12.
Angerona crocataria (*Fabr.*)	June 12.
Hyperetis alienaria (*Her.-Sch.*)	June 12.
Nematocampa filamentaria *Guen*	June 25.
Endropia hypochraria (*Her.-Sch.*)	June 6.
Endropia homuraria *Grote*	June 12.
Endropia serrata *Drury*	June 25.
Ellopia fiscellaria *Guen*	Sept. 18,	Oct. 5.
Caberodes phasianaria *Guen*	July 3.
Caberodes majoraria *Guen*	July 3.
Ennomos magnaria *Guen*	Sept. 28.
Cleora pulchraria *Minot*	Sept. 6,	Sept. 24.
Tephrosia disconventa *Walk.*	June 6.
Acidalia enucleata *Guen*	June 12,	July 20.
Acidalia sinuata *Pack.*	July 16.
Stegania pustularia *Guen*	Aug. 8.
Macaria bisignata *Walk.*	June 12.
Macaria 4-signata *Walk.*	July 4.
Corycia albata *Lef.*	June 7.
Corycia semiclarata *Walk.* = *Bapta viatica* Harvey	June 7.
Fidonia bicoloraria *Minot*	May 25–	June 12.
Fidonia Faxonii *Minot*	May 21–	June 7.
Hæmatopis grataria (*Fabr.*) *	June 9–	Sept. 24.
Aspilates coloraria (*Fabr.*)	May 16,	June 4.
Phasiane mellistrigata *Grote*	May 29.
Lozogramma defluaria *Walk.*	May 14–	June 4.
Abraxas ribearia *Fitch*	July 15.
Melanthia albicillata (*Linn.*)	May 29.
Melanthia ruficillata *Guen*	June 24,	July 21.
Melanippe gothicata *Guen*	June 24.
Coremia propugnata *W.-V.*	May 20,	Oct. 28.
Coremia ferrugata *Alb*	July 30,	Aug. 14.
Camptogramma fluviata *Hübn* †	July 28,	Aug. 1.

* Observed June 9, 12; July 4, 14; August 19, 25; September 1, 8, 24.

† *Camptogramma gemmata* Hübn., is the ♀ of *C. fluviata*, as has been recently ascertained through rearing both forms from a single oviposition.—SPEYER.

Cidaria diversilineata *Hübn*		July 3.
Cidaria gracilineata *Guen*		Aug. 1–Sept. 8.
Eupithecia interrupto-fasciata *Pack*		Sept. 25.

(COLLECTED PRIOR TO 1872.)

Boarmia gnopharia *Guen*	Schoharie	July 30.
Boarmia intraria *Guen*	Center	May 21.
Boarmia humaria *Guen*	Schoharie	June 15.
Boarmia indicitaria *Walk*	Schoharie	July 1.
Tephrosia disconventa *Walk*	Center	June 7.
Tephrosia spatiosaria *Walk*	Schoharie	June 5.
Paraphia subatomaria *Wood*	Bethlehem	June 17.
Aplodes latiaria *Pack.**	Schoharie	June 5.
Aplodes approximaria *Pack*	Center	June 9.
Cabera intentaria *Walk*	Schoharie	June 21.
Cabera erythemaria *Guen*	Bethlehem	June 25.
Halia subcessaria *Walk*	Schoharie	July 26.
Corycia semiclarata *Walk*	Center	May 21.
Eumacaria brunneata *Pack*	Center	May 25.
Caripeta divisata *Walk*	Schoharie	July 26.
Larentia perlineata *Pack*	Schoharie	May 3.
Eupithecia interrupto-fasciata *Pack*	Schoharie	April 29.
Eupithecia vernata *Pack*	Albany	May 25.
Cidaria rigidata *Walk*	Schoharie	May 14.
Fidonia truncataria *Walk*	Center	May 23.

DELTOIDÆ.

Chytolita morbidalis (*Guen.*) *Grote*		June 12.
Zanclognatha lævigata *Grote*		July 9–July 23.
Philometra longilabris *Grote*		Aug. 24.
Phalænostola larentioides *Grote*		Aug. 1.
Rivula propinqualis *Guen*		June 19.
Helia phæalis *Guen*		Aug. 18.
Epizeuxis lituralis *Grote*		July 3.
Epizeuxis strictilinealis *Grote*		July 25.
Epizeuxis Americalis (*Guen.*)		Sept. 1.

