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## INFESTATION OF RAPTORIALS BY *ORNITHODOROS AQUILAE*

BY RALPH B. WILLIAMS

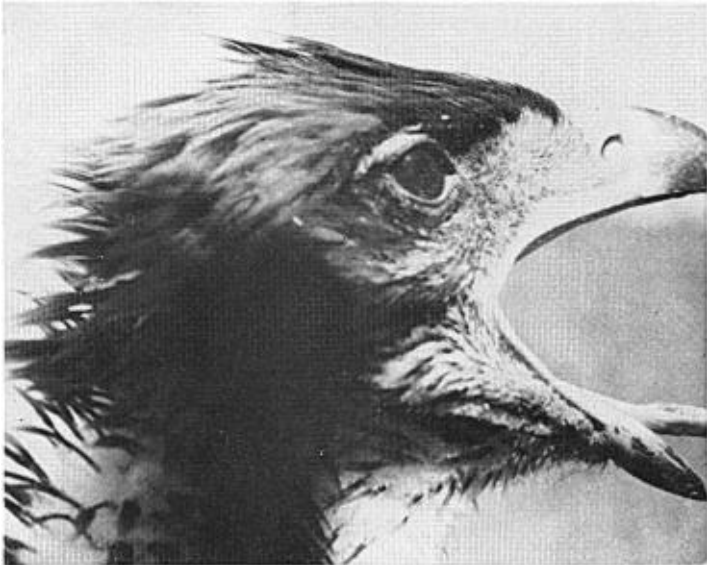
*Plates 7-8*

WHILE collecting data for a life-history study of the Prairie Falcon, *Falco mexicanus* Schlegel, and while on banding excursions in north-eastern Colorado and southeastern Wyoming, I observed that nestlings of these falcons and other raptorial birds were infested with larval ticks about the heads in the region of the eyes.

On July 17, 1942, I collected a number of the engorged larvae and forwarded them alive for identification to the United States Fish and Wildlife Service, Washington, D. C. This agency in turn forwarded the specimens to the Division of Insect Identification, United States Department of Agriculture, Washington, D. C., where they were classified as "very interesting larvae and nymphs" of some member of the Genus *Ornithodoros*. Attempts made there to feed the larvae and nymphs on domestic chickens failed, and all specimens succumbed after molting into the first nymphal stage. Searches were made in Weld County, Colorado, for additional specimens, but none could be found because all the young raptorial birds had left the eyries by the time the report was received.

R. A. Cooley, Senior Entomologist with the Rocky Mountain Laboratory of the United States Public Health Service at Hamilton, Montana, agreed to examine and classify the larvae and nymphs collected during the ensuing year. Modified Hixon jars and mailing containers were supplied by Doctor Cooley.

Beginning on May 31, 1943, I collected 12 immature *Ornithodoros* ticks taken as larvae from the heads, wings and bodies of five downy, week-old *Falco mexicanus* at Chalk Bluffs in Weld County, Colorado. It was noted that upon extremely young birds the larvae were at-



