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THE FOOD OF BIRDS AS RELATED TO AGRICULTURE.

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The relation which birds sustain to agriculture is one which has been deemed of sufficient importance to engage the attention not only of agriculturists and ornithologists, but also of legislators. In part because of the benefit supposed to be derived from them, the laws of this State protect some throughout the year, and provide at what times and how others may be destroyed. Although much has been said upon this subject from one stand-point or another, I am not aware that any attempt has been made to present any thing like the entire, or even the salient points to be considered in determining what the influence of birds upon agriculture actually is.

For this purpose I propose to give a list of the birds which are found in the State, at the same time mentioning their general habit, whether resident during all or part of the year, or simply migrant or visitors. Those which are summer residents may be considered as breeding with us. To this I add, as far as may be correctly expressed in one or two words, an account of their relative abundance. In so doing I have not pretended to more than a general accuracy. A bird may be given as migrant when a few remain and breed, the greater number of individuals of that species passing north of us for that purpose; or one may be given as common, when in certain localities or in some years it is abundant, but in other localities or in other seasons it is not found. In general, these comments may be considered as correct according to my own observations in the vicinity of Columbus, at the same time understanding that some birds have been given as common which have never been taken in this vicinity.

I have named these birds in the order of their scientific arrangement and by families, and have given the principal and characteristic articles of food of the family, supplementing this by naming any peculiar or important article known to be used by certain species only of the family. A glance will show that to enumerate the articles of food used by each bird would have caused much unnecessary repetition.

The arrangement of the families is that of Dr. Cones in his Key to North American Birds, and the nomenclature that of his Check List, these being the latest and best authority on this subject, from whose works also not a few of the facts here given were obtained.*

* Key to North American Birds, containing a concise account of every species of living and fossil Bird at present known from the Continent North of the Mexican and United

Family TURDIDÆ. Thrushes.

Turdus migratorius. Robin. Spring, summer and fall resident. Abundant.

" *mustelinus*. Wood Thrush. Summer resident. Common

" *pallasi*. Hermit Thrush. Migrant. Very common.

" *swainsonii*. Olive-backed Thrush. Migrant. Very common.

" " *var. aliciae*. Alice's Thrush. Migrant. Very common.

Mimus polyglottus. Mocking Bird. Rare in summer.

" *Carolinensis*. Catbird. Summer resident. Abundant.

Haiporhynchus rufus. Brown Thrush; Thrasher. Summer resident. Very common.

The Robin and Catbird frequent cultivated places in summer; the Brown Thrush is found in thickets; the small species are mostly confined to woodland. Their food consists of saals, caterpillars, beetles, grasshoppers, spiders, numerous other insects and their larvæ, and in summer and fall consists largely of berries, the Robin and Catbird taking their pay in small fruits for the worms which they have destroyed.

Family SAXICOLIDÆ. Bluebirds.

Sialia sialis. Eastern Bluebird. Spring, summer and fall resident. Abundant

Found everywhere. Feeds upon grasshoppers, spiders, wire-worms, winged insects and berries.

Family SYLVIIDÆ. Sylvias.

Regulus calendula. Ruby-crowned Kinglet. Spring and fall migrant. Abundant.

" *satrapa*. Golden-crested Kinglet. Winter resident. Abundant.

Poliophtila cerulea. Blue-gray Gnatcatcher. Summer resident. Abundant.

More especially frequent woodland, and subsist upon small caterpillars, beetles, gnats, mosquitoes and eggs of insects.

Family PARIDÆ. Titmice or Chickadees.

Lopophanes bicolor. Tufted Titmouse. Resident. Abundant.

Parus atricapillus. Black-capped Chickadee. Resident. Abundant.

" " *var. Carolinensis*. Carolina Chickadee. Resident. Not common.

Found everywhere and almost omnivorous, feeding upon spiders and winged insects, caterpillars and eggs of insects, seeds, acorns, crumbs, meat and berries. The Black-capped Chickadee is said to destroy the eggs of the canker-worm.

Family SITTIDÆ. Nuthatches.

Sitta Carolinensis. White-bellied Nuthatch. Resident. Common.

" *Canadensis*. Red-bellied Nuthatch. Migrant. Common.

" *pusilla*. Brown-headed Nuthatch. Accidental.

Found in woodland. Their food consists of spiders, ants, larvæ and eggs of insects, and seeds, especially of coniferous trees.

States Boundary. Illustrated by 6 steel plates and upwards of 250 wood cuts, by Elliott Coues, Assistant Surgeon United States Army. Salem: Naturalist's Agency, 1872.

Field Ornithology, comprising a Manual of Instruction or procuring, preparing and preserving Birds, and a Check List of North American Birds, by Elliott Coues, United States Army. Salem: Naturalist's Agency, 1874.

