

Rose-breasted Grosbeak, *Pheucticus ludovicianus*
Indigo Bunting, *Passerina cyanea*
Black-and-white Warbler, *Mniotilta varia*
Tennessee Warbler, *Vermivora perigrina*
Nashville Warbler, *Vermivora ruficapilla*
Yellow Warbler, *Dendroica petechia*
Magnolia Warbler, *D. magnolia*
Myrtle Warbler, *D. coronata*
Black-throated Green Warbler, *D. virens*
Cerulean Warbler, *D. cerulea*
Blackburnian Warbler, *D. fusca*
Chestnut-sided Warbler, *D. pensylvanica*
Palm Warbler, *D. palmarum*
Ovenbird, *Seiurus aurocapillus*
Kentucky Warbler, *Oporornis formosus*
Yellowthroat, *Geothlypis trichas*
Yellow-breasted Chat, *Icteria virens*
Canada Warbler, *Wilsonia canadensis*
American Redstart, *Setophaga ruticilla*

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ABNORMALITIES AMONG BROWN-HEADED
COWBIRDS TRAPPED IN ALABAMA

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The incidence of externally visible abnormalities in a population of Brown-headed Cowbirds (*Molothrus ater*) wintering at Montgomery, Alabama, was recorded during the winter of 1960-61. During this winter, 8,275 cowbirds taken by bait trapping were examined, banded, and released. Ten additional birds were killed for laboratory examination.

Of the 8,285 birds handled, 7,537 were males and 748 were females. Abnormalities were observed on 292 of the males and 29 of the females, an incidence of 3.9 percent in birds of each sex.

Bird Pox.—Seventy-seven birds (0.9 percent) had nodular proliferations on the legs, feet, or head resembling the nodules that are characteristic of bird pox. Except for one nodule at the base of a bird's bill, all nodules were on feet or legs. Thirteen females (1.7 percent) and 64 males (0.8 percent) had these pox-like nodules.

Scaly Leg-Mite.—Forty-four male birds (0.6 percent) and no females had infestations of scaly leg mites. The mites from one bird were identified as *Knemidocoptes mutans*, the same species that infests domestic chickens.

Flesh or Subcutaneous Mite.—One female cowbird had three lumps beneath the skin of the neck and back; the lumps were close together and covered an area approximately 3 centimeters in diameter. They contained yellow granular material, and microscopic examination revealed many immature mites, tentatively identified as *Laminosioptes cysticola*, a subcutaneous or flesh mite.

Cyst-forming Trematodes.—One male cowbird had a lump near the cloacal opening. Examination revealed what appeared to be cystic glands located in the submucosa of the cloaca. There were three distinctly circumscribed cyst-like structures enclosing a brownish fluid that looked much like fecal material. Microscopic examination of the fluid revealed oval structures, approximately 30 by 10 microns, that were tentatively identified as eggs of the fluke, *Collyriculum faba*.

Deformed, broken, and lost legs or toes.—One hundred and seventy-five male cowbirds (2.3 percent) and 9 females (1.2 percent) had toes or tarsal bones missing or deformed. The alterations varied from a slightly twisted toe to missing tarsal bones. Four females (0.5 percent) and 97 males (1.3 percent) had lost parts, ranging from a toenail to several toes. Seventy-eight males (1.0 percent) and 5 females (0.7 percent) had broken or amputated tarsal bones or deformed toes.

Thirty-one males (0.4 percent) and one female (0.1 percent) had one or more toes that were twisted from their normal positions. The extent of twisting ranged from minor alterations to bending at right angles to the normal position.

Two birds had broken tarsal bones, with the lower segment of the tarsus and the foot remaining attached only by the tendons; the ages of the injuries indicated that the bones had been broken before the birds were trapped. Ten birds, 9 males and 1 female, had the lower segments of the tarsus and the foot gone, these losses presumably following breaking of tarsal bones.

Loss of parts of the foot did not always follow breaking of tarsal bones, for one bird had a broken bone healing in a normal position, and 33 males and 3 females had tarsal bones healed in twisted positions. In two of these, the tarsal bones were so badly twisted that the normal bottom of the foot was turned upward. The tarsus usually was flattened laterally after breaking and healing.

Dry necrosis of legs and feet.—Both tarsi and feet of two male birds were in a condition of dry necrosis, the appendages being lifeless below the heels. The toes of one were dried in a flexed position, and the toes of the other were dried in an extended position.

