

## PROCEEDINGS OF THE ENTOMOLOGICAL SOCIETY OF AMERICA.

### Cleveland Meeting.

The seventh annual meeting of the Entomological Society of America was called to order by President Stephen A. Forbes at 10:00 A. M., Tuesday, December 31st, in the Auditorium of the Normal School. All the meetings of the Society were well attended, seventy-five or more at each session, and it was pronounced by several the best meeting of the Society that they had attended. The following committees appointed previous to the meeting, were named:

Committee to draft resolutions on the death of Dr. John Bernhardt Smith—Herbert Osborn, Henry Skinner, E. P. Felt.

Committee to draft resolutions on the death of Dr. Thomas Harrison Montgomery, Jr.—Philip P. Calvert, Henry Skinner, J. H. Comstock.

The chair was directed by motion to appoint the following committees: Committee on Resolutions; Committee on Nominations; Auditing Committee.

The following papers were then read:

*C. Betten, Lake Forest University: An Interesting Feature in the Venation of Helicopsyche, the Molannidæ, and the Leptoceridæ.* (Printed in this number of Annals).

Discussion: W. A. Riley—Dr. Betten's interpretation of the modifications of  $R_5$  is especially interesting as still further emphasizing the close relationship in wing venation between the Trichoptera and the Lepidoptera. The lepidopterous wing venation exhibits specialization by reduction and Dr. Betten has clearly demonstrated that what has been regarded as an accessory vein is really a branch of a primary vein.

*Lucy W. Smith, Mt. Holyoke College: Mating and Egg-laying Habits of Perla immarginata.* (To appear in June number of Annals.)

*Alvah Peterson, University of Illinois: Head and Mouth parts of Cephalothrips yuccæ.*

A preliminary report on the asymmetry of the mouth-parts of Thysanoptera. A detailed description of the anatomy of the mouth-parts and head capsule of *Cephalothrips yuccæ*, a species belonging to the suborder Tubulifera, was given. Numerous details and parts heretofore undescribed as to mandibles, hypopharynx, epipharynx, arms of tentorium, etc., were shown. Similar observations were made on *Anthothrips verbasci* in order to verify results found in *Cephalothrips yuccæ*.



Comparing the work done by H. Garman on *Limothrips cerealium*, a species of Terebrantia, with the work done by Muir and Kershaw, on a species of Tubulifera, a difference in interpretation exists as to whether the asymmetrical parts are mandibles or maxillæ. Muir and Kershaw interpret the asymmetrical parts as maxillæ. Observations made by the writer on two species of Tubulifera verify their position in general. The writer expects to continue his observations on species of the sub-order Terebrantia to determine if possible whether the interpretation of H. Garman is correct or not.

Discussion: R. A. Cooley—It was asked as to whether any evidence of glandular secretion from the mouth was found, which being answered in the negative, it was stated that in a species feeding on terminals of currant and gooseberry we have noticed a considerable distortion of the leaves and stem, suggesting the possibility of a secretion introduced while feeding.

J. E. Wodsdalek, University of Wisconsin: *Life History and Habits of Trogoderma tarsale*, a Museum Pest. Read by Title.

Leonard Haseman, University of Missouri: *Life Cycle and Development of the Tarnished Plant Bug, Lygus pratensis Lin.* Presented by the Secretary.

Owing to the very serious injury to peach and pear in the early spring which seemed to be due to the work of the tarnished plant-bug, the writer has undertaken a careful study of the life cycle, habits and development of this insect. The work has been carried through the late summer and fall months and will be continued throughout the following spring and summer.

In this work it has been found that the tarnished plant-bug breeds largely upon various flowering weeds such as wild asters, daisies, and mare's tail (*Erigeron canadensis*). The tarnished plant-bug deposits its eggs in the blossoms of the host plant and not in the tissue of the leaves or stems. These eggs hatch in from five to seven days and the insect passes through five distinct nymphal stages in its development in the place of four, as other writers have maintained. The insect remains in each nymphal stage for about the same length of time and completes its growth in from thirty to thirty-five days.

Discussion: P. J. Parrott—There occurs in New York a species (*Lygus invitus*) Say which is during some seasons quite destructive to pears. In feeding on the fruit, the epidermis is ruptured by the proboscis and protruding granular areas form about the wounds. This species closely resembles *pratensis* and is easily confused with it. In order to establish distinguishing characters we have bred the two insects through their various life stages. Both species have five nymphal instars and can



easily be separated by certain characters which we hope to explain later. I noted with much interest the remarks on oviposition habits of *pratensis*, and I would also add that we have obtained the eggs of this species from ripe strawberries, raspberries and blackberries, and for rearing the insect during its various nymphal stages we have found nothing more satisfactory than the berries of these different fruits.

Victor E. Shelford, University of Chicago: *The Ontogeny of Elytral Pigmentation in Cicindela*.

The pigment develops in the form of a faint pattern, somewhat variable but with certain lighter areas occurring in the same general position in several species. These lighter areas lie between the tracheæ and in certain transverse bands: their positions correspond to those of certain white markings of Ethiopian and Oriental species.

Discussion: Miss Annette Braun—The question was raised as to whether the position of the dark transverse bands on the elytra of *Cicindela* is determined by structural characters of the elytra, citing work on the ontogeny of wing pattern in certain moths where the position of the tip of the veins decides the position of markings, the tip of the vein remaining unpigmented.

V. E. Shelford. The dark cross bands which separate the spots are not correlated with any known elytral structures. There is no evidence of metamerism in the wing. The pigment develops throughout the elytron, the base does not appear oldest.

N. L. Partridge, University of Illinois: *The Tracheation of the Pupal Wings of some Saturnians*.

A method of preparing permanent mounts of lepidopterous pupal wings was described. The pupal wings were removed in the customary manner and the specimens secured, floated upon clean water to straighten the wings and remove any dirt which might adhere to them. Then they were placed on a clean, untreated, glass slide, smoothed, and allowed to dry, without further treatment. The result was a transparent mount showing all the tracheoles as well as the tracheæ. Some of these mounts were used as lantern slides giving clear images on the screen.

It was shown that a greater amount of variation was found in the pupal wings than in the adult wings. The homologies between the tracheæ and veins of the specimens shown was indicated.

L. B. Walton, Kenyon College: *Studies on the Mouth-parts of Rhyparobia maderiæ (Blattidæ) with a consideration of the Homologies existing between the Appendages of the Hexapoda*.

The question as to the homologies existing among the paired appendages of the Hexapoda has received attention from various investigators,



and in particular from Hansen, Heymons, Börner, Verhoeff, and Escherich, none of whom however have progressed far toward a satisfactory solution of the problem. In general it has been accepted that the stipes and mentum correspond to the thoracic and abdominal coxæ while the maxillary and labial palpi were equivalent to the trochanter, femur, etc., or the functional leg.