*This species was erroneously determined in the 23d Ann. Rep. St. Cab. N. H., p. 196, line 23, as *A. mimosaria* Guen.

Pangrapta decoralis *Hübn.=Hypena elegantalis* Fitch	June 4.
Phalænophana rurigena *Grote*	May 22.
Palthis angulalis *Hübn*	June 24.
Hypena evanidalis *Rob*	June 28, July 7, Sept. 9.
Bomolocha abalienalis (*Walk.*)	June 18.
Plathypena scabra (*Fabr.*) *Grote*	Sept. 6–Sept. 23.
Meghypena velifera *Grote*	July 13.
Macrhypena deceptalis (*Walk.*) *Grote*	July 26.
Lomanaltes lætulus *Grote*	May 25.
Tortricodes bifidalis *Grote*	June 10.

PYRALIDÆ.

Botis terrealis *Treits*	June 1.
Botis plectilis *Gr.-Rob*	June 5.
Botis thesealis *Led*	July 10, Aug. 1, Sept. 24.
Botis marculenta *Gr.-Rob*	July 6.
Eurycreon chortalis *Grote*	May 21, June 4.
Asopia olinalis (*Guen.*)	July 9.
Asopia farinalis (*Linn.*)	July 7, July 28.
Asopia fimbrialis *W.-V*	July 7.
Cataclysta opulentalis *Led*	June 21.
Nomophila noctuella *Hübn*	Aug. 24, Sept. 24.
Scoparia centuriella *W.-V*	June 23.

TORTRICIDÆ.

Nolophana malana (*Fitch*)	June 25.
Nolophana (Asisyra) Zelleri *Grote*	June 5.

TINEIDÆ.

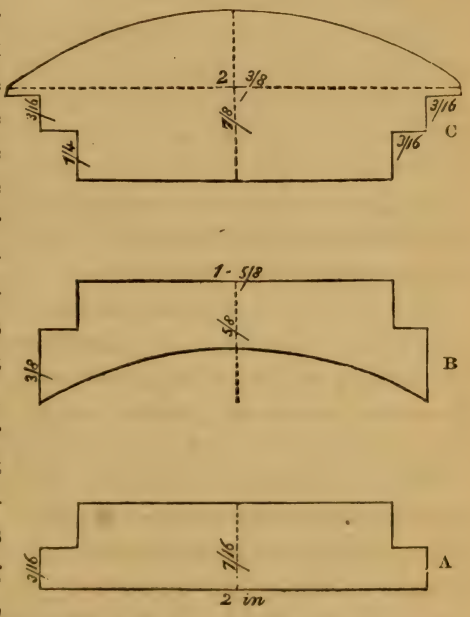
Cryptolechia Schlagæri *Zeller* *	June 12.
Depressaria heracliana *De Geer*	Aug. 12, Aug. 19.
Crambus chalybirostris *Zeller*	Aug. 26.
Crambus girardellus *Clem*	July 21.
Crambus laqueatellus *Clem*	June 24.
Pterophorus tenuidactylus *Fitch*	June 30.
Pterophorus marginidactylus *Fitch*	June 30.

* Seven examples of this beautiful moth were collected at this time. As it sits at rest on the upper surface of a leaf, its peculiar form and singular combination of colors render it almost undistinguishable from a deposit of bird excrement. A simulation so nearly perfect cannot fail of giving it, while in repose, almost entire immunity from its enemies.

X. DESCRIPTION OF A CONVENIENT INSECT CASE.

[From the Fifth Annual Report on the Insects of Missouri, 1873.]