Recurved and abnormally long toenail.—One male bird had a long, recurved toenail, about twice the length of a normal toenail.

Hallux hooked around tarsus.—Three males and one female had the rear toe hooked around the tarsus. The birds appeared unable to free the toes, but the toes returned to their natural position and appeared to be immediately usable when I freed them.

Punctured eyeball.—The eyeball of one male presumably had been punctured, so that it presented a concave surface. The bird appeared to be otherwise normal.

Bill deformities.—Four females (0.5 percent) and no males had bill deformities. One had a bill shorter than normal, with the tips of the upper and lower mandibles slightly crossed. The second had a normal lower mandible, but an abnormally long upper mandible, extending 18 millimeters beyond the tip of the lower. The third bird had both the upper and lower mandibles deformed, the upper recurved and extending 13 millimeters beyond the top of the lower; the lower was only slightly longer than normal, but its tip was two-pointed. The fourth bird had an abnormal upward extension on one side of its lower mandible, the extension being about 4 millimeters above the normal portion of the bill and 12 millimeters from front to back.

Partial albinism.—Four males and no females had some white in their plumages. One male had a patch of white feathers covering most of his crown, but no other white feathers in his plumage. A second bird had white only on the tip of number 3 primary of the right wing for a length of about $\frac{1}{2}$ centimeter. The third bird had relatively more white in his plumage, and his condition was described in my notes as follows: "secondaries 4 and 5 of both wings white, except for a small gray blotch near tips of all feathers; number 10 of left wing white except for a blotch of gray on proximal end." The fourth bird also had considerable white in his plumage, and this was described in my notes as follows: "bases of all body feathers white; both alulae white; proximal half of all retrices white; primaries numbers 8, 9, and 10 of right wing tipped with white for about one centimeter of length; primaries numbers 8, 9, and 10 of left wing white on proximal half of length."

DISCUSSION

The flesh mite, *Laminosioptes cysticola*, has apparently not been previously reported from the cowbird. This mite has, however, been reported from chickens, turkeys, pheasants, geese, and pigeons in many parts of the world. The flesh mite is usually found in loose subcutaneous tissue, but it has also been found in muscles, abdominal viscera, lungs, and on the peritoneum. The granular material found in the nodules appears to consist of caseo-calcareous deposits formed by the bird's tissue as it encloses mites that die in the tissue. The life cycle of the flesh mite is unknown, but the mite is known to go through all stages of its life cycle in the tissues of the host. The flesh mite appears not to affect the health of the host (Benbrook, 1959).

Some conditions were more prevalent in one than the other sex despite the fact that the overall incidence of abnormalities was approximately the same in both sexes. For example, four females, but no males, had bill deformities, although more than ten times as many males as females were examined. In contrast, 44 males, but no females, had scaly leg mites. Similarly, partial albinism was found only in males.

The condition in which the bird's rear toe was hooked around the tarsus was always found after the birds had been confined in a burlap bag awaiting banding. It is possible, therefore, but doubted, that this was a temporary condition associated with handling of the birds.

SUMMARY

A total of 8,285 Brown-headed Cowbirds (7,537 males and 748 females) were examined during the winter trapping in Alabama in 1960-61. Externally visible abnormalities were found on 292 males and 29 females, an incidence of 3.9 percent of each sex. The following abnormalities were noted: pox and flesh mite nodules, scaly leg, cyst in submucosa of cloaca, broken and deformed legs and toes, recurved toenail, bill deformities, rear toe hooked around tarsus, punctured eyeball, and partial albinism.

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BANDING OF MIGRANT THRUSHES IN ALMIRANTE, PANAMA

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The role of migratory birds in the dissemination of arboviruses between widely separated geographical areas has been the subject of speculation for many years. However, aside from circumstantial evidence, practically no experimental data has been produced to back this hypothesis.

For the last four years Gorgas Memorial Laboratory investigators have been conducting a long-term research program on the ecology of arboviruses in Almirante, Republic of Panama. As part of this program, studies were planned to clarify the role of some northern migratory birds in the introduction or dissemination of arboviruses to and from the study area. Observations during the first two years indicated that some northern avian species migrate from and to the North in very large numbers through Almirante during the Fall and Spring, while others remain in Almirante for several months as