Studies on *Rhyparobia maderiæ* the "giant cockroach" from Panama, particularly of 10 mm. and 12 mm. embryos, as well as other investigations in connection with the appendages of the Thysanura, make it evident that the typical appendage (mouth-parts, thoracic, abdominal, caudal) of the Hexapoda consists of seven definite areas best represented by the maxillæ with the galea, lacina, ectostipe,<sup>1</sup> endostipe, ectocardo, endocardo, and palpus. Furthermore the palpus should be homologized with the stylus of the thoracic and abdominal coxæ and not with the functional leg, inasmuch as both palpus and stylus are appendages of homodynamous areas (ectostipe, ectomentum, meron) while the leg is an appendage of the area (endocoxa) corresponding to the endostipes.

The facts noted suggest the origin of the biramous appendage of the Hexapoda directly from the parapodium of the Polychaeta, the notopodium and neuropodium arising in connection with the dorsal and ventral bundles of setæ and corresponding to the outer (ectal) and inner (endal) groups of sclerites as outlined above. It would thus appear that the Arthropoda are a polyphyletic group, and that the relationship between the appendages of the Hexapoda and Crustacea is a more remote one than generally accepted in connection with the studies of Hansen and Börner.

The historical development of the problem as well as the presentation of the facts which would seem to establish the views here advanced, will appear in the completed paper of which this is a partial summary.

Discussion: W. A. Riley—I have been especially interested to learn that Dr. Walton is swinging away from his earlier belief in the double nature of the insect segment. It has seemed to me that embryological data afforded no evidence in support of the theory though there are indications of the biramous nature of the appendages. The theory of the origin of the insect appendages from the pleuropodes receives much additional support from the work here presented.

The President announced the following committees:

Committee on Resolutions—S. J. Hunter, W. A. Riley, and L. B. Walton.

Committee on Nominations—Herbert Osborn, R. A. Cooley, and Cornelius Betten.

Auditing Committee—P. J. Parrot, A. F. Burgess, and W. E. Britton.

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1. The prefixes "ecto" and "endo" have been utilized in an attempt to establish a better nomenclature while minor changes have been made in the terminology of older parts, e. g. "ectostipes" is a more cumbersome term than "ectostipe."



The Society then adjourned to meet at 2:00 p. m. when the following business was transacted and papers read:

The Committee appointed to draft resolutions on the death of Dr. John Behrnhardt Smith presented their report. It was ordered accepted and printed.

*James Zetek, Sanitary Commission Canal Zone: Determining the Flight of Mosquitoes.* Read by Title.

*William A. Riley, Cornell University: Some Sources of Laboratory Material for Work on the Relation of Insects to Disease.*

The demand for at least elementary courses on the relation of insects to disease brings up the question as to available laboratory material. There is comparatively little difficulty in obtaining the parasitic mites, ticks, lice, house-flies, mosquitoes and fleas in their various stages, but it is usually assumed that most of the pathogenic Protozoa are tropical species and that nothing can be substituted for them in laboratory work. As a matter of fact, a number of insect-borne Protozoa and worms occur in this country and together with other blood parasites whose life-history is less better known, are available for laboratory work. The species discussed were *Trypanosoma lewisi* a widely distributed parasite of brown rats; *Trypanosoma rotatorium* from the frog; the related *Corithidia* from the "sheep tick"; *Herpetomonas* from the house-fly; *Monocystis* from the seminal vesicles of the earth worm as introductory to the study of the Hæmosporidia; *Lankesterella ranarum* *Haemogregarina* sp.; *Proteosoma*, *Halteridium*, *Babesia hilaria* in the blood of the crow and English sparrow, and *Dipylidium caninum*, the double-spored tape worm of dogs, cats, and man.

Discussion: F. L. Washburn—It was asked whether Dr. Riley had ever found acridids killed by the presence of an excessive number of gregarines. Being answered in the negative, it was stated that a party in western Oregon had recently written him of the occurrence of large swarms of locusts in the Willamette valley which did not lay eggs, but perished in large numbers and a microscopical examination disclosed a very large number of gregarines in each insect and the reproductive glands entirely disintegrated.

*Y. H. Tsou and S. B. Fracker, University of Illinois: The Homology of the Body Setæ of Lepidopterous Larvæ.*

This paper consisted (1) of a statement of the difficulties involved in homologizing the body setæ of these larvæ, (2) of a consideration of the serial homology of the setæ of the different segments and (3) of the specific homology in the larger groups. Greek letters were employed to designate the setæ in order to obviate the confusion which has arisen from the use of numbers in different ways by different authors. The



prothorax of *Hepialus* was shown to represent the primitive arrangement of setæ and was used as a type for determining the homology of the setæ on the different segments. The authors had studied many species and gave figures of four: *Hepialus lectus* and *H. humuli* of the Jugatæ, *Pseudanaphora arcanella* of the Tineidæ and *Mamestra picta* of the Noctuidæ. Each of these was compared with the type, segment for segment. This is the first time the setæ of the prothorax have been homologized with those of the other segments.

Discussion: W. A. Riley—I wish to speak in appreciation of the important work which Mr. Tsou and Mr. Fracker have reported upon—work which is especially difficult to present in a non-technical manner. It is quite customary to ridicule work upon such a subject as the “hair of a caterpillar” and even some entomologists are inclined to question the possibility of homologizing such structures. Yet, as Professor Comstock sometimes says, “We read that the very hairs of our head are numbered, and in the case of lepidopterous larvæ this may be literally true”. That certain hairs or groups of hairs may be persistent and may be homologized throughout a wide series of forms, is due to the fact that they possess important sensory functions. Pioneer work in this country on the homologizing of setæ was done by Dyer, and the late C. B. Simpson extended this by an important study which is deposited as a thesis in the Cornell University library. It is gratifying to see the work continued under Dr. MacGillivray who is best qualified to supervise it.

*Anna H. Morgan, Mt. Holyoke College: Eggs and Egg-laying of May-flies.*

This study of May-fly eggs was made to determine the relative fecundity of different species. This led to the study of a series of elaborate sculpturings found upon the chorion. In several species the chorion bears long thread like extensions which terminate in viscid spheres or disks. These seem to help buoy up the eggs. Threads two and three inches long were found. In nature these threads are probably entangled in sticks and vegetation and this prevents the eggs from being covered by silt. In the ovaries of half grown nymphs these structures are well defined and are of aid in connecting up the life histories where rearing is impossible.

