

BIENNIAL REPORT

OF THE

DIRECTOR

OF THE

ILLINOIS STATE

LABORATORY OF NATURAL HISTORY

CHAMPAIGN, ILLINOIS

1889-1890

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*Dr. S. H. Peabody, Regent of the University:*

SIR: In accordance with the spirit (although, I must confess, not strictly with the letter) of a resolution adopted by the Trustees of the University July 1, 1885, to the effect that the Director of the State Laboratory of Natural History should make to the Trustees, through the Regent, quarterly reports of the affairs and operations of the Laboratory, I beg to offer this report of our affairs during the last two years.

The organization of this establishment and its operations during this time have differed but little in scope and general character from those reported to the Trustees in 1888.†

The staff of the Laboratory during the last two years has consisted of a botanist, Prof. Burrill,—engaged for only a small part of his time; a botanical assistant, alternately Mr. Moses Craig and Mr. G. P. Clinton; an office entomologist, Mr. C. A. Hart; a field entomologist, Mr. John Marten; a zoölogical assistant, Mr. H. S. Brode (giving the Laboratory such part of his services as were not appropriated by the University); an amanuensis, Miss M. J. Snyder; and an artist, Mr. A. M. Westergren, employed in drawing (chiefly entomological) for only seven months. The salaries of those whose time is divided between the Laboratory and University are derived in part from each source, in amounts proportioned as nearly as may be to their services for each. The botanist has received from the Laboratory \$200 a year, the botanical assistants full pay for time actually spent on Laboratory work, and the zoölogical

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\*For financial statements for the two years ending June 30, 1890, see Fifteenth Report of the Board of Trustees of the University of Illinois, pp. 92, 177.

† See Fourteenth Report of the Board of Trustees of the University of Illinois, p. 185.

assistant \$100 for the present year only. The salaries of the office entomologist, field entomologist, and amanuensis (who acts also as librarian) have been, respectively, \$600, \$900, and \$800.

Owing to changes of assistants, indirectly due to the organization of a large number of new state agricultural experiment stations, the general zoölogical work of the State Natural History Survey has materially fallen off, but relatively greater attention has been given to economic investigation. The zoölogical work has been limited to considerable additions to the ornithological collections, made for a further study of the food of birds; and desultory studies on the lower aquatic animals of the state, especially insect larvæ, Vermes, and Protozoa. The progress of our knowledge of the aquatic zoölogy of Illinois has been indirectly advanced by vacation work done outside our state limits,—during the summer of 1889 in northern Michigan and Lake Superior, and during that of 1890 in the lakes and streams of the northern Rocky Mountains. Reports on these collections have been prepared, or are in course of preparation, for publication by the U. S. Fish Commissioner, and as this material is studied, our similar and parallel collections from this state are studied with it, to the great advantage of the local work.

Our entomological investigations have been, as heretofore, almost wholly economic in their motive; nevertheless, no opportunity has been lost to improve our acquaintance with the insects of Illinois, whether economically interesting or not. The building of an insectary and separate office (the former devoted to experimental work upon the life histories of insects, their injuries to vegetation, and methods of practically controlling them) has given us an opportunity not before enjoyed for continuous observation and accurate experiment on some of the most difficult species. The principal subjects which we have studied are the life histories of cutworms, the contagious diseases of the chinch bug, the life history of the corn root louse and of the species of ant uniformly associated with it, the feeding habits of the plum and peach curculio with insecticide experiments for its destruction on the peach, the stages and life history of a new plum borer, the injuries to fruit by the

common Thrips or strawberry "midget," the injuries and life history of the little-known corn root worm, the spring and summer history of the Hessian fly, and the life histories of the common white grubs and wireworms. Other subjects of interest studied are injuries to fruit trees by the European bark beetle, the damage to wheat, oats, and other grains by the grain Aphis, the life history of the swamp bill bug, the species and life histories of a considerable number of gall gnats, and the breeding, identification, and description of common aquatic larvæ from temporary pools in spring. Especially important progress has been made in our knowledge of the history and habits of some of the commonest and most destructive insects of the farm, including the white grubs, the Hessian fly, and the corn root louse.

