

# THE MEMORY OF HUMMINGBIRDS

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Ruby-throated Hummingbirds (*Archilochus colubris*) have been regular summer visitors to a clearing at Lindner Point on Emma Lake since the late 1930's, where they feed on nectar from the flowers of delphinium and clematis that were planted by Ernie Lindner when he first built a cabin on the island in 1935.

Spring migrants of this species arrive in the region of Emma Lake and Prince Albert in late May (Houston and Street, 1959), long before flowers are in bloom. Between their first spring arrival and the time when nectar from flowers is available, we have observed hummingbirds feeding on sap from holes made by Yellow-bellied Sapsuckers (*Sphyrapicus varius*) and on spiders and other small arthropods from the branches and needles of spruce trees. The dependence of hummingbirds on sap from sapsucker holes has long been known (see *Blue Jay*, 23:80-81); R. W. Nero (pers. comm.) has suggested the interesting possibility of a correlation between the northern limit of distribution of the Ruby-throated Hummingbird and the distribution of sapsuckers in western Canada.

In the spring of 1964 artificial feeders were installed by the authors at several locations in the yard at Lindner Point, and these feeders were subsequently used regularly by female Ruby-throated Hummingbirds every summer for the next four years. The feeders consisted of wire loops that supported 18 x 145 mm. lip vials filled with a 50% sugar solution coloured with red vegetable dye (Fig. 1).

A study of the feeding behaviour of Ruby-throated Hummingbirds in the summer of 1968 (Miller and Miller *in press*) was designed to test the relative importance of colour and the position of a food source in the establishment of feeding preference. The results showed that Ruby-throated Hummingbirds do not have a significant prefer-

ence for any one colour when given a choice of different coloured foods of equal quality. The location of a food source is more important than its colour in the quantitative expression of a feeding preference, although any of several colours may act as a discriminator stimulus in the process of locating and identifying a food. An interesting and important question is the length of time that the location of a food source is remembered.

Previous authors (Collias and Collias, 1968) have noted that hummingbirds frequently show "exploratory shifts" to other colours, even when trained to one colour as a food source. This was observed frequently during these experiments. It was also observed that the hummingbirds would often investigate plants that were not yet in flower, in spite of an abundant food supply from the artificial feeders. This activity was usually directed to delphinium and clematis, which are the most important sources of nectar in the yard when they are in bloom. Collias and Collias (1968) suggest that an "exploratory shift" away from a known food source "increases the probability that flowers of a different species will be discovered to be profitable just as soon as they begin to have a good nectar flow." The efficiency of this activity would obviously be greater if hummingbirds remembered the location of plants that were important food sources in previous years. Some observations made during this study suggest such a possibility.

If a feeder is removed from its position, hummingbirds will continue to visit that position, often dipping their bills through the wire loop that previously supported a feeder. This practice was often continued for several weeks, in spite of the fact that the feeder was not replaced and the bird received no reward for its visits. In one case, a single female which was identifiable by some broken feathers

