

wing, would seem to be particularly liable to injury, sufficient, we should think, to offset the amount it may protect the compact carpals below. The extra area covered by the wing on account of the ossicle is easily measured. It is simply the area of a triangle, which has for its base the difference in altitude between the process of the metacarpus and the sesamoid ossicle, 3 millimeters say, and for its altitude the distance between the carpus and the origin of the extensor petagii longus, say 2.5 decimetres. Absolute measurements cannot be given since no Hawks are to be got in Boston at present. So the entire increase of area would be 3.75 square centimetres, and this increase is at the base of the wing, where it would least increase the resistance of the wing. This difference becomes quite small in the ratio  $\frac{\sqrt{2a}}{\sqrt{\text{weight}}}$  where  $a$ ,

the area of one wing, represents hundreds of square centimeters. Yet the ratio is that of the supporting power of the wing to the weight of the body, other things being equal. In the above calculation it is assumed that Dr. Shufeldt meant millimeters not centimeters,\* when giving the dimensions of the "os prominens."

To sum up, the bone serves: (1) To keep the friction of the extensor petagii longus muscle off the carpus. (2) To increase the power of that muscle to abduct the thumb. (3) To slightly increase the supporting power of the wing. (4) To protect the carpus (?).

Here it may not be improper to state that during the winter of 1880-81, the writer *showed a specimen* of the carpus of *Accipiter fuscus*, and explained his views as here stated of the function of the "os prominens," at a meeting of the Nuttall Ornithological Club.

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NOTES ON SOME OF THE BIRDS OBSERVED NEAR  
WHEATLAND, KNOX CO., INDIANA, IN THE  
SPRING OF 1881.

BY ROBERT RIDGWAY.

Monteur's Pond, situated about ten miles east of Vincennes and two miles west of the village of Wheatland, on the O. & M. R. R., is of considerable extent, being about nine miles long by

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\* [See Erratum on p. 64 of this issue.—EDD.]

a mile in average width. It is rather a swamp, however, than a pond, probably less than half its area being open water, the remainder filled with trees, chiefly willows (*Salix nigra*) averaging 50-60 feet high, mixed in places with a larger growth, chiefly ashes (*Fraxinus americana*, *F. sambucifolia* and *F. pubescens*), red maple, and swamp cottonwood (*Populus heterophylla*), the latter chiefly around the margin of the pond, where grow also swamp, white, and water oaks, sweet gums, and an occasional catalpa (*C. speciosa*). The surrounding country, where not cleared, consists chiefly of original forest, of various oaks and hickories, "poplar" (*Liriodendron*), beech, elm, and other trees in great variety, coniferous species being wholly absent.

The pond is never very deep, probably nowhere or at anytime exceeding four feet, and in seasons of drouth becomes absolutely dry, then forming an excellent pasturage for the stock of the neighboring farmers. Even when filled with water, the latter is, in the season of vegetable growth, entirely hidden by a luxuriant growth of aquatic plants, rendering the passage of a boat, of any description, impossible, while numerous muskrat holes and the intricate submerged stems render wading difficult and fatiguing in the extreme. For these reasons the pond was but slightly explored, while it was wholly neglected after the use of a boat became out of the question. I am therefore quite ignorant as to what species may have been breeding in the recesses of the pond, my investigations having been wholly confined to the surrounding fields and woodland, the northern portion of the pond and its immediate vicinity having been the scene of my ornithological investigations from April 15 to May 27.

Notwithstanding the very unusual lateness of the season I found on my arrival (April 15) that many of the migratory birds had preceded me, but subsequent arrivals were carefully noted up to May 6, and are presented herewith.

April 15. Prairie Warbler (*Dendroica discolor*).

April 17. Yellow-throated Warbler (*Dendroica dominica albilora*), Yellow-throated Vireo (*Lanius flavifrons*), Least Flycatcher (*Empidonax minimus*).

April 18. Prothonotary Warbler (*Protonotaria citrea*), Canada Flycatching Warbler (*Myiodioctes canadensis*), Blue Yellow-backed Warbler (*Parula americana*), Scarlet Tanager (*Pyrranga rubra*), Summer Red-bird (*P. aestiva*), Lark Finch (*Chondestes grammica*), Summer Yellow-

bird (*Dendræca æstiva*), Maryland Yellow-throat (*Geothlypis trichas*), White-eyed Vireo (*V. noveboracensis*), Wood Thrush (*Hylocichla mustelina*), Black-throated Green Warbler (*Dendræca virens*), Indigo Bird (*Passerina cyanea*).