Discussion: Philip P. Calvert—It was remarked that Miss Morgan's statements that *Heptagenia interpunctella* and *H. pulchella* closely resembled each other as adults and lived in the same situation as larvæ and eggs might seem to indicate an exception to Jordan's law that the nearest related species are



always separated from each other by some kind of a barrier, but in view of the great differences in the eggs of the two species, it might be doubtful whether these two species are really so closely related. It is therefore evidently necessary to know all the stages of two species before one can pronounce on their relationships and whether they do or do not contradict the law mentioned.

*Herbert Osborn, Ohio State University: Notes on Cicadidæ with Especial Reference to the Ohio Species.*

Cicadas constitute a conspicuous element in an Insect fauna and their relation to varied forest conditions was discussed especially for the species occurring in Ohio. The origin and function of the tympanal organs present problems for study and the suggestion is made that this structure is primarily a secondary sexual character functioning in sexual excitation and only incidentally a sound producing organ.

*Frank E. Lutz, American Museum Natural History: On the Biology of Drosophila ampelophila.*

This insect is remarkably useful in laboratory work since it can be kept going throughout the year on bananas as food and its short life-cycle (about ten days to two weeks) enables one to get a large number of generations. Sexual difference characterizes the insect. Not only do the sexes differ in adult color and structure but they differ in the duration of the immature stages, in their reactions to light and the age at death.

*E. P. Felt, State Entomologist, New York: Observations on the Biology of a Blow Fly and a Flesh Fly.*

A study of *Phormia regina* Meign. and *Sarcophaga georgina* Wied. was undertaken primarily for the purpose of obtaining data which could be used as a basis for estimating the period a human body had lain exposed to the elements in midsummer. Our knowledge of these two species is summarized and original data are given of the habits and duration of the various stages under known climatic conditions. The egg of *Phormia* and the three larval stages and puparium of both species are described and a bibliography of each appended.

The Society adjourned at 4:30 p. m., to meet Wednesday, January 1st, at 10:00 a. m.

The annual business meeting of the Society was held upon reconvening and the following reports presented:

The Secretary presented the following report for the Executive Committee, which met at the Hotel Euclid, Tuesday evening, December 31.



## REPORT OF THE EXECUTIVE COMMITTEE.

Your Secretary asks the privilege of departing from the custom of former secretaries in reporting the various matters that have been submitted to the Executive Committee in the interim between meetings. The secretary feels that all these matters should be reported at the annual meeting of the Executive Committee and put on record in the proceedings of the Society.

The following matters were considered during the year 1912:

1. The revision of By-Law No. 9 as reported in the *Annals*, Vol. V, p. 83.

2. The appointment of Professor Herbert Osborn, the retiring President, as the second councilor of the Society to the American Association for the Advancement of Science.

3. The following were named as delegates to the second International Congress of Entomologists, held at Oxford, England, August 5-10, 1912:

Professor J. H. Comstock, Dr. Henry Skinner, Dr. W. J. Holland, Professor V. L. Kellogg, Dr. Philip P. Calvert, Dr. L. O. Howard, Dr. W. M. Wheeler, Professor Herbert Osborn, Professor S. A. Forbes, and Professor J. G. Needham.

4. The appointment of a committee of three to draft resolutions inviting the International Congress of Entomology to hold its next meeting, 1915, in America. The following were named: Professor S. A. Forbes, Chairman; Dr. Henry Skinner, and Professor J. H. Comstock. The success attending the efforts of this committee are reported in another place.

5. That there be printed at the head of the list of papers on the program for each annual meeting the following statement: Each paper will be limited to fifteen minutes, second titles will be placed at the end of the program and read in the order listed.

Upon an invitation from the Academy of Natural Sciences of Philadelphia, the President named the following as delegates to the celebration of the centenary anniversary of the academy: Professor John B. Smith, Dr. L. O. Howard, Dr. E. P. Felt, Dr. W. E. Britton, and Dr. W. M. Wheeler.

The following twenty-seven new members were elected by the Executive Committee, June 1, 1912:

J. Lyonel King.	H. R. Niswonger.	James McDunnough.
H. M. Parshly.	C. L. Metcalf.	Miss E. D. Faville.
M. M. High.	Prof. O. W. Oestlund.	N. L. Partridge.
E. H. Strickland.	P. W. Mason.	Col. T. L. Casey.
A. C. Burrill.	J. C. Faure.	S. C. Bishop.
J. H. Paine.	Harold Morrison.	D. L. Crawford.
D. C. Mote.	E. M. Schalck.	E. C. Cotton.
Prof. T. D. Jarvis.	R. A. Grizzell.	A. W. Baker.
Lawson Caesar.	Prof. R. W. Hegner.	A. B. Johnson.

The following have died during the year:

Dr. John B. Smith.	Prof. G. W. Taylor.
Prof. T. H. Montgomery, Jr.	E. L. Jenne.



The following resignations were presented, accepted by the Executive Committee, and the membership terminated:

Prof. C. E. Johnson.	E. J. Kraus.	H. G. Smith.
E. D. Keith.	Prof. F. H. Shoemaker.	E. S. Tucker.
G. Chagnon.		

A list of twenty names of persons who had been dropped for the non-payment of dues for two years or within one year of election to membership, was presented and adopted. This is in accordance with Sections 7 and 8 of the By-Laws.

The following twenty-four names were proposed for membership and elected by the Executive Committee at its meeting last evening:

C. J. Drake.	C. Carter.	H. Fox.
W. J. Phillips.	W. E. Snyder.	D. Milton Brumfiel.
A. G. Vestal.	C. E. Hood.	J. J. Culver.
M. M. Wells.	Margaret Washington.	C. H. Baldwin.
C. W. Creel.	F. W. L. Sladen.	P. S. Welch.
C. W. Long.	W. A. Ross.	E. M. R. Lamkey.
R. W. Leiby.	E. H. Gibson.	R. H. Wilson.
O. C. Bartlett.	C. R. Neillie.	W. J. Kostir.

The membership of the society as given in the last volume of the *Annals* contains two honorary fellows, 33 fellows, and 356 members, or a total of 391. There is reported above the death of one fellow and three members, the resignation of seven members, and the dropping of 20 others, which reduces the roll to 359. To this number should be added the 27 members elected in June and the 24 elected at this meeting, which makes the present total membership of the society 410.

