

A STUDY OF HUMMINGBIRD BEHAVIOR
DURING A NESTING SEASON

By CHARLES L. WHITTLE

EQUIPPED with a spring balance, reading to one half gram by estimation, and several cylindrical glass flower-containers placed within five to fifteen feet of the house, I have been able to study the habits of the Ruby-throated Hummingbird (*Archilochus colubris*) during the 1937 nesting season at close range.

The accuracy of the balance was carefully tested by using standard metal weights. The liquid containers for the syrup were found to be essentially of equal diameter for their entire length, and when full that they held two grams of syrup, thus affording a means of estimating approximately the weight of the contents eaten by the birds when desirable. The pan on the balance was replaced by a horizontal twig to which a red Packard feeder was attached. The twig was often used as a perch for the Hummers while they fed from the container. With binoculars it proved easy to read the bird weights with accuracy. The location of the balance and the feeders, six in number, close to the house served to bring the birds so near that exceptional opportunity was afforded to observe their behavior prior to nest building, during their courting and nidification and after the young left the nest. Two pairs at least nested near the house, with the result that one or more birds were usually feeding from the containers or flowers from early morning till nearly dark, the attendance becoming less as the season advanced and the flowers increased. The males in particular became less attentive beginning with the appearance of young Hummers about the middle of August.

ACTIVITIES PRIOR TO AND DURING NESTING TIME

The first Hummer to arrive at the station was a male arriving on May 17th. He at once visited a feeder, but was not seen again, probably moving northward in migration. On May 21st a second male appeared and he too visited a feeder immediately. He then began a long vigil lasting until May 30th, believed to be a search for a female. This vigil took place from three observation posts overlooking a circular flower garden, one on an aerial, one on a dead branch of an elm, and a third on a dead twig at the top of an apple tree, all these perches being from fifteen to twenty feet from the ground. For the major portion of each day he occupied these perches, moving from one to another, and while perching he continually moved his head from side to side through an arc of 60-70 degrees. One cannot well escape the conclusion that he was searching for a female, since the habit was immediately discontinued upon

the arrival of a female at the station on May 30th. Now, for a period of about a month, his attention was directed to the female and consisted of the usual zooming before her whenever she appeared at the feeders and no doubt elsewhere. During this period two or more females and another male (a late arrival) visited the feeders many times daily. Now there were two zooming males in place of one. The females paid not the slightest attention to the advances of the males, and this lack of attention continued up to about July 1st, when their attitude towards the males underwent a complete change. On July 2d a male and a female were seen facing each other in the air about eight to ten inches apart, ascending and descending vertically to a height of about ten feet, and occasionally dropping to the ground for a moment. At other times their flights were more or less spiral in character, and such exhibitions were frequent up to July 7th, when Mrs. Whittle observed a pair drop to the ground beside our driveway, where copulation took place. From this time on the males were seen zooming only occasionally, and vertical flights ceased entirely after the first week in July. It is naturally assumed that this behavior was coincident with the duration of the egg-laying period.

Early in August the males' attendance at the feeders was noticeably less (owing partly, no doubt, to the increase of their favorite flowers), and by August 10th several days would pass without a visiting male being seen. In the meantime the females divided their attention between the feeders and the flowers.

By August 27th Hummers were becoming scarce. On the 28th and 29th none was seen. On the 30th one, evidently a migrant, passed through. None was seen on the 31st, or on September 1st or 2d, but on the 3d another was seen for a moment:

REGARDING MATING

The voluminous literature on Hummingbirds, covering many aspects of their life-history, is singularly deficient in the details of the behavior of mated pairs. The paucity of recorded cases of a male visiting the nest during incubation or during the feeding of the young in the nest is especially striking. During personal observations for a period of four nesting seasons. I have never noted the presence of an adult male in the two maples where at least one pair has nested each year.

Mating, in the ordinary sense of the word, that is, pairing off well in advance of nest-building and continuing during nidification and raising of the young birds, as far as any evidence observable at this station is concerned, appears not to take place. No preference for a male on the part of a female is indicated until *just prior to egg-laying*, a period seemingly of three or four days. I have found no

evidence that a male's interest in a female one day is manifested towards the same female the following day. All the pretty ways common among many species of mated pairs, often lasting two months at least, are entirely lacking among Hummingbirds. The male appears to be a free lance whose intimate interest in the female is confined to the short period just before and during egg-laying.