Family CERTHIDÆ. Creepers.

Certhia familiaris. Brown Creeper. Spring, fall and winter resident.

Feeds upon beetles, insects, their larvæ and eggs and seeds.

Family TROGLODYTIDÆ. Wrens.

Thryothorus ludovicianus. Great Carolina Wren. Resident. Common.

" *Bewickii*. Bewick's Wren. Rare in summer.

Troglodytes aedon. House Wren. Summer resident. Common.

Auorthura troglodytes var. *hyemalis*. Winter Wren. Winter resident. Common.

Telmatodytes palustris. Long-billed Marsh Wren. Summer resident. Common.

Cistothorus stellaris. Short-billed Marsh Wren. Summer resident. Rare.

Feed upon spiders, grasshoppers, moths, insects, their larvæ and eggs.

Family ALAUDIDÆ. Larks.

Eremophila alpestris. Shore Lark. Winter resident. Abundant.

Frequents barren fields and gravelly shores, feeding upon seeds of weeds, torpid insects and eggs of insects. When the ground is covered deeply with snow most of their food is obtained from offal in barn-yards and roads.

Family MOTACILLIDÆ. Wagtails.

Anthus ludovicianus. Brown Lark; Titlark; Pipit. Migrant. Abundant.

Late in fall and early in spring, frequenting the same localities as the preceding, and with the addition of aquatic insects and larvæ their food is the same.

Family SYLVICOLIDÆ. American Warblers.

Mniotilta varia. Black and White Creeper. Summer resident. Common.

Parula Americana. Blue Yellow-backed Warbler. Migrant. Not very common.

Protonotaria citræa. Prothonotary Warbler. Rare in summer.

Helminthophaga vermivorus. Worm-eating Warbler. Summer resident. Not common.

Helminthophaga pinus. Blue-winged Yellow Warbler. Summer resident. Not rare.

" *chrysoptera*. Blue Golden-winged Warbler. Summer resident. Not common.

" *ruficapilla*. Nashville Warbler. Migrant. Common.

" *celata*. Orange-crowned Warbler. Migrant. Rare.

" *peregrina*. Tennessee Warbler. Migrant. Irregular in spring, very common in the fall.

Dendroæca æstiva. Summer Warbler. Summer resident. Very common.

" *virens*. Black-throated Green Warbler. Migrant. Very common.

" *cærulescens*. Black-throated Blue Warbler. Migrant. Common.

" *cærulea*. Blue Warbler. Summer resident. Very common.

" *coronata*. Yellow-rumped Warbler. Migrant. Abundant.

" *Blackburniæ*. Blackburnian Warbler. Migrant. Abundant.

" *striata*. Black-poll Warbler. Migrant. Common in spring, abundant in fall.

" *castanea*. Bay-breasted Warbler. Migrant. Irregular in spring, abundant in fall.

" *Pennsylvanica*. Chestnut-sided Warbler. Migrant. Common.

" *maculosa*. Black and Yellow Warbler. Migrant. Abundant.

FOOD OF BIRDS.

- Dendroica tigrina*. Cape May Warbler. Migrant. Rare.
 “ *discolor*. Prairie Warbler. Summer resident. Rare.
 “ *dominica, var. albilora*. White-browed Yellow-throated Warbler. Summer resident. Common.
 “ *Kirtlandi*. Kirtland’s Warbler. Exceedingly rare in spring.
 “ *palmarum*. Yellow Red-poll Warbler. Migrant. Very common.
 “ *pinus*. Pine-creeping Warbler. Summer resident. Not common.
Seiurus aurocapillus. Golden-crowned Thrush. Summer resident. Abundant.
 “ *noveboracensis*. Water Wagtail; Water Thrush. Migrant. Common.
 “ *ludovicianus*. Large-billed Water Thrush. Summer resident. Common.
Oporornis agilis. Connecticut Warbler. Migrant. Rare.
 “ *formosus*. Kentucky Warbler. Summer resident. Rare.
Geothlypis trichas. Maryland Yellow-throat Warbler. Summer resident. Abundant.
 “ *Philadelphia*. Mourning Warbler. Migrant. Not common.
Icteria virens. Yellow-breasted Chat. Summer resident. Abundant.
Myiodioctes mitratus. Hooded Flycatching Warbler. Summer resident. Not common.
 “ *pusillus*. Green Black-capped Flycatching Warbler. Migrant. Abundant.
 “ *Canadensis*. Canadian Flycatching Warbler. Migrant. Common.
Setophaga ruticilla. Redstart. Summer resident. Abundant.