#### TREASURER'S REPORT.

Cash on deposit in the First National Bank of Champaign, Illinois, December 19, 1911.....	\$ 696.60
Life Membership Fees deposited in Rothschild Bros. Savings Bank of Ithaca, New York, with interest at 4% to May 3, 1912.....	107.85
Cash received from Herbert Osborn, Managing Editor of the <i>Annals</i> ...	428.35
Cash collected as dues.....	812.56
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	\$2,045.36
Bills Paid.....	\$1,904.49
Life Membership Fees deposited in the Citizens Savings and Trust Co., of Cleveland, Ohio.....	100.00
Cash on deposit in the First National Bank of Champaign, Illinois, December 9, 1912.....	40.87
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	\$2,045.36

If the cash balance for 1912 is compared with that of 1911, it might seem that the financial condition of the society was not very good. The financial conditions on the contrary are the best for any year of which your treasurer has made any study of the accounts. He has paid for six numbers of the *Annals* in addition to handling the expense of mailing certificates of membership. Certificates have been sent to all persons included on the membership roll of the society and if there are any who have not received a certificate, the secretary should be notified. The net expense of issuing the six above mentioned numbers of the *Annals* alone was \$1731.93. The only outstanding account is for the December *Annals*, which had not been issued when the Treasurer's accounts were closed.



The Executive Committee appointed the Secretary-Treasurer and Professor J. H. Comstock at the Washington meeting a committee to deposit the fees of life members in a bank that they should consider safe at a good rate of interest. After considerable correspondence the Citizens Savings and Trust Company of Cleveland, Ohio, was selected and the funds deposited there May 3, 1912, where they will draw four per cent interest.

The following amendment to the Constitution submitted at the Boston meeting and voted upon at the Washington meeting was referred back to the Executive Committee by the latter meeting for further consideration:

Article IV. Section 3. The President shall represent the Society upon the Council of the American Association for the Advancement of Science until such time as the Society shall be qualified for representation by two councillors, in which case the second councillor shall be elected from the fellows by the Executive Committee.

To be amended to read:

Section 3. Councillors to the American Association. The President and the preceding Past-President shall represent the Society upon the Council of the American Association for the Advancement of Science.

The Executive Committee would recommend the following amendment:

Section 5. Councillors to the American Association: The President and the preceding Past-President shall represent the Society upon the council of the American Association of the Advancement of Science. In case of the death or resignation of either or both councillors, the vacancy shall be filled by the Executive Committee.

The Executive Committee took the following action: It was moved that the President and the preceding Past-President should represent the Society upon the Council of the American Association for the Advancement of Science during the year 1913.

Mr. Edward P. VanDuzee, Librarian of the Grosvenor Public Library, Buffalo, New York, who has made a special study of the Hemiptera, was by a unanimous vote of the Executive Committee elected a fellow of the society.

The following amendments and additions to the constitution are recommended:

Article V. Section 3. Election of Officers—All officers shall be elected by ballot at the annual meeting for the term of one year and shall be eligible for re-election. Their term of office shall commence with the first of June following their election.

To be amended to read as follows:

Article V. Section 3. Election of Officers—All officers shall be elected by ballot at the annual meeting for the term of one year and shall be eligible for re-election.

The following additional article to the Constitution, dealing with the publication and management of the Annals, to be number VII and the present article of that number, to be numbered VIII:



## ARTICLE VII.

SECTION 1. Publication—The official publication of the Society shall be known as the *Annals of the Entomological Society of America*. Each volume shall consist of four quarterly fascicles and the first fascicle of each volume shall contain the proceedings of the annual meeting.

SEC. 2. Editorial Board—The publication shall be under the charge of an Editorial Board consisting of ten members, one of whom shall be Managing Editor. The Managing Editor and his associates shall be responsible for the selection of the material to be published.

SEC. 3. Election of Editorial Board—The members of the Editorial Board shall be elected by the Executive Committee. Each member of this board, except the Managing Editor, shall serve for three years or until his successor has been elected, three members retiring annually.

SEC. 4. Report Managing Editor—The Managing Editor shall present a report at each annual meeting to the Executive Committee and the accounts of his office shall be reported upon by the Auditing Committee.

The Executive Committee took the following action regarding the mailing of the *Annals*, this action is to be printed on page three of the cover of each number of the magazine:

The Managing Editor is provided with the most recent address of all members on record in the Secretary's office for mailing the numbers of the *Annals* and hereafter members complaining of the non-receipt of numbers must present their complaint to the Secretary within four months from the date of the mailing of the issue. After that time the numbers will be furnished only at the regular published rate.

The Secretary reported the receipt from Jas. A. Barr, Manager of Conventions for the Panama-Pacific Universal Exposition of an embossed invitation issued by the president and directors of the Exposition, inviting the society to hold its meeting for 1915 on the Pacific coast. This meeting is to be held either in the Auditorium provided by the Exposition and located about half a mile from the Exposition entrance or at the University of California or at Stanford University. The Executive Committee offers the following recommendation: That the Executive Committee recommend to the Society that a special committee of five be appointed, to include two Pacific coast members, to consider and report at the next annual meeting concerning the desirability of holding a meeting in San Francisco in the summer of 1915.

On motion, the report of the Executive Committee was adopted.

The President named the following committee to consider the desirability of holding a meeting in San Francisco in 1915: E. P. Felt, New York State Entomologist, Albany, N. Y., Chairman; Vernon L. Kellogg, Stanford University, California; A. J. Cook, Horticultural Commission, Sacramento, California; W. M. Wheeler, Harvard University, Cambridge, Mass.; T. D. A. Cockerell, University of Colorado, Boulder, Colorado.

The committee appointed to draft resolutions on the death of Dr. Thomas Harison Montgomery, Jr., presented their report. It was ordered accepted and printed.



The following reports were presented:

REPORT OF THE MANAGING EDITOR OF THE ANNALS.

The report upon the progress of the Annals for the year 1912 might follow very closely the statement for the year previous but I feel that we are warranted in counting the past year as one of even more solid growth and that we may look with still greater confidence to future improvement.

In the matter of financial support there has been a distinct gain and the receipts of the editor which show a total of \$551.53 of which \$193.40 were for subscriptions, \$176.55 for back volumes sold and \$181.58 for reprints, etc., from authors indicates what may be expected as practically permanent revenue though we may not be equally successful every year in sale of back volumes.

The editor's expenses have been \$63.05 for engravings, \$35.20 for labor and stenographic service, \$24.93 for express and postage, and \$428.35 has been turned over to the treasurer.

In this connection it may be mentioned that a little effort by members in helping to place sets of the back volumes in libraries not yet supplied will assist materially in increasing income and giving support to enlargement and improvement. I am sure that such effort was helpful in the past year.

While we have not published quite as many pages of matter as for 1911 the volume will reach over 450 pages and includes a very creditable series of papers. The editor has in hand matter enough to practically fill a good March number and other desirable papers in sight. This with the prospect of a somewhat larger fund to devote to printing the coming year assures us I believe an excellent volume for 1913.

The Managing Editor desires to take this opportunity to express his gratitude for the many important aids rendered by the members of the Editorial Board in securing desirable contributions. He is especially indebted to Professors Folsom and MacGillivray for assistance in the issuing of the September number.