FLYING SPEED

During this nesting season (1937) for the first time in my experience an opportunity occurred to get an estimate of a Hummingbird's flying speed. This occurred in the following way: A straight driveway about two hundred and fifty feet in length extends from the highway to the house. On one occasion I was sitting within ten feet of the driveway when a pair of Hummers came over the house about one foot apart and crossed the driveway, very close to me, to a field. I noticed that they were swinging around so as to reenter the driveway. This they did, and then followed it back and over the house again, a measured distance of two hundred and ten feet. The time required to fly this distance was slightly under two seconds. Calling the time two seconds, they flew at the rate of seventy-one miles per hour. At best this is an estimated speed, but I feel sure their real speed was over, rather than under, that figure.

HUMMINGBIRD WEIGHTS

Using the balance above described, several dozen weighings of adults of each sex were made during a month's time and at all hours of the day. Of the total weighings of males made, only two were of three grams, and of females only two were of two grams. One male also weighed two grams, but fully ninety per cent of the weighings of both sexes gave two and one half grams, and this is doubtless their average weight. The high readings were probably due to recent feeding on the heavy syrup, and the low readings to early-morning weighings when the alimentary tract was quite empty.

Several weighings of very young birds (sexes not known) were made, and they were found to weigh close to two grams. It was noticeable, however, that, while the adults showed no evidence of molt, the plumage of the young birds was less trim and was manifestly not completely grown. One had a dark throat-patch where the natal down still showed, the same bird also having a prominent whitish spot at the base of the upper mandible that possibly may be a remnant of the egg-tooth.

Commonly the birds fed from the feeders for only a moment at a time, but occasionally one would take a long, uninterrupted drink. On one occasion a female during fifteen seconds consumed one-half gram of syrup.

1936 MIGRATION NOTES

During the first week of September, 1936, a migration of Hummers was easily observed. At that time there were several hundred gladioli in bloom close together, forming a conspicuous patch next a field on the south. During this period the feeders were in place as usual, but flowering plants visited by these birds were scarce. Each day females or young Hummers from the north came singly or in twos and, rarely, in threes, and fed from the gladioli, stopping only a moment usually but occasionally for two or three minutes. They then in each instance flew swiftly southwesterly across the field. None of the birds visited the feeders.

It is thought probable that this is the usual manner of migration, at least in New England, the birds lingering at places where flowers occur conspicuously, but moving rapidly across less promising terrain.

REPORT ON THE COÖPERATIVE HERRING GULL PROJECT

<i>Station</i>	<i>Number Banded*</i>	<i>1937 Color Combinations***</i>	<i>Bander</i>
Kent's Island, N. B.....	2,350	Survey band over one red band	W. A. O. Gross and N. R. Pillsbury, Jr. (Bowdoin Scientific Station)
Labrador Coast.....	300**	Survey band over one yellow band	Harold S. Peters (U. S. Biological Survey)
Isles of Shoals, N. H.....	500	Two red over Survey band	L. O. Shelley (N. E. Bird-Banding Association)
Razades Islands, Que.....	727	Two blue over Survey band	D. A. Déry (Provancher Society)
Bonaventure Island, Que....	100	Two yellow over Survey band	William Duval
Wicopesset Island, N. Y.....	75	Survey band over red over blue	W. C. O'Brien (Nat'l. Assoc. of Audubon Societies)
St. Mary Islands, Que.....	505	Survey band over red over yellow	H. F. Lewis (National Parks of Canada)
Penikese Island, Mass.....	500	Survey band over blue over red	L. B. Fletcher (N. E. Bird-Banding Association)
Heron Islands, Me.....	700	Blue over yellow; Survey band on opposite leg	Stanley Hyde (N.E. Bird-Banding Association)
Muscongus Bay, Me.....	683	Survey band over yellow over blue	A. D. Cruickshank (Nat'l Assoc. of Audubon Societies)
Total.....	6,440		

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*All birds were fledglings except 200 adults at Kent's Island, which have an additional black band on opposite leg.
**Unofficial.
***Bands are on either leg.