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# A Further Study of the Home Life of the Brown Thrasher

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# A FURTHER STUDY OF THE HOME LIFE OF THE BROWN THRASHER—Toxostoma rufum Linn.

BY IRA N. GABRIELSON.

During the summer of 1911, the writer made a detailed study of the nesting habits of the Brown Thrasher which covered a considerable part of the nesting period. The report of this study was published in the Wilson Bulletin.*

During the summer of 1912 the writer made one full day's observations on a nest of the same species under somewhat different circumstances, such that some additional conclusions are reached regarding the nestling food.

The nest in question was located in a cherry orchard, about two and one-half feet from the ground, in one of the cherry trees. At the time of the study the trees were loaded with an abundance of ripe fruit. The nest was discovered on June 17. It was of the usual type and contained four eggs. Between the tree rows and on all sides of the nest was a dense thicket of raspberry bushes. These bushes and the loose moist earth beneath them was a favorite hunting ground for the thrashers and furnished an abundant supply of grasshoppers, beetles and cutworms.

On June 18 the four eggs hatched. On the 22nd the observation blind was erected by the nest. Observations began on the 23d at 3:30 o'clock in the morning and continued without a break until 8:30 in the evening. All of the records were taken by the writer and Mr. Howard Graham, to whom I wish to express my thanks.

The proximity of the food supply kept the parent birds in the immediate vicinity of the nest the greater part of the time. Occasionally one of them flew down the hill to a small creek, but at other times one could either see or hear them in the bushes near by.

It was very easy to distinguish the male from the female. The plumage of the female was of a much duller color, especially on the head where the markings were obscured by a dirty gray color. The female also possessed one or two badly worn and broken tail feathers. These

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were of great assistance in distinguishing the parents when they came to the nest at the same time or in rapid succession. In the tables the four young will be designated as A, B, C, and D.

During the day the parents made 169 visits to the nest with food. The first feeding was recorded at 4:20 A. M. and the last at 8:03 P. M., the active day being 15 hours and 43 minutes. This would be an average of one feeding every 5.57 minutes. Of the total of 169 visits, 85 were made by the male and 84 by the female. These were not made in regular alternate turns but very irregularly, sometimes four or five trips being made by one bird between the visits of the other. Table I will show something of the variety and amount of the food.

TABLE I.

| | By male | By female | Total |
|---|---|---|---|
| Unidentified | 6 | 9 | 15 |
| Grasshoppers | 15 | 23 | 38 |
| Maybeetles | 35 | 30 | 65 |
| Cutworms | 15 | 14 | 29 |
| Spiders | 8 | 10 | 18 |
| Earthworms | 2 | 8 | 10 |
| Crickets | 8 | 5 | 13 |
| Flies | .. | 2 | 2 |
| Damsel flies | .. | 2 | 2 |
| Centipede | 1 | .. | 1 |
| Wireworm | .. | 1 | 1 |
| Dragonflies | 1 | .. | 1 |
| Beetles | 2 | 1 | 3 |
| Cherries | 16 | 3 | 19 |
| Totals | 109 | 108 | 217 |

From this table it will be seen that out of 217 insects, cherries, etc., fed to the nestlings, 109 were brought by the male and 108 by the female, a very equal division of the work.

Some significant facts concerning the economic value of this species are revealed in this table. Grasshoppers, cutworms, and maybeetles furnish over one half the food supply. The exact figures are: grasshoppers 38 out of a total of 217 morsels fed, or 17.51%; maybeetles 65, or 29.95%; and cutworms 29, or 13.36% of the total. These three varieties thus make up a total of 132 out of the 217, or 60.82%. These forms are very destructive in the small truck farms of the immediate vicinity, particularly the cut worms and the larvae of the maybeetles.

Both were more abundant than usual during the season of 1912, due undoubtedly to a favorable season. The cutworms destroyed many cabbage and tomato plants by cutting them off one or two inches below the ground. One man who makes a specialty of raising cabbage estimated his loss at from 25 to 30% of the total number of plants set out. On an adjoining plot, especially noticed by the writer, out of 500 tomato plants less than 50 remained three days after they were transplanted. On investigation one to five cutworms were found around each plant examined. Of course this unusually high percentage of loss was due to some condition in this particular plot especially favorable to the cutworms. In the strawberry beds the maybeetle larvae did considerable damage by cutting the plant just below the crown. From the present observations it would seem that this species might be of considerable value to the market gardner and fruit growers.

Before estimating the economic value of the species we must take into consideration the fruit consumed. During the one day's observation the young were fed 19 cherries out of 217 morsels of food, or 8.75%. Spiders formed 8.29% of the total and miscellaneous worms and insects the remainder. One fact noted in connection with the feeding of the cherries was that the male fed practically all of them, 16 out of 19 being credited to him. The larger portion of these were taken from the nest tree, many of them being taken from the tree and fed during visits to the nest with insect food. The most striking fact about the latter is the low percentage of fruit consumed considering its availability. It would seem that this amount represents the maximum fruit eating proclivity of this species, at least in regard to the nestlings, since it would be difficult to conceive of more favorable conditions for its use. The remaining 22.13% of miscellaneous insects consists of such small numbers of each species that their destruction has little economic importance. Their use as food indicates that the birds have no aversion to them. It might also warrant the conclusion that if for any reason any of these forms should increase in numbers enough to become economically important, the Brown Thrashers would help keep them in check.