He appreciates particularly the cordial and hearty cooperation which has marked the relation of the members of the society to this enterprise.

Respectfully submitted,

HERBERT OSBORN,  
*Managing Editor.*

REPORT OF THE AUDITING COMMITTEE.

We, the undersigned, have this day examined the accounts of Alexander D. MacGillivray, Treasurer and Secretary of the Entomological Society of America for the year ending December 10, 1912, compared the vouchers therewith and found the same correct and properly cast.

Signed

P. J. PARROTT,  
A. F. BURGESS,  
W. E. BRITTON.



## REPORT OF THE COMMITTEE ON NOMENCLATURE.

Your Committee on Nomenclature has to report that no questions have been submitted to it for consideration during the past year.

The discussion of the idea of *nomina conservanda* has been much in evidence of late, and the members of the committee have very decided personal opinions upon that subject. They realize, however, that any expression of their opinion as a committee would have no more weight than the sum total of their individual views, and therefore do not present any recommendation on the subject. Attention should be called to the point, however, that in the numerous lists of workers published, who have expressed themselves on the subject, many are morphologists only secondarily interested in questions of nomenclature, and rarely doing anything themselves in this subject. It would seem that the opinions of this class should hardly be given equal weight with those offered by persons constantly engaged in systematic work and who are therefore much more familiar with the difficulties constantly presenting themselves under either method.

It may also be appropriate here to call attention to earlier proposals nearly forty years ago, for the establishment of *nomina conservanda* which were favorably received at first, and to some extent adopted for a few years, but generally abandoned after a time. (Rules of Nomenclature as authorized to be published by the Entomological Club, A. A. A. S., July, 1877).

Your committee is inclined to regard the International Code as the one to accept in all cases, representing as it appears to, the formulated opinions of the largest body of scientific zoological workers in the world, and therefore presenting the largest number of supporters, to serve as a nucleus around which scientific opinion at large should concentrate and crystallize. They regret, however, that recent interpretations of the code seem to imply that a generic name accompanied by more or less of a description, but without reference either by name, figure, description or otherwise to any described and named species of animal, should be held as valid. They do not feel that this is any real use of a binomial nomenclature, and would welcome a ruling that any generic name to be applicable to any animal must be published in connection with some described or otherwise clearly indicated species, and that all generic names not so published should be regarded as *nomina nuda*.

Signed,

H. T. FERNALD,  
E. P. FELT,  
T. D. A. COCKERELL.

The report of the Committee on Nomenclature was accepted and ordered printed.

The following motion presented by Philip P. Calvert and seconded by F. L. Washburn was presented:

Moved that it is the sense of this meeting of the Entomological Society of America that the use of the International Code



of Nomenclature be recommended for the use of Entomologists generally. Carried.

The following report, of the delegates to the International Congress, in attendance at the Cleveland meeting, was presented:

REPORT OF DELEGATES TO THE INTERNATIONAL CONGRESS  
OF ENTOMOLOGY, AT OXFORD, ENGLAND.

While no official report has been called for from the delegates of the Society, and while from the fact that the delegate representation was not provided for at the Congress, such report may be unnecessary, it seems that some statement as to the work accomplished and scope of the Congress may be in order.

The delegates can all report a very enjoyable occasion with delightful opportunities for acquaintance with Entomologists from various countries who were at the Second International Congress. They can also report with much appreciation the advantages of the place of meeting, and the enthusiasm with which the Congress was entertained by the local Entomologists.

In the various sectional meetings there were presented a large number of creditable papers and these provoked profitable discussions. The sections in Taxonomy and Economic Entomology were particularly well attended and successful. The questions upon nomenclature introduced by the resolution from the Entomological Society of London, were the subject of much discussion, and resulted in the provision for an international committee to consider the particulars of nomenclature. The details for this arrangement will doubtless in time come to the Society with a request for the designation of a member of the Society to serve on such committee.

The constitution of the Congress appears to your delegates to be faulty in that it does not provide delegate representation from the different countries or from National Societies, and until such provision is made it appears to us that the results of action in the Congress must fail to secure any general acceptance.

The Congress, as at present constituted, is composed simply of members who may pay the fee, and such membership is open to all persons whether entomologists or not, so it follows that any individual subscribing the membership fee has just as much weight in voting as a delegate or representative from a country, representing hundreds of society members. Further, the constitution of the Executive Committee, which seems not to be subject to election by the Congress at large, as well as the election of officers and decision as to place of meeting, are entirely in the hands of the Executive Committee of four members.

While the arrangement for the committee on nomenclature may prove successful, there are certainly many other questions of international importance, which should be considered by such a Congress, and we believe that it should be urged upon the Executive Committee



that some provision be made for delegate representation from different countries, and from different Entomological Societies, and that a definite constitution be prepared and submitted to Entomological Societies of different countries, with carefully prepared plans for the election of officers, the formation of the Executive Committee and other details of organization not yet provided for.

As delegates we wish to emphasize the value of the social features of the Congress, and to express the belief that such meetings will be of great ultimate advantage to entomological science in bringing together the entomological workers of different countries. We wish also to express our appreciation of the cordiality of the local representatives.

In accordance with directions from the Society we presented the invitation to the Congress to meet in America for its next session, but the question of place of meeting, had evidently been determined by the Executive Committee, and while our presentation of the case was listened to, there was evidently no chance to secure a favorable decision for the next Congress. We were assured, however, that the Congress would hope to meet in America in the near future, and it seemed well understood that an invitation to meet in America in 1918, would receive cordial response and favorable action.

The next Congress is to be held in Vienna in 1915, under the presidency of Dr. Handlirsch.

Signed                      HERBERT OSBORN,      STEPHEN A. FORBES,  
                                    PHILIP P. CALVERT,      L. O. HOWARD.

#### REPORT OF COMMITTEE ON NOMINATIONS.

Your committee begs leave to report the following names as nominees for the respective offices for 1913:

#### OFFICERS.

President: C. J. S. Bethune, Ontario Agricultural College, Guelph, Ontario.  
First Vice-President: Philip P. Calvert, University of Pennsylvania, Philadelphia, Pennsylvania.

Second Vice-President: William M. Marshall, University of Wisconsin, Madison, Wisconsin.

Secretary-Treasurer: Alexander D. MacGillivray, University of Illinois, Urbana, Illinois.

#### ADDITIONAL MEMBERS OF EXECUTIVE COMMITTEE.

Herbert Osborn, Ohio State University, Columbus, Ohio.

C. P. Gillette, Colorado Agricultural Experiment Station, Fort Collins, Colorado.

Vernon L. Kellogg, Leland Stanford Jr. University, Stanford University, California.