April 19. Great-crested Flycatcher (*Myiarchus crinitus*), Kingbird (*Tyrannus carolinensis*), Catbird (*Galeoscoptes carolinensis*), Pine-creeping Warbler (*Dendræca pinus*).

April 20. Golden-crowned Thrush (*Siurus auricapillus*), Kentucky Warbler (*Oporornis formosa*).

April 21. Red-eye Vireo (*Vireosylvia olivacea*), Tawny Thrush (*Hylocichla fuscescens*).

April 22. Yellow-breasted Chat (*Icteria virens*).

April 23. Blue-winged Yellow Warbler (*Helminthophaga pinus*).

April 24. Warbling Vireo (*Vireosylvia gilva*), Ruby-throated Humming Bird (*Trochilus colubris*), Baltimore Oriole (*Icterus galbula*), Chestnut-sided Warbler (*Dendræca pennsylvanica*), Worm-eating Warbler (*Helminthoherus vermivorus*), Nighthawk (*Chordeiles popetue*).

April 25. Rose-breasted Grosbeak (*Zamelodia ludoviciana*\*), Blue Warbler (*Dendræca cærulea*\*), Hooded Warbler (*Myiodiodes mitratus*), Yellow-billed Cuckoo (*Coccyzus americanus*).

April 26. Black-throated Bunting (*Spiza americana*), Yellow-winged Sparrow (*Coturniculus passerinus*), Wood Pewee (*Contopus virens*), Oak-woods Sparrow (*Peucaea æstivalis illinoensis*).

April 30. Bay-breasted Warbler (*Dendræca costanea*), Long-billed Marsh Wren (*Telmatodytes palustris*).

May 2. Black-throated Blue Warbler (*Dendræca cærulescens*), Black-and-yellow Warbler (*D. maculosa*), Chestnut-sided Warbler (*D. pennsylvanica*), Red-poll Warbler (*D. palmarum*).

May 3. Blackburnian Warbler (*D. blackburniæ*).

May 6. Nashville Warbler (*Helminthophaga ruficapilla*), Cape May Warbler (*Perissoglossa tigrina*), Mourning Warbler (*Geothlypis philadelphia*).

May 7. Tennessee Warbler (*Helminthophaga peregrina*).

Among the migratory species which had already arrived by the 15th were the Large-billed Water Thrush (*Siurus motacilla*), numbers of which were heard singing in the swamp, the Black-and-white Creeper (*Mniotilta varia borealis*), Blue-gray Gnatcatcher (*Polioptila cærulea*), and a few others.

The nesting season began much later than usual, as the following list, of the earliest date on which the eggs of any species were obtained, will show.†

\* These all common on the date when first observed.

† The difference between the season just passed in the arrival and time of nesting of the birds, may be illustrated by the fact that in the spring of 1880, *Setophaga ruticilla* was noted near Wheatland April 1, while in the spring of 1878, eggs of *Protonotaria citrea* were obtained near Mt. Carmel April 27.

- April 27. Yellow-crowned Night Heron (*Nyctherodius violaceus*).  
 April 30. Hairy Woodpecker (*Picus villosus*), two sets; Grass Finch (*Poæcetes gramineus*).  
 May 2. Field Sparrow (*Spizella pusilla*), Chewink (*Pipilo erythrophthalmus*).  
 May 9. Redbird (*Cardinalis virginianus*).  
 May 18. Red-eyed Vireo (*Vireoslyvia olivacea*).  
 May 19. Prothonotary Warbler (*Protonotaria citrea*), Wood Thrush (*Hylocichla mustelina*).  
 May 20. Acadian Flycatcher (*Empidonax acadicus*).  
 May 22. Yellow-breasted Chat (*Icteria virens*), Maryland Yellowthroat (*Geothlypis trichas*), Indigo Bird (*Passerina cyanea*), Black-billed Cuckoo (*Coccyzus erythrophthalmus*).  
 May 24. Green Heron (*Butorides virescens*).