Summing up these facts the balance seems to be strongly in favor of the birds. Against the actual loss caused by the consumption of fruit to the extent of 8.75% of the food, can be placed the destruction of injurious insects amounting to 60.82% of the total. As previously stated the conditions were very favorable for the use of fruit as food, and this makes it probable that the amount of fruit consumed would rarely exceed 10% of the total food supply. In determining the economic

status of these birds it is easy enough to estimate in dollars and cents their depredations on fruit; but it is impossible to state in similar terms the value of their work in destroying noxious insects because we deal here not only with the actual insects destroyed with but numerous other generations which would follow.

Comparing these results with those of the previous report, we find that while the two studies were made in different localities, and during two quite dissimilar seasons, the results compare very favorably. In the former report we find a total of 1,260 morsels of food consumed. 425 of these were mayflies; 247 grasshoppers; 103 cutworms; 38 beetles and 22 larvae, practically all of both being maybeetles; and 425 of various forms in small numbers, including 237 moths of various species. The two greatest discrepancies shown by a comparison of Table III of the previous report and Table I of the present article are first, the large number of mayflies and moths consumed by the first brood studied and their total absence from the list of insects fed to the last brood and second, the absence of fruit in the first table and its presence in the latter. These facts will be discussed in the next paragraph. Selecting from the previous study the data on the three forms of insects most numerous in the present data, viz., grasshoppers, maybeetles, and cutworms, we find the three forms total 410 out of 1,260, or 32.54%. Mayflies form 33.73% of the total and the remaining 33.73% consists of moths and miscellaneous species. From the data furnished by these two studies, it seems that these three forms mentioned above furnish a considerable percentage of the nestling food of the species. No definite figures can be given as the percentages will vary somewhat in individual birds and will also fluctuate from day to day in the food of the same individual. This fluctuation will depend on two factors; first, on the number of individuals of each species of insects that are in the immediate vicinity of the nest; and second, on the availability of other food supply.

There are two general facts that may be stated from the data obtained which have some bearing on the economic status of the species.

First, a great number of species of insects are acceptable to the brown thrasher as food. A glance at the two tables previously mentioned will be sufficient to demonstrate this fact and further study would undoubtedly greatly extend the list.

Second, the birds easily adapt themselves to varying conditions in the food supply and so act as a check on different species of insects. For example at Okoboji in 1911 the mayflies were present in great numbers and the food of the brood studied consisted of over 33% of this form. Grasshoppers were numerous and formed 20% of the food and 19%

was made up of the various kind of moths. On the other hand no fruit was fed to the nestlings. At Sioux City in 1912 the mayflies were not noted among the forms fed. This was due to the absence of any considerable body of water in the vicinity of the nest. The moths were also absent. Maybeetles, cutworms, and grasshoppers were the most abundant forms and they constituted over 60% of the total. If some other of the species consumed by the brown thrasher should become plentiful and easily obtained it would undoubtedly be found to furnish a large percentage of the food. Data from other localities would furnish a basis for an interesting study of the effect of varying food supplies on the nestling food of the species.

Table II will show the distribution of the food among the nestlings.

TABLE II.

| Parent feeding. | A. | B. | C. | D. | Total. |
|---|---|---|---|---|---|
| Male ..... | 22 | 21 | 30 | 22 | 95 |
| Female ..... | 27 | 24 | 19 | 15 | 85 |
| Total ..... | 49 | 45 | 49 | 37 | 180* |

The apparent discrepancy between the 169 visits and the 185 feedings is explained by the fact that on 16 visits the parents fed two of the nestlings making 16 more feedings than there were visits to the nest. On 13 of these occasions the male did the double feeding and the female did it 3 times. In the case of five of the feedings the nestling receiving the food was not identified, leaving 180 recorded feedings or an average of 45 to each nestling. Actually A was fed 49 times, B 45 times, C 49 times, and D 37 times. A curious fact noted in the two studies in regard to the average feeding was that in both broods one of the nestlings received considerably below the average amount of food while the other three received very close to it or slightly above it. In both instances the one receiving less than the average amount of food during the period of observation was very noticeably smaller and weaker than the others. There was no regular sequence of feeding or any approach to it. At times one of the nestlings would be fed three or four times in quick succession and then might be neglected for an hour or more.

In the sanitation of the nest the same cleanliness was observed as in the previous study. Only once during the day did any of the excreta touch the nest and that occurred when one of the packages of excreta

*Five times the nestling fed was not identified. Three of these feedings were by the male and two by the female, making the actual number of feedings 185; 98 by the male and 87 by the female.

broke in the parent's beak. On this occasion the part retained was devoured and the remainder picked carefully from the nest and carried away. During the day the excreta was removed from the nestlings 36 times; 20 times by the female and 16 by the male. Out of the 16 times the male devoured the package 11 times and carried it away 5 times and the female devoured it 5 times and carried it away 15 times. Out of a total of 36 the excreta was removed 33 times from the bird last fed and 3 times from some other bird. Thus confirming the previous observations on this point.