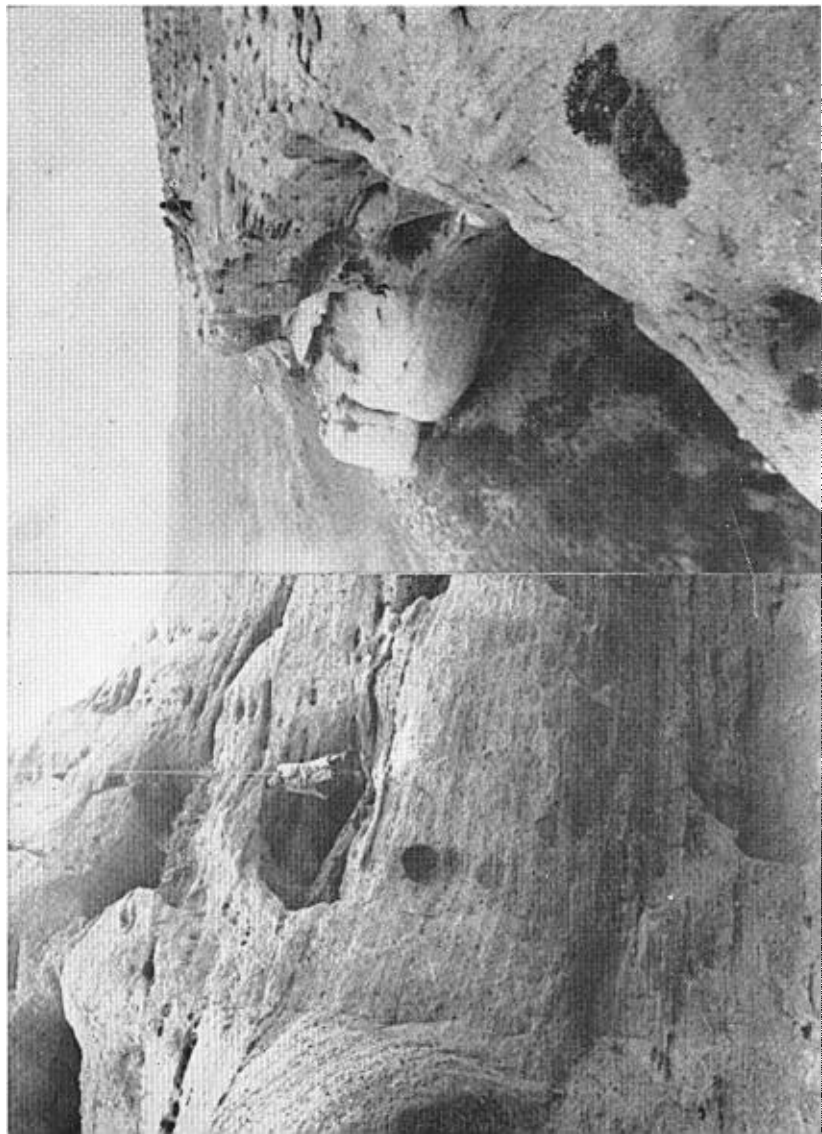
YOUNG GOLDEN EAGLES SHOWING LORES INFESTED BY TICKS.

tached to various parts of the body, but later, as the feathers developed, they could be found only in the vicinity of the head, especially about the eyes. Ordinary thumb forceps were used to pull off the larvae, care being taken not to crush the engorged bodies. Removal of the larvae did not cause bleeding although some were very firmly attached.

The first group was given Rocky Mountain Laboratory accession number 20247 to be followed by No. 20262, *Falco mexicanus*, Chalk Bluffs, Weld County, Colorado, elev. 5780, June 16, 1943, 9 larvae; 20263, *Buteo regalis* (Gray), Chalk Bluffs, Weld County, Colorado, June 16, 1943, 17 larvae; 20264, *Falco mexicanus*, Chalk Bluffs, Weld County, Colorado, June 16, 1943, 6 larvae; 20267, *Aquila chrysaetos canadensis* (Linnaeus), Simpson Creek, Weld County, Colorado, June 19, 1943, many larvae; 20269, *Falco mexicanus*, Pawnee Buttes, Weld County, Colorado, June 20, 1943, many larvae; 20270, *Aquila chrysaetos canadensis*, Big Simpson Creek, Weld County, Colorado, June 20, 1943, many larvae; 20275, *Aquila chrysaetos canadensis*, near Chugwater, Platte County, Wyoming, June 26, 1943, 13 larvae; 20278, *Aquila chrysaetos canadensis*, Big Simpson Creek, Weld County, Colorado, July 4, 1943, 27 nymphs; 20279, *Aquila chrysaetos canadensis*, Chalk Bluffs, Weld County, Colorado, July 3, 1943, 18 nymphs; 20280, *Falco sparverius sparverius* (Linnaeus), Big Simpson Creek, Weld County, Colorado, July 3, 1943, 1 nymph; 20281, *Falco mexicanus*, Chalk Bluffs, Weld County, Colorado, July 4, 1943, 11 nymphs.

Some of the above raptorial birds were so heavily infested that their eyes were almost closed; with this exception, however, the birds did not demonstrate any ill effects. I looked carefully for signs of "tick paralysis" but could find none. My observations do not agree with those of Webster (4) who states that only 35 per cent of the young *Falco mexicanus* survive the first month in northeastern Colorado. He attributed the mortality to a certain tick with which he was unfamiliar, but which he reported as obtaining a foothold and killing off a goodly number of the young falcons. Baerg (1) in his study of *Ixodes baergi* Cooley on *Petrochelidon albifrons albifrons* (Rafinesque) found that superficial examination of the nestlings' eyes did not show any serious injury as has been observed by Thomas (3) and Worth (5).

