

- HYPNUM (*Amblystegium*) SERPENS L. Putnam, 5, 1893.  
 LEPTOTRICHUM PALLIDUM (Herb.) Hampe. Vigo, 5, 1893.  
 LEPTOTRICHUM TORTILE (Schrad.) Müll. Lake (Roll). [Herb. Barnes.]  
 LEUCOBRYUM VULGARE Hampe. Fulton, 10, 1893; Putnam, 10, 1893.  
 LEUCODON JULACEUS (Hedw.) Sulliv. Monroe (Blatchley); Putnam, 10,  
 1891; 12, 1891.  
 MNIUM AFFINE Bland. Montgomery (Barnes). [Herb. Barnes.]  
 MNIUM CUSPIDATUM Hedw. Putnam, 5, 1892.  
 PHYSCOMITRIUM TURBINATUM (Michx.) Brid. Putnam, 5, 1892; 5, 1893; Tip-  
 pecanoe, 4, 1892; Owen; 5, 1893.  
 POGONATUM BREVICAULE Beauv. Putnam, 10, 1892.  
 POLYTRICHUM FORMOSUM Hedw. Montgomery (Barnes). [Herb. Barnes.]  
 POLYTRICHUM OHIOENSE Ren. & Cardot. Marshall, 10, 1893.  
 POTTIA TRUNCATA (Hedw.) Fuern. Tippecanoe, 4, 1892.  
 TIMMIA MEGAPOLITANA Hedw. Montgomery (Barnes). [Herb. Barnes.]  
 WEISIA RIVIDULA Brid. Putnam, 4, 1892.

#### SPHAGNACEÆ.

- SPHAGNUM CYMBIFOLIUM Ehrh. Fulton, 10, 1893.\*  
 SPHAGNUM PAPILLOSUM LEVE Warnst. Fulton, 10, 1893.\*  
 SPHAGNUM RECURVUM MUCRONATUM. Fulton, 10, 1893.\*  
 SPHAGNUM RUFESCENS. Fulton, 10, 1893.\*

\* Determined by Prof. D. C. Eaton.

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## ZOOLOGY.

C. H. EIGENMANN, DIRECTOR.

In connection with the general circular of the Biological Survey of Indiana, the following special circular for the Zoological section was issued:

#### SPECIAL ANNOUNCEMENT OF THE DIVISION OF ZOOLOGY.

The leading aim of this division during the season will be the compilation of a complete bibliography of the vertebrates of Indiana and of as many invertebrates as can be provided for.

At the same time any material showing the distribution of animals in the state is especially desirable. To determine the distribution, complete collections of the vertebrates of as many localities as possible should be

made. Collections should always accompany notes, so that the observations may be verified by some specialist.

No opportunity should be neglected to observe the breeding habits and seasons, and the animal with young should, whenever possible, be preserved and forwarded to the Director, who will transmit it to the proper authority for record.

Another subject which should receive attention is the migration, or seasonal appearance and disappearance of mammals, birds, reptiles and fishes. The interesting results obtained in the observation of the migration of birds only suggest what may be done with the less conspicuous but no less interesting habits of other forms.

CARL H. EIGENMANN, Director,  
Bloomington, Indiana.

The chief aim of this division for the past season—the compilation of the bibliography of the vertebrates of Indiana—has been completed, and, wherever that has not been done before, preliminary lists of the Indiana species have been compiled and are ready for the printer. Where such lists had recently been published in accessible form they have not been reproduced.

I give here the titles of the lists of species and bibliographies with their place of publication :

A CATALOGUE OF THE MAMMALS OF INDIANA, WITH BIBLIOGRAPHY.

A. W. Butler and B. W. Evermann. These proceedings.

A CATALOGUE OF THE BIRDS OF INDIANA.

Amos W. Butler. Proceedings of the Agricultural Society, 1890.

BIBLIOGRAPHY OF INDIANA ORNITHOLOGY.

A. W. Butler. These proceedings.

THE BATRACHIANS AND REPTILES OF THE STATE OF INDIANA.

O. P. Hay. Seventeenth Report Indiana Geological and Natural History Survey.

BIBLIOGRAPHY OF THE BATRACHIANS AND REPTILES OF INDIANA.

O. P. Hay. These proceedings.

A CATALOGUE OF THE FISHES OF INDIANA.

Carl H. Eigenmann and C. H. Beeson. These proceedings.

BIBLIOGRAPHY OF INDIANA ICHTHYOLOGY.

Carl H. Eigenmann. These proceedings.

The invertebrates have not been so well provided for, although some of the groups have received an equal share of attention.

No reports on the Protozoa, sponges, Plathelminthes and Vermes have been prepared.

A catalogue of the Mollusca with bibliography has been completed by Mr. R. Elsworth Call, and appears in these proceedings.

Several groups of the Arthropods have recently been dealt with.

In the Memorial Bulletin (No. 46, 1893) of the U. S. National Museum, the complete writings of our late associate, Harvey Bollman, have been reproduced. In this volume the Indiana Myriopoda are more fully treated than those of any other state. In the same volume, L. M. Underwood has given a complete bibliography of the American Myriopoda, and naturally, the Indiana bibliography is included.

A CATALOGUE OF THE BUTTERFLIES KNOWN TO OCCUR IN INDIANA.

