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## DOWN-TREE PROGRESS OF *SITTA PYGMAEA*

WITH NINE ILLUSTRATIONS

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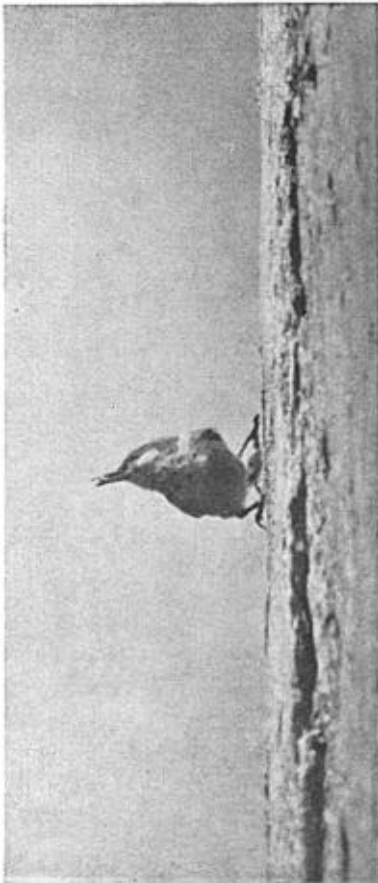


Fig. 13. PIGMY NUTHATCH ON VERTICAL TRUNK. NOTE DEPRESSION OF SOLE OF LOWER FOOT, WHILE UPPER IS PULLED AWAY FROM TREE SURFACE.

There seems to be no end of subtle influencing factors, all presented in the twinkle of an eye, which may be important in the simple life of a nuthatch. It is hard to appraise them even with the help of a camera, when a split second is often too late. For instance, what is the exact position and use of the feet of a nuthatch as it travels down a tree or clings head downward on a perpendicular surface? Let the camera answer.

In taking the pictures, attention was focused on the feet of the birds, and the body poses, usually just out of clear focus, are the by-product. Some pictures, not concerned with feet, have been included because of their life-history interest, and comments on them have been added.

The opportunity came with the discovery of a nest of this species on August 17, 1926, at Bluff Lake in the San Bernardino Mountains of southern California. It contained tiny young. The nest was tucked away among the cracks of a huge naked weather-silvered pine trunk, already creaking for its final fall. As the nest was only  $8\frac{1}{2}$  feet from the ground, it was possible to photograph the parents at close range as they came with food. On the 17th and 18th, much of the time during which the nest-hole area was in direct sunlight, was spent in an endeavor to catch the various poses.

Down-tree progress for a nuthatch seems to be a series of sidling hops or drops. While the bird is moving, its body rarely, perhaps never, parallels the axis of the tree, and at each pause one foot is usually apparent, cling-

ing up-trunk, its grasp transverse to the axis of the tree (see figs. 15 and 16). When the bird stops, its body may turn so that the body and head point directly downward, and even then there is always that foot up-trunk holding on while the other foot holds the body out from the tree.

When the head is downward, one may believe that the near-dorsal position of the acetabular socket, from which the legs hinge, tends to pivot the anterior end of the body out from the trunk of the tree, a position the bird often takes when it pauses. This appears to be merely the effect of gravity pull, controlled by the hip-joint suspension, which for the moment has become the center of motion. The head down position may therefore be considered one of complete relaxation.



Fig. 14. PIGMY NUTHATCH  
HOPPING DOWN TREE.  
PHOTO BY HERMAN H. GARNER.

It is obvious, if we think a minute, that in this position the function of the up foot is to cling by the toes, while that of the down foot is to support. Several of the pictures taken indicate in profile this definitely different function of the two feet. It may be seen in figure 13. The sole of the lower foot is depressed against the trunk while that of the upper foot is free.

Probably mechanical difficulties inhibit a purely vertical position with the feet side by side, when a bird's body is headed downward. It may be that a vertical grasp, with the grain of the wood, is too precarious, especially when, in a head down position, only a single claw of each foot, that of the hallux, is available for the hook-in. In the reverse position, head up, it is the lateral toes, wide spread, that make the grasp secure. For a bird hopping down a perpendicular surface, there must be no uncertainty that each grasp will be instantly secure. Not that a miss would involve any danger to the bird, since wings are ever ready, but it might be annoying. And Nature seems to abhor such annoyances, if we may judge by the precision with which she seems to provide against them.

It may be of interest in this connection to note that the wings as shown in figures 15 and 18 are pushed about as far back and across as possible: for what reason, I cannot guess. It is hard to believe (I do not) that a single raising of them would yield any value in pushing the body toward the trunk, and the first return stroke, when the head was down, would surely be trying to the bird's equilibrium.

For a radius of two inches around the nest hole, the silvering of the rotting trunk had yielded to a buffy color, no doubt due to the constant and concentrated pricks from the sharp claws. Through a large vertical crack a little light reached and exposed the nest which was slightly higher than the tiny south-front entrance hole. (See fig. 20.) At one time of the day a person, peering in, might see waving heads responding eagerly as the trunk was lightly tapped.