For beauty and security, and the perfect display of the larger Lepidoptera, I have seen nothing superior to a box used by Mr. Lintner, of Albany, N. Y. It is a frame made in the form of a folio volume, with glass set in for sides, and bound in an ordinary book cover. The insects are pinned on pieces of cork, fastened to the inside of one of the glass plates; and the boxes may be set on end, in library shape, like ordinary books. For the benefit of those who wish to make small collections of showy insects, I give Mr. Lintner's method, of which he has been kind enough to furnish me the following description: *



Figures A, B and C represent, in section, the frame-work of the volume; A showing the ends, B the front, and C the back. The material can be prepared in long strips of some soft wood, by a cabinet-maker (if the collector has the necessary skill and leisure for framing it), at a cost of sixty cents a frame, if a number sufficient for a dozen boxes be ordered. Or, if it be preferred to order them made, the cost should not exceed eighty cents each. Before being placed in the hands of the binder, the mitering should be carefully examined, and any defect in fitting remedied, so that the glass, when placed in position, may have accurate bearings on all the sides. The interior

* The description was originally intended for one of the State Museum Reports, but, at the request of Mr. Riley, State Entomologist of Missouri, it was sent to him for publication in his Fifth Report, and by his permission it is here republished.

of the frame is covered with tin-foil, made as smooth as possible before application, to be applied with thoroughly-boiled flour paste (in which a small proportion of arsenic may be mixed), and rubbed smoothly down to the removal of the blisters which are apt to appear. The tin-foil can be purchased, by weight, at druggists, and the sheets marked off and cut by a rule in strips of proper width, allowing for a trifle of overlapping on the sides. Its cost per case is merely nominal.

First quality single-thick glass for sides must be selected, wholly free from rust, air-bubbles, veins or any blemish. Such glass can be purchased at fifteen cents a pane. The lower glass, after thorough cleaning, especially of its inner surface, with an alkaline wash, and a final polishing with slightly wetted, blank printing paper, is to be firmly secured in its place by a proper number of tin points; the upper glass is but temporarily fastened. The binder must be directed to cover the exposed sides of the frame with "combed" paper, bringing it over the border of the permanent lower glass and beneath the removable upper glass.

The covers of the volume are of heavy binder's board (No. 18), neatly lined within with glazed white paper. On the inside of one of the lids may be attached, by its corners, a sheet with the numbers and names of the species contained in the case, or these may be placed on the pin bearing the insect. If bound in best quality of imitation morocco, with cloth sides, lettered and gilded on the back, the cost (for a dozen cases) need not exceed $1 each. If in half Turkey-morocco, it will be $1.50.

The lettering and ornamentation of the back will vary with the taste of the individual. The family designations may be permanently lettered, or they may be pasted on the back, on a slip of paper or gum-label, as are the generic names, thus permitting the change of the contents of a case at any time, if desired.

The bits of cork to which the insects are to be pinned are cut in quarter-inch squares from sheet-cork of one-fourth of an inch in thickness. If the trouble be taken to trim off the corners, giving them an octagonal form, their appearance will be materially improved, and much less care would be required in adjusting them symmetrically on the glass.

The cement usually recommended for attaching the cork to the glass is composed of equal parts of white wax and resin. My experience with this has not been favorable, for, after the lapse of a few

years, I have invariably been subjected to the serious annoyance of being compelled to remove the entire contents of the case, clean the glass and replace the corks with new cement. From some cause, inexplicable to me, a gradual separation takes place of the cork with its cement from the glass, first appearing at the angles of the cork, and its progress indicated by an increasing number of iridescent rings which form within until the center is reached, when, if not previously detached, the insect falls with the cork, usually to its injury and that of others beneath it.

A number of years ago I happened to employ, in attaching a single piece of cork in one of my cases, a cement originally made for other purposes, consisting of six parts of resin, one of wax and one of venetian red. Several years thereafter, my attention was drawn to this piece, by finding it as firmly united as when at first applied, and at the present time (after the lapse of twelve years) it is without the slightest indication of separation. Acting upon this hint, I have of late used this cement in the restoration of a number of my cases, and with the most satisfactory results. It is important that the cement, when used, should be kept heated (by a spirit lamp or gas flame) to as high a degree as it will bear without burning. An amount sufficient to cover the bottom of the flat metal vessel containing it to the depth of an eighth of an inch will suffice, and prevent the cork from taking up more than its requisite quantity. It should occasionally be stirred to prevent the precipitation of its heavier portions. The cork may be conveniently dipped by the aid of a needle inserted in a handle, when, as quickly as possible, it should be transferred to the glass, for the degree of adhesion seems to depend upon the degree of fluidity of the cement. From some experiments made by me, after the corks had been attached as above, in heating the entire glass to such a degree as thoroughly to melt the cement until it spreads outward from beneath the weight of the cork, and then permitted to cool—the glass meanwhile held horizontally that the corks might not be displaced—the results appear to indicate that the above cement, applied in this manner on glass properly cleaned, will prove a *permanent* one; it is scarcely necessary to state that this method is not available where the glass has been bound as above.

