REPORT OF THE BOTANICAL DIVISION OF THE INDIANA STATE BIOLOGICAL SURVEY FOR 1894.

LUCIEN M. UNDERWOOD, DIRECTOR.

In presenting my second annual report as Director of the Botanical Division of the Biological Survey, it is fair to state that the organization of the survey allows no appropriation for carrying on the work, and whatever has been done by the Director has been in addition to the cares of a laboratory and department of botany. In the present year the Director was necessarily absent from the state during the entire summer and was further prevented from doing as extensive field work during the latter part of the year as was planned, on account of the accumulation of work of other kinds during the summer. It is very desirable that certain explorations be made in some of the less visited portions of the state, and in order to do this some arrangement will have to be made to secure transportation to these regions.

During the spring and fall considerable collections were made in the immediate vicinity of the university (Putnam County) and quite a number of additions were made to the list of last year; the trip to Rochester during the spring meeting of the Academy resulted in several additions to the flora. A trip to Franklin County in November was only partially successful on account of heavy rains. Material has been collected also by Mr. E. W. Olive in Montgomery County, who has made a considerable number of additions to the list of parasitic fungi of the state. Some of my own students have made small collections, notably in Grant, Green and Orange Counties. With further determinations of previously collected materials, together with that collected during the present year, we can add some plants to the previously published list. These plants, with their data, are included in Appendix A to this report. Mr. J. B. Ellis has furnished descriptions of three new species of *Fungi Imperfecti*. A list of new host plants for fungi forms, Appendix B. Notes on the previous report are included in Appendix C.

It is desirable to obtain a complete list of the persons who are willing to collect data and otherwise serve as correspondents to the survey. We ought to have at least one in each county of the state from whom reliable data can be received in regard to the occurrence, relative abundance and present status, of certain plants. If possible, yearly reports as to the appearance of new plants, particularly weeds, should be received. The recent issue of a bulletin on this subject from the State Experiment Station well illustrates the need of a fuller list of correspondents, and as well the immensely practical value of such information

when properly collated and brought into its proper bearings. The fact remains, however, that these correspondents are for the most part only able to render assistance on the higher plants. There are very few persons in the state who have the proper training or who are willing to make the effort to collect the lower plants. Here there is opportunity for those who have charge of courses of instruction in the colleges to render assistance. It would be of immense practical advantage to many of our botanical students to learn how to recognize the lower forms of plant life in the field, and their work in regions which have not yet been visited would add materially to our knowledge of the distribution of these plants in the state.

In order to facilitate the recognition of the lower plants, and in accordance with the preliminary announcement issued last year,* there has been prepared a series of exsiccatæ representing the flora of Indiana. The first fascicle consists of 100 species of parasitic fungi so selected as to illustrate as many as possible of the groups which prey upon the tissues of other plants. These sets are to be distributed as follows:

One set to each of the four colleges of the state in which a department of botany exists, and in which there is a permanent herbarium established.

Three sets to public institutions outside the state, where there are large collections of plants accessible to the botanical student. The herbaria thus selected are (1) the collection of the Missouri Botanic Garden, St. Louis; (2) the Department of Agriculture at Washington; and (3) the Herbarium of Columbia College, New York.

One set to the private herbarium of the Director.

Other sets will be reserved for distribution to other institutions of the state where there is a reasonable certainty that they will be properly preserved and made useful for reference to students; or they will be sent to individuals who contribute an equivalent amount of material representing the lower flora of their respective regions. Some sets have been used by the director for the purpose of exchange with persons outside the state, where this could be done in such a way as to increase his facilities for work.

There are five sets remaining that can be distributed within the state. It is the purpose of the director to issue further sets illustrating other groups if sufficient encouragement is given. The expense of the present issue, including postage, envelopes for the specimens, and labels, to say nothing of the labor of preparation, has been contributed by the director. If it is thought desirable to continue this distribution, it is recommended that the actual outlay of money

* Proc. Indiana Academy of Science, 1893: 16, 1894.

for the above named incidentals be regarded as legitimate expenses of the survey, and be paid for by the Academy. It is also desirable to have the labels in further issues printed in full. This will add greatly to the appearance of the series without any great additional expense.

