

THE CONDOR

A BI-MONTHLY MAGAZINE OF
WESTERN ORNITHOLOGY

Published by the
COOPER ORNITHOLOGICAL CLUB

VOLUME XXXIII

SEPTEMBER-OCTOBER, 1931

NUMBER 5

HUMMINGBIRD BOARDERS

WITH THREE ILLUSTRATIONS

By ROBERT S. WOODS

During that portion of the year when flowers are least plentiful, no birds respond more enthusiastically to proffered hospitality than do the hummingbirds. By providing a suitable food supply, one not only obtains the satisfaction of witnessing their evident enjoyment, but gains as well the opportunity to become better acquainted with hummingbird psychology and to make such experiments as may suggest themselves. In the following account are described some of the reactions of hummingbirds to artificial feeding, as observed by the writer at Azusa, California, since July, 1929.

The first experiment tried was suggested by an assertion in an article appearing in a well-known magazine, to the effect that Ruby-throated Hummingbirds (*Archilochus colubris*) had been attracted by the odor of perfume. This idea seemed quite novel and the evidence cited not particularly convincing, in view of the hummingbird's inquisitiveness in many matters; but a simple test was arranged in order that the local hummingbirds might verify the statement if they were so inclined. Two small vials, to be filled with sugar solution, were fastened to stakes, one of the bottles being wrapped with red cloth, and the other with green cloth upon which were placed several drops of a mild, sweet perfume. The stakes were then set in a flower bed frequented by several immature hummingbirds of various species.

The birds' attention was immediately attracted to the red-covered vial, which they inspected minutely, though only one was observant enough to discover the sugar solution within, since they probed the sides rather than the top of the vial. Finding no nourishment, the others lost interest in it after one or two visits. The perfumed, green-covered vial, on the other hand, was entirely ignored, although the birds often passed close by it. Later, drops of vanilla were placed on the foliage of plants, but this pronounced odor was equally ineffective in attracting the hummingbirds. Neither did a heavily fragrant night-blooming cactus (*Trichocereus*) draw them, while the richly scented jasmine seemed less favored than many other flowers. Thus, although

these tests yielded no positive results, they served to strengthen the writer's previous belief that it would be very difficult to show that hummingbirds were at all guided by any sense of smell.

It may be pertinent to mention at this point that the hummingbird's sense of hearing is well developed, as shown by its definite response to sharp sounds, though its reaction may be merely a nervous start or an attitude of alertness, instead of the immediate flight which is invariably precipitated by any abrupt visible movement. This sudden flight, like the nervous start, can undoubtedly be attributed to reflex action rather than conscious alarm. On the other hand, the slight sound of the crunching of a dead leaf seems to arouse in the hummingbird the same feeling of apprehension which it does in so many other creatures.

Experiments on domesticated birds, such as pigeons and fowls, have been reported as indicating that the spectrum visible to birds extends into the infra-red and stops short of blue and violet. It is evident that the latter part of this conclusion, at least, does not apply to hummingbirds, as they freely visit blue and purple flowers. Bits of red and blue cloth were both found to attract their attention, with no apparent preference shown.

After abandoning the perfume experiment, the hummingbirds were quickly lured to the green-covered vial by inserting a blue agapanthus blossom in its opening. Upon again removing the flower, some of the birds were at first at a loss to know where to obtain the food, but after a time they learned to identify the plain, undecorated vial as a new and exceptionally productive kind of flower.

In drinking, when the syrup is beyond the reach of the bill, it is lapped up by rapid movements of the tongue. The bird is able to reach it in an upright vial at a depth equal to twice the length of the bill. Should the vessel be filled nearly to the top, the liquid is either sipped with the end of the bill submerged or lapped with the tip of the bill held just at the surface and the tongue extended only slightly. The amount of saturated sugar solution normally consumed daily by an Anna Hummingbird (*Calypte anna*) is about two teaspoonfuls, only a few drops being taken at a time.

When the weather is cool, the birds visit the feeding places at short though irregular intervals throughout the day; but in the heat of the summer, half an hour is likely to elapse between mid-day trips, with late afternoon bringing gradually quickening activity. Always, the visits are most frequent and prolonged after the shadows of evening have fallen. Summer or winter, the Anna Hummingbird's day ends at about ten minutes after sunset, as far as feeding is concerned. In the morning the birds are seen drinking earlier than fifteen minutes before sunrise.