This large and interesting family are found mostly in woodland, though many of them may be observed during their migrations in the gardens and shade trees of towns and cities. They are almost exclusively insectivorous. Birds of the genera *Mniotilta*, *Protonotaria*, *Helmitherus*, *Helminthophaga*, *Seiurus*, *Oporornis*, *Geothlypis* and *Icteria* are best adapted to destroy snails, spiders, caterpillars and larvæ, while those of the genera *Myiodioctes* and *Setophaga* are especially adapted for the pursuit of winged insects. Birds of the genera *Parula* and *Dendroica* combine the characteristics of both other groups as to their food, some of the species of *Dendroica* presenting structural characters which ally them to either of the two other groups. The Black poll Warbler is said to be destructive to canker-worms, and this is probably true of many others of the family. The Water Thrushes, as the name suggests, live largely upon aquatic insects and larvæ. Few of them exhibit vegetarian proclivities to any extent; some, as the Yellow Red-poll Warbler, devouring the stamina of flowers; others, as the Yellow-breasted Chat, prefer to mingle their beetles with berries in the proper season.

Family TANAGRIDÆ. Tanagers.

- Pyrranga rubra*. Scarlet Tanager. Summer resident. Very common.
 “ *æstiva*. Summer Red-bird. Summer resident. Rare.

These birds feed upon wasps, hornets, wild bees and other large insects, berries and seeds.

Family HIRUNDINIDÆ. Swallows.

- Hirundo horreorum*. Barn Swallow. Summer resident. Abundant.

- Tachycineta bicolor*. White-bellied Swallow. Summer resident. Abundant.
Petrochelidon lunifrons. Cliff Swallow; Eave Swallow. Summer resident. Very common.
Cotyle riparia. Bank Swallow; Sand Martin. Summer resident. Very common.
Stelgidopteryx serripennis. Rough-winged Swallow. Summer resident. Abundant.
Progne purpurea. Purple Martin. Summer resident. Abundant.

Birds of this family feed exclusively upon winged insects, and their habits in this respect are well known. The various swallows feed principally upon gnats, flies and mosquitoes, but the larger Martin devours wasps, bees, beetles and other large insects as well.

Family AMPELIDÆ. Waxwings.

- Ampelis garrulus*. Bohemian Waxwing. Winter visitor. Rare.
 " *cedrorum*. Cedar Bird; Cherry Bird. Resident. Very common.

Of these birds the first named is found only in northern Ohio in winter, and when here feeds upon berries. The Cedar Bird is well known, and has been most unjustly judged. It is true that he gorges himself almost to insensibility upon cherries and berries, and sometimes proves a most destructive visitor to gardens and orchards. In spring, however, his appetite for beetles, caterpillars and canker-worms is equally voracious. He is, moreover, a most expert flycatcher. In winter he subsists upon various berries, especially preferring those of the juniper, gum and mountain ash.

Family VIREONIDÆ. Vireos, or Greenlets.

- Vireo olivaceus*. Red-eyed Vireo. Summer resident. Abundant.
 " *philadelphicus*. Brotherly-love Vireo. Migrant. Rare.
 " *gilvus*. Warbling Vireo. Summer resident. Very common.
 " *flavifrons*. Yellow-throated Vireo. Summer resident. Common.
 " *solitarius*. Blue-headed Vireo. Solitary Vireo. Migrant. Not common.
 " *noveboracensis*. White-eyed Vireo. Summer resident. Not common.

Birds of this family affect mostly woodland, except that the Warbling Vireo is most common in towns and cities and along the wooded banks of streams; and the White-eyed Vireo affects thickets. Their food consists largely of caterpillars, with a liberal admixture of other insects, their larvæ and eggs. In the fall they eat sparingly of soft berries.

Family LANIIDÆ. Shrikes.

- Collurio borealis*. Great Northern Shrike. Butcher Bird. Winter resident. Not common.
Collurio ludovicianus. Loggerhead Shrike. Summer resident. Common.
 " " *var. excubitoroides*. White-rumped Shrike. Summer resident. Common.

The Shrikes or Butcher Birds form an interesting family, their habits in some respects resembling those of birds of prey on one hand and singing on the other. Their food consists mainly of large insects, such

as grasshoppers, crickets and spiders; but they sometimes, and this is especially true of the Northern Shrike, attack, kill and feed upon small birds and mice. They are noted for impaling their surplus game, bird or grasshopper, upon thorns.

Family FRINGILLIDÆ. Finches, etc.