Although situated about 20 miles north and the same distance east of Mt. Carmel, the bird-fauna was entirely the same, allowing for differences in the character of the country, the environs of Wheatland being much less varied, and therefore not such as to attract so great a variety of species. Nearly all the characteristic summer birds found further south were abundant near Wheatland, however, even *Peucaea illinoensis* occurring there. Among the more numerous species were the Cerulean, Blue-winged Yellow, Kentucky and Prothonotary Warblers, all of which were quite as numerous as near Mt. Carmel. At the time of my arrival, the most abundant bird was probably the Cardinal Grosbeak, it being no unusual sight to see several males at one time along the railroad track, picking up grain dropped from passing cars, while the swamp and surrounding woods were filled with their sweet but monotonous whistlings. Later in the season, however, other species became rather more numerous, it being difficult to decide between the Redstart and Red-eyed Vireo, as to first rank in point of numbers. Other species almost as well represented as those mentioned, were the Red-headed Woodpecker, Tufted Titmouse, Blue Jay, and Red-winged Blackbird, and, for a brief season, the Rose-breasted Grosbeak and Cedarbird. Hawks were very plentiful, especially the Red-shouldered and Red-tailed, and on one occasion eight of the former (all adults) were observed soaring about, near together, uttering their clamorous cries. Barred Owls were exceedingly numerous among the trees growing in the swamp, and at night afforded much amusement by their "family squabbles." Ducks

and Geese which had been very plenty on the pond during the winter, had gone northward prior to the middle of April, except a few Mallards, Shovellers, and Blue-winged Teal, which remained until about the end of the month, as did also multitudes of Coots (*Fulica americana*).

The following list of course includes only a small proportion of the total number of species observed.

GRAY-CHEEKED THRUSH (*Hylocichla aliciae*).—The exact date of arrival of this species was not noted, but was somewhere near the 20th of April. During the last week of April and the first three weeks of May it was very common, perhaps more so than any other of the small Thrushes. Specimens were shot May 23, and others were observed as late as the 28th of that month, the date of my departure.

TAWNY THRUSH (*Hylocichla fuscescens*).—Arrived April 21 and remained until toward the last of May. Less common than *H. aliciae* but frequenting the same localities and having nearly identical manners.

BEWICK'S WREN (*Thryomanes bewicki*).—Rather common, found only about the out-buildings of farms and in the village.

HOUSE WREN (*Troglodytes aëdon*).—Less common than Bewick's Wren, and noticed only about brush-heaps and along old fences.

PROTHONOTARY WARBLER (*Protonotaria citrea*).—Very abundant among the "elbow-brushes" (*Cephalanthus occidentalis*) and willows in the pond, nesting in hollows of the latter.

BLUE-WINGED YELLOW WARBLER (*Helminthophaga pinus*).—Very abundant among the undergrowth in thick woods, chiefly in the bottoms.

GOLDEN-WINGED WARBLER (*Helminthophaga chrysoptera*).—Not uncommon for a few days during the early part of May.

TENNESSEE WARBLER (*Helminthophaga peregrina*).—As usual, very numerous for several days, arriving May 7.

NASHVILLE WARBLER (*Helminthophaga ruficapilla*).—Rather rare during the middle portion of May, arriving about the 6th.

CAPE MAY WARBLER (*Perissoglossa tigrina*).—Probably not uncommon, four specimens being obtained, all shot from the top branches of tall trees, and not recognized until after being shot.

BLACK-AND-YELLOW WARBLER (*Dendræca maculosa*).—Much the most abundant of the migratory species.

BAY-BREADED WARBLER (*Dendræca castanea*).—Rather common for a few days.

BLUE WARBLER (*Dendræca cærulea*).—Very abundant summer resident, first noticed about the 25th of April. Diligent search failed to discover a single nest, though pairs evidently having nests were met with on every hand through the woods.

YELLOW-THROATED WARBLER (*Dendræca dominica albilora*).—Unaccountably rare, only two having been obtained, and one or two others

heard. I am at a loss to account for the scarcity of this species, unless it be the rarity of sycamore (*Platanus*) trees in the locality under consideration.

Since there is evidently a general misapprehension of the characters distinguishing this race from true *D. dominica*, it may be as well to state here that the latter is larger, with a *constantly and very decidedly longer bill*, while the yellow over the lores is *never absent*. Var. *albiflora* frequently has the yellow over the lores almost as distinct as in typical *dominica*, but the bill is always much smaller, and somewhat differently shaped.

PINE-CREEPING WARBLER (*Dendroica pinus*).—Rather rare.

PRAIRIE WARBLER (*Dendroica discolor*).—Heard singing among the bushes in an old field on the day of my arrival, and frequently afterward.

CONNECTICUT WARBLER (*Oporornis agilis*).—Not uncommon about the middle of May, but very shy. Frequented the borders of the swamp, and escaped into the thick button-bushes when surprised.

KENTUCKY WARBLER (*Oporornis formosa*).—One of the most abundant of the summer residents.

