

PROTOCOLLIPHORA LARVAE INFESTING NESTLING BIRDS OF PREY

By HAROLD M. HILL and TELFORD H. WORK

During the past three years, in the course of field work with birds of prey in the San Francisco Bay area, two broods, one of the Sparrow Hawk (*Falco sparverius*) and one of the Golden Eagle (*Aquila chrysaetos*), were found infested in the ears and nostrils with blood-sucking larvae. On June 10, 1945, two Sparrow Hawks about ten days old were removed from their nest in a sycamore hollow in La Costa Valley, central Alameda County, and taken home to be raised for photographic purposes. There were two or three other young birds in the nest; one was dead, but unfortunately was not examined carefully. The day after removing the young hawks from their nest a black crust about the ear openings was noticed. When this had been removed, it became apparent that the ear canal was markedly swollen and filled with fat, squirming, grayish larvae. The right nostril and both ears of each bird contained larvae; none was found elsewhere. The nostrils were deformed, as the diameter of the larvae found there far exceeded the width of the normal nasal passages. Nine larvae were removed from one bird and 13 from the other. They varied from two to eight millimeters in length and usually contained a visible amount of the red blood on which they were feeding at the time of removal. The black crust about the ears was apparently from the excreta of the parasite, the dark color being due to the blood pigments which had passed through the larvae. It seemed to us that the two parasitized hawks were more restless and had larger appetites than two other normal Sparrow Hawks about the same age that we were keeping under observation at the same time.

On April 10, 1946, we visited an eagle nest near Sunol in central Alameda County. Earlier in the season this nest had contained three eggs. On this day we found two chicks about three days old and one dead chick only partly out of the shell. When we returned ten days later, the ears of both of the eaglets were packed with blood-sucking larvae which appeared identical to those found in the Sparrow Hawks. The black crust about the ears stood out conspicuously against the white down, as shown in figure 14. Both birds appeared in good health. We returned the next day with forceps and removed most of the larvae; unfortunately the instruments were not small enough to reach as far down the ear canal as some of the larvae were and all were not removed. Unfortunately the larvae were lost. One month later, on May 21, we returned to the nest to band the young birds. At this time no larvae were found in the ears, and the birds appeared to be in good condition.

In reviewing the literature on infestation of birds by *Protocalliphora*, it was found that numerous song birds, crows, and Mourning Doves were reported as hosts, but there was no mention of raptors. It is of interest that the nests reported in this note are but a few miles from Berkeley where O. E. Plath in 1917 worked out the life cycle of one species in this genus (*P. azurea*) in relation to its avian hosts. He reported that 39 of 63 nests of common song birds that he examined in the vicinity of Berkeley were infested (Condor, 21, 1919:30-39). It is not known whether the species of fly found in raptors are the same as those in song birds of this region, as none of the larvae was allowed to pupate and hatch out, and it is not possible to identify these species from the larval stage. The larval specimens obtained from Sparrow Hawks were identified as to genus through the courtesy of C. F. W. Muesebeck, Division of Insect Identification, U. S. Bureau of Entomology and Plant Quarantine. As was mentioned in Neff's recent paper on *Protocalliphora* infestation in Mourning Doves (Condor, 47, 1945:75), the blowfly family Calliphoridae is being revised by Dr. David G. Hall of the U. S. Bureau

of Entomology, and a new generic name is to be substituted for the American blowflies previously assigned to *Protocalliphora*.

In those *Protocalliphora* the habits of which have been studied, it has been found that the larvae feed for a relatively short time, in the case of the Mourning Dove (Neff, *op. cit.*:74) as little as 15 minutes, and then fall back into the nest where they remain



Fig. 14. Golden Eagle 13 days old showing enlarged and encrusted ear opening resulting from infestation by *Protocalliphora* larvae.

until hungry again. The usual place of attack is the feet, legs, or body, although Neff reported the larvae in the ears and nostrils of Mourning Doves. In the case of the young raptors reported here, the larvae were so densely packed in the ear canal, the relatively small opening of which was partly occluded by the hard dried excrement, that it appeared very unlikely that they crawled in and out frequently. Furthermore, the nostrils of the Sparrow Hawks were distorted and enlarged so as to just accommodate the one or two larvae present, indicating that they had been established there for some time. Thus, it appears that the habits of the raptorial parasites may be somewhat different from those previously studied. As the infestation is quite often fatal in the species of birds which have been investigated, it is not unlikely that the young Sparrow Hawk found dead in the nest had succumbed to the parasites.

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