- Hesperiphona vespertina*. Evening Grosbeak. Accidental.
Pinicola enucleator. Pine Grosbeak. Winter visitor. Not common.
Carpodacus purpureus. Purple Finch. Migrant. Common.
Loxia leucoptera. White-winged Crossbill. Winter visitor. Rare.
 " *curvirostra*. Common Crossbill. Winter visitor. Not common.
Ægiolthus linaria. Red-poll Linnet. Winter visitor. Common.
Chrysomitris pinus. Pine Linnet. Winter visitor. Common.
 " *tristis*. American Goldfinch. Yellowbird. Resident. Abundant.
Plectrophanes nivalis. Snow Bunting. Winter visitor. Common.
 " *lapponicus*. Lapland Longspur. Winter visitor. Common.
Passerculus savanna. Savanna Sparrow. Migrant. Abundant.
Poocetes gramineus. Bay-winged Bunting. Grass Finch. Summer resident. Very abundant.
Coturniculus passerinus. Yellow-winged Sparrow. Summer resident. Abundant.
 " *Henslowii*. Henslow's Sparrow. Summer visitor. Rare.
Melospiza Lincolni. Lincoln's Finch. Migrant. Not Common.
 " *palustris*. Swamp Sparrow. Migrant. Abundant.
 " *melodia*. Song Sparrow. Resident. Very abundant.
Junco hyemalis. Snow Bird. Winter resident. Very abundant.
Spizella monticola. Tree Sparrow. Winter resident. Very abundant.
 " *socialis*. Chipping Sparrow. Summer resident. Very abundant.
 " *pusilla*. Field Sparrow. Summer resident. Very abundant.
 " *pallida*. Clay-colored Sparrow. Summer resident. Rare.
Zonotrichia albicollis. White-throated Sparrow. Migrant. Abundant.
 " *leucophrys*. White-crowned Sparrow. Migrant. Common.
Chondestes grammacus. Lark Finch. Summer resident. Common.
Passer domesticus. English Sparrow. Resident. Imported.
Passerella iliaca. Fox Sparrow. Migrant. Very common.
Empidonax americanus. Black-throated Bunting. Summer resident. Very abundant.
Goniaphea ludoviciana. Rose-breasted Grosbeak. Summer resident. Common.
 " *caerulea*. Blue Grosbeak. Summer visitor. Very rare.
Cyanospiza cyanea. Indigo Bird. Summer resident. Abundant.
Cardinalis Virginianus. Cardinal Redbird. Resident. Very common.
Pipilo erythrophthalmus. Towhee Bunting; Chewink. Summer resident. Abundant.

This is the great granivorous family, and may practically be considered as gregarious and as feeding entirely upon seeds, except during the breeding season. The first five species named, while with us, consume the seeds of coniferous trees, birch and alder, as well as a few berries. Other winter residents and visitors, together with those which are migratory, subsist on seeds of weeds and grasses, some of the larger species devouring a few berries. The Fox Sparrow scratches the ground

for hybernating insects, their larvæ and eggs, snails, etc. Those which are resident all the year, and those which are summer residents only, subsist during the breeding season and feed their young almost exclusively upon insects. At other times their food does not differ from those before named, consisting largely of seeds of grass and weeds. The common Yellowbirds prefer the seeds of thistles and the like, often destroying seeds of lettuce; but it also feeds upon the Hessian fly. It is also fond of certain oily seeds, as those of the sunflower. During the breeding season their insect food is as varied as that of the *Sylvicolidæ*, and embraces beetles, grasshoppers, caterpillars, canker and cut-worms, and other worms, larvæ, and eggs of insects. The Rose-breasted Grosbeak is especially mentioned as feeding upon berries of sour-gum and juniper, and is the only bird known to devour the Colorado beetle or potato-bug; but it should be noted that the appearance of this pest has not caused an increase in numbers of these birds, nor have the comparatively few birds which breed with us effected any considerable reduction in numbers of these insects. The Cardinal or common cage Redbird feeds upon corn, both when wild or confined, and is also said to devour bees. It may be here remarked that the migrants of this family, as well as other migratory graminivorous birds, pass north earlier in spring, and south later in fall, than do the insectivorous migrants.

Family ICTERIDÆ. American Starlings.

Dolichonyx oryzivorus. Bobolink; Reed Bird; Rice Bird. Summer resident. Abundant.

Molothrus ater. Cowbird. Summer resident. Very abundant.

Agelaius phœniceus. Red-winged Blackbird. Summer resident. Very abundant.

Xanthocephalus icterocephalus. Yellow-headed Blackbird. Accidental in summer.

Sturnella magna. Field-lark; Meadow-lark. Summer resident. Abundant.

Icterus spurius. Orchard Oriole. Summer resident. Very common.

" Baltimore. Baltimore Oriole. Summer resident. Abundant.

Scolecophagus ferrugineus. Rusty Grackle. Migrant. Abundant.

Quiscalus purpureus. Purple Grackle; Crow Blackbird. Summer Resident. Very abundant.