MOURNING WARBLER (*Geothlypis philadelphia*).—Became suddenly very common May 6. Frequented chiefly brush-piles and old fences. Most of the specimens observed were males in fine plumage.

BLACK-CAPPED YELLOW WARBLER (*Myiodioctes pusillus*).—Rare during migration.

CANADA FLYCATCHING WARBLER (*Myiodioctes canadensis*).—One of the most numerous of the migratory species; first noted April 18, but not common until a week later.

HOODED WARBLER (*Myiodioctes mitratus*).—Rather common in deep woods, but much less so than in the vicinity of the Cypress swamp, further south.

SOLITARY VIREO (*Lanivireo solitarius*).—Rare.

CEDARBIRD (*Ampelis cedrorum*).—Exceedingly numerous among the willows in the swamp, where feeding upon the larvæ of *Diabrotica 12-maculata* infesting these trees.

SUMMER REDBIRD (*Pyrranga æstiva*). Rather common, but owing to the comparative absence of high, dry woods, much less so than near Mt. Carmel. A female, killed at the same shot with her mate, resembled the male except in the tint of the red, which was of a brick-red rather than vermilion, the male also being in the parti-colored plumage of the immature bird, the red occupying, in both male and female, one-half or more of the plumage. The ovaries of the female were well developed.

GRASS FINCH (*Poæcetes gramineus*).—Common in the meadows, a nest with four eggs being taken April 30.

LARK FINCH (*Chondestes grammica*). Rather common, chiefly in fields near roadsides.

WHITE-CROWNED SPARROW (*Zonotrichia leucophrys*).—Became common about the middle of May.

WHITE-THROATED SPARROW (*Zonotrichia albicollis*).—Very abundant up to the middle of May, and a female was started among some bushes

near the edge of the swamp about the 27th or 28th of the month, her actions and notes strongly suggesting a nest in the vicinity, but I was unable to discover one.

FIELD SPARROW (*Spizella pusilla*).—A very common bird. Remarkable variations were noticed in the song of this species, several individuals repeating the usual song three times without stopping. Another had such peculiar notes that it was followed and shot for a strange bird.

OAK-WOODS SPARROW (*Peuceea aestivalis illinoensis*).—Rare, and observed only on one occasion, on the 26th of April. The locality was a "woods pasture," about one-half cleared of trees, with occasional old logs and brush-piles on the open portion, and plenty of dead standing trees, the ground high and rolling. Immediately upon sighting the locality I thought of this bird, and at almost the same instant heard one sing. This one was shot, as he sat upon a brush-pile. Two or three others were heard at a distance, but I failed to discover them.

LINCOLN'S SPARROW (*Melospiza lincolni*).—Very abundant about brush-piles in swampy clearings.

CARDINAL GROSBEAK (*Cardinalis virginianus*). By far the most numerous of the resident *Fringillidae*, and one of the most abundant of all birds. It was a very common thing to hear several males singing at the same time, and I once saw three males and two females near together on the railroad track, picking up grain scattered from the cars.

ROSE-BREASTED GROSBEAK (*Zamelodia ludoviciana*).—Exceedingly common during the greater part of the month of May. The first were seen April 25. They were most numerous among the willows in the swamp, engaged in feeding upon a small green beetle (*Diabrotica 12-maculata*) which infested the trees. They were also common in the sugar-maple groves, and were in full song during their stay.

BLUE GROSBEAK (*Guiraca caerulea*).—A single specimen seen but not obtained (date forgotten).

BRONZED GRACKLE (*Quiscalus purpureus aeneus*).—Very numerous, breeding among the willows in the swamp. The "love note" of this bird is decidedly more metallic and more musical than that of *Q. purpureus*.

RED-HEADED WOODPECKER (*Melanerpes erythrocephalus*).—Much the most numerous of the Woodpeckers.

BARRED OWL (*Strix nebulosa*).—Exceedingly numerous, the swamp resounding at night with their hootings.

COOPER'S HAWK (*Accipiter cooperi*).—Common, breeding.

RED-SHOULDERED HAWK (*Buteo lineatus*).—Much the most numerous of the Hawks. On one occasion eight adults were observed circling together overhead, all uttering their clamorous cries.

MOURNING DOVE (*Zenaidura carolinensis*).—Abundant. All the specimens shot had the ends of the toes frozen off, showing that they had remained during the past severe winter.