In order to determine food preferences, various liquids were offered to one hummingbird which was a regular boarder, a supply of sugar solution being maintained in another vial at the same time as a means of comparison. Juice of preserved strawberries and a solution of quince jelly were definitely rejected, as were milk and watermelon juice. Cane-and-maple syrup was taken readily, but the plain sugar seemed to be preferred. Strained honey was well received, though its viscosity, when undiluted, seemed to occasion some slight inconvenience, for after every few sips the hummingbird would draw away and protrude its tongue rapidly several times. A later trial of the best quality of strained honey did not meet with particular approval, for the birds, after one sample, returned to the sugar syrup.

Changes in the form of the feeding device are often puzzling to the hummingbirds, and necessitate their re-education. When an automatic drinking fountain formed by inverting a bottle into a small cup was substituted for the upright vials,

the hummingbird attempted to thrust its bill through the upturned bottom of the bottle, and even after finally discovering the liquid, was unable on subsequent trips quite to overcome the idea of getting the food through the top of the device.

The hummingbirds' remembrance of these sources of supply is not in any way dependent upon accidentally catching sight of them. A hummingbird, upon visiting a feeding station and finding that the bottle had been removed, flew at once to another which was maintained on the farther side of the house. Their memory for location is surprisingly accurate; when a feeding device has been moved, a hummingbird, upon returning, will often hover at the exact spot from which it has been taken, and will probably make several trips to the place before finally giving it up. On the other hand, a similar device in a new location will attract their attention almost immediately, and they are also quick to visit any additional container which may be placed beside the one they have been using, unless it is of a kind with which they are unfamiliar.

Apparently a hummingbird's discovery of food supplies is aided very little by its observation of its fellows, since a drinking fountain may for some time be patronized

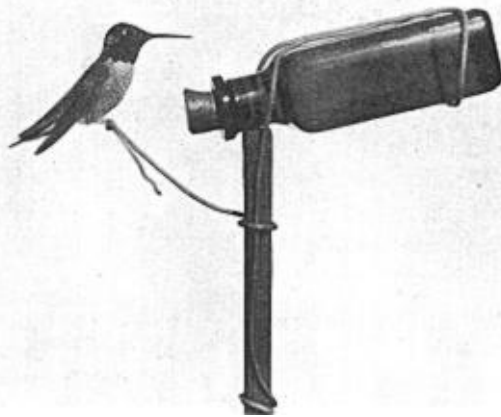


Fig. 35. A HUMMINGBIRD "FILLING STATION". THE CUSTOMER'S NAME IS CALYPTE ANNA. AZUSA, NOVEMBER 20, 1929.

by but one or two of several hummingbirds present. There are indications, however, that the example of one eventually leads to similar action by others.

To the nature of its feeding habits, no doubt, may be attributed the fact that it seems not to occur to the hummingbird to try to reach its food through the use of force, no matter how slight. Should a small leaf or other light covering be placed over the opening of the bottle, the hummingbird will attempt to discover a way around the obstruction, but will make no effort to push it aside. If it finds a crack it inserts its bill with what appears almost like deliberate care to avoid moving the covering.

The artificial feeding sometimes brings out strikingly the differences in individual temperament among the hummingbirds, as in the case of the first two which became regular patrons. One of these, a young male Costa (*Calypte costae*), always

approached the vial confidently and devoted himself wholeheartedly to satisfying his appetite. The other, which looked like a female Black-chinned (*Archilochus alexandri*), was ever on the alert, retreating in alarm and returning to snatch a few more swallows, never seeming entirely at ease even after many visits; its apprehensions were aroused one day by a wad of burlap tied around the middle of the stake to discourage exploratory ants. Most of the others were somewhat intermediate between these two in their characteristics. Nearly all of the birds would leave the drinking fountain as soon as they had satisfied their hunger, but one individual was accustomed to remain at ease on the perch until driven away by another hummingbird.



Fig. 36. A BEE-PROOF DRINKING FOUNTAIN. UNDER ORDINARY CIRCUMSTANCES THE OTHER TYPE IS MORE CONVENIENT. JULY 30, 1930.