Three young *Falco sparverius sparverius* and seven young *Falco mexicanus* were taken into captivity during 1942 and 1943 and it was found that in each instance all falcons were free from ticks in any stage by the twelfth day. These falcons were taken from the



GOLDEN EAGLE EYRIE, CHALK BLUFFS, COLORADO. (*Right*) MAN'S HAND POINTS TO LOWER MARGIN OF ARIKAREE FORMATION WHICH CAPS WHITE RIVER FORMATION.

eyries just prior to their full-fledged stage. The larvae began to drop within seven days after removal from the eyrie. No precautions were taken to prevent re-infestation, but none occurred.

Extensive searches were made in the vicinity of the infested eyries for other stages in the life cycle of this tick. Debris and soil samples were taken from the eyries of the birds and from burrows of mammals. Large numbers of *Sylvilagus auduboni baileyi*, *Lepus californicus melanotis*, *Cynomys ludovicianus*, *Citellus tridecemlineatus tridecemlineatus*, *Citellus elegans*, *Citellus richardsonii*, *Dipodomys ordii*, and other species were shot and trapped, but ectoparasite collections did not reveal the presence of these ticks.

The ticks were found only on raptorial birds nesting in similar types of geological formations, while the same species of raptorial birds nesting on mud banks and in trees within short distances of these 'badlands' were not infested at any time during the seasons from 1942 through 1944. P. G. Worcester (6), Department of Geology, University of Colorado, Boulder, Colorado, informs me that "the Pawnee Buttes in Weld County are composed of the chalky white and gray Brule shales of the White River Formation which is Oligocene in age, capped by darker colored massive sandstone and conglomerates of the Arikaree formation which is Miocene in age. The protective capping of the Buttes is of course their outstanding feature." All eyries examined were found on ledges and in potholes in the Arikaree formation. The Chalk Bluffs are of very similar formation. Big Simpson Creek in Colorado flows for the first eight or nine miles south of the Wyoming line on the Arikaree; then it cuts into the underlying White River formation. The bluffs near Chugwater and Wheatland, Wyoming, are of similar geological materials and formations. Worcester states that "the White River formation underlies the whole area of southeastern Wyoming and northeastern Colorado, and it is covered in many places by the Arikaree and Ogallala formations. Erosion through the Arikaree and Ogallala would expose the chalky materials of the White River." There may be no significance in my observations, but these ticks have not been observed outside the given type of geological formations and each yielding formation is quite widely separated from the others by open prairies on which the nesting raptorial birds were free from infestation.

The larvae sent to Doctor Cooley were first fed on an immature *Buteo regalis* and later on mice and guinea pigs. His attempts to feed them on young domestic chickens were not successful. Some of the larvae were reared to adult stages and five females and four

males were obtained. From the larval, nymphal, and especially from adult characters the ticks were found to constitute a new species, *Ornithodoros aquilae* Cooley. This form is closely related to *O. talaje* (Guerin-Ménéville, 1849) and *O. kelleyi* Cooley and Kohls 1941, and can easily be confused with them.

The adult stages of this tick have not been found in nature. Other ectoparasites collected in this study were of little or no significance; they were not found so frequently nor so consistently on all species of raptorial birds as were the *Ornithodoros aquilae*. Of these the Mallophagon *Degeeriella fusca* (Nitz.) was the second most consistent form collected.

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*Juneau*  
*Alaska*

## LONGEVITY OF THE AMERICAN HERRING GULL

BY HUBERT MARSHALL

THE longevity of birds has long been a subject of popular interest as well as a problem of biological importance. Prior to the last decade most longevity records were, of necessity, based on birds in captivity since returns from banding operations have only recently made possible an accurate estimate of the longevity of birds in their natural habitats. Gurney (1899), Mitchell (1911), and Flower (1926, 1938) have compiled records of the ages attained by birds in captivity and have attempted to evaluate the reliability of the many claims to extreme age set forth in the literature of the last several centuries. From their compilations it is apparent that individual passerine birds occasionally live for 20 years and that larger birds live on rare occasions to 50 or even 80 years of age. All three writ-