WILD TURKEY (*Meleagris gallopavo americana*).—Common. Scarcely a day but what one or more were seen, and on one occasion a flock of

fourteen was met with. When surprised they fly into the swamp, where, alighting on the trees, they are secure from pursuit. The inhabitants pay no attention whatever to the game laws, and it is owing entirely to the safe retreat afforded by the swamp that the Turkeys have not been more nearly exterminated.

VIRGINIA QUAIL (*Ortyx virginiana*).—Almost exterminated by the severe winter of 1880-81.

GREEN HERON (*Butorides virescens*).—Abundant. A small colony had their nests in a second-growth thicket, some distance from the swamp. The nests (seven in number) were placed in saplings at 12-15 feet from the ground, and, with two exceptions, contained five eggs each.

YELLOW-CROWNED NIGHT HERON (*Nyctherodius violaceus*).—Abundant, a colony of perhaps a hundred pairs having their nests among the tall ash and sweet-gum trees in a creek bottom, near the edge of the pond. The nests were mostly at a considerable height, and few of them readily accessible. They had just begun to lay, and were frightened away from the locality during a "wet spell" by squirrel hunters. A female was shot from her nest April 27, and a perfect egg cut from her oviduct. Several fine specimens of the bird were secured, and it was noticed that the delicate, almost luminous, yellowish buff of the forehead very soon faded.

AMERICAN WOODCOCK (*Philohela minor*).—Common, breeding.

SOLITARY SANDPIPER (*Rhyacophilus solitarius*).—Common, and undoubtedly breeding, about small ponds in the woods.

SORA RAIL (*Porzana carolina*).—Common among the sedges in the swamp.

FLORIDA GALLINULE (*Gallinula galeata*).—Probably common in the swamp. A fine specimen with its neck broken was picked up on the railroad track near the depot in Vincennes, having been killed by flying against the telegraph wires.

AMERICAN COOT (*Fulica americana*).—Exceedingly numerous in the swamp during latter half of April and early part of May, but toward the last of the latter month the greater part had disappeared.

MALLARD (*Anas boscas*).—Very numerous at the time of our arrival and for a week or two afterward. A few pairs are said to breed in the swamp.

SHOVELLER DUCK (*Spatula clypeata*).—Much the most numerous of the Ducks at the time of my arrival (April 15).

BLUE-WINGED TEAL (*Querquedula discors*).—Abundant, even up to the latter part of May, and undoubtedly breeding.

SUMMER DUCK (*Aix sponsa*).—Common and breeding in the swamp.

HOODED MERGANSER (*Lophodytes cucullatus*).—More common than *A. sponsa*, breeding, like that species, in hollow trees in the swamp.

THICK-BILLED GREBE (*Podilymbus podiceps*).—Very common in the swamp, where it was breeding.

At the time of my arrival the Ducks had mostly departed for the North, while the Geese had entirely disappeared. Both had passed the winter in



the swamp, in immense numbers. A thorough exploration of the swamp would no doubt have added largely to the list of Water Birds, but I could not afford the time and labor necessary to accomplish even a partial exploration after the birds had begun breeding.

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NOTES ON THE HABITS AND CHANGES OF PLUMAGE OF THE ACADIAN OWL (*NYCTALE ACADICA*), WITH SOME ADDITIONAL RECORDS OF ITS BREEDING IN MASSACHUSETTS.

BY WILLIAM BREWSTER.

In the Bulletin for July, 1881, I gave an account of the breeding of the Acadian Owl at Tyngsboro', Massachusetts, with a description of a set of eggs taken there by Mr. Perham on April 5. Early in June of the same season Mr. Perham sent me a brood of four young Saw-whets which he had taken from the nest about the 15th of the preceding month. They were all in the plumage of *N. "albifrons,"* and showed little individual variation, save in respect to size, the two females being slightly larger than their brothers. In their fresh, silky feathering they were beautiful little creatures, the warm sepia-brown of the upper parts harmonizing well with the rich fulvous beneath, and their white foreheads showing in strong contrast with both. Nor were their manners less engaging than their plumage, for, unlike most Owls, they were perfectly gentle from the first, never attempting to bite or scratch those who handled them. With each other they were really affectionate, often going through a caressing performance with their bills, and showing a mutual forbearance at meal-times which was very pleasing. They eat all kinds of meat with avidity, but seemed especially fond of mice. The latter were invariably skinned and the flesh torn in shreds and devoured, the skins being swallowed afterwards as dessert. I often saw them eject those peculiar pellets of bones, fur, and other indigestible fragments which all Owls and many Hawks are in the habit of depositing