James G. Needham, Cornell University, Ithaca, New York.

C. T. Brues, Harvard University, Cambridge, Massachusetts.

Nathan Banks, United States National Museum, Washington, D. C.

#### MEMBER OF COMMITTEE ON NOMENCLATURE.

E. P. Felt, New York State Entomologist, Albany, New York.

(Signed)                      HERBERT OSBORN,  
                                    R. A. COOLEY,  
                                    CORNELIUS BETTEN.



On motion, the secretary was instructed to cast a single ballot for the officers named. They were declared elected.

REPORT OF THE COMMITTEE ON RESOLUTIONS.

*Resolved*, That we express to the authorities of the Western Reserve University and of the Normal School our deep appreciation of the courtesies extended this society;

*Resolved*, That the thanks of this Society be extended to Mr. E. H. Edwards for his generous assistance in arranging rooms for our use at the Normal School as well as his personal help toward the success of this meeting;

*Resolved*, That we commend the Editorial Management of the Annals of this Society and hereby recognize the value of Professor Osborn's painstaking work in furthering the interests of this publication.

Signed           S. J. HUNTER,  
                    W. A. RILEY,  
                    L. B. WALTON.

On motion the report was adopted.

Upon the recommendation of the Committee on Resolutions of and by action of the Society at the Washington meeting, the following committee on types was appointed. Their report follows:

REPORT OF THE COMMITTEE ON ENTOMOLOGICAL TYPES.

Your Committee, appointed to report on Entomological Types, submits the following:

**Location of Types.** According to reports kindly furnished by the Directors or Curators, some of the larger museums of this country contain types as follows:

U. S. National Museum. About 16,000.

Museum of Comparative Zoology. Over 10,000.

Philadelphia Academy and American Entomological Society. About 7,100.

Dr. Skinner states that this includes only holotypes and lectotypes. It is believed that the combined Philadelphia collections probably contain 35,000 "types", counting all the cotypical, paratypical and typical specimens.

Carnegie Museum, including Dr. Holland's collection (on deposit). About 4,000.

The number owned by the Boston Society of Natural History (several hundreds, at least), American Museum of Natural History and Museum of the Brooklyn Institute cannot be given at the present moment, but will be ascertained later. A list of the types of insects, other than Lepidoptera and Formicoidea, in the American Museum has just been published (Bull. Amer. Mus. Nat. Hist. XXXI, pp. 353-379). The Milwaukee Public Museum has 71 types. Doubtless the British Museum has more insect types than any other museum in



the world, but there is no catalogue and the number is not known, even approximately. The New York State Museum at Albany possesses a large number of types under the care of the State Entomologist. A catalogue was published in N. Y. Museum Bulletin 141 (1909) pp. 119-122, but Dr. Felt informs me that probably about 700 Cecidomyiidae are to be added. Stanford University has about 500 types, the majority Mallophaga.\*

There are some very large private collections, such as those of Dr. William Barnes at Decatur, Illinois, (890 types), Dr. Nathan Banks at East Falls Church, Va., (about 1500 types and about 300 cotypes or paratypes) and Col. Thos. L. Casey. In the above estimates cotypes or paratypes are in nearly every case reckoned as types.

**Opinions on the Location of Types.** We have sought to ascertain the opinions of representative entomologists regarding the location of types, and cite the following as examples:

"We believe that privately owned types should eventually go to some good museum."—H. Skinner.

"I consider it unwise to make any suggestion as to restricting types to certain institutions."—S. Henshaw.

"I believe that it should be the policy of authors to place their types where they will be cared for in the future."—W. J. Holland. (See also *The Conservation of Types*, First International Entomological Congress, p. 366, where six museums are named as the only ones in the United States to which types should be consigned).

"I do not believe that types should remain permanently in private collections."—W. M. Wheeler.

"I do not see how any fixed rules regarding the distribution of types can be made, nor can we prohibit them from being private property. With many a zoologist his collection and books are his only assets, and while he is working they are probably doing as much good in his own collection as in a public museum. When I am through with my collection I want it to go into the hands of a dipterist."—C. W. Johnson.

"It would be of course a very good thing to have the types in a limited number of public institutions, or still better in one only, but I am afraid this ideal condition will never be reached. In regard to a privately owned type, I am of the opinion that as soon as a new species is described the type becomes public property, and the author, if he keeps it in his own collection, should take great pains to keep the type safe and in good condition, and provide sooner or later for a resting place in a public institution."—Chas. Schaeffer.

"Personally I am inclined to the view, that types ought to be restricted to as few institutions as possible. As to the number of these, or how they should be selected, I have no opinion."—S. Graenicher.

"We deposit all particularly perishable types (such as pinned insects) in the U. S. National Museum."—A. G. Ruthven, Head Curator, University of Michigan Museum.

\* Since the report was read, the University of Kansas has reported the possession of 897 types and 36 cotypes, etc. The University of Kansas does not loan types.



"It seems to me that the committee ought to strongly urge the designation of only one specimen as type, and that all such types should be put in institutions easy of access, having fire-proof buildings and careful curators."—F. E. Lutz, American Museum of Natural History.

"I think that insect types ought to be especially available to the men most active in working with the groups represented by them. If these men are in or near the greater museums, then the types should be in these museums. My belief is that the types should be where they can be and will be most effectively used."—V. L. Kellogg.

"Respecting types in general, I believe that they should be most carefully cherished and available for study by any competent party. The ideal arrangement would be to deposit all such types at some central point, for example, the National Museum, but as matters are now I fear this is impractical. Even were I personally willing to deposit all my types in the National Museum, I do not believe that the parties responsible for the integrity of the Museum and its collections would for a moment consider such a proposition. In any event, I should not care to part with types until certain that my studies in the group were completed. You can readily understand that in many cases it would be extremely difficult to fix any such date. It seems to me very desirable to segregate, so far as practical, the types of any one group; for example, the type of a single species of Coleoptera might much better be deposited in a large collection where there are numerous types of allied forms, than retained in some other collection possibly equally extensive, with practically no other type material in that order. My reason for suggesting this is that it is so easy by scattering types in widely separated groups for them to be lost unless they are in some collection known to be valuable because of the large amount of such material it may contain. It should at least be possible to deposit co-types with workers in special groups or in our larger collections, for example, those of the National Museum."—E. P. Felt.

"In general I do not approve of types being held by private individuals where the collection is not properly looked after and liable to destruction at any time (*vide* the French collection, which is now *totally* destroyed by Dermestes, types and all). Of course in Dr. Barnes' case it is different. His collection has assumed museum proportions just as the Walsingham collection in England."—J. McDunnough.