Preparatory to corking the glass for the specimens assigned to it, the spaces required for them are to be ascertained by arranging them in order on a cork surface or soft-wood board. On a sheet of paper of the size of the glass, perpendicular lines, of the number of the rows

and at their proper distances, are to be drawn, and cross lines equal in number to the insects contained in the rows. The distances of these lines will be uniform, unless smaller specimens are to occupy some portion of the case, when they may be graduated to the required proportion. With the sheet ruled in this manner and placed beneath the glass, the points where the corks are to be applied are indicated by the intersection of the lines. The sheet, marked with the family of the insects for which it was used, and, with the numbers designating its divisions, may be laid aside for future use in the preparation of other cases for which it may be suitable. In a series of unbound cases in my collection, in which the glasses measure 11 × 14½ inches, I have used for my Lepidoptera and laid aside the following scales, the citation of which will also serve to show the capacity of the cases: 3 × 8, Catocalas; 2 × 7 and 3 × 9, Sphingidæ; 4 × 11 to 4 × 14, Bombycidæ; 5 × 13 to 6 × 16, Noctuidæ; 8 × 16 and 8 × 20, Lycænidæ and Tortricidæ.

The unbound cases above referred to are inexpensive frames, made by myself, of quarter-inch white wood or pine, the corners mitred, glued and nailed with three-quarter inch brads, lined within with white paper (better with tin-foil), and covered without with stout manilla paper. The glasses are cut of the exact size of the frame, and, when placed in position thereon, are appressed closely to it by laying upon them, near each corner, a heavy weight (the weights used by me are four-inch granite cubes, weighing nearly seven pounds each, which are sufficient to overcome the curvature of the glass); strips of an enameled green paper cut to the width of one inch, are pasted over the edges of the glass, extending a little beyond the thickness of the frame, and brought downward over the sides of the frame. On its front, two gum-labels, indicating the insects inclosed, are placed at heights respectively of seven and twelve inches, when, if all has been neatly done, the cases present a tasteful appearance upon a shelf. When there is reason to believe that the case will need to be opened for the change or addition of specimens, it will be found convenient to employ, for the fastening of the upper left-hind side of the upper glass, paper lined with a thin muslin, to serve as a hinge when the other sides have been cut.

Should it become desirable to bind these cases, outside frames may be constructed after the plans above given, with the omission of the inside quarter-inch (the equivalent of these frames), in which these may be placed and held in position by two or three screws inserted in their sides.

INDEX

TO

ENTOMOLOGICAL CONTRIBUTIONS.

PAGE.

Abraxas ribearia 166, 182
Acidalia enucleata 182
sinuata 182
Acronycta *acris?* 136
alni 136, 157, 158
Americana 135, 157, 158
brumosa 136
connecta 158
funeralis 158
hastulifera 136, 158
ligustri 136
morula 137
oblinita 159, 180
occidentalis 136, 158, 180
psi 158
vinnula 136
Actias Luna 126, 152, 180
Ægeria tipuliformis 179
Aglia tau 153
Agrius eremitus 179
Agrotis herilis 159, 161, 180
jaculifera 159
subgothica 159, 167, 180
suffusa 180
tricosa 159, 161
venerabilis 180
Alypia octomaculata 119, 121, 122
Amblyscirtes vialis 178
Amphidasys cognataria 166
Amphipyra pyramidoides 181
tragopogonis 181
Ancyloxypha Numitor 178
Angerona crocataria 182
Anisota senatoria 180
stigma 180

PAGE.

