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NOTES ON PROTOCALLIPHORA DURING THE
SUMMER OF 1931

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THE work of Mr. William P. Wharton of Groton, Massachusetts, on the method of combating the injury done to nestling birds by the blood-sucking maggots of *Protocalliphora* by removing the original nest after the birds are several days old and substituting a hand-made one proves most interesting. The following is a list of the nests Mr. Wharton sent to me, with his notes, to which I have added what the nests actually contained.

June 12. Bluebird. "The original nest was removed after the young were four days old." The very young maggots failed to pupate.

June 20. Tree Swallow. "Nest removed in a similar manner to that of the Bluebird." This nest when examined contained 37 puparia from which 37 flies of *Protocalliphora sialia* emerged.

June 25. Bluebird. "Original nest removed." Only one small puparium and fly of *P. sialia*.

June 25. Barn Swallow. "Nest removed after the young had fallen from it and died." The dead birds were sent with the nest. After removing the birds all that I obtained from the nest was a number of the two scavenger flies, popularly known as "blue bottles," *Calliphora viridescens* and *Lucilia sericata*.

June 26. Robin. "Inside portion of the nest removed when maggots were noticed in it, after the young birds had left." From seven puparia emerged seven *P. sialia*.

June 29. Bluebird. "Nest substituted by me for that removed on June 12th. The young left apparently in good condition." In the nest were 34 puparia, 18 of which were parasitised by the little chalcid *Mormoniella vitripennis*, Walk. (*brevicornis* Ashm.)

June 29. Song Sparrow. "The nest was collected after the young birds had apparently left prematurely, one having been found dead beneath the nest." From the puparia emerged 4 males and one female, referable to *Protocalliphora splendida* Macq. The males more closely resemble those of *P. sialia* than any I have seen, but the terminal segment of the abdomen is a bright green, not blue.

July 1. Tree Swallow. "The young birds were in good condition when removed from the nest." The nest was placed in

a glass jar, and the puparia were noticed a little later to be heavily parasitized. An examination of the nest September 11th showed that only 3 flies had emerged; 46 of the puparia had the little exit holes of the chalcid *Mormoniella vitripennis*, and three were apparently dead. One of the latter puparia was, however, broken open, and I was surprised to find in it the larvæ of a parasite much larger than those of the chalcid, which had appeared between the 15th and 20th of July. Evidently we have another parasite of Protocalliphora that possibly passes the winter in the puparium of the fly. I am guarding them carefully but doubt if I can raise them now that the puparium is broken. I am now saving all supposed dead puparia, hoping for some results.

July 10. Tree Swallow. "The replaced nest of the above brood, the young apparently all having flown but one, which was dead." The nest contained 34 maggots, 9 larvæ, and 3 puparia, which were preserved in alcohol. From the other puparia emerged 14 flies of which 2 were parasitized and 4 were dead.

July 2. Tree Swallow. "This is also a replaced nest. Two of the young birds died, three having probably flown." The nest contained 38 puparia, 34 of which were parasitized by the little chalcid *Mormoniella*. This is another remarkably high percentage of parasitism. In the nest of July 1st there was over 91 per cent, while in this one it is over 96 per cent.

July 16. House Wren. "The young birds had probably left the nest in good condition." The nest contained 22 puparia; 17 flies emerged and 5 were dead.

July 16. Starling. The large nest was alive with mites when received. The nest was examined September 11th and contained 69 puparia. Fifty flies had emerged; 8 were dead and 11 had been destroyed by some predaceous insect, a large irregular hole having been made on the side of the puparium. There were also present numerous puparia and flies of the "Little Housefly" (*Fannia canicularis*), "Meal worm" (*Tenebrio obscurus*), the Cadelle (*Tenebroides mauritanicus*), a little moth, *Monopis irrorella*, etc., all acting as scavengers in the filthy nest.

July 28. Barn Swallow. "The young had jumped out of the nest onto the floor and were saved." The nest contained 42 puparia; 26 flies emerged; 16 were parasitized and 6 were dead.

August 1. House Wren. The nest contained no puparia of Protocalliphora.

Mr. A. W. Higgins of Rock, Massachusetts, sent a Bluebird's nest and under date of July 8th says: "The nest belongs to the

second clutch of eggs; the first nest was destroyed by a male House Sparrow. The nest was taken July 2d, and the four young birds were alive. I counted 119 maggots and pupæ in the nests." The nest was put in a jar when received, but evidently a few of the maggots escaped in transit, for I find only 109 puparia, from which emerged 51 flies; 13 were parasitized and 45 were dead. Mr. Higgins also sent a Tree Swallow's nest, which he said had contained one dead bird and one alive, which left the nest June 29th. The nest contained 21 puparia and 21 flies emerged.

On May 16th Mr. Paul A. Stewart of Leetonia, Ohio, sent me the nest of a Starling, from which 92 *Protocalliphora sialia* emerged early in June. Mr. Stewart writes: "The young birds in the nest were not dead but apparently healthy. Probably the infestation was not sufficiently heavy to destroy the six young the nest contained." If 92 large blood-sucking maggots failed to have any effect on the young Starlings, I think that it throws some light on the situation in New England where the Starlings have been so prevalent for several years. I have suggested before that the Starlings probably have something to do with the apparent increase of *Protocalliphora* in this section, and as I continue this work I feel more convinced that this is the case. Our native birds cannot compete with this more vigorous intruder.

On August 1st Mr. Stewart sent the nest of a Bluebird with the following note: "The young Bluebirds in the nest were in an entirely healthy condition. Ten maggots have been removed from the nest and preserved. I would appreciate very much if you will send me the number of adult flies produced by the maggots." There were 64 puparia, from which emerged 51 flies; there were also 13 small undeveloped larvæ. None of the puparia were parasitized, quite unusual for this time of the year.

Mr. Wendell P. Smith of Wells River, Vermont, in sending a Bluebird's nest taken May 27th says: "Four young birds died in the nest during the 25th and 26th. I noticed larvæ, about one eighth of an inch in length, of a drab color." A few of the larvæ pupated, but most of them were too young to transform.

On July 2d Mr. O. L. Austin, Austin Ornithological Research Station, South Wellfleet, Massachusetts, sent ten nests of the Tree Swallow. It was something of a surprise when an examination failed to show a single *Protocalliphora*. Fleas and mites were abundant in some of the nests. Is *Protocalliphora* absent on Cape Cod?

The contents from a Downy Woodpeckers nest from Holderness, New Hampshire, were received from Mrs. R. B. Harding,