

have been able to glean from Nature (as illustrated in the figures on the plate), I am not yet convinced that it is wise to assert that a fruit-grower must drench his trees with arsenate of lead only and that the spray must be applied with a force necessary to drive it into the lower calyx cavity of young apples. The evidence submitted in Bulletin 131 of the Colorado Experiment Station to show that fruit trees are being poisoned and killed by excessive use of poison sprays should be seriously considered by both entomologists and fruit-growers in alkaline regions. Under similar conditions cannot just as satisfactory results be obtained against the codling-moth with either Paris Green or arsenate of lead applied as a fine spray in moderate quantities evenly over the trees, at about 100 pounds pressure, if the spray is properly directed downward into the open outer calyx cavities of the recently-set apples? I have not yet seen sufficient evidence to warrant entomologists in answering this question in the negative.

---

### THE ARMY WORM AT DURHAM, NORTH CAROLINA

By Z. P. METCALF, Assistant Entomologist, State Department of Agriculture,  
*Raleigh, N. C.*

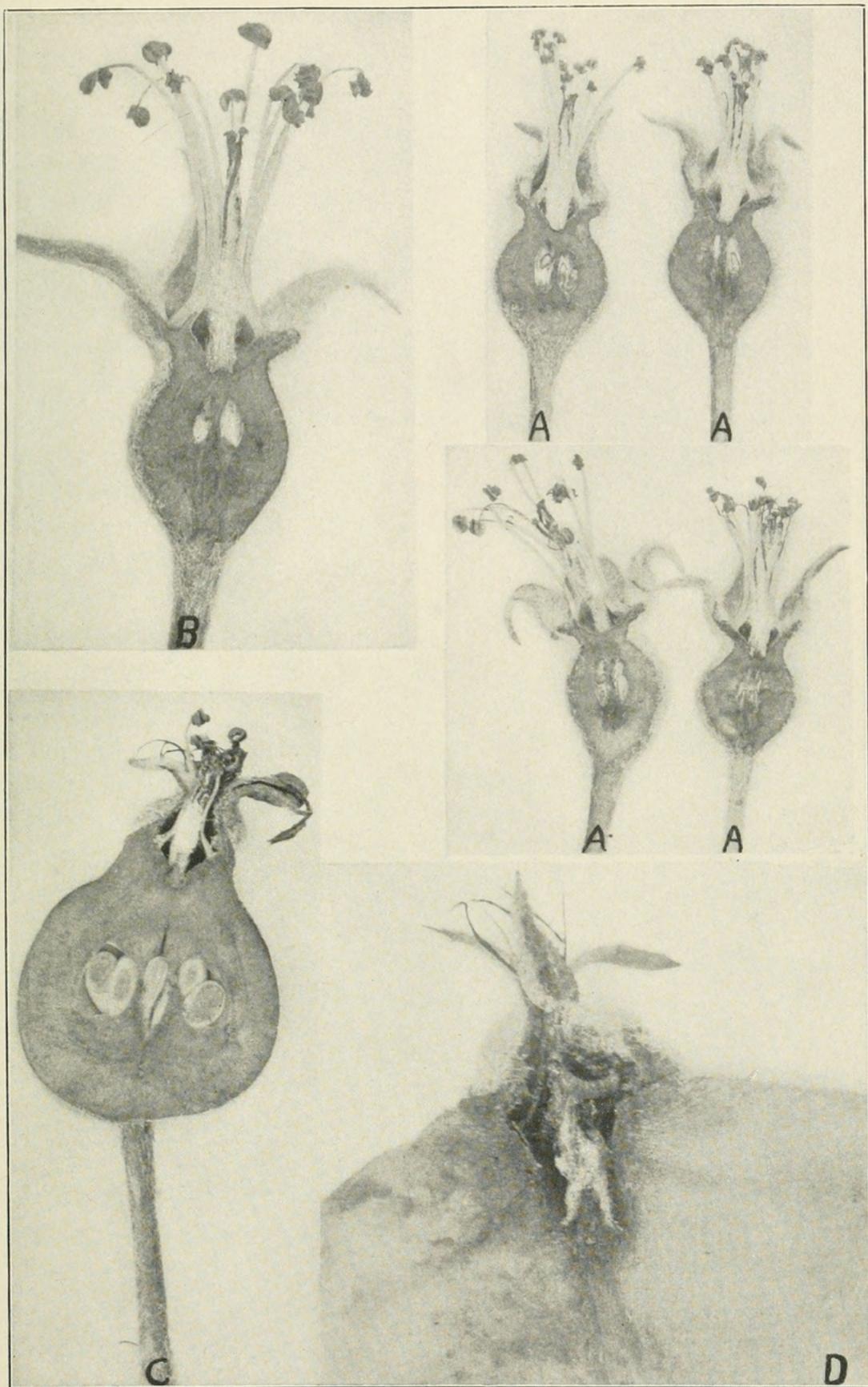
The occurrence of the Army Worm (*Heliophila unipuncta*) in destructive numbers at Durham, in the east central part of this state, on August 9, 1908, presented three interesting points:

