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TWENTY-FIVE MINUTES IN THE LIFE OF A *SELASPHORUS* HUMMINGBIRD

WITH ONE ILLUSTRATION

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Each spring and autumn, as the tide of *Selasphorus* hummingbirds sweeps up and down over central California, there is an impressive display of activity as individuals or aggregations of this group visit gardens, cultivated or wild, before going northward to their nesting areas or southward to their wintering places. During late spring or early summer, when nesting is in progress, the birds are scattered out, and less is to be seen of them. But before and after this annual event, numbers may be assembled in favorable locations and a brilliant and dashing display ensues. In the springtime, the males are performing their distinctive nuptial "swings", but in late summer when sexual ardor has subsided, males and females, old and young, engage in active contest for favored feeding places. A garden full of late summer blooming flowers is likely to attract anywhere from two to a dozen of the birds.

Birds, as a group, and particularly the "higher groups" of land birds, manifest a high rate of activity; like ourselves, they are delicately adjusted physico-chemical entities. Their higher body temperatures are probably related to planes of nutrition and activity above those of the somewhat "cooler" bodied mammals. This generally greater degree of activity, combined with the relatively uniform marking of most members of a species, increases the difficulties of the observer who desires to follow the activities of particular individuals. Chronicling the activities of an individual bird is difficult save under favorable circumstances. An instance of the latter character furnishes the material of the present paper.

Late in July, 1924, I was enjoying the genial hospitality of the H. E. Wilders at their home near Carlotta, in the valley of the Van Duzen River, in Humboldt County, California. A small clearing at the margin of the redwood forest is occupied by the house and the flower and fruit garden. A host of annuals and perennials was in bloom, including a number of large Fuchsia bushes, and these had attracted a number of *Selasphorus* hummingbirds.

Birds of this group ordinarily cannot be identified, out of hand, farther than to the genus. At Carlotta, the presumption would lie in favor of a majority of *rufus*, since this locality is toward the northern end of the known breeding range of *alleni*. Of the birds watched, one adult male, with full reddish back, was certainly *rufus*, but the others, which included some females and young, might have been of either or both species, since the southbound movement of *rufus* from north of California is known to be in progress at the end of July.

There were, I think, on July 28, at least five *Selasphorus* with headquarters in this garden. At least three of these had definite forage ranges or "territories". Whether the other two had regular territories of less favorable character, or whether they, and possibly others, were persistent "poachers" repeatedly endeavoring to encroach upon the domains of the more fortunately located individuals, I could not decide. Each of the three "owners" had a home range, or, better, a forage range, and each could apparently forage within his or her respective range without being molested by the others of the trio. But there was almost constant invasion by, and repulsion of, outsiders. In the *Selasphorine* world, as in the world of human affairs, the favorable hunting grounds of some owners proved an irresistible temptation to others less fortunately provided. There were many pursuits; the population was ever in a condition of unstable equilibrium. Sometimes the "invader" departed at the first movement of the "owner"; on other occasions he would be literally "run out of the country" by being chased fifty yards or so across a clearing to the border of the forest. Exceptionally, the owner and invader grappled with one another, apparently bill to bill, and tumbled through the air until close to earth before separating. Once I saw a "poacher" sneak into the lower dense foliage of a *Fuchsia* which "belonged" to another hummingbird; it remained there for some seconds, sipping rather quietly from blossoms until discovered and driven out by the "owner".

When foraging in one of the pendant flowers, a hummingbird would poise beneath and turn its bill directly upward, maintaining its position by fanning out the tail and then tilting it up or down as necessary so that the resultant action, with the continuously beating wings, was to keep the bird where it could reach easily for its food. Occasionally one of the birds when perched in a *Fuchsia* bush would reach its bill over to a conveniently adjacent flower and feed.

The hummers were active throughout the daylight hours, and this meant more than a 12-hour day. Feeding, chasing off invaders, and, between these, brief periods of rest, filled the day in unending program; seldom was there quiet for so long as a minute. Even when perched, a bird often turned its head this way and that to keep watch on competitors. Several times I noticed that a bird which had been in vigorous action when it came to perch, seemed to be panting heavily as a result of its strenuous activity.

I chose for study the hummingbird with what seemed to me to be the most favorable forage area, and that happened to be the bird which also could be most easily observed at its various activities. With watch and pencil in hand, I endeavored to make a record of its activities for a brief period. I cannot say positively that at all times I was seeing the same bird, since there was no certain mark for repeated identification; yet I have no reason to doubt that I was following one particular individual. With each change of activity I recorded the time and nature of the activity and, when the bird came to rest, the perch occupied. For convenience of examination I have brought the record into a graphic presentation. Disconnected observations on this bird, before and afterward, and subsequently, elsewhere, on others of the genus, indicate that the schedule here recorded is a fair sample of late summer activity.

