HEAD-SCRATCHING MOVEMENTS IN BIRDS

BY MARGARET M. NICE AND W. E. SCHANTZ

Birds scratch their heads in two distinct ways. One, practiced by the domestic fowl, is under the wing, *vornherum* as Heinroth (1930) called it, or "directly" (Simmons, 1957). The other, shown by most passerines, is over the wing, *hinterherum,* or "indirectly"; here the wing is drooped and the leg brought up over it. These movements have been considered to be fixed actions, consistently shown by all members of one family and thus having considerable taxonomic significance (Simmons, 1957).

The following birds have been reported to scratch under the wing, the authority being Heinroth except as otherwise noted:

Great Crested Grebe (Simmons, 1955); Great-winged Petrel (Warham, 1956), herons, storks, ducks, geese, swans, hawks, gallinaceous birds, jacana (Haverschmidt, 1957), sandpipers, turnstone (Simmons, 1957), gulls, terns, pigeons, parrots that use the foot in bringing food to the bill (Simmons, 1957; Haverschmidt), ani (Haverschmidt), puffbirds (Haverschmidt), toucans. Scratching under the wing has also been observed by the senior author in the following: Rufous Tinamou *(Rhynchotis rufescens pallescens),* American Flamingo *(Phoenicopterus ruber),* Sora *(Porzana carolina),* Virginia Rail *(Rallus limicola),* American Coot *(Fulica americana),* Seriema *(Cariama cristata),* and by the junior author in the Yellow-billed Cuckoo *(Coccyzus americanus).*

The following birds have been reported to scratch over the wing:

Oystercatcher, plovers, stilts, avocets, sand grouse, some parrots (Simmons, 1957), goatsuckers, swifts, hummingbirds (Haverschmidt), kingfishers, bee-eaters, hoopoes, barbets, hornbills, most woodpeckers, most passerines. As to these last two groups Heinroth (1930: 338) says merely: *"fast alle Singvögel (Passeriformes). . . . und meist auch die Spechte".* ("almost all songbirds (Passeriformes) . . . and also most woodpeckers"). In addition the senior author has observed King and Little Penguins *(Aptenodytes patagonica* and *Eudyptula minor)* scratching over the wing.

Simmons (1957) gives a long list of passerines watched in the London Zoo; all of them scratched over the wing except Timaliidae. The Fickens (1958), however, report various nestling passerines as scratching under the wing, before switching to over the wing, among them their hand-raised Northern and Louisiana Waterthrushes *(Seiurus noveboracensis* and *S. motacilla).* Ovenbirds *(S. aurocapillus),* on the other hand, scratched under the wing both in the nest and as adult.

The junior author of the present paper has made a long series of experiments on this subject with birds captured for banding. Pieces

of gummed paper were attached successively to chin, lores, ear patch and crown, and the response of the bird noted and in many instances photographed. The subject was placed in a cage lighted by a 15-watt fluorescent lamp or by Christmas tree bulbs of 3 colors. The camera was focussed on the perch through the side of the cage. The observer watched through an 18 inch slot from the dark outside. Time was allowed for the bird to become accustomed to the set-up, and sounds such as that of a vacuum sweeper or static on a radio had a calming effect on the warblers but not on the thrushes. Birds often bathed or ate or preened after a brief period in the observation cage.