W. S. Blatchley. Seventeenth Annual Report Indiana Geological and Natural History Survey.

THE GRYLLIDÆ OF INDIANA.

W. S. Blatchley. Proc. Indiana Academy I, 126.

THE LOCUSTIDÆ OF INDIANA.

W. S. Blatchley. Proc. Indiana Academy II, 92.

THE BLATTIDÆ OF INDIANA.

W. S. Blatchley. Proc. Indiana Academy II, 153.

A PARTIAL LIST OF NEW SPECIES OF PARASITIC HYMENOPTERA REARED IN INDIANA.

F. M. Webster. Proc. Indiana Academy II, 89.

The Crustacea of Indiana have been considered by O. P. Hay in the proceedings of the Indiana Academy I, 147.

Hereafter all specimens coming into the hands of the Academy will be referred to the following specialists:

Mammals and Birds . . . . .	A. W. Butler.
Batrachians and Reptiles . . . . .	O. P. Hay.
Fishes . . . . .	Carl H. Eigenmann.
Lepidoptera and Orthoptera . . . . .	W. S. Blatchley.
Crustacea . . . . .	W. P. Hay.
Animal Parasites . . . . .	A. W. Bitting.
Arachnida . . . . .	Dr. Henry C. McCook.

The field work for the past two seasons has been limited to private enterprise except as far as the explorations of the U. S. Fish Commission were concerned.

The specialists in the various branches will record the details of the progress in their respective departments.

The work in fishes has been as follows:

Mr. D. C. Ridgely has collected for the Indiana University in Trail creek, a small stream of La Porte county, emptying into Lake Michigan. Mr. W. O. Wallace has collected a good series of fishes in Wabash county. Messrs. Kirsch and Beeson on behalf of the U. S. Fish Commission have explored the Eel river along its entire length and made collections in various points of the Maumee basin.

Offers of assistance and co-operation have been received from various persons over the state who have not yet given any concrete assistance.

It is the intention of the director of the Zoological Survey to establish stations at various places in the state during successive summers to study the fauna in situ. The work during the coming summer will either be explorations along the Ohio river or on one of the lakes of northern Indiana. Next to the distribution of Indiana organisms their correlation in different localities, their geographical variations, migrations and breeding habits seem to be questions which should be studied.

The position and general features of Indiana are such that not a single animal need be expected to be restricted within its geographical boundaries. The same may be said of the four states surrounding it. Nor would they with Indiana form a geographical unit. For these reasons it seems to me that the advantages of co-operation with neighboring states may be overestimated. If the survey is to be restricted by geographical boundaries, the boundaries of Indiana will do about as well as the boundaries of the states surrounding us. While too great value can not be placed on the thorough exploration of neighboring states and of the states bordering on them for purposes of comparison, our best efforts, must for economic reasons, be devoted to our own bailiwick.

This leads me to say a word in favor of county surveys. The same interests that bind us together to conduct a survey of the state unite the teachers and others of the same county and through this common interest county surveys may be established and the survey of the state furthered. I am well aware that animals and plants do not respect county lines, but neither do they state lines. I would urge the formation of county science associations whose sole purpose it shall be to make a careful survey of the respective counties. Wabash county has such an association, and judging the work of this association from the part that has passed through my hands, this association may well form a model for other counties.

Teachers and others of this county formed an association similar to that of the Academy of Sciences. Some one interested in a particular branch was made curator of that branch and all specimens referred to him. As a result we have a very fair collection of the fishes of this county with exact locality labels, a complete set of the birds, including several not known to occur elsewhere in the state, (*Dendroca kirtlandi*) and a similar list of the plants. Work as well done as this in every county of the state would rapidly advance our knowledge of the habits and distribution of the organisms in the state.

Those counties in which academies, colleges or universities are situated ought to lead in this respect. It is certainly the duty of the biological departments of such institutions to make a survey of the surrounding country and *display its fauna and flora*. While I deprecate the miscellaneous collections of odds and ends from nowhere and the ends of the world, a systematic collection of the organisms displayed with proper labels showing the geographical distribution would have a definite, scientific and educational value. The data for the geographical distribution of Indiana animals will be furnished in the reports of the survey.

#### BIBLIOGRAPHY OF INDIANA FISHES.

Indiana has had more than her share of American Ichthyologists; in fact, she has harbored at one time or another nearly as many as all the other states put together.

These have come in two widely separate periods. Rafinesque, the author of the *Ichthyologia Ohiensis*, and Le Sueur, both of whom were for a time at New Harmony, published between 1814 and 1820. While works of a general nature had an indirect bearing on the fishes of Indiana, nothing appeared on the fishes of Indiana between 1820 and 1875. All the more recent work has been due to the presence in Indiana of David Starr Jordan. It may be noted here that Jordan's first Ichthyological venture was the publication of a description of the Sisco of Lake Tippecanoe, in 1875, and his last Indiana effort the description of a new fish from the Tippecanoe river, 1890.

About Jordan there arose a group of his pupils, all of whom have added something to the knowledge of the fishes of the state.

The names of these which owed their inspiration directly or indirectly to Jordan are Copeland, Brayton, Gilbert, Hay, McKay, Rosa Smith