The Starlings constitute the most decidedly gregarious family among land-birds which is largely represented among us. Even during the breeding season, when the flocks of Sparrows are broken up, and each family live in independence, the Starlings associate together. Like the previous family, they are graminivorous with us only in the fall. Their food consists of various insects, large and small, beetles, may-flies, caterpillars, grasshoppers, crickets, moths, flies, larvæ, spiders and bugs. As to the grains they eat, the Bobolink gives preference to the seeds of weeds; the Cowbird to the droppings of animals; the Red-winged and Crow Blackbirds to corn and other grains. The latter also destroys the eggs, and, according to Dr. Coues, the young of other birds, while the Rusty Grackle—the

only species which does not breed with us—eats corn and berries. A peculiarity of habit which should be mentioned in connection with the food of the species I have specially mentioned, is their preference for swampy, uncultivated places, and the vicinity of water. To this statement the Cowbird and Crow Blackbird are an exception, being found everywhere. The Orioles are least graminivorous of the family, and feed upon caterpillars, beetles, bugs, grasshoppers and spiders. The Baltimore Oriole is particularly expert in his management of hairy caterpillars, dissecting them and discarding the hairy skin with as much skill as he shows in weaving his pendant nest. In return for their watchful care over the garden and orchard, the Orioles take their tithe, and usually as much more as they can get, of the first and finest small fruits. The Meadow-lark is the most terrestrial of the family, and feeds upon beetles, cut-worms, and other larvæ in great quantities, so long as they are to be had. A moderate amount of grass and other seeds completes his bill of fare.

Family CORVIDÆ. Crows, Jays, etc.

Corvus corax. Raven. Winter resident. Rare.

“ *Americanus*. Common Crow. Resident. Very common.

Cyanurus cristatus. Blue Jay. Resident. Abundant.

This family is omnivorous. The Raven feeds upon shell-fish, eggs, reptiles, worms, grubs, fruits and grain. The Crow devours mice, moles, eggs, grubs, beetles, worms, caterpillars and other insects, and corn, for which latter article he has long suffered in reputation. The Blue Jay feeds upon eggs, young birds, insects and caterpillars, acorns, chestnuts, corn, and small fruits.

Family TYRANNIDÆ. Flycatchers.

Tyrannus Carolinensis. King Bird. Bee Martin. Summer resident. Abundant.

Myiarchus crinitus. Great-crested Flycatcher. Summer resident. Abundant.

Sayornis fuscus. Pewee; Pewit; Phoebe. Summer resident. Very common.

Contopus borealis. Olive-sided Flycatcher. Migrant. Rare.

“ *virens*. Wood Pewee. Summer resident. Abundant.

Empidonax acadicus. Acadian Flycatcher. Summer resident. Very common.

“ *traillii*. Traill's Flycatcher. Summer resident. Common.

“ *minimus*. Least Flycatcher. Migrant. Very common.

“ *flaviventris*. Yellow-bellied Flycatcher. Migrant. Common.

The food of this family consists almost entirely of winged insects, which they capture by short flights. The King Bird, and to a less degree the Pewee, affect open places. Others of the family are found in woodland and thickets. The larger species devour soft berries in the fall, and the Yellow-bellied Flycatcher sometimes feeds upon ants.

Family CAPRIMULGIDÆ. Goatsuckers.

Antrostomus vociferus. Whippoorwill; Night Jar. Summer resident. Common.

Chordeiles Virginianus. Night-hawk. Summer resident. Common.

The Night-hawk and Whippoorwill capture their insect prey on the wing, as do the Swallows, but they are nocturnal or crepuscular in their habits. Their food consists of moths, flies, beetles, grasshoppers, ants, and other winged insects.

Family CYPSELIDÆ. Swifts.

Chaetura pelagica. Chimney Swift. Summer resident. Abundant.

The Chimney Swift, or Chimney Swallow, feeds exclusively upon small winged insects.

Family TROCHILIDÆ. Humming Birds.

Trochilus colubris. Ruby-throated Humming Bird. Summer Resident. Abundant.

The food of the Humming Bird consists of small beetles, spiders, and winged insects, most of which are captured in the corolla of flowers.

Family ALCEDINIDÆ. Kingfishers.

Ceryle alcyon. Belted Kingfisher. Spring, summer and fall resident. Very common.

The Kingfisher is believed to feed exclusively on fish.

Family CUCULIDÆ. Cuckoos.

Coccyzus erythrophthalmus. Black-billed Cuckoo. Summer resident. Very common.

" *Americanus*. Yellow-billed Cuckoo. Summer resident. Very common.

Insectivorous, feeding upon hairy caterpillars, moths and beetles, especially those known as June-bugs or Rose-beetles (*Melolontha*). They also eat snails, birds' eggs and berries.

Family PICIDÆ. Woodpeckers.

Hylotinus pileatus. Pileated Woodpecker; Logcock. Resident. Not common.

Picus villosus. Hairy Woodpecker. Resident. Common.