A list of the plants distributed in this first fascicle is appended. (Appendix D).

The work on the higher flora, as stated in the report of last year, was placed in the hands of Professor Stanley Coulter, who makes a separate report on the progress of his work. A set of blank cards to be used as a working index in preparing the final catalogue was ordered from the Botanical Supply Company, of Cambridge, Mass., and this is the only expense that the Division has asked the Academy to meet during the year. Professor Coulter deserves the thanks of all the botanical workers of the state for the laborious work he has already done, and deserves the support of every man in the state who knows even the commonest plants, in order that the catalogue when published finally shall completely represent the distribution of our higher flora.

It is the intention of the Division to publish from year to year such additions as are made to the flora among the Archegoniates and Thallophytes in order to make a permanent record of their occurrence, for it will be many years before the lower plants of the state will be known with even approximate completeness. It must be remembered that many of the plants belonging to the lower orders are ephemeral in their character, and unless collected in their season disappear and leave no visible trace of their existence. Many of them appear in certain years when the conditions are favorable to their development, and perhaps may not reappear for a succession of years. The past few seasons have been particularly unfavorable for the development of the fleshy fungi, especially those that appear during the midsummer. The same is also true with regard to some that appear in the autumn. As an instance *Phallus Ravenelii* was very abundant in the vicinity of Greencastle during the latter part of 1891, but it has not been seen since. It will thus be seen that the care required in searching for the lower plants is of necessity much greater than in the case of the higher plants, which for the most part are perennial and of constant growth. It will also be seen that the opportunities for bringing to light rare plants is much greater among lower forms. There is scarcely a low, wet piece of woodland where fallen timber is abundant that will not yield a rich harvest of species not yet found in the State. There is scarcely a rocky ravine that will not yield additional bryophytes. There is

scarcely a stagnant pond but that will yield an abundance of algae which have as yet been scarcely touched in this region.*

The great need is for students who have the patience, the perseverance and the fortitude to make a special study of some of these groups that are waiting for the enthusiastic collector.

In conclusion, it is desirable to extend thanks to those who have aided in the prosecution of the work of the survey. Especially would we mention Messrs. Ellis, Peck and Morgan, for the continuance of favors in determinations and for the communication of other material assistance in the work of the survey. To my assistant, Miss Mary E. Wright, for the very laborious work of preparing the labels for the exsiccatæ. And finally to the management of the Vandalia and Big Four Railroads for favors extended to the survey, that have made more extensive field work possible.

APPENDIX A.

LIST OF ADDITIONS TO THE STATE FLORA.

MYXOMYCETES.

ARCYRIA MINOR Schw. Putnam, 5, 1894 (Paul Burlinganius).

HEMIARCYRIA FUNALIS Morgan. Putnam, 10, 1894.

PHYSARUM ATRUM Schw. Tippecanoe, 6, 1893 (Arthur).

PHYSARUM POLYMORPHUM Mont. Grant, 7, 1894 (Mary Wright).

ASCOMYCETES.

DISCOMYCETES.

DASYSCYPHA VIRGINEA (Batsch) Fckl. Putnam, 9, 1893.

MACROPODIA MACROPUS (P.) Fckl. (*Peziza macropus*, P.) Putnam, 5, 1894. (Fred Howe.)

SPHÆRIACEÆ.

CARYOSPORA PUTAMINUM (S.) De Not.

On Peach Stones, Putnam, 5, 1893.

DIATRYPELLA CEPHALANTHI (S.) Sacc.

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*One of the great drawbacks in the study of the algae is the lack of proper references. The director is pleased to announce that he had secured a set of Rabenhorst's *Die Algen Europas*, (including over 2,500 specimens of algæ exsiccatæ); and shall be glad to make them useful to students who wish to consult them. These, with the two series of American exsiccatæ issued during the present year, sets of which are now in the herbarium of the director, give fairly good opportunity to compare our local forms.