

The woodpeckers and nuthatches which frequented the orchards, were not seen to eat the eggs of the canker-worm moth. As they were not numerous, none were killed. Mr. Bailey observed, however, that the nuthatches were eating scales which they found on the limbs of the apple-trees in a neighboring orchard. In relation to these scales the following note from Mr. Kirkland is of interest :

"March 20, 1895 Mr. Bailey brought in specimens of apple twigs infested with the Bark Scale louse, *Mytilaspis pomorum*, Fig. 31. He reported that the nuthatch was feeding on them. These twigs were infested in a worse manner than I have ever seen before. They were literally covered with the scales. On one small twig, one-half inch in diameter, I counted 367 scales on one inch of the twig. The eggs contained in a number of scales varied from sixty-two to eighty-two, with an average of seventy."



Fig. 31.

These scales, when numerous, are very injurious to the apple-tree. Each scale covered a dead female of the preceding year and the hibernating eggs, many of which must have been disposed of by the nuthatches. I was shown, both by observation and dissection, that birds feeding in the same neighborhood and upon the same trees showed considerable variance in the character of their food. Kinglets taken, had 10 canker-worm eggs, but had eaten largely of bark borers. Woodpeckers seemed to confine themselves to the larvæ of borers and to wood-ants and other insects which bore into the wood of the tree. Chickadees and nuthatches ate the pupæ and eggs of insects found upon the bark or in the crevices of the trunks. No birds were seen to eat the eggs of the tent caterpillar, nor were any found in the stomachs of any of the birds examined. It seems probable that these eggs are so protected by a hard covering that they are not eaten by most birds.

It is impossible, in the limited space at our command, to give results of all observations and dissections in detail. We can merely give the apparent results of the presence of the birds in the orchard.

It was found that these birds were not only destroying the eggs of the canker-worm in this orchard, but were feeding on the eggs of the same insect in the woods where bait had been suspended.

As the frost left the ground on the first warm days of spring the wingless females of the spring canker-worm moth appeared in the orchard and began ascending the trees in great numbers. The chickadees commenced catching and eating the females and their eggs. Mr. Bailey placed twenty-two of the females on one tree, and in a few minutes twenty of them were captured and eaten by chickadees.

It was noticed as spring approached and insects became more numerous that the chickadees came very seldom to the meat. They were not as assiduous in their attention to the orchard, and a small portion of their food consisted of the early gnats which were flying on bright sunny days. In early April they had nearly deserted the meat, although they still frequented the orchard in search of the female canker-worm moths. They seemed to prefer animal food to all other, and even in cold weather would hardly notice grain or seeds of any kind, though one individual ate a few oat kernels which were placed near his accustomed feed of meat.

Towards the last of April the English or house sparrow (*Passer domesticus*) began to make its appearance in the vicinity and apparently drove the chickadees to the woods, as they disappeared and did not nest in the orchard, but remained in the woods, where they paired and nested.

I believe that the English sparrow is largely responsible for the fact that chickadees are not now found nesting in our orchards. Though they still nest in the orchards on the remoter farms and in the villages where the English sparrow is not numerous, they seem to have disappeared in summer from orchards near cities. At the time of the advent

of the sparrow in old apple orchards.

In the late fall on the apple trees on the apples at that while tree to a less degree the chickadees paratively few

With the neighborhood of Chickadees (*Parus canus*), Purple Blackbird (*Agelaius socialis*), Ovenbird (*Galeoscoptes cafer*), Cuckoo (*Coccyzus erythrophthalmus*), Warbler (*Mniotilta*), Dendroica (*Dendroica pensilvanica*), Warbler (*Dendroica ruticilla*), (Helminthophila), beak (*Habia lucasii*), Least Flycatcher (*Phoebe*), Kingbird

It was not (Fig. 27) first it devoured a canker-worm. The cuckoos, however, were intent on the caterpillar.

Birds from trees infested by a short time the by birds, and the swarming with stripped of their that the trees to protected that trees at a distance enough to disprove apparently demonstrating the wisdom of a nearly all species worms, but the orchards, flying and making regular

On May 1 They were apparently he is certain, for Later, on May 3 large portion of nest about once