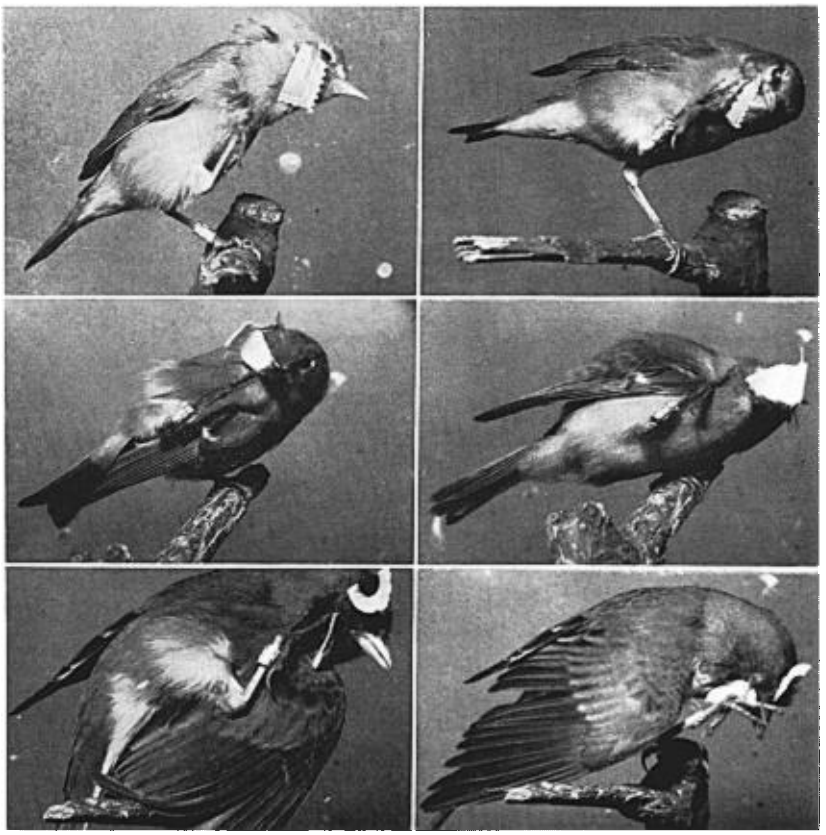
When the patch was first applied, most of the birds dashed about in alarm, at the same time scratching. When the patch was removed and applied elsewhere the bird was usually less alarmed, but otherwise responded in much the same manner as during the first test. There was no indication of trial and error learning, but rather of random reactions to discomfort. The most pronounced scratching followed when patches hindered vision and when feathers beneath the patch had been ruffled.

A great many records were obtained on 207 individuals of 40 passerine species, and 113 photographs were made of birds scratching their heads. One hundred and fifty-three birds of 25 species scratched consistently over the wing, while 35 birds of 7 species scratched consistently *under the wing.* Surprisingly enough, 19 birds of 8 species *used both methods.*

Much variety was found among the 19 species of Parulidae tested. One Hooded Warbler *(Wilsonia citrina),* 2 Yellowthroats *(Geothlypis trichas)* and 3 Redstarts *(Setophaga ruticilla)* scratched over the wing, as did 6 *Dendroica* species (from 1 to 8 individuals of each). With larger samples of 3 *Dendroica* species—16, 16, and 25 individuals—all but 4 birds scratched over the wing; but 1 Myrtle Warbler *(D. coronata),* 1 Blackpoll *(D. striata),* and 2 Bay-breasted Warblers *(D. castanea)* used both methods.

The 3 *Vermivora* species, however, all scratched under the wing: 1 Orange-crowned *(V. celata),* 7 Nashvilles *(V. ruficapilla)* and no less than 19 Tennessees *(V. peregrina).* The same was true of 2 Ovenbirds, 1 Yellow-breasted Chat *(Icteria virens),* and 2 Canada Warblers *(Wilsonia canadensis).* As to 4 examples of another species of this genus—Wilson's Warbler *(W. pusilla)*—one scratched over the wing, one under, and two used both methods.

Information has been kindly given us on 4 other warblers in the wild: the Prairie Warbler *(Dendroica discolor)* scratched over the wing (Val Nolan, Jr.), as did the Chestnut-sided *(D. pensylvanica)* and Yellow-throated *(D. dominica)* (I. C. T. Nisbet), but the Worm-eating



Head-scratching Movements. (*Above left*) Nashville Warbler, *Vermivora ruficapilla*. (*Above right*) Tennessee Warbler, *Vermivora peregrina*. (*Middle left*) Ruby-crowned Kinglet, *Regulus calendula*, No. 59209, scratching over the wing. (*Middle right*) Ruby-crowned Kinglet, same individual, scratching under the wing. (*Below left*) Slate-colored Junco, *Junco hyemalis*, No. 53612, scratching over the wing. (*Below right*) Slate-colored Junco, same individual, scratching under the wing. (Photos by W. E. Schantz.)