The hummingbirds have competitors, of course, who are equally fond of sweets and will in some cases deprive them of the benefits if not guarded against. During the warmer part of the year ants are persistent, and in summer wasps have given trouble when the supply was placed beside a pool where they congregated. The Arizona Hooded Oriole (*Icterus cucullatus nelsoni*) and the Audubon Warbler (*Dendroica a. auduboni*) also are not averse to an occasional drink of sugar syrup. The honey bees, though abundant, showed no interest in the sugar except during a period in the midwinter of 1929-30, when they swarmed around the feeding places in such numbers as seriously to interfere with the hummingbirds' use of them.

Due to their habitual association, perhaps, the hummingbirds accept the presence of the bees more philosophically than that of the ants. Unless the bees are flying, the birds show no particular fear of them, and will thrust their bills through a struggling mass of the insects. A few ants about the mouth of an open vial will often keep the hummingbirds away, though they cause much less concern when swimming in the syrup. A moat filled with water or some repellent liquid is doubtless the most certain means of discouraging these pests.

As it proved impractical to make the corked bottles (figs. 35 and 37) proof against bees, the device shown in figure 36 was arranged with this in mind, the opening being narrow and located so that the liquid would not be drawn by capillarity within their reach. This drinking fountain, when properly protected against ants, seems to give the hummingbirds a virtual monopoly, though it is not unlikely that they themselves prefer the less formidable-looking containers. It consists of a small-mouthed bottle and a glass jar with a metal cover. Two holes are cut through the cover, a round opening on one side just large enough to receive the neck of the bottle, and a slot on the opposite side wide enough comfortably to admit the hummingbird's bill, but too narrow to allow the entrance of a bee or wasp. There is little evaporation and no overflow, as the jar has sufficient reserve capacity to take care of the water forced out of the bottle by the daily expansion of the enclosed air. A supply of undissolved sugar in the bottom of the jar maintains a saturated solution, which is held at a constant level as long as any water remains in the inverted bottle.

The four-ounce brown bottle with a diagonal hole through the cork (fig. 35) is well suited to the hummingbird's convenience, though it may sometimes be subject to leakage or overflow. A narrow air vent along the upper side of the cork helps to overcome the latter trouble as the bottle becomes partially emptied; and permanent sealing of the cork prevents leakage. Superior types of feeding devices could of course easily be designed, but it was the intention to use materials and methods which might come readily to hand.

There has been no indication that the abundant food supply served to delay migration or even, in most instances, to check the nomadic movements of the Anna Hummingbird. During the late summer and fall of 1929, the feeding places were visited by a succession of Anna Hummingbirds, none of which remained long, until a male arrived early in October. This bird's gorget was incomplete at the lower edge until about the middle of November. His "nuptial flight" was first definitely noted on November 20, and it was not until after that time that he took up the characteristic habit of perching on high, exposed places. Previously his favorite resting places had been in the centers of shrubs or small trees.

In January there arrived another male Anna Hummingbird, of slightly larger size and bronzier back—probably the same one which had been regularly passing the late winter and spring months here. The new arrival immediately took charge of the situation, and the visits of the other became gradually fewer and finally ceased.

During the early part of February, this larger hummingbird, now the only one present, patronized the bottles every few minutes during the daylight hours, often braving swarms of struggling bees in order to obtain the syrup; but with the opening of early spring blossoms, both bees and hummingbirds suddenly lost interest in the artificial food, though the bird continued to return during the next two or three days for hasty and dissatisfied sips.

It was not until the following July, with its influx of immature Anna and Black-chinned hummingbirds, that any could be induced again to interest themselves in the bright-colored vials. One of the birds had for several days been drinking from a blue-covered vial, when it was noticed that a young male Anna Hummingbird often perched directly above the vial, but did not visit it. A bottle similar to that in figure 35 was then placed about two feet from the vial, and the bird's attention was quickly attracted to it by inserting a flower in the opening. For several days thereafter the two birds were frequently seen visiting the place, the one drinking only from the vial, the other only from the corked bottle.

After a time the bottle was replaced by the drinking fountain of figure 36. Since it would be too much to expect a hummingbird to solve this new problem without assistance, steps were taken to introduce it to him by degrees. First, the inverted bottle was removed, the jar turned around with the larger hole next to the perch, and a flower placed in the opening. When the habit had been formed by a few visits, the flower was removed. The next day the jar was turned around again, and the larger opening covered up. Finally, the bottle was replaced, thus completing the automatic feeding device—and all without interruption to service.

