

second three females. The mean wing lengths (point 3) seem to confirm this. The conclusion would be that the sample consists of more than three times as many males as females. This conclusion is acceptable only if it can be shown that some other part of the winter range has a similar preponderance of apparent females. A more reasonable view is that the shorter winged birds in the first three columns are also females. If all birds in those columns with wing lengths under 77 mm. are considered females then there would be 1 1/2 males to one female, a more credible, but not necessarily correct, result.

Reasonable conclusions are that: (1) adult birds do not show the category "very brown" and average distinctly less brown than immatures; (2) the sexual difference in wing length may prove to be about 4 mm. (Ridgway 1901, Bul 50, U. S. N. M., p. 278, gives about 4 1/2 mm.).—Charles H. Blake, Museum of Comparative Zoology, Cambridge, Mass.

Observations on Bird Ticks.—At Hillsboro, N. C. I have kept records of ticks found on banded birds. How many species of ticks have been seen is unknown but the great majority of individuals agree in appearance with specimens kindly identified by Dr. J. C. Bequaert as *Ixodes brunneus*. This species is peculiar to birds in the Western Hemisphere. Males have never been found and its life history is unknown.

My own observations show that these ticks are only present on the head of the host. It is quite possible that a tick attaching anywhere else would be discovered and picked off with the beak. All the individuals I have seen appeared to be in the last instar. The engorged tick drops off its host and there is no evidence that the eggs are attached to the host. I am reasonably certain that engorgement does not require more than about 10 days. Ticks have been found in all months from October to April inclusive. Repeating birds show evidence for new infestation or reinfestation during the winter. Ticks have been observed on the following species: Carolina Wren, Mockingbird, Hermit Thrush, Cardinal, Purple Finch, Rufous-sided Towhee, Slate-colored Junco, Field Sparrow, White-crowned Sparrow, White-throated Sparrow, Song Sparrow.

I have chosen to examine more particularly the infestations found at banding of the four species shown in Table I.

The restriction of infestation to the winter months is certainly real. Cardinals and Field Sparrows are handled in some numbers throughout the year but no ticks have been seen except in the months noted. The records for October and November, 1963 reinforce the indication in the table of a three-year cycle of abundance. The simultaneous presence of two or three ticks on the same bird is not at all uncommon. The heaviest infestation I have seen was ten ticks.

A small area around the point of attachment of a tick is usually denuded of feathers. These are replaced soon after the parasite drops off. Attachment very close to the eye is accompanied by partial closing of the lids. I have not been able to find any damage to the eye itself.

The majority of the infestations are found at banding and practically none are first found on repeaters taken during the first two or three weeks after banding. Either the birds bring their ticks from somewhere else or few birds are captured until they have been in the vicinity for several days. The first alternative seems much more probable, at least in October and November. Recovery data show that our individuals of the species in the table are confined to the Atlantic slope. My own experience in eastern Massachusetts and, with Purple Finches, in central Vermont gives no evidence of tick infestation, even in winter. This leads to the possible conclusion that infestations are acquired a rather short distance north of the banding point. It is clear that the questions implied in this discussion will only be answered by data obtained over a much wider area.

See also the findings of Ali in Proc. XIII Internat. Ornith. Congress, 1963 p. 354 in which he emphasizes the restriction of rather different ticks largely to ground-feeding birds. Charles H. Blake, Museum of Comparative Zoology, Cambridge, Mass.