Warbler (*Helmitheros vermivorus*) scratched under the wing (I. C. T. Nisbet).

Thus striking variety in head scratching has been found in the family Parulidae: 12 species of 4 genera (*Dendroica, Geothlypis, Wilsonia, Setophaga*) have been seen scratching over the wing only; 7 species of 5 genera (*Helmitheros, Vermivora, Seiurus, Icteria, Wilsonia*) under the wing only, while 6 species of 3 genera (*Dendroica, Seiurus, Wilsonia*) have been watched carrying out both methods. Scratching over the wing has been reported in 5 genera, under the wing in six.

Diversity was also found among the 21 other species tested. Fifteen of them scratched consistently over the wing. The one Catbird (*Dumetella carolinensis*) scratched under the wing, doing so "several times." One Starling (*Sturnus vulgaris*) scratched over the wing; two used both ways. Four Common Grackles (*Quiscalus quiscula*) scratched over the wing, while one employed both techniques. Nine Ruby-crowned Kinglets (*Regulus calendula*) scratched over the wing, but one, as shown in the photographs, used both ways. Slate-colored Juncos (*Junco hyemalis*) proved to be the most successful of all the birds in employing both methods: 10 scratched over the wing, and one only under the wing, but 9 scratched both over and under. Under the wing was ordinarily used when the bird was particularly annoyed; it was commonly used on the ground, while over the wing was used on a perch. There was little evidence that position of the patch influenced the method of scratching.

Robert W. Ficken writes us that he has seen the Common Grackle scratch under the wing on two occasions. Ian C. T. Nisbet writes us he has observed the same in a recently fledged Brown-headed Cowbird (*Molothrus ater*): "it was a notably awkward affair," and the junior author has noted this method in three individual cowbirds, a nestling, a juvenile male, and an adult female.

Two observations on non-passerines should be mentioned. An Abyssinian Lovebird (*Agapornis taranta*) scratched under the wing as a nestling and occasionally when adult, although as a rule it scratched over the wing (W. C. Dilger, pers. obs.). A hand-raised Killdeer (*Charadrius vociferus*) scratched under the wing from his first day to the morning of the eighth; in the afternoon he switched to over the wing and continued in this manner thereafter (Nice, MSS.).

Thus some birds, both passerine and non-passerine, may scratch under the wing at first, then later over the wing. No instance of the reversed situation seems to have been reported.

Of the 19 individuals reported by the junior author as using both methods, 16 employed predominantly the typical passerine technique.

It is evident that on occasion a number of passerines are capable of using the direct method. With some of the Parulidae, however, scratching under the wing appears to be the habitual custom. This seems well established for the Ovenbird and for the Nashville and Tennessee Warblers. The junior author spent more time on the last species than on any other, for he tried his best to get an indication of over the wing scratching; he spent as much as 6 hours watching some individuals and even 18 hours on an especially cooperative bird. Members of this family offer a fruitful field for observation.

The observations of the Fickens, ourselves, and others, differ from Simmons' conclusions that: "Birds scratch in one only of two ways, either directly or indirectly, and one method is used by all members of the same family," (1957: 181). This character has proved less rigid than has been believed. It has been shown that some species may start scratching the head under the wing, then change to over the wing. Also there may be diversity in this movement within one family, one genus, one species, and even in one adult bird.

SUMMARY

Head-scratching movements in birds—whether under the wing or over the wing—are reviewed and additional cases reported.

Experiments in which head-scratching was induced by sticking a piece of gummed paper on the side of the head of birds captured for banding provided records for 40 passerine species. Much variety in method of head-scratching was found, especially among the 19 species of Parulidae tested.

The method of head-scratching proves to be less stereotyped than has been assumed. Diversity may exist within a family, a genus, or among individuals of the same species, and the same individual may use both methods.

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This article is dedicated to Erwin Stresemann on the occasion of his seventieth birthday.