**Location of Types in the Collections.** In nearly all collections, so far as we have ascertained, the types are placed in the systematic series. At the British Museum certain special collections, as the Banks collection (types of Fabricius) and the Wollaston collection (Coleoptera from the Atlantic Islands) are kept separate; while other types are in the accession drawers or in special cabinets, awaiting the rearrangement of the groups to which they belong. At the Museum of the University of Michigan all types (including cotypes and paratypes) are kept together in a fire-proof case on the first floor of the building. They are, however, not very numerous. At the Carnegie Museum the Ulke collection of Coleoptera remains in the boxes exactly as received from Mr. Ulke, and the Smith collection of Brazilian bees studied by Cockerell



is also still as received from that author. At the Museum of Comparative Zoology some recent accessions have not yet been placed in the series.

It is the nearly universal policy not to separate the types from the rest of the collection.

**Labelling of Types.** It is usual to label the types, and in no case is it the regular policy not to do so. In some of the older collections the types are not, or not all marked. In several instances the labelling of the types has been done by curators after the collections had passed out of the hands of the describers. This has of course been necessary, but it has not always been carefully done, and we know of cases, in large museums, where so-called types are either not of the same species, or from the same locality, as the specimens originally described under the name.

Red is the favorite color for type labels, but great diversity prevails. Some museums have different labels for types, cotypes, etc. A sheet of type-labels is appended for inspection at the meeting. The U. S. National Museum has special red labels for slides and alcoholic specimens.

**Catalogues of Types.** Some institutions, as the American Museum of Natural History and the New York State Museum, have published partial or complete catalogues of their types. In many, such as the U. S. National Museum, a manuscript catalogue is kept, and each type receives a number. Some institutions have no catalogues; several report one in progress. At the British Museum the types are not catalogued, except in the published catalogues of the Museum, such as that of Sir G. F. Hampson, which will when complete cite all the types of moths.

**Loaning Types.** The following replies have been received in answer to our questions:

"It has never been legal for a type to leave the building, and the rule has been invariably enforced."—G. Meade-Waldo, British Museum.

"Recently the rule against the loaning of holotypes has been enforced. Cotypes or paratypes are loaned when we have the type or others of the same sort. If, however, the cotype or paratype is the only type specimen we have it is treated as a holotype, i. e., not loaned."—J. C. Crawford, U. S. National Museum.

"The American Entomological Society does not loan unique types." The Philadelphia Academy treats each case on its merits.—H. Skinner.

"All M. C. Z. rules are elastic, but we do not loan types except there is especial reason for so doing."—S. Henshaw, Museum of Comparative Zoology.

"The Society has loaned types; whether it will continue to do so is a question."—C. W. Johnson, Boston Society of Natural History.

"There is a rule against sending types out of the Museum, though the Director has loaned his private types."—Hugo Kahl, Carnegie Museum.

"It is against our rules to loan types."—C. Schaeffer, Museum of Brooklyn Institute.



"We do not make a practice of loaning type material."—E. P. Felt, New York State Museum.

"We do not loan holotypes. We do loan cotypes and paratypes."—V. L. Kellogg, Stanford University.

"We have a rule against loaning types. When, however, all the following conditions exist we do occasionally send them out. The borrower must be a trustworthy man who cannot conveniently get to New York. The specimens must be of such a character that they would not be likely to be injured in transportation, and there must be a series, all of which are designated "type" by the author. The latter seems to be a bad practice, but when there is such a series and the other conditions are met we have occasionally sent out one or two specimens."—F. E. Lutz, American Museum of Natural History.

"I think the question of loaning types is a delicate one. I believe in institutions loaning them to thoroughly accredited persons and under very stringent conditions."—W. M. Wheeler.

The Milwaukee Public Museum has no rules governing the loan of types.

**Fireproof Buildings.** Experience has shown that so-called fireproof buildings are sometimes destroyed by fire. Nevertheless, the following information is of value. The new National Museum "is absolutely fireproof, the only wood in construction being a skin floor on the top floor and wooden window casing on this same floor. The doors are of steel. The only thing that would burn is the exhibits, and, in the case of insects, we store them in steel cases, making it impossible for them to catch fire if anything exposed should burn." It should be said, however, that very large alcoholic collections are kept in the basement. At the British Museum the collections of fishes and reptiles (except the public exhibits) are in a separate building, on account of the danger from fire. It is hardly conceivable that a fire among the alcoholics in the basement of the U. S. Museum would effect the insects, which are on an upper floor.

The American Museum of Natural History "is as completely fireproof as it is possible to be made."

"The collections (of the New York State Museum) at the present time are not in a fireproof building, though we expect to move within a few months into a thoroughly modern fireproof structure."

"The Museum of the Brooklyn Institute is considered fireproof."

"The Carnegie Museum building is fireproof."

The Museum of Comparative Zoology building was considered fireproof when examined by insurance experts.

The Philadelphia Academy building "is built of brick, steel and concrete; the upright steel girders are covered with terra cotta and then cemented. The main rooms and floors are all separated by automatic fire doors. The floors are concrete with no wood."



## RECOMMENDATIONS.

**Location of Types.** It is necessary for the progress of entomology that specialists should frequently have in their possession collections containing many types, and experience shows that so long as these collections are in use the types are reasonably safe and well cared for. Ultimately, however, these types should find a place in some large public museum, where they will be preserved for the use of posterity. If entomologists are expected to make arrangements looking toward the placing of their types in public museums, they have the right to demand that these museums shall be made fully competent to take care of them. Not only must the buildings be practically fireproof, and the cabinets adequate, but there must be a staff large enough to take care of the specimens and keep them in order. Types should never be deposited where a continuous succession of competent curators (entomologists) cannot be depended upon.

**Location of Cotypes and Paratypes.** New species of insects are frequently described from considerable series of specimens, designated cotypes or paratypes. Authors would probably be glad to distribute some of these among the principal museums or collections, if convenient arrangements existed for doing so. Such distribution would greatly facilitate entomological work, and we suggest the desirability of considering whether some distributing center cannot be organized.

**Location of Types in Collections.** We believe that types are best kept in the systematic series, where they can readily be found and compared with their allies.

**Labelling of Types.** It is highly desirable that uniform labels should be used for types. Among those submitted for examination, the circular labels with colored margins, from the British Museum, seem to have a sufficient degree of distinctness to enable them to be readily seen, without the rather offensive conspicuousness of some other labels. There should, however, be a place for the type number.

**Cataloguing Types.** Every museum should catalogue its types, giving each a number. It is very desirable to publish the catalogue, with supplements from time to time. We also suggest that lists of the types received during the year would be useful additions to museum reports, and might well replace some of the worthless information which these usually contain.