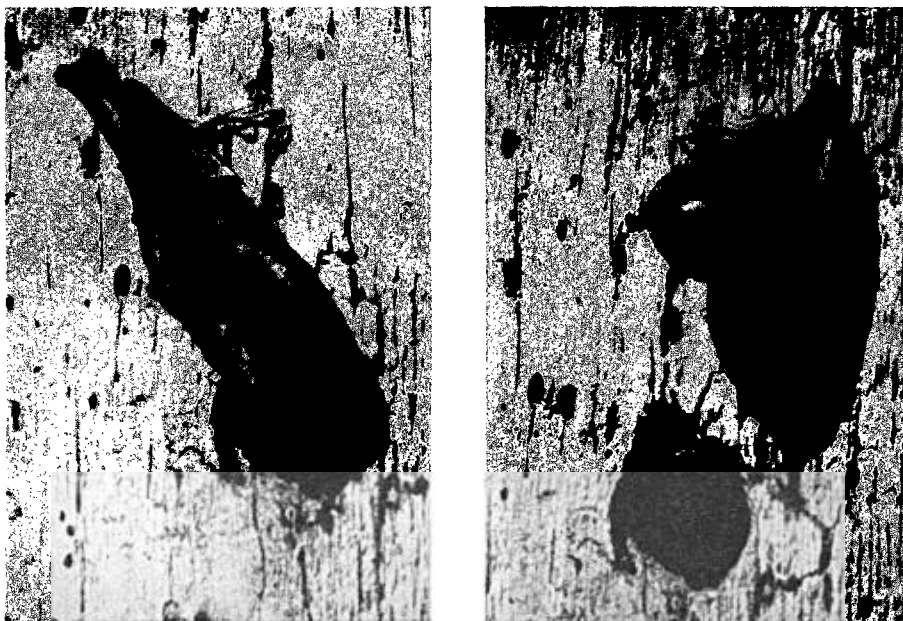


Fig. 15. PIGMY NUTHATCHES, WITH FOOD IN BEAKS, HOPPING DOWN TREE TOWARD THE NEST HOLE.

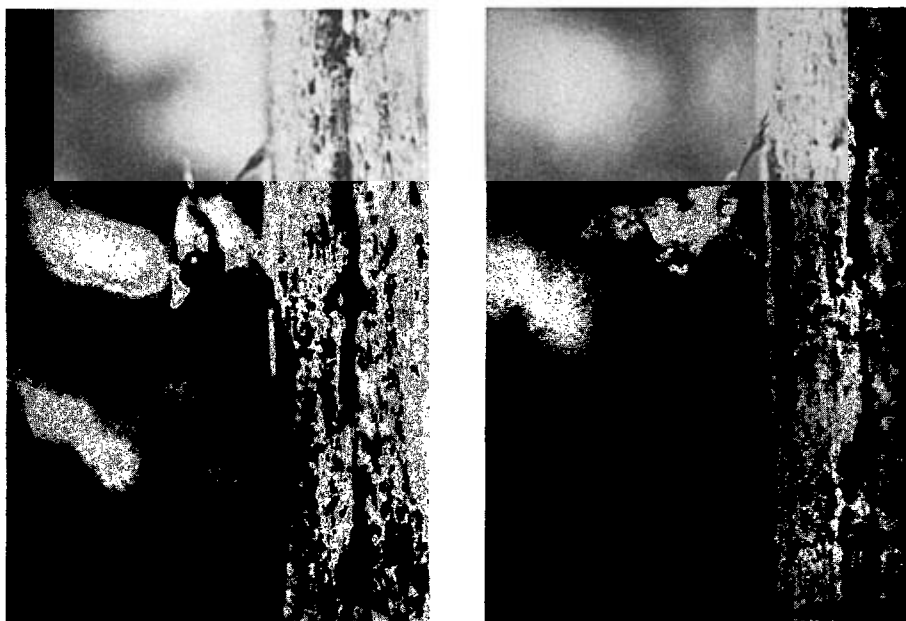


Fig. 16. PIGMY NUTHATCHES APPROACHING NEST FROM UP TREE BY DOWNWARD HOPS.

Each parent quite independently searched for and brought food, but occasionally one arrived at the nest when the other was inside and either went on in, or waited outside until the occupant came out. (See fig. 18.) Rarely the parent inside relayed the food brought by the other, taking it at the "door". A parent coming toward the nest often gave the chattering notes from the last tree perch (no trees were nearer than 50 feet) before flying to the nest tree. Until they became accustomed to my presence, the birds usually stopped on a limb up trunk, and then sidled down-tree to the nest. Even when they were used to me and flew directly to the nest, they always paused for one look at me before entering.

On emerging from the hole, there was a pause (figures 18 and 20) with body half out as if waiting until the eyes adjusted to the brighter light outside. On



Fig. 17. PIGMY NUTHATCH ABOUT TO ENTER NEST CAVITY.

leaving, the birds often flew some distance, though occasionally only to the nearest tree. The flight usually ended 50 feet or more up tree. When a fecal sac was brought out, it was not dropped in flight but was carried out and left attached to some high limb. One particular limb of another tree received it on more than one occasion that I saw. After depositing the feces the bird wiped and rapped its beak on the limb vigorously. From figure 20 we may believe that on such errands the sacked feces are seized so firmly across their equator that the beak seems to be closed.

Sometimes a parent worked up the trunk of the nest tree and squatted in a crotch as if weary. At times, in moments of apparent relaxation, I detected a distinct yawn, possibly a reaction from muscles tired by long holding of food carried. Occasionally a parent with food staid up tree and finally ate the food itself. A couple of grown-ups, perhaps from the last brood, sometimes teased for the food being brought to the younger brood, but received no consideration. The food brought varied:

spiders, moths, worms, perhaps big red-bodied ants, for so they looked.

Figure 21 shows a large fly which looked like a *Protocalliphora* and which, after some circling, finally entered the nest cavity. Several times such a fly was observed about the entrance, and I dare say its blood-sucking progeny preyed on this brood of nuthatches. On many occasions I have seen these blue flies circling the entrance to nests containing the young of nuthatches, chickadees, and bluebirds. The soft material with which each of these birds lines its nest cavity furnishes an ideal nursery for the maggots of this destructive parasite.

Two years later, in late June, 1928, another nest of *Sitta pygmaea* was found, a stone's throw from the site of the nest observed in 1926. Young old enough to stand at the entrance looked well fledged.

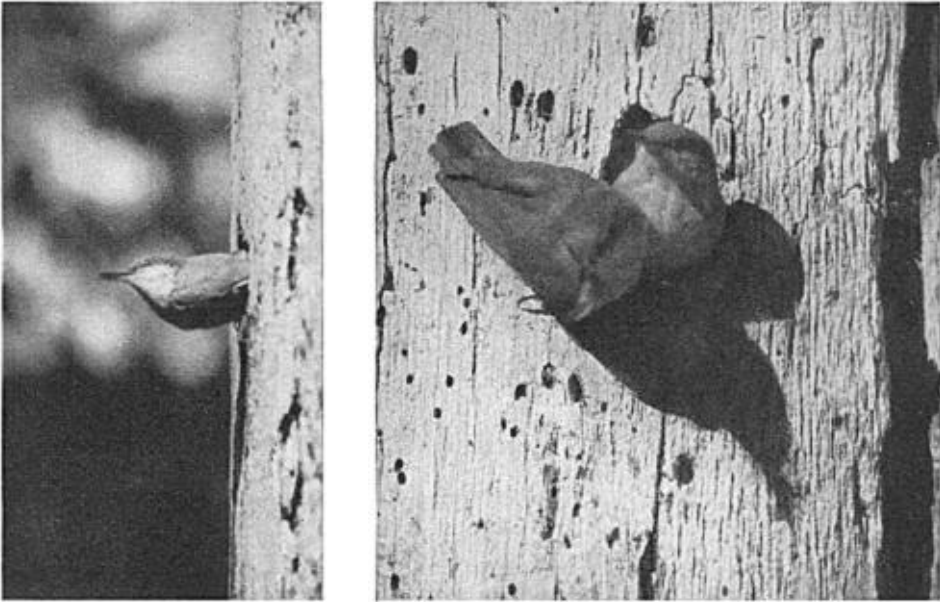


Fig. 18. LEFT: THE PAUSE BEFORE DEPARTING. RIGHT: A CHANCE MEETING, ONE PARENT EMERGING, THE OTHER WAITING TO ENTER.



Fig. 19. FIGMY NUTHATCHES: ONE PARENT LEAVING AS THE OTHER ARRIVES. NOTE VERTICAL EXTENSION OF WING AND DROOPING FEET.



Fig. 20. PIGMY NUTHATCHES EMERGING FROM THE NEST CAVITY WITH FECES FIRMLY HELD IN THEIR BEAKS. THE MATERIAL OF THE NEST IS REVEALED IN THE WIDE CRACK AT THE RIGHT.



Fig. 21. A BLUEBOTTLE FLY (RIGHT OF CENTER NEAR TOP) WHICH LOOKED LIKE A *Protocalliphora* AND WHICH LATER ENTERED THE NEST CAVITY OF THE PIGMY NUTHATCH.

One day as Dr. Tracy I. Storer and I stood near, a parent, grasping with its beak, seized a nestling by the shoulder, and after a rough tussle pulled the chick out and let it go fluttering to the ground. There, after a rest, during which parental solicitude obviously urged action, the fledgling fluttered along the ground directly to the base of a huge live pine near-by and began to climb. A yard or two at a time, intervalled by long rests, it finally worked up the trunk to the first limbs, some 50 feet. The astonishing thing was that this fledgling elevated itself up trunk mainly by rapid fluttering of its wings while keeping the body axis parallel with the perpendicular tree trunk, all the while pawing the bark furiously with its feet. Progress was slow, dangerously near no progress, it seemed.

*Altadena, California, December 3, 1928.*