The diagram of the garden indicates only the principal objects. The individual hummingbird under discussion controlled the territory to the right of the figure. Its foraging was practically all done in *Fuchsia* "b" which was also the site of its perch "no. 1". For perch no. 2 it occupied several places on the row of Dahlias, where it faced toward the forage bush. Perch no. 3 on a bush in the shade of a tree, was evidently not a regular station; perch no. 4 was on some part of a wire, which was about 20 feet from the *Fuchsia*. *Fuchsia* "a" was presided

over by a second hummingbird which perched at times in the prune tree. Other hummingbirds inhabited the other Fuchsias shown. At "x" between the two Fuchsias "a" and "b" was a "no-man's land" which if entered by one would be contested by the other. But the proprietors of Fuchsias "a" and "b" did not attack one another when each was in his or her proper forage bush.

The activity record indicates the frequency and duration of periods given to chasing invaders, resting and foraging. In the 25 minutes of activity recorded, there were 27 chases, lasting from 2 to 25 seconds each (average 10 seconds each),

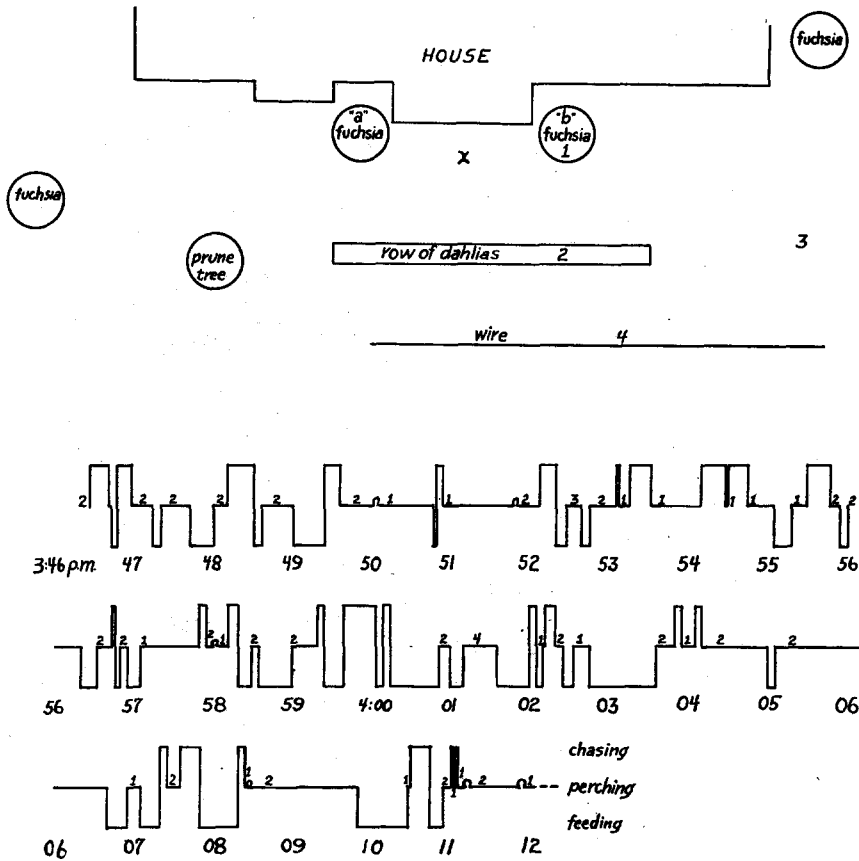


Fig. 60. ABOVE, THE FORAGE AREAS OF THE HUMMINGBIRDS; BELOW, THE ACTIVITY RECORD OF A SINGLE *Selasphorus*. TIME IS INDICATED IN MINUTES. THE CENTRAL LINE (WITH THE PERCH NUMBERS INDICATED) REPRESENTS TIME SPENT ON A PERCH, THE UPPER LEVEL INDICATES TIME SPENT IN CHASING RIVALS, THE LOWER LEVEL RECORDS TIME SPENT IN FEEDING. CHANGES OF PERCH ARE INDICATED BY A SMALL LOOP.

29 feedings, of from 2 to 50 seconds duration (average 14.4 seconds each), and 38 times when the bird was perched. On one or more occasions the hummingbird scarcely alighted before it took off again; the longest rest was of one minute and 35 seconds duration; the average rest was for 20 seconds. A total of 269 seconds was devoted to repelling invasion, 420 to feeding, and 782 seconds to perching.

Davis, California, April 7, 1930.