Anomis xylina 181
Apamea finitima 180
iaspis 180
Apatela Americana 136, 159
Apatelodes Angelica 130
Aplecta herbida 180
Aplodes approximaria 183
latiaria 183
mimosaria 183
Arctia arge 143, 179
Argynnis Aphrodite 166, 177
Bellona 166
Cybele 166, 177
Myrina 166, 177
Asopia farinalis 150, 184
fimbrialis 184
olinalis 184
Aspilates coloraria 182
Atrytone Zabulon 178
Bapta viatica 182
Boarmia gnopharia 183
humaria 183
indicitaria 183
intraria 183
Bomolocha abalienalis 184
Botis marculenta 184
plectilis 184
terrealis 184
thesealis 184
Cabera erythemaria 183
intentaria 183
Caberodes majoraria 182
phasianaria 182
Callimorpha Lecontii 142
militaris *var* 142

PAGE.
Callosamia Promethea 126
Camptogramma fluviata..... 182
gemmata 182
Caripeta divisata..... 183
Cataclysta opulentalis..... 184
Catocala amatrix 181
cara 181
cerogama 181
concumbens 181
desperata 181
habilis 181
ilia 181
parta 164
piatrix 181
polygama 181
relicta 181
retecta 181
ultronia 181
Catocala—— sp..... 140
Celæna herbimacula..... 180
Ceramica picta 136
Cerura borealis 151
Chamyris cerintha..... 163, 181
Chariclea exprimens 163, 181
Charidryas Nycteis 177
Chrysophanus Americana..... 167, 178
Chytolita morbidalis 183
Cidaria diversilineata 183
gracilineata 183
rigidata..... 183
Cleora pulchraria 182
Clisiocampa Americana..... 147, 155
sylvatica..... 147
Cœlodasys unicornis 131
Colias Pholodice 166, 177
Coremia ferrugata 182
propugnata..... 182
Corycia albata..... 182
semiclarata 182, 183
Crambus chalybirostris..... 184
girardellus 184
laqueatellus 184
Cryptolechia Schlagæri..... 184
Ctenucha virginica..... 155, 179
Cucullia absynthii..... 169, 174
asteris..... 169, 173
asteroides.. 139, 168, 169, 173, 181
blattariæ..... 172
caninæ..... 172
chamomillæ..... 170, 173, 174

PAGE.
Cucullia convexipennis, 138, 170, 173, 181
florea..... 161, 173, 176
intermedia, 168, 170, 173, 176, 181
lactucæ 173
lichnitides 170, 174
lichnitis..... 170, 172
lucifuga.... 168, 170, 172, 174, 176
postera 163, 169, 173, 174, 181
prenanthis 172
punctigera 169
scrophulariæ 170, 172, 174
scrophularivora..... 172
serraticornis..... 174
Speyeri 168
taneceti 172
thapsiphaga 172
umbratica..... 170, 171, 172, 174
Yosemitæ 173
Danais Plexippus..... 166, 177
Darapsa Chœrilus..... 179
Daremma undulosa 179
Deilephila chamænerii 179
lineata 179
Depressaria heracleana 145, 184
Ontariella 145
Deva purpurigera..... 181
Diphtera deridens 157
Drasteria erechtea 182
Dryocampa rubicunda 133
Eacles imperialis..... 180
Edema albifrons..... 151
Ellema Harrisii 132, 179
Ellopia fiscellaria 182
Empretia stimulea..... 149
Endropia homuraria..... 182
hypochraria 182
serrata 182
Ennomos magnaria..... 165, 182
Epargyreus Tityrus..... 178
Epizeuxis Americalis 183
lituralis..... 183
strictilinealis 183
Erastria carneola 181
muscosula..... 181
nigritula 181
Euchætes collaris..... 146, 147
egle 145, 146
Oregonensis 144
Euclidia cuspidea..... 182
Eudamus Tityrus 167

PAGE.

Eudryas grata..... 117, 120, 122, 123
unio 117, 119, 123
Eumacaria brunneata 183
Euphanessa mendica 179
Eupithecia interrupto-fasciata..... 183
vernata 183
Eurycreon chortalis..... 184
Eutrapela transversata..... 182
Fidonia bicoloraria..... 182
Faxonii 182
truncataria 183
Gastropacha Americana 154
Grapta comma..... 166, 167
interrogationis 166
J-album 177
Progne..... 166, 167
Hadena adjuncta 161
arctica 180
devastator..... 180
dubitans 180
lignicolor 161, 180
Hæmatopis grataria..... 182
Halia subcessaria 183
Halisidota caryæ..... 148
Helia phæalis..... 183
Heliothis armigera..... 181
Hemileuca Maia 154
Hydrœcia immanis 180
lorea..... 180
nictitans 180
sera 180
Hypena elegantalis..... 184
Hypena evanidalis..... 184
Hyperchiria Io 180
Hyperetis alienaria..... 182
Hypoprepia miniata..... 179
Hyppa xylinoides..... 180
Ichthyura albosigma..... 147, 180
inclusa..... 147
vau 147
Larentia perlineata 183
Leptosia concinnimacula 181
Lerema Hianna..... 178
Leucania pallens..... 180
unipuncta 180
Limenitis Arthemis 167
misippus 167, 177
Ursula 167
Limochores bimacula 178
Manataaqua 178

PAGE.