**Loaning Types.** We are of the opinion that holotypes, or specimens designated as *the type* should under no circumstances be loaned; but cotype or paratype material should be loaned under proper restrictions.

**Permanent Committee.** We suggest that the type committee be made permanent, with changing membership, like the committee on nomenclature, and that its members be requested to examine and report on museums and collections as opportunity offers.

Signed

T. D. A. COCKERELL,  
L. O. HOWARD,  
HENRY SKINNER.



On motion, the report was ordered accepted and printed, and the committee continued for another year.

The following papers were then read:

*Edith M. Patch and William C. Woods, Maine Agricultural Experiment Station: A Study in Antennal Variation.* Read by title.

*Alex. D. MacGillivray, University of Illinois: Propharynx and Hypopharynx.*

The pharynx after entering the occipital foramen makes a distinct bend toward the mouth. In the region of the clypeus, it divides transversely, one-half passes to the clypeo-labral side, the other half to the labial side of the mouth, while folds extend along each lateral margin and unite with the mandibles and maxillæ. The name of propharynx is proposed for the portion lying adjacent to the clypeo-labral part of the mouth and hypopharynx is used for the portion lining the labial portion. The propharynx consists of three parts: frontal lobe, epipharynx, and fulcrum. The frontal lobe is usually wanting in sucking insects, the epipharynx is modified into a tongue or piercing organ and the fulcrum into a cuticular supporting plate. In the muscids the epipharynx and fulcrum are located outside of the mouth, the proximal end of the fulcrum is attached to the distal margin of the labrum. The hypopharynx also consists of these parts; lingua, superlingua, and pharyngeal sclerites.

*F. L. Washburn, State Entomologist, Minnesota: A few Experiments in Photographing Living Insects.*

*Thomas J. Headlee, New Jersey Agricultural Experiment Station: Some Facts Regarding the Influence of Temperature and Moisture changes on the Rate of Insect Metabolism.*

While connected with the Kansas State Experiment Station at Manhattan, the writer found by subjection of different groups of the Southern Grain Louse (*Toxoptera graminum* Rodani) to various constant temperatures under constant atmospheric moisture conditions and other groups to various constant percentages of relative humidity under constant temperature conditions: (1) that the rate of increase in metabolism for each 10°F. increase in temperature, starting at 58°F., decreases as the optimum temperature is approached, and that while the metabolism of degeneration becomes more rapid after the optimum is passed the rate of growth is retarded; (2) that a variation of from 60 to 62% in atmospheric moisture does not effect the rate of metabolism when the creatures have an abundant supply of succulent food.

Similar tests of the effect of temperature on the rate of metabolism in *Lysiphlebus tritici* Ashm, and of the effect of temperature and moisture on the rate of metabolism of the Chinch Bug (*Blissus leucopterus* Say) infected and uninfected by the chinch-bug fungus (*Sporotrichum globuliferum* Speg.) gave similar results.



J. T. Abbott, Washington University: *The Strigil in Corixidae and its Probable Function.* Read by Title.

Edna Mosher, University of Illinois: *The Anatomy of Some Lepidopterous Pupæ.* (Presented by Mr. Alvah Peterson).

Figures of pupæ of three species were shown and described. *Sthenopis thule*, *Archips argyrospila*, and *Lymantria leucostigma*. Figures of the pupal cases of each of these species were shown, also figures of the pupæ, with the cases dissected away so as to show the parts underneath. Considerable difficulty has been encountered in homologizing the pupal structures from the external appearance particularly in the case of the fixed parts of the head and the appendages of the head and thorax. The leg cases were shown to be a frequent source of error. Instead of showing externally only the cases for the tibiæ and tarsi, as Scudder claims is the case in the butterflies, certain forms show the femur cases and either the whole or part of the coxal cases in certain pairs of legs. What Packard calls the paraclypeal pieces, were shown in these forms to contain functionless mandibles which had their distal margins toothed in the case of *Lymantria*.

This detailed anatomical study is to be made the basis for a phylogenetic and taxonomic arrangement of the Lepidoptera based on an examination of the characters of the pupæ.

Charles K. Brain, Ohio State University: *Some Anatomical Studies of Stomoxys calcitrans Lin.* (Introduced by Professor Herbert Osborn). Printed in part in December Annals. Part II will appear in June Annals.

S. W. Bilasing, Ohio State University: *Observations on the Food of Spiders.* (Introduced by Professor Herbert Osborn)

Spiders are known to feed upon insects but exact records of kind and quantity of food for particular species are very meager. Extended observations and records were made during the summer and fall of 1912 and data from some of these are presented. As an example of the records given, grasshoppers constituted 39% of the food of *Miranda aurantia*, 59% of the food of *Agalena nævia* and 22% of the food of *Aranea trifolium* during the period under observation.

Herbert Osborn, Ohio State University: *Observations on Insects of a Lake Beach.*

The Insect fauna of the Cedar Point Beach of Lake Erie is discussed with reference to its derivation and adaptation for the conditions presented. The insect drift, the migrant and the resident members of the association are separated and records of species in each group given.

C. H. Tyler-Townsend, Government Entomologist of Peru: *The Species-Status and the Species-Concept.* Read by Title.

C. H. Tyler-Townsend, Government Entomologist of Peru: *A New Application of Taxonomic Principles.* Read by Title.



A smoker was held in a grill room of the Hotel Euclid after the annual public address, by a number of the entomologists in attendance at the meetings.

The annual public address of the Society was given on Wednesday evening, January 1st in the Auditorium of the Normal School by Dr. Philip P. Calvert, University of Pennsylvania.

The following exhibits were shown:

R. D. Glasgow, University of Illinois.—Apparatus for orienting insects under the microscope.

F. E. Lutz, American Museum Natural History.—Professor T. H. Morgan's mutants of *Drosophila ampelophila*.

Herbert Osborn, Ohio State University.—Some examples of Cicadidæ, especially the Ohio species of the genus *Cicada*.

N. L. Partridge, University of Illinois.—Pupal wings of *Attacus cecropia*.

Victor E. Shelford, University of Chicago.—Experimental modification of the colors and color patterns of *Cicindela*.

Alex. D. MacGillivray, University of Illinois.—The propharynx and hypopharynx of a cockroach, a locust, and a hornet.

F. L. Washburn, State Entomologist of Minnesota.—Snap shots of living insects in the field.

Anna H. Morgan, Mt. Holyoke College.—Drawings of the eggs of May-flies.

On motion, the Society adjourned to meet in one year with the American Association for the Advancement of Science at Atlanta, Georgia.

ALEX. D. MACGILLIVRAY,  
Secretary.





MacGillivray, Alexander Dyer. 1913. "Cleveland Meeting." *Annals of the Entomological Society of America* 6, 130–153.

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