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The first paper of the evening was presented by Mr. A. F. Burgess, as follows:

AN ABNORMAL COCCINELLID.

By A. F. BURGESS, *Malden, Mass.*

The economic importance of scale insects and Aphids is correlated with that of the Coccinellids, a group which furnishes the chief checks upon their increase. The introduction of the *Vedalia cardinalis* and allied species into California will illustrate the benefit derived from an accurate knowledge of the habits of these predaceous beetles, and a thorough study of the food habits of our native ladybirds probably would show that they are the chief agencies controlling the increase of many of our indigenous scale insects, and without their assistance these insects might prove highly injurious.

Our most common Coccinellid, *Adalia bipunctata*, plays an important part in checking the undesirable increase of certain Coccids and Aphids in this region, and an interesting fact concerning this species, noted during the present season, may be recorded properly at this time. On April 13 while collecting in the Middlesex Fells, Malden, Mass., I took a pair of ladybirds *in coitu* on a white birch upon which Aphid eggs were thickly massed. An examination of the specimens showed the female to be a normal *Adalia bipunctata*, while the male was black in color with a blood-red marking at the humeral angle of each elytron; posterior to each of these markings was a small dot of the same color. The beetles were fed upon Aphid eggs at the insectary, and upon April 20 the female laid a cluster of fourteen eggs, followed by another of eight eggs on April 23. These lots of eggs hatched in four and seven days, respectively. The larvæ were fed upon Aphids, and from the material left after the preservation of specimens two imagos were reared, both being of the black form. The male parent insect was placed with a female *Chilocorus bivulnerus* on May 3, but, as expected, died without mating. The female *Adalia* continued to lay up to June 1, the eggs, with the exception of the last four clusters, proving fertile. Many of the larvæ died before completing their transformations, and only a single black adult was reared.

On May 5 another pair of these insects were found *in coitu* near the place where the first pair was taken, and in this case the male was of the black type, the female being a normal *Adalia*. From eggs deposited by this female there were reared two beetles of the black form and an *Adalia* of the normal color and form. These three insects were placed in a jar with the three beetles from the brood previously mentioned. On June 15 two of the black form were found pairing, the eggs subsequently laid proved fertile, but the larvæ died before reaching maturity. June 26 an *Adalia* male and a black female (both belonging

to the above lot) were found mating, and from eggs laid by the female there have been reared ten typical *Adalias* and four of the black form.

The latter seem to correspond closely with *Coccinella humeralis* Say, which was described from two specimens taken near the Rocky Mountains. Le Conte, in his edition of Say's writings published in 1859, states that this species is unknown to him, and probably for this reason Mr. Henshaw does not include it in his list of the Coleoptera.

I am unable to decide whether the black form is an abnormal *Adalia* or represents a distinct species. Against the ground that it is an abnormal or "sport" *Adalia* may be placed the continuity of this form through two generations. If the preceding was the case it would seem that in the progeny of this form there would have been a greater reversion to the *Adalia* type. On the other hand, if the black form represents a distinct species, we have clearly a case of hybridization, resulting in the product of fertile hybrids. In insects, hybrids generally partake of the characters in size, form, and color of both parents. In this case the progeny of these mismated insects do not show any blending in these respects. The black forms are duplicates of the black parents and the *Adalia* are of the normal *Adalia* type.

[Since presenting this paper Dr. John B. Smith has kindly compared the black form with specimens in the Horn collection at Philadelphia. He says: "I find in that collection a number of specimens, some of them resembling yours closely, some differing in details and marked *Adalia bipunctata* var. *humeralis* Say. The localities represented in this series are Minnesota, Arizona, California, Colorado, Utah, and Oregon. You will see, therefore, that the form is widely distributed, and, in fact, occurs wherever the type occurs." I have also, through the courtesy of Mr. Samuel Henshaw, examined the specimens in the Le Conte collection at the Museum of Comparative Anatomy at Cambridge, Mass. I find several examples of the black form placed in company with examples of *Adalia bipunctata* and labeled *C. humeralis* Say.

Thus it appears that we have here a strongly marked variety, which retains its characters even when inbred with typical forms of the species. So far as I can learn, the inbreeding of these forms has not been recorded heretofore.]

This communication was discussed by Messrs. Howard and Smith, the latter referring to the value of genitalia of insects as a means of separating species or groups of species, stating that in some genera these characters have no value whatever, while in other genera the characters found might be absolutely relied on as indicating specific differences. He said that a difference in genitalia always means a different species, but a similarity or identity in genitalia does not necessarily mean the same species. He believed the black form

described by Mr. Burgess to be the normal black dimorphic female of the species.

Referring to the feeding of the species on the San Jose scale, he stated that this record was important as showing that our native species may do the work which it was desired to accomplish by the importation of foreign predaceous insects.

Mr. Cooley read the following paper:

NOTES ON SOME MASSACHUSETTS COCCIDÆ.

By R. A. COOLEY, *Amherst, Mass.*

The "maple leaf-louse," *Pseudococcus aceris*, continues to be a serious enemy to street maples in this State, and a brief account of our experience with it may be of interest to the members of the association. The worst infested locality which has come under my observation is the one in Springfield, although another in Holyoke is scarcely less important. The authorities of Springfield have been fighting this insect ever since their attention was called to it a number of years ago, but their efforts have been attended with only partial success. During the winter of 1895-96 the trunks of the trees were scraped smooth and treated with a concentrated solution of whale-oil soap, applied with whitewash brushes. Visiting the locality on April 9, 1896, the writer gathered specimens on pieces of bark from the trees and took them to the insectary, where they were examined and all found to be dead. It seemed certain then that the insect was well under control, but by fall it had again multiplied to destructive numbers. The treatment was repeated during the winter of 1896-97, but, if the writer is correctly informed, the insects were more abundant than ever the next summer. Last winter the trees were under the care of Mr. W. F. Gale, who has been appointed city forester in place of Mr. Clark, who previously held the position. Mr. Gale treated the trees with an insecticide prepared as follows: Three pounds of whale-oil soap were dissolved in 3 gallons of hot water, and to this solution was added 1 gallon of kerosene. This mixture was churned till an emulsion was formed, after which 2 drams of crude carbolic acid were stirred in. Before applying the emulsion it was diluted with an equal part of water. The writer examined the trees on July 20 and again on August 6, and could find comparatively few specimens of the insect and the trees appeared to be perfectly healthy.

Quite in contrast to this experience in Springfield has been that of Mr. D. H. Newton, city forester of Holyoke. Mr. A. V. Capen, Mr. Newton's foreman, informed the writer that in February of 1896 the infested maples in Holyoke were sprayed with whale-oil soap solution, 1 pound of the soap in 1 gallon of water, and that since that time the insects had never been abundant enough to require treatment.