SOME ADDITIONAL NOTES ON PROTOCALLIPHORA

BY CHARLES W. JOHNSON

COMPARATIVELY few birds' nests were studied during the summer of 1928. Even this number, however, show that the blood-sucking larvæ of *Protocalliphora* are still a serious menace to nestling birds, deserving a careful and thorough investigation.

On June 18th a Bluebird's nest was received from Mrs. E. L. Hathaway, of West Bridgewater, Massachusetts. It contained 58 puparia of *Protocalliphora splendida* var. *sialia*. Forty-one flies emerged, and 16 puparia were parasitized by the little chalcid *Mormoniella brevicornis*, a parasitism of about 38 per cent. On July 24th Mrs. Hathaway sent me the nest of the second brood of the Bluebird. When banding the nestlings she had found four of the maggots clinging to the birds. There were two sizes of larvæ in the nest, but all apparently pupated, although 19 puparia were quite small, owing, no doubt, to underfeeding. The total number of puparia was 153. Flies emerged from 38, from 26 flies failed to issue, and 89 were parasitized. Most of the small puparia were parasitized, the total parasitism being about 58 per cent.

On July 7th a Barn Swallow's nest was received from Mrs. Karl G. Wormuth of Belmont, Massachusetts. It contained 51 large maggots, which had probably driven the nestling birds from the nest during the night, as these were found dead in the morning on the floor of the barn. Only 39 flies emerged from the puparia. There was no parasitism.

From the puparia in the nest of a Chestnut-sided Warbler collected near Ashland, New Hampshire, Mrs. R. B. Harding obtained seven specimens of the typical *P. splendida*. From the puparia in the nest of a Robin also collected near Ashland, New Hampshire, Mrs. Harding obtained 39 flies, apparently the same as those infesting the Bluebirds. In neither case did I see the puparia, so that parasitism, if present, could not be noted.

The two nests of the Bluebird received from Mrs. Hathaway show one very interesting feature. While only 38 per cent of the puparia of *Protocalliphora* were parasitized in the first nest, 58 per cent were parasitized in the second. This tends to emphasize what I suggested in my previous paper, viz.: burn the first nests as soon as the nestlings leave the nest, thus destroying the *Protocalliphora* that would otherwise injure the second brood of birds. On the other hand it seems best to wait

about a month before destroying the nests of the second brood, thus enabling the parasites to escape. The increased parasitism of the fly in the second brood, together with a natural loss of the adult flies during the long hibernation, should tend toward keeping the number of *Protocalliphora* down to what would be considered normal conditions.

In 1924 I obtained from Mr. J. S. Pfeil two maggots taken from swellings on the neck of a sparrow found near Middleboro, Massachusetts. The larvæ pupated August 3rd, and the adults (male and female) emerged August 12th. This was recorded in 1925 as *Protocalliphora hirudo* var. *cuprea* Shann. and Dobs. (It was described in 1924 from Seattle, Washington, from the nest of a Western Robin.) This constitutes the only Eastern record for the species and is of special interest, showing that there is also in this section of the country a *Protocalliphora* with habits very different from those described. The larva of this species must enter the bird when the larva is very young, the irritation of the maggot causing a swelling in which pus forms, on which the maggot feeds, similar to the larvæ of subcutaneous bots such as the ox-warble. If anyone should find a bird with swellings on the neck as in the case of the sparrow above described, I should like very much to obtain the specimen.

I am planning to continue my study of these flies during the coming season and hope for the continued co-operation of those interested. It is desirable that the entire nests should be sent as soon as the nestlings leave, both of the first and second broods, so that I may be able again to check up the relative amount of parasitism.

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MIGRATION STUDIES OF JUNCO AND CHIPPING SPARROW GROUPS

BY C. L. WHITTLE

THE summer and fall seasons just passed (1928) have afforded some details of the habits of Juncos (*Junco h. hyemalis*) and Chipping Sparrows (*Spizella p. passerina*) during migration, or preliminary to migration, of considerable interest. The observations were possible in part at least owing to the fact that here in Peterboro, New Hampshire, we have maintained two banding stations which were also, of course, places