(1) The occurrence of this species so far south and so far east in the state; (2) its occurrence so late in the season; and (3) the per cent of worms parasitized.

Our office records covering the last eight years show that this insect does not occur in destructive numbers very far east of the mountains. It was reported as being injurious in May, 1907, from the extreme southwestern portion of the state.

Although the Army Worm has been reported as being destructive as late as the last of September, it rarely occurs in injurious numbers after the last of July.

As is usual during such outbreaks, large numbers of Tachina flies (*Winthemia quadripustulata*) were to be found in the fields laying eggs on the worms. With the intention of making a more careful study of these parasites 491 larvæ were brought back and placed in cages. The following data gleaned from the records of these cages are presented as being of some interest. Of the 491 larvæ, 442 were infested with the eggs of the dipterous parasite, *Winthemia quadripus-*



MUST THE CALYX CUP BE FILLED?



*tulata*, leaving only 49 larvæ, or 10 per cent of the whole number, uninfested; yet 61 larvæ were able to pupate. From these 61 pupæ, however, only 7 adult moths emerged, showing a total mortality among the Army Worm from larva to adult of 98.6 per cent. And since 90 per cent of the larvæ were infested with the eggs of this parasite, it would seem to indicate that, in this case at least, the parasitic fly was decidedly the most important factor in causing the high mortality of the Army Worm. In a few cases it was found that where only a single parasitic egg was attached to a larva, that the host was able to complete its transformations.

The greatest number of parasitic eggs observed on a single larva was 12, with an average of 3 for the entire number (442) infested. The 442 infested larvæ yielded 709 parasitic puparia, or an average of nearly two for each infested larva. The 709 puparia yielded 556 adult parasites. The greatest number of adult flies from a single Army Worm was four. These figures show that the mortality with the parasitic fly from egg to puparium was 52 per cent, and from puparium to adult 22 per cent, making a total mortality from egg to adult of 73 per cent.

This shows that the tendency would be for the fly to continually gain in relative numbers, owing to the lighter mortality, and easily accounts for the complete subjugation of the Army Worm in normal years by this one natural enemy. No other parasites were found in the course of these experiments.

---

## NOTES ON THE HEN FLEA (*XESTOPSYLLA GALLINACEA*)

By GLENN W. HERRICK

During the summer of 1907 the ground beneath one of the dwelling houses on the campus of the Mississippi Agricultural College became infested with fleas to such an extent that the occupants were greatly annoyed by these pests. On examination I found that two species were present beneath the house, namely, the hen flea and the dog flea. The house, of course, stood on brick pillars some distance above the ground, and thus gave opportunity for hens to go under, where they would lay eggs and rear chickens. Dogs and cats also had free access to the space beneath the house. To secure relief the space under the house was treated with a thorough dusting of slacked lime and nothing more was heard from the occupants until the summer of 1908, when the fleas again became troublesome.



Metcalf, Z. P. 1908. "The army worm at Durham, North Carolina." *Journal of economic entomology* 1(6), 354–355. <https://doi.org/10.1093/jee/1.6.354>.

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

**DOI:** <https://doi.org/10.1093/jee/1.6.354>

**Permalink:** <https://www.biodiversitylibrary.org/partpdf/325915>

**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>.