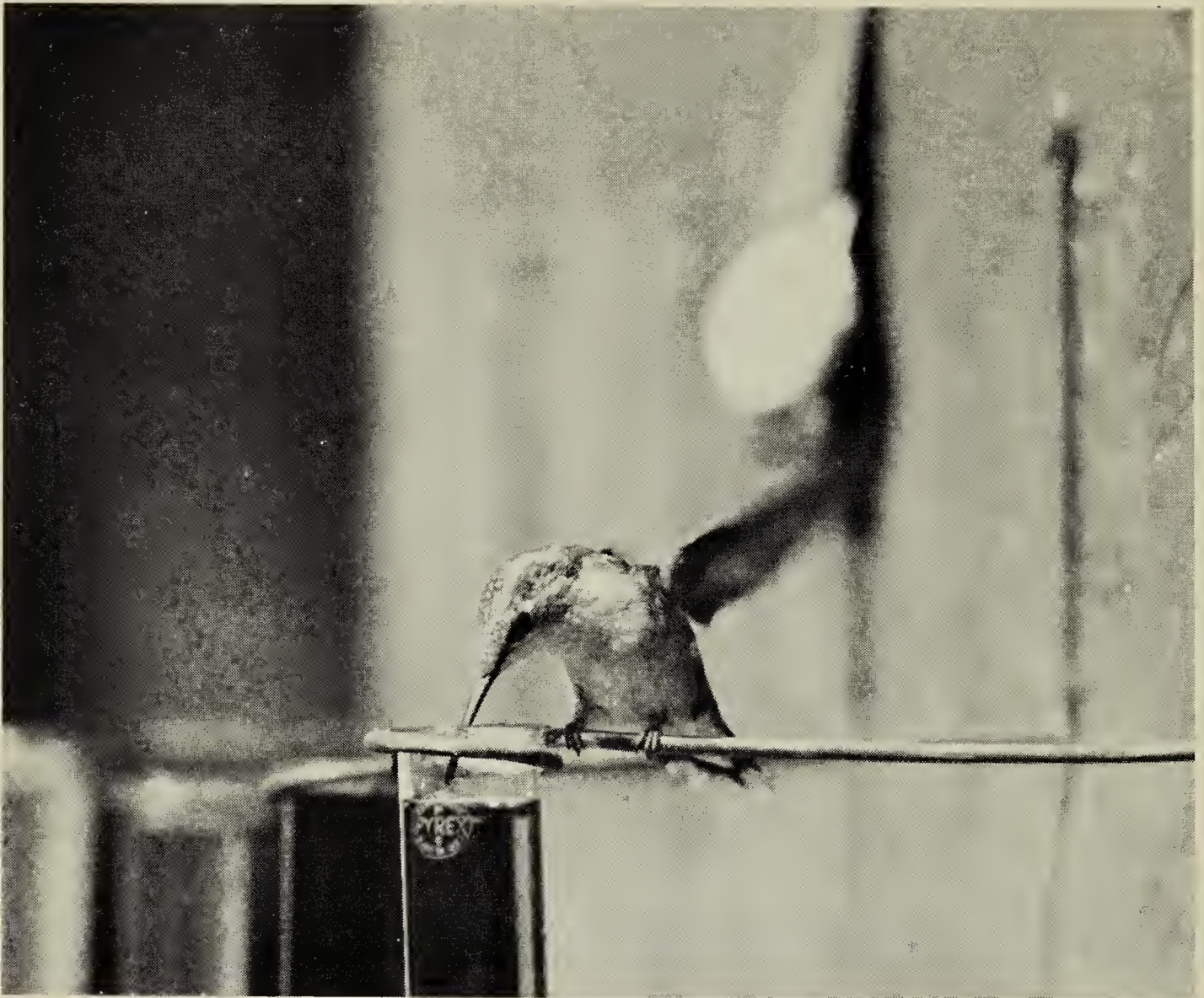


Figure 1. Female Ruby-throated Hummingbird at feeder.

visited an empty feeder position on a window ledge several times every day in the summer of 1968, even though that position had not held a feeder since the summer of 1967. It might be argued that she discovered the wire loop on the window ledge in 1968 and associated it with other feeders in the yard, but this seems unlikely in view of her persistent visits without food reinforcement. The most convincing observations were made in late May of 1967 and 1968, before any flowers were in bloom and before any of the feeders had been filled and placed in their holders. Hummingbirds were observed visiting the empty feeder positions in the same sequence that was usually followed by experienced birds in previous summers. As these positions had no distinguishing features other than the empty wire loops to identify them, the most reasonable

explanation for this behaviour would seem to be that these birds were return migrants that remembered the feeder positions as sources of food from previous summers.

Although the conclusions drawn from these observations are speculative, there is at least circumstantial evidence that hummingbirds do remember the location of food sources from one year to the next, and that their "exploratory shifts" may often be directed towards a known potential food supply.

#### LITERATURE CITED

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