FURTHER STUDIES OF ANTING BY BIRDS

BY H. R. IVOR

Plate 3, lower figure

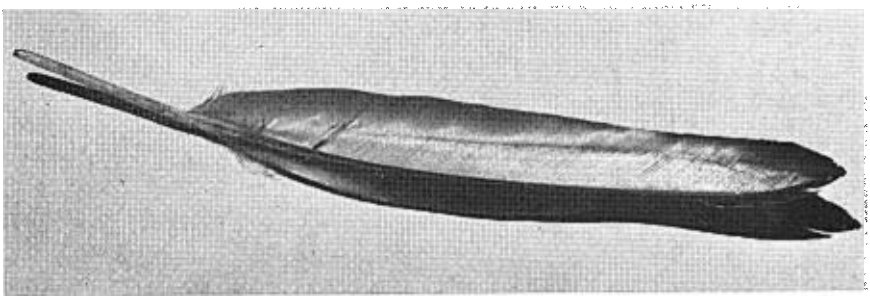
IN a paper on "'Anting' by Birds," McAtee (1938) reviews the articles on this curious phenomenon, citing 28 references and listing sixteen species and six passerine families in which this behavior has been noted. Records of its occurrence in additional species and families have been given by Nice and ter Pelwyk (1940), Ivor (1941), Thomas (1941) and Bourke (1941), so that at present it has been reported in thirty-nine species of thirteen families: Corvidae, Timeliidae, Cinclidae, Mimidae, Turdidae, Muscicapidae, Bombycillidae, Sturnidae, Meliphagidae, Compsothlypidae, Icteridae, Thraupidae and Fringillidae.

In my former paper I described the results of some observations in my aviary during 1940. Since then I have carried out a series of sixteen experiments designed to discover the exact procedure during anting. Grateful acknowledgements are due to Mrs. Margaret M. Nice, Chicago, Ill., for helpful suggestions in regard to the paper, and to Dr. F. A. Urquhart, Curator of Insects, Royal Ontario Museum of Zoology, for identification of the ants used in the experiments.

According to McAtee's notations on the casual observations listed by him, birds have been reported as doing the following: crushing ants and rubbing them into their tail feathers; placing ants under their wings and taking them out again; depositing them among their feathers back of and underneath their wings; placing them under their wings where the action of formic acid would be effective; passing them through the wing, back and leg feathers; anointing the legs, rump and wings; and storing insects under the wings in order to have food with them during migration.

In my experiments, seventy-three birds of nine families and thirty-one species were used. Of these sixty-eight were native, three European and two Asiatic. All were adult except for twenty-five of the native birds.

A shovelful of earth containing several hundred ants was scattered over an area of four to six square feet on the earthen floor of the aviary. After placing the ants, I sat or reclined on the ground sufficiently close to observe the actions of the birds at reading distance. This I was able to do for the reason that over half of the birds were hand-reared and exceedingly tame; so confident, in fact, that some



RICHARDSON: THE INNER VANE OF THE REMIGES. Second primary of a Wood Duck (*Aix sponsa*), ventral view. The overlapping ridges of the inner rami form the stiffened silvery area. Photograph by Waldo Holcombe.

IVOR: STUDIES ON ANTING. Blue Jay anting. Probably the first photograph to be taken of this behavior. Photograph by Hugh M. Halliday.

would ant on my hand. Others had so little fear that I was able to sit beside them. When I believed that about half of the ants had been used, I retired about fifteen feet so as to allow the participation of the shyer birds. Notes were made at the time and transferred to the bird diary as soon as the performance was over.

OBSERVATIONS

Typical performances as noted in my bird diary will cover the season.

Close as I was to the birds—a matter of some sixteen inches from the particular bird I was watching at the moment—I found it quite difficult to follow the movements. Not only was it distracting to have so many birds all performing at once, but the human eye was hardly quick enough to follow them accurately as the performance was of great rapidity. However, as it lasted in its entirety for a considerable length of time—about half an hour—what was missed by the eye during one movement could usually be seen during others —that is, so far as the eye was capable of following such movements.

The moment an ant was sighted by any bird which anted, there seemed to be an instantaneous and instinctive reaction. The ant was picked up and held in the tip of the bill; the eyes were partly closed; the wing was held out from the body but only partly spread; the wrist was drawn forward and raised, thus bringing the tips of the primaries far forward and touching the ground; the tail was always brought forward and under to some extent, on the same side as the extended wing, and often so far that the feet were placed upon it. Stepping on the tail at times caused the bird to fall on its side or even on its back. The ant, which may or may not have been crushed, *was swiftly rubbed on the ventral surface of the outer primary or primaries, beginning, so far as could be seen, just below the wrist and extending to the tip.* I could not determine whether or not the ant was rubbed on more than one primary; whether it was rubbed on the shaft, the margin or the inner web; certainly it was never rubbed on the dorsal surface. No suggestion of what we know as preening was evident, nor was any preening done immediately after, or a short time after, the performance was finished with one exception. On this occasion a female Indigo Bunting (*Passerina cyanea*) flew to a perch and went through all the actions of drying herself as after a bath.

Even after watching for some time I was under the impression still that occasionally the ant was rubbed on the under side of the tail

as reported in my former paper. Closer observation showed, however, that this did not seem to be so in any instance, but that the bird was persistent in reaching the very tip of the primary which often was resting on the tail.

At no time did I see any bird *rubbing the ant on any other part of the plumage or on the legs,* nor did I see a bird placing an ant among the feathers. I found that when a bird seemed to be rubbing an ant on the legs it was in reality picking off the ant which had crawled there and using it on the primary. Sometimes a number of ants could be seen crawling over the body, and these were picked off the breast and from under the partially outstretched wing and used likewise.