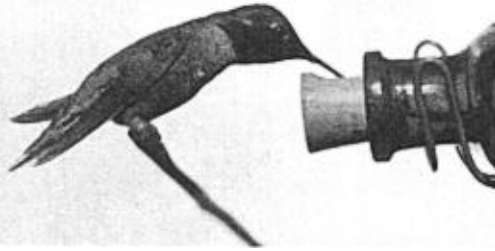


Fig. 37. THIS ANNA HUMMINGBIRD APPLIED HIMSELF SO DILIGENTLY TO THE BUSINESS IN HAND THAT IT WAS DIFFICULT TO PHOTOGRAPH HIM IN ANY OTHER ATTITUDE. FEBRUARY 22, 1931.

The color of this presumably immature Anna Hummingbird's head and throat, at first sooty black with glints of red, slowly became redder, and finally the feathers of the throat lengthened until, about the first of October, the ruff appeared to have been completed, though the gorget still seemed to be lacking somewhat in brilliancy and perfection of outline.

This hummingbird was in full "song" from the time of its arrival early in July. As far as noted, its initial "nuptial flight" occurred on September 12. On this first occasion the chirp uttered at the lowest point of the flight was not typical either in strength or quality—plainly a beginner's attempt.

About the middle of October it was noticed that the bird—almost certainly the same individual, as it had been present continuously, and no more than one male was observed during this time—had been molting the feathers of its crown and gorget; the ruff had been lost and the throat and head were decidedly ragged-looking, the former being streaked with gray. The balance of the plumage showed no signs of molting. The new and brilliant gorget was practically complete by the first of November, a week or two earlier, perhaps, than in the case of the previous

year's individual. The "nuptial flight" was not observed during the molting period, but was resumed not later than the middle of November.

In 1931, contrary to the experience of the year before, the abundant blooming of spring flowers brought no abatement in the consumption of syrup by the two Anna Hummingbirds, male and female, which had been regular boarders for more than six months. The only obvious explanation for this difference would be the greater care used in maintaining the freshness of the solution and the more shaded location of the drinking fountain.

Though the nest of this female hummingbird was not found, her attendance at the feeding station seemed to indicate rather clearly the nature of her activities. During the last few days of January and the early part of February she was seldom seen; after that the redoubled frequency of her visits suggested that there must be other mouths to feed. Since no young birds were seen at this time, it is not unlikely that the brood met with some mishap. Two months later the same cycle was repeated, but as before, the result was undetermined.

While the birds which consumed sugar syrup did not entirely neglect the flowers, plainly no large part of their sustenance could have been derived therefrom. A nearby row of coral-bells (*Heuchera sanguinea*), a particularly favored hummingbird flower, was often visited by other hummingbirds, but seldom by those frequenting the drinking fountain. The insect food needed to furnish the protein portion of their diet must be obtained through their gnat-catching activities.

That a considerable amount of mineral matter is required, at least by the females in spring, may be inferred from certain of their actions, in which they appear to be picking up particles of sand or mortar. Sometimes, too, the female Anna Hummingbird would hover close to the ground and thrust her bill repeatedly into the loose soil.

Since Anna Hummingbirds have ordinarily been absent from this particular locality during the early summer, the disappearance of the male about April 20, after nine months' residence, was not unexpected, though it may have been hastened by the recent arrival of a larger male of the same species, or possibly by the persecutions of the female, whose former meekness had been replaced, about the beginning of the nesting season, by a decidedly tyrannical attitude toward her mate. At the time of writing, this female hummingbird is enjoying the sole use of the sugar syrup, for none of the numerous spring visitants profited by her example, or was lured by the occasional offer of a flower-decorated vial.

In conclusion, it is evident that under conditions which prevail in much of California, the Anna Hummingbird will be the chief beneficiary of any feeding system; also, that the most favorable time for introducing such a program will be in mid-summer, when flowers have become less plentiful and when there are numbers of immature hummingbirds whose inexperience and curiosity lead them to investigate any unfamiliar, brightly-colored object.

Azusa, California, May 13, 1931.