" *pubescens*. Downy Woodpecker. Resident. Common.

Sphyrapicus varius. Yellow-bellied Woodpecker. Migrant. Very common.

Centurus Carolinus. Red-bellied Woodpecker. Resident. Common.

Melanerpes erythrocephalus. Red-headed Woodpecker. Summer resident. Very abundant.

Colaptes auratus. Golden-winged Woodpecker; Flicker. Spring, summer and fall resident. Very abundant.

The food of this family consists largely of the larvæ of the wood-boring insects, and as these are concealed and stationary, and the birds peculiarly adapted for discovering and dislodging them, they are not obliged, as are other insectivorous birds, to migrate at the approach of cold weather to obtain food. They also eat, in small quantities, green corn and berries. The Red-headed Woodpecker is frequently on the ground in search of food, but the Flicker is the most terrestrial, and his food largely consists of ants. Both these birds have a fondness for cherries and other fruits, and are sometimes quite destructive. Others, especially the Yellow-bellied Woodpecker, are charged with sucking the

sap from apple and other trees. This is denied by some, while others claim that no harm is done if they do, trees which exhibit their numerous punctures appearing to be benefited by their visits.

Family ARIDÆ.

Conurus Carolinensis. Carolina Paroquet. Rare visitor.

Feeds upon cockle-burs, beech-nuts and hackberries.

Family STRIGIDÆ. Owls.

Strix flammea. Barn Owl. Rare. Summer visitor.

Bubo Virginianus. Great Horned Owl. Resident. Common.

Scops asio. Screech Owl; Mottled Owl. Resident. Common.

Otus vulgaris, *var. Wilsonianus*. Long-eared Owl. Resident. Rather common.

Brachyotus palustris. Short-eared Owl. Resident. Common.

Syrnium lapponicum, *var. cinereum*. Great Gray Owl. Very rare. Winter visitor.

" *nebulosum*. Barred Owl. Resident. Common.

Nyctea nivea. Snowy Owl. Winter visitor. Not common.

Surnia ulula. Hawk Owl. Winter visitor. Rare.

Nyctale Acadica. Acadian Owl; Saw-whet Owl. Not common. Resident.

This is the nocturnal family of raptorial birds. Mice seem to be their staple article of diet, and with rats, shrews, rabbits, squirrels, moles, partridges and small birds and beetles, about fill the ordinary bill of fare for the larger species. Sometimes, if hunger presses and opportunity affords, they make sad havoc in the poultry-yard. The Barn and Snowy Owls are said to be expert in catching fish, and the Barred Owl catches frogs. The smaller species, with mice also for their chief staple, destroy small birds, and large numbers of beetles, grasshoppers, crickets, cicadas, moths and other large winged insects.

Family FALCONIDÆ. Diurnal birds of prey.

Circus cyaneus, *var. hudsonius*. Marsh Hawk; Harrier. Resident. Common.

Nauclerus furcatus. Swallow-tailed Kite. Summer visitor. Very rare.

Accipiter fuscus. Sharp-shinned Hawk; Pigeon Hawk. Resident. Common.

" *Cooperii*. Cooper's Hawk; Chicken Hawk. Resident. Very common.

Astur atricapillus. Goshawk. Winter visitor. Rare.

Falco communis. Peregrine Falcon; Duck Hawk. Winter visitor. Not common.

Falco columbarius. Pigeon Hawk. Migrant. Common.

" *sparverius*. Sparrow Hawk. Summer resident. Abundant.

Buteo borealis. Red-tailed Buzzard; Hen Hawk. Resident. Very common.

" *lineatus*. Red-shouldered Buzzard. Resident. Common.

" *Pennsylvanicus*. Broad-winged Buzzard. Summer resident. Common.

Archibuteo lagopus, *var. sancti-johannis*. Rough-legged Buzzard. Winter visitor. Not common.

Pandion haliaetus. Fish Hawk; Osprey. Summer resident. Not common.

Aquila chrysaetus. Golden Eagle. Rare.

Haliaetus leucocephalus. White-headed Eagle; Bald Eagle. Rather common. Resident.

The food of this family resembles the last. The majority feed upon mice, small birds, snakes, lizards and frogs. To these the larger hawks and buzzards add moles, rabbits, squirrels, rats, water-fowl and game, and the smaller feed largely on such insects as locusts, grasshoppers, beetles, crickets and dragonflies. The only species which commonly invade the barn-yard are the Sharp shinned, Cooper's and the Goshawk, the Red-tailed, Red-shouldered and Broad-winged Buzzard. These frequently carry off young chickens and ducks with surprising skill and boldness. They atone for their shortcomings in this respect by pursuing and driving away the flock of blackbirds, reed-birds and wild pigeons which would inflict greater damage.

