

Mountain ranges form barriers to the migratory flights of doves. Some immature doves do not migrate the first winter.

If we stop to consider the relationship of this study to the study of bird migration in general, we find that it adds nothing of importance to what was already known.⁶ We find that it tells us nothing new of the *modus operandi* of migratory flight, nor does it clarify our understanding of its causes. Migration is still as much of a mystery as ever. However, through the application of the bird banding method some detailed knowledge of the migration of a species, which from its own peculiar habits renders it impossible to study by any other method yet devised, has been secured.

KANSAS, ILLINOIS.

NESTING OF THE WHITE-WINGED JUNCO IN THE BLACK HILLS OF SOUTH DAKOTA

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During July and August of 1924, while collecting plants along the highway (No. 83) above Pactola in the Black Hills of South Dakota, Mr. Over observed numerous young and adults of the White-winged Junco (*Junco aikenii*). These birds were particularly abundant near a sawmill, and around a barn where horses were kept, feeding on wasted grain, etc. Upon inquiry he learned that they were reared earlier in the season in the immediate vicinity. Search also revealed several old nests, one on a horizontal 2x4 piece of timber bracing the wall and not six feet from the man who took the boards from the saw. Another nest rested on a timber under the floor and just beneath the saw. The band that ran the sawdust-carrier passed day after day within six inches of this nest. Several employees at the mill bore testimony to the fact that young birds were reared in each of these nests. Two other old nests were found, one in the mill, and another on a rafter plate of the roof of the blacksmith shop, nine feet above the ground and in almost the exact spot where in two succeeding seasons Mr. Clement found occupied nests of this species.

During the holiday season of 1924-25 Mr. Over spent a few days in the locality, and found many of these Juncos present and feeding daily around the buildings. They readily responded to an invitation to visit a hastily improvised feed box where crumbs and cracked nut-

⁶See Problems of Bird Migration, by A. Landsborough Thompson, Chap. XVI.

*This paper has been prepared by Mr. Over, but the material is taken largely from the field notes by Mr. Clement. Efforts made in 1928 by Mr. Clement to photograph the nests and birds were not successful.

kernels were put for their convenience. Again during the last week of March, 1926, a visit to the locality found the birds abundant, and visiting the food box. At this time the mill employees informed the writer that the Juncos were not so plentiful in the summer of 1925 as in the preceding summer.

Mr. F. A. Patton reported this species as common at the State Game Lodge during the first ten days of March, but found no nests.

These facts gave evidence that the White-winged Junco was a breeding resident of the Black Hills. Consequently about May 25, 1926, Mr. George M. Clement, later a student at the University of South Dakota, made a trip to the Black Hills under the direction of Mr. Over for the purpose of collecting.

On June 3 he found the first nest in an old gallon syrup can in a thicket of small pine trees. The location was near an old road camp and only a short distance from the highway. The discovery was made by first observing the male approach the can with a worm. The nest contained four eggs well advanced in incubation. Both birds were taken in order to determine the species.

On June 5 the second nest was found on the ground under a board in a pine thicket near the sawmill. It contained four eggs, too far advanced to save. On the same day another nest was found under the end of an old log, and contained four young which "distinctly showed the white wing bars".

On June 6 a nest was found on a roof plate in the blacksmith shop, about nine feet from the ground. The bird had approached the nest from under the eaves. The nest contained four young birds a few days old, in whose plumage the white wing bars were apparent. This was almost the exact location of the old nest taken by Mr. Over in 1924.

On June 7 another nest was discovered under the root of a tree near the highway. The four eggs were well advanced. On the same date still another nest with four young birds was found in a very similar location and close by.

The season of 1927 was backward, due to late snows in the Black Hills. The first nest found this year by Mr. Clement was on June 13, and in the exact place in the blacksmith shop where one had been found in two preceding seasons. Whether the same female built here during four consecutive seasons we do not know, but Mr. Clement records the fact that the female in 1927 did not flush from the nest until touched by the hand, which may be taken as evidence that she

had become accustomed to human associations. This nest contained three fresh eggs.

On June 11 two nests had been reported to the writers; one under a log with four eggs was destroyed when the log was moved, while another contained eggs well advanced.

On the 14th a nest was located in a tomato can within ten feet of the syrup can nest of 1926. It contained only two eggs, and although the nest was visited daily until the 17th no more were laid. The two, therefore, constituted a full set. About twelve feet distant an old nest was found in another tomato can, which led us wonder if this was a territory claimed annually by the same pair of birds. On the 15th another nest was found under the exposed root of a tree near the roadside. The female was flushed by striking the tree with a stick and joined her mate in a tree a few yards from the nest. The four eggs were too far along to save. It should be stated that Mr. Clement carried a drill, and tested one egg before taking a set. During the last season of work he was able to detect the condition in some cases without the loss of a single egg.

On June 26 another nest was reported by sawmill employees but was destroyed in moving the log. As late as June 29 a nest was found containing one egg, and was visited daily until a set of five was taken.

In 1928 Mr. Clement made a third trip to the Black Hills with the following results: The first nests were found on May 27 under old logs on a hillside; two nests contained four eggs each, but only one set was saved. On the 28th a nest under exposed roots contained four eggs far advanced; here Mr. Clement watched three young birds reared until they left the nest. On the 28th he found another nest with four fresh eggs, which were taken. On the 30th five nests were found, as follows: nest under a log with four incubated eggs; nest on the side of a steep canyon with four eggs far advanced; another nest in same locality with three fresh eggs; another nest with young which left on June 5; the last nest with eggs far advanced.

On May 31 a nest was found with three young birds just leaving the shells, while the fourth hatched on the following day. These birds were under observation until they were able to leave the nest, on June 10. On the same day another nest was found in an open field under a clump of dead grass; it contained four young. Three nests were found on June 1, one under a rock ledge with four advanced eggs, one with four fresh eggs, and one with four eggs ready to hatch. On the 2nd another nest under a rock ledge with young birds, on the 3rd a nest under exposed roots with four young, and on the 6th

a nest with four fresh eggs under a rock ledge, were added to the list.

Mr. W. D. Sharwood, a resident of the Black Hills, has sent me the following notes of the White-winged Junco observed in his vicinity: Parents feeding young on June 12, 1919. Adults apparently nesting on May 8, 1924. Building nest in rear wall of an outhouse on April 13, 1925. Female incubating on May 31, 1925. Young being fed by parents on September 5, 1925.

By way of summary it may be noted that the White-winged Junco is a more or less abundant resident species in local areas of the Black Hills, especially at an elevation of about 5300 feet. From the experience of Mr. Clement it would seem that the species was more abundant in 1928 than in the other periods studied, or that Mr. Clement became more skilled in finding the nests; perhaps both factors played a part.

It is also evident that their nesting season extends over a rather long period, varying according to climatic conditions. As to the nest sites Mr. Clement's notes of 1928 state that this junco prefers "a sloping, mossy hillside, extending up from a creek of running water. The nests are on the ground, under a rock ledge, exposed root, or log." Mr. H. E. Lee reports a nest of this species which was located six inches above the ground in a low shrub with thick foliage. With the nests found in the blacksmith shop nine feet from the ground, as well as others in the sawmill, and including the old fruit cans, it is quite evident that these juncos can adjust themselves to a variety of locations. After all, their nesting habits do not vary far from those of the genus, but are in close resemblance to those of the Oregon Junco.

While four eggs is the usual clutch, it varies from two to five, the small number probably being that of very young or very old females.

We have reports of the nesting of the Slate-colored Junco in the Black Hills, but as yet no authentic records are at hand.

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