Limochores Mystic 178
Taumas 178
Lithacodes fasciola..... 149
Lomanaltes lætulus 184
Lozogramma defluaria 182
Lycæna comyntas..... 167, 178
neglecta..... 177
Scudderii 178
violacea..... 177
Lycomorpha pholus..... 156
Macaria bisignata..... 182
4-signata 182
Macrhypena deceptalis 184
Mamestra chenopodii 180
Meghypena velifera..... 184
Melanippe gothicata..... 182
Melanthia albicillata 182
ruficillata 182
Melaporphyria immortua..... 181
Melitæa Phaeton..... 177
tharos 167
Mesographe stramentalis..... 164
Microcœlia diphteroides..... 180
vinnula 136
Nadata gibbosa..... 150
Nematocampa filamentaria..... 165, 182
Neonympha Eurytus..... 177
Nephelodes violans 180
Nisoniades Ausonius..... 178
Brizo 178
Icelus..... 178
Juvenalis..... 178
Lucilius..... 178
Martialis..... 178
Persius 178
Noctua augur..... 180
bicarnea 180
clandestina..... 180
Nolophana (Asisyra) Zelleri..... 184
malana 184
Nomophila noctuella..... 184
Notodonta——?..... 151
Ocytes Metea..... 178
Orgyia leucostigma..... 148, 179
Palthis angulalis..... 184
Pangrapta decoralis..... 184
Papilio Asterias..... 166, 177
Troilus..... 166, 177
Turnus..... 166, 177
Paraphia subatomaria..... 183

PAGE.
Parorgyia parallela..... 129, 179
Phalænophana rurigena..... 184
Phalænostola larentioides..... 183
Phasiane mellistrigata..... 182
Philampelus Pandorus 179
Philometra longilabris 183
Phobetron pithecium 149
Phyciodes Batesii..... 177
tharos 177
Pieris oleracea..... 166
protodice 166
rapæ..... 177
Pionea eunusalis 165
stramentalis 165
Placodes cinereola 181
Plathypena scabra..... 184
Platycerura furcilla 131
Platysamia Cecropia..... 125, 180
Plusia ærea..... 181
æroides..... 164, 181
balluca..... 163
precationis 181
simplex 181
Plusiodonta compressipalpis..... 181
Poaphila quadrifilaris 182
Polites Peckius..... 178
Psychomorpha epimenis 119, 121
Pterophorus marginidactylus 184
tenuidactylus 184
Pyrameis Atalanta 166, 167
cardui..... 166, 167
huntera..... 167
Rivula propinqualis..... 183
Satyrus Alope 167
Nephele..... 167
Scepsis fulvicollis 156, 179
PAGE.
Scoliopteryx libatrix..... 164
Scoparia centuriella..... 184
Sesia gracilis 179
Sicya truncataria 182
Smerinthus excæcatus..... 179
geminatus..... 179
Sphinx chersis 179
drupiferarum..... 179
Gordius 179
kalmiæ 179
Spilosoma acrea 143
fulvicosta 146
latipennis..... 143, 144
virginica 143, 179
Stegania pustularia 182
Tæniocampa instabilis..... 180
Telea Polyphemus..... 152
Tephrosia disconventa..... 182, 183
spatiosaria 183
Thecla Augustus..... 177
Edwardsii 177
Irus 177
Melinus 177
Niphon 177
Thorybes Pylades..... 178
Thyreus Abbotii..... 179
Tolype laricis 180
velleda..... 134
Tortricodes bifidalis..... 184
Utetheisa bella 179
Vanessa Antiopa..... 167, 177
Milbertii 167
Xanthia circillaris 180
Xylina cinerea 180
Bethunei 181
Zanclognatha lævigata 183