The Fish Hawk subsists entirely upon fish. The Eagles destroy rabbits, waterfowl, and sometimes lambs and pigs. Both feed upon dead animals and carrion, and the White-headed Eagle upon fish; in this respect he is largely dependent upon the Fish Hawk.

Family CATHARTIDÆ. American Vultures.

Cathartes aura. Turkey Buzzard. Summer resident. Very common.

" *atratus*. Black Vulture; Carrion Crow. Has ceased to visit the State.

The Vultures, or Buzzards, as they are commonly called, feed entirely upon carrion and offal.

Family COLUMBIDÆ. Pigeons.

Ectopistes migratorius. Wild Pigeon. Resident most of the year. Abundant.

Zenaidura Carolinensis. Carolina Dove. Resident most of the year. Abundant.

The food of this family consists of acorns, beech-mast, corn, buckwheat, hempseed and various grains, with dogwood, poke, partridge and whortleberries. It will be noticed that insects do not enter into their diet, and this is true of them and their young at all times; the young are fed by the parents on half digested food regurgitated. The Wild Pigeon in former years did considerable damage to grain crops, but now, in the more cultivated portions of the State at least, they have ceased to appear in such enormous flocks as formerly.

Family MELEAGRIDÆ. Turkeys.

Meleagris gallipavo var. Americana. Common Wild Turkey. Resident. Not common.

The food of the Wild Turkey consists of grain, nuts, acorns, grapes and other berries, grasshoppers and some large insects.

Family TETRAONIDÆ. Grouse, etc.

Cupidonia cupido. Pinnated Grouse; Prairie Hen. Resident. Almost exterminated.

Bonasa umbellus. Ruffed Grouse; Partridge; Pheasant. Resident. Common.

Ortyx Virginianus. Virginia Partridge; Quail; Bob-white. Resident. Abundant.

Various grains, as corn, wheat, rye, oats, buckwheat and seeds, with berries, worms and insects, form the food of these birds. The Grouse

devour also grapes, chestnuts and the leaves and buds of various plants. The Quail is fond of the seeds of rag-weed (*Ambrosia*).

Family CHARADRIIDÆ. Plover.

Squatirola helvetica. Black-bellied Plover. Migrant. Not common.

Charadrins fulvus, var. *Virginicus*. Golden Plover. Migrant. Very common.

Ægialitis vociferus. Kildeer Plover. Summer resident. Abundant.

" *semipalmatus*. Semipalmated Plover; Ringneck. Migrant. Common.

" *melodius*. Piping Plover; Ringneck. Migrant. Not common.

Feed upon grasshoppers, beetles, moths, and other winged and aquatic insects, and larvæ, worms, small mollusks, and berries.

Family HÆMATOPODIDÆ. Oyster-catchers. Turnstones.

Streptilas interpres. Turnstone. Migrant. Rare.

Feeds upon small mollusks, fish spawn, grasshoppers, worms and insects.

Family RECURVIROSTRIDÆ. Avocets. Stilts.

Recurvirostra Americana. Avocet. Migrant. Rare.

Himantopus nigricollis. Stilt. Migrant. Not common.

They feed upon crustacea, shell-fish, spawn, snails, aquatic larvæ and insects.

Family PHALAROPODIDÆ. Phalaropes.

Steganopus Wilsonii. Wilson's Phalarope. Migrant. Rare.

Lobipes hyperboreus. Northern Phalarope. Migrant. Rare.

" *fulcarinus*. Red Phalarope. Migrant. Rare.

The food of the Phalaropes probably consists of small mollusks and aquatic insects.

Family SCOLOPACIDÆ. Snipe, etc.

Philohela minor. American Woodcock. Summer resident. Common.

Gallinago Wilsonii. American Snipe; Wilson's Snipe. Migrant. Abundant.

Macrorhamphus griseus. Red-breasted Snipe. Migrant. Not common.

" " var. *scolopaceus*. Long-billed Snipe. Migrant. Not common.

Micropalama himantopus. Stilt Sandpiper. Migrant. Rare.

Ereunetes pusillus. Semipalmated Sandpiper. Migrant. Very common.

Tringa minutilla. Least Sandpiper. Migrant. Abundant.

" *Bairdii*. Baird's Sandpiper. Migrant. Not common.

" *maculata*. Pectoral Sandpiper. Migrant. Very common.

" *Bonapartei*. White-rumped Sandpiper. Migrant. Common.

" *maratima*. Purple Sandpiper. Migrant. Rare.

" *alpina* var. *americana*. American Dunlin. Migrant. Not common.

" *canadensis*. Red-breasted Sandpiper; Knot. Migrant. Not common.

Calidris arenaria. Sanderling; Ruddy Plover. Migrant. Not common.

Limosa fedoa. Great-marbled Godwit. Migrant. Not common.