The entomological collection has been greatly enlarged, especially in Diptera, and a large number of determinations in all orders have been made. The named collection is now contained in 160 double boxes, and numbers about 5,000 species, each being represented, as a rule, by four selected specimens. The pinned and determined duplicate insects on hand — largely in process of distribution to public schools — amount to 42,600 specimens. The alcoholic insects, including large numbers of larvæ, are contained in about 10,200 bottles and vials.

Seven hundred and forty-four copies of the zoölogical volume — the first on the ornithology of the state — have been issued up to the present time (Dec. 31, 1890), 732 of them gratuitously, 656 in Illinois and 76 outside of the state, and 12 have been sold at cost (\$3.50 a volume). There remain of the edition printed 256 copies, 200 of which we have reserved for future use.

There have been printed since my last statement two of my reports as State Entomologist, that for the years 1885 and 1886 — long delayed in the hands of the printer — having finally been issued in 1889, and the report for 1887 and 1888, in 1890. Each of these reports contains seven articles; the first 103 pages and the second 226 pages.

In the Bulletin of the Laboratory six articles have been issued in the last two years, one on the animals of the Mississippi bottoms, by Prof. H. Garman; two by myself, describing

new species of Vermes; two by Mr. Weed, on the "harvestmen" of Illinois; and one by Prof. Garman, on Illinois reptiles and amphibians — 110 pages in all.

Other articles prepared at the Laboratory during the period covered by this report, but published elsewhere, are as follows: "Note on Chinch-Bug Diseases," "Early Occurrence of the Chinch Bug in the Mississippi Valley," "Arsenical Poisons for the Plum and Peach Curculio," "Office and Laboratory Organization," "History and Status of Public School Science Work in Illinois," "New and Old Insects," and a "Synopsis of Recent Work with Arsenical Insecticides," by myself, and a description of a new gall-fly by Mr. John Marten.

Other articles prepared by us and now in press, are as follows: "On Some Lake Superior Entomostraca," "Preliminary Report upon the Invertebrate Animals inhabiting Lakes Geneva and Mendota, Wisconsin," "A Summary History of the Corn-Root Aphis," "On the Life History of the White Grubs," and "Report of Progress in Economic Entomology," by myself; "Life History and Immature Stages of Wireworms," by Mr. C. A. Hart; and "New Notes on the Life History of the Hessian Fly," by Mr. Marten.

I have addressed, during the two years, fourteen farmers' institutes in various parts of the state and three horticultural societies, and have also lectured before the Chicago Institute and the Cincinnati Natural History Society.

The accumulation of duplicate insects has reached a point where it is again possible to distribute them to advantage to such public schools as teach regularly the subjects they illustrate. I consequently sent in 1889, a circular of inquiry to a number of these schools, from the replies to which a list of schools was made to which sets of insects will be sent during the winter. The specimens available for this distribution (22,000 in number) will be made up into forty sets and sent out as fast as ready, with lists of names, both technical and common, and a pamphlet of economic notes respecting the species related in any important way to agriculture or horticulture. The amount of work involved in this distribution may be judged in part by the fact that the mere numbering and arrangement of this material in boxes, ready for shipment,

after the labor of collection, preservation, determination, and systematic classification is all done, will take all the time of one assistant for about a month.

Our work of the past two years has been greatly hampered by the insufficiency of our library fund, and the loss of valuable assistants with years of experience on our subjects and training in our methods, and more useful here than any one else could be for a long time to come. This loss was due simply to inadequate provision for their salaries. If this work is to continue on its present basis, it is indispensable that our library appropriation be put back to what it was two years ago, and that sufficient allowance be made for salaries to enable me to hold good assistants in competition with experiment stations and other institutions offering employment to able and well-trained young men.

Respectfully submitted,

S. A. FORBES,

Director of Laboratory.

December 31, 1890.