These observations show that the sketches in Nice and ter Pelkwyk's paper, although giving a general idea of attitudes assumed in anting, appear to be partially inaccurate in detail.

At times young Wood Thrushes (*Hylocichla mustelina*) made motions which at first seemed to indicate that they were rubbing the ant on the breast, abdomen or flank. Continued close observation showed, however, that although the movement of the bill was in the direction of, and close to, these parts, the ant was not actually touching the feathers. The curious feature here was that at times the ant was then rubbed on the primary before being eaten and at other times eaten immediately after the above movements.

With few exceptions the ant seemed to be used only in one single stroke down the primary. On one occasion I saw a Pekin Robin (*Liothrix lutea*) rub an ant on the primary five times before eating it and several times noticed a bird use the same ant on the primaries of both wings before eating or discarding it. Several time I was under the impression that I saw birds rubbing ants on the ventral surface of the secondaries but could not make sure of this.

The ant, after being used, was often eaten but not invariably. As near as I could judge, the majority were eaten immediately rather than discarded.

I was unable to see any ant clinging to the feathers with its jaws, but numerous times it was evident that an ant had bitten a bird.

There seemed to be no fundamental differences in the specific actions of families, species or individuals, the only variations being in position. This seemed to be determined by the extent to which the tail was drawn forward. Although there was always tail action, it varied from slight to as far forward as was physically possible. This did not apply only to some individual bird or birds, but to all.

Enthusiasm for anting varied with the season. During March, 1941, none of the birds anted. From the middle of April until near the end of July, all of the birds which anted did so enthusiastically. During August, September and October, little interest was shown either in anting or in consumption of ants, in spite of the fact that the temperature on one occasion in September and one in October was over 80° F. in the shade. During February, 1942, semi-dormant carpenter ants were placed before the birds. Eight anted to some extent; the Pekin Robins and the Baltimore Orioles (*Icterus galbula*) continued until all of the ants were used. During March I carried on two experiments with the same species of ant and again only eight birds anted. In both months most of the birds ate the ants, including the Cedar Waxwings (*Bombycilla cedrorum*) and Black-headed Grosbeaks (*Hedymeles melanocephalus*).

During the height of the anting season the act of anting seemed to engender a state of ecstasy so overwhelming that even domination and enmity were forgotten. The Rose-breasted Grosbeaks (*Hedymeles ludovicianus*) are very quarrelsome, but it was rare to see even one of these make a belligerent movement toward another bird during the performance. This, too, in spite of the fact that, at times, from twenty to thirty birds would be going through the performance at one time on a space of four or five square feet, where they were continually bumping against one another.

Twenty species anted: Blue Jay, Pekin Robin, Catbird, Robin, Wood, Hermit and Wilson's Thrushes, Cedar Waxwing, Bobolink, Baltimore Oriole, Cardinal, Rose-breasted Grosbeak, Black-headed Grosbeak, Indigo Bunting, Junco, and Harris's, White-crowned, White-throated, Fox and Song Sparrows.

Ten species did not ant but ate the ants: Flicker, Horned Lark, Brown Thrasher, Bluebird, European Blackbird (*Turdus merula*), Cowbird, Evening Grosbeak, Purple Finch, Greenfinch (*Chloris chloris*) and Brambling (*Fringilla montifringilla*).

The Pine Siskin neither anted nor ate the ants.

The ants used in these experiments were as follows: *Formica sanguinea, Lasius niger, Tapinoma* sp., and *Camponotus pennsylvanicus.*

SUMMARY

The data show that ants were placed only *on* the feathers and not among or under them; *they were rubbed only on the ventral surface of the primaries,* and were not seen to cling to the feathers. They were not rubbed on the legs. Not all of the species having an op-

portunity to ant would do so; not all species of any one family performed; but all individuals of a species which anted also performed. The only variation in actions shown was by juvenile Wood Thrushes. Enthusiasm for anting was much more evident during late April to the end of July than it was in early spring and in the fall. Some ants were eaten and some discarded. The experiments gave no indication as to the biological significance of anting.

LITERATURE CITED

BOURKE, P. A.
1941. Honeyeater and Ants. Emu, 41: 163–164.
IVOR, H. R.
1941. Observations on Anting by Birds. Auk, 58: 415–416.
MCATEE, W. L.
1938. 'Anting' by Birds. Auk, 55: 98–105.
NICE, M. M. AND J. J. TER PELKWYK.
1940. 'Anting' by the Song Sparrow. Auk, 57: 520–522.
THOMAS, RUTH.
1941. 'Anting' by the Summer Tanager. Auk, 58: 102.

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SCARLET TANAGERS 'ANTING'

BY HORACE GROSKIN

THE peculiar behavior of birds known as 'anting,' whereby birds seize ants and place them in their feathers under their wings or elsewhere, crush the ants with their bills and rub the juices on their feathers, or dust themselves in ant hills, has been noted and recorded by a number of ornithologists both in this and other countries. Various theories have been advanced for this rather unusual behavior: that ants are placed among the feathers to drive out ectoparasites; that the bird anoints its feathers with the formic acid secretions of the ant to repel ectoparasites; that the bird eats the ant for the formic acid which may be beneficial as a medication to increase muscular energy, and the like, or to expel endoparasites; that the bird places the ant in the feathers to have a reserve food supply during migration; and other suggestions.

McAtee (1938) reviews the literature on the subject and gives in condensed form the observations, comments and some conclusions as to its biological significance drawn by twenty-six ornithologists in various countries. He also describes in full an observation made by E. R. Kalmbach in 1935 of Starlings anting in Washington, D. C.

In view of the fact that the accounts of anting in this country are