" *Hudsonica*. Hudsonian Godwit. Migrant. Rare.

Totanus semipalmatus. Semipalmated Tattler. Summer resident. Rather common.

" *melanoleucus*. Greater Tottale. Migrant. Very common.

Totanus flavipes. Yellow-shanks. Migrant. Very common.

“ *solitarius*. Solitary Tattler. Summer resident. Very common.

Tringoides macularius. Spotted Sandpiper. Summer resident. Abundant.

Actiturnus Bartramius. Bartramian Sandpiper. Upland Plover. Summer resident. Abundant.

Tryngites rufescens. Buff-breasted Sandpiper. Migrant. Rare.

Numenius longirostris. Long-billed Curlew. Migrant. Not common.

“ *Hudsonicus*. Hudsonian Curlew. Migrant. Not common.

“ *borealis*. Esquimaux Curlew. Migrant. Not common.

This large family of shore-birds feed upon small mollusks, leeches, aquatic insects and larvæ, the larger species, as the Curlews, adding crustaceans and berries. The Upland Plover and Buff-breasted Sandpiper destroy many grasshoppers.

Family TANTALIDÆ. Ibises. Spoonbills.

Ibis falcinellus. Glossy Ibis. Rare visitor.

This rare bird feeds upon insects, mollusks and some vegetable substances.

Family ARDEIDÆ. Herons.

Ardea herodias. Great Blue Heron. Summer resident. Very common.

“ *egretta*. Great White Egret. Summer resident. Not uncommon.

“ *candidissima*. Little White Egret. Rare summer visitor.

“ *virescens*. Green Heron. Summer resident. Abundant.

Nyctiardea grisea, *var. naevia*. Night Heron. Summer resident. Not common.

Botaurus minor. Bittern; Indian Hen. Summer resident. Common.

Ardetta exilis. Least Bittern. Summer resident. Not common.

The food of this family consist of fish, frogs, snakes, lizards, crayfish, snails, grasshoppers, dragon flies, worms, larvæ and insects. The Great Blue Heron and Great White Egret also eat the seeds of the spatterdock.

Family GRUIDÆ. Cranes.

Grus Americana. White Crane; Whooping Crane. Migrant. Rare.

“ *Canadensis*. Brown Crane; Sand-hill Crane. Migrant. Rare.

The Cranes feed upon mice, moles, rats, reptiles, fish and worms.

Family RALLIDÆ. Rails, etc.

Rallus elegans. Fresh-water Marsh Hen. Summer resident. Rather common.

“ *Virginianus*. Virginia Rail. Summer resident. Abundant.

Porzana Carolina. Carolina Rail; Sora, Ortolan. Summer resident. Abundant.

“ *novaboracensis*. Yellow Rail. Migrant. Rare.

Gallinula galeata. Florida Gallinule. Summer resident. Common.

Fulica Americana. Coot. Summer resident. Abundant.

The food of this family consists of small mollusks, worms, insects, larvæ and seeds, especially of wild rice, grapes and aquatic plants. To these the Gallinule sometimes adds fish.

Family ANATIDÆ. Geese, Ducks, etc.

Cygnus buccinator. Trumpeter Swan. Migrant. Not common.

" *Americanus*. Whistling Swan. Migrant. Not common.

Anser albifrons, *var.* *Gambelli*. American White-fronted Goose. Migrant. Common.

" *cærulescens*. Blue Goose. Migrant. Rare.

" *hyperborens*. Snow Goose. Migrant. Not common.

Branta bernicla. Braut Goose. Migrant. Not common.

" *Canadensis*. Canada Goose; Wild Goose. Migrant. Common.

" " *var.* *Hutchinsii*. Hutchins' Goose. Migrant. Rare.

Anas boschas. Mallard. Migrant. Abundant.

" *obscura*. Dusky Duck. Migrant. Common.

Nettion acuta. Pintail; Springtail. Migrant. Common.

Chaulelasmus streperus. Gadwall; Gray Duck. Summer resident. Not common.

Mareca americana. American Widgeon; Baldpate. Migrant. Abundant.

Querquedula carolinensis. Green-winged Teal. Migrant. Abundant.

" *discors*. Blue-winged Teal. Migrant. Abundant.

Spatula clypeata. Shoveler. Summer resident. Common.

Aix sponsa. Summer Duck; Wood Duck. Summer resident. Very common.

Fuligula marilla. Greater Black-head. Migrant. Common.

" *affinis*. Lesser Black-head. Migrant. Abundant.

Fuligula collaris. Ring-neck Duck. Migrant. Common.

" *ferina*, *var.* *Americana*. Redhead; Pochard. Migrant. Common.

" *vallisneria*. Canvas-back. Migrant. Not common.

Brