"That the Secretary in calling for titles be authorized to request a fifteen-minute limit for papers, at the same time not necessarily limiting the length of important papers to that time; and that the time desired by each author be stated when submitting his title."

At the evening session the President called attention to the desire of the representatives of the American Association of Nurserymen to have a committee appointed to attend their annual convention at Milwaukee.

It was voted that a committee of three be appointed by the chair. The following members were selected,—Messrs. Forbes, Burgess and Symons.

Mr. Orlando Harrison, representing the above mentioned Association, thanked the Association of Economic Entomologists for the courtesies extended to the nurserymen during the meeting.

Immediately before adjournment Mr. W. D. Hunter presented the resolution which follows:

Resolved, That the thanks of the Association be extended to the President, Prof. H. A. Morgan, for the equanimity, for the genial good nature, and for the wisdom with which he presided over the meetings of the twentieth annual session.

This resolution was put before the meeting by Mr. Hunter and received unanimous approval.

President Morgan expressed his appreciation of the sentiments conveyed in the resolution, and with his usual unselfishness attempted to show that the Secretary was responsible for the success of the meeting.

There being no further business the meeting adjourned.

PART II

The annual address of the President was presented at the opening session of the meeting, Friday morning, as follows:

THE RELATION OF THE ECONOMIC ENTOMOLOGIST TO AGRICULTURE

By H. A. MORGAN, *Knoxville, Tenn.*

The discussions of the systematic, developmental, and purely economic aspects of the subject of Entomology that have been presented before this body from time to time have indicated in a conspicuous way the broad yet definite field of the economic entomologist. In the interest of the future work of the Association these general boundaries should be maintained, as it is difficult to predict just when or where even the most remote biologic investigation, discovery or observation

will thread its way into some definite economic problem, or when a commonly recognized condition will induce a purely scientific search for the unknown cause.

In selecting for discussion at this time the relation of the economic entomologist to agriculture, it is not my purpose to restrict the interpretation of this relation to that which prevailed nearly a quarter of a century ago, when this Association was instituted, but to point out that larger interpretation which the wave of interest in agricultural education and investigation justifies, and which will be realized unless misdirection from one cause or another shall materially affect the present tide. Agriculture is in need of the entomologist, and the entomologist has a fruitful field in agriculture.

In the United States the land-grant colleges, made possible by the Morrill Act, in 1862, sent out the first organized tracer after a lost agriculture. A study of the history of many of these colleges in the light of present agricultural conditions indicates that the men who were placed in charge of these initial institutions were oftentimes without an agricultural compass and, what is worse, were without the sympathy and support of the people for whom the effort was being made. Hence, there was much time lost in adjusting a modern movement to old-time conditions. Not until the Hatch Act was put into operation, and investigational work was set in motion, did the complex nature of agriculture begin to be apparent. Through independent efforts of pioneer entomologists in some of the states, entomology had already found a place in the agricultural schedule, and upon the organization of the state experiment stations, entomologists were placed on the staffs; or the subject had won sufficient recognition to be associated with departments of biology or horticulture, already a part of the colleges with which the stations were affiliated.

The relation of economic entomology to agriculture was recognized by the nation prior to 1887, and, while not specified in the Hatch Act, its real relation to a state's agriculture was no doubt a part of the general conception of the author of the bill which gave each state an institution for agricultural investigation.

Some of the colleges receiving the benefits of the Morrill Act were giving limited courses in entomology at the time the experiment stations were organized. In others the number of insect forms had given taxonomic value to the study of entomology in zoölogical courses; while in others the economic aspect of insects was incidentally emphasized by the horticulturist or agriculturist in connection with some orchard, garden, or field pest.

Are we not justified in concluding, then, that when the spirit of investigation became effective in agriculture, economic entomology re-

ceived its logical setting? This may be true of many other sciences entering into composite agriculture; yet the peculiar relation of entomology to agriculture is conspicuous. Were this not true, the rapid strides that have been made in associating the two would have been impossible.

You will agree with me that with economic entomology unsatisfactorily associated, its future imperfectly projected, and with meager means for the preparation of persons for the work, the pioneers of this science merit commendation not usually accorded them. It is true that many of the men who took positions as entomologists of experiment stations in the beginning were better prepared for many other lines of work, but the wealth of opportunity for observation and investigation, and their application of these to agricultural progress, could hardly be mistaken. Now and then errors of observation were made and recorded, some of which unfortunately have been perpetuated by quotation to this time. It was to be expected, too, that certain easy methods and successful lines should drift economic entomological thought and activity into definite directions and veil for a time the real value of biological as well as ecological investigations and their application to preventive and remedial relief. The biting and sucking mouth parts were for a time the only recognized parts of an insect's anatomy, and hellebore, Paris green, and coal oil emulsion the standard substances in insect warfare.

The conceptions of the scope of entomological research as related to agricultural development have gradually but surely been expanded, until now a worker in this field finds himself involved in problems of very much wider range than the superficial anatomy of a common insect enemy of a local crop, or the compounding of a standard insecticide. Insects are related to diseases of live stock, as hosts of sporozoic organisms and nematodes, or as disseminators of diseases of bacterial origin; the importing and distributing of predatory and parasitic forms, and the adjusting of these to new conditions and even new hosts; the exact relation of insects to fruit and seed development; and the interrelation of insects, as in the case of ants and aphids, are all modern problems of economic entomology. While these questions are associated, either directly or indirectly, with agriculture, and are of great importance, I wish at this time to consider to what extent the student of economic entomology, in order to apply his knowledge to the best advantage, should be also a student of agriculture.

Within recent years deep-seated problems in connection with the occurrence of insects and allied forms have given prominence to lines of investigation of unusual merit in point of results. During the past season the army worm again appeared in destructive numbers in many

portions of Tennessee. Some observations were made of well separated outbreaks to determine if possible the reason for the unusual attack. In most cases the system of crop rotation and the farm practice were found conducive to the protection of the wintering forms under suitable climatic conditions. In the latitude of Tennessee a general rotation is corn, wheat, meadow. During average seasons corn land, after what is termed the "laying by," becomes foul with weeds, particularly a species of *Ambrosia*. This land, after the wheat is cut the second year produces a heavy growth of weeds from seeds of the previous year. The weeds are cut and left as a mulch for the meadow. This mulch affords protection for the army worm during winter and early spring of the third season, which results, if a late spring obtains, in the destruction of the meadow crop and the spread of the worms into contiguous fields. These observations place the burden of proof for the outbreak upon the corn crop and the practices prevailing in its cultivation. Preventive measures must be sought in a change in the rotation and possibly in the introduction of a new crop. Here agricultural information is demanded. The ravages of the sugar cane borer (*Diatraea saccharalis*) have been traced to practices of handling the cane during fall planting, windrowing, and spring planting, and to the planting of corn on land previously devoted to second-year stubble. Here, again, a change in a rotation system and common practices of handling the crop are involved in preventive suggestions. In fact, the best methods of control of many of the insect enemies of a diversified agriculture are to be found in the adjusting of agricultural practice to biologic conditions. Evidence of this may be found in the recommendations for the corn root aphid, the Hessian fly, the cotton boll worm, the tobacco worm, the differential grasshopper, the North American cattle tick, the corn root worm, wireworm and cutworm, and many other pests of general distribution.

The invasion into the Southern States of the Mexican cotton boll weevil, and its effect upon a crop of international importance, enlisted unusual interest in methods of control. Growing out of the efforts made in connection with the boll weevil, more than any other insect, has the relation of detailed biologic study to the cultural methods of remedial relief been emphasized, if not permanently established. Never before have the importance of a study of agricultural conditions and the habits of most plants been so intimately associated in the development of preventive methods. Our standing with the farming fraternity and our opportunities to promote entomological investigation in its broadest and most acceptable field seem to suggest an intimate study of conditions that will protect in the most economical way the

interests of the crop producer. If a change in the system of cropping is necessary, recommendations in keeping with the best practice should be available. If postponement of the time of seeding will bring relief from insect attack, the influence on yields from other causes due to late seeding should be carefully studied, and estimated, and compared with the losses occurring from the damage under normal conditions. Some may think these matters belong to other departments of agricultural investigation, and that the recommendations which are the outcome of biological study should be turned over to other persons for their execution. Such action is not in keeping with the crop producer's estimate of agricultural organization, and he is an important factor in the successful development of any remedial plan. Delay consequent on the shifting of the execution of any method or methods is destructive of the best interests of agriculture and of the various sciences which make up its multifarious structure.

In concluding, I wish to express confidence in the opportunities offered to economic entomologists for the development of preventive and remedial measures against insect attack, by the timely correlation of a thoroughly matured knowledge of agricultural conditions with an exhaustive life-history and habit study.

The discussion of this address was postponed until the afternoon session.

A paper was presented by Mr. Smith:

CULTIVATION AND SUSCEPTIBILITY TO INSECT ATTACK

By JOHN B. SMITH, *New Brunswick, N. J.*

(Abstract.)

It is a common complaint in New Jersey by fruit growers that care best for their orchards, that some of their neighbors that never spray suffer less from the pernicious scale than they; and there is a basis of fact for the complaint. In almost every section of the state there are old orchards, chiefly apple, that bear annual crops of good or fair fruit, practically free from scale, though no spraying work is ever done in the orchards and the trees have been infested for years.

Investigation brought out a few facts that seem to be suggestive. *First*, as a rule, vigorous, sappy growth is much more generally infested and injured than slow, hardy growth. *Second*, trees growing in well cultivated orchards, highly fertilized, are much more likely to suffer from scale attack than others. *Third*, trees that grow slowly, or in sod, without much care, are much the more resistant to scale

Morgan, Harcourt A. 1908. "The relation of the economic entomologist to agriculture." *Journal of economic entomology* 1(1), 11–15.

<https://doi.org/10.1093/jee/1.1.11>.

View This Item Online: <https://www.biodiversitylibrary.org/item/37189>

DOI: <https://doi.org/10.1093/jee/1.1.11>

Permalink: <https://www.biodiversitylibrary.org/partpdf/325759>

Holding Institution

New York Botanical Garden, LuEsther T. Mertz Library

Sponsored by

The LuEsther T Mertz Library, the New York Botanical Garden

Copyright & Reuse

Copyright Status: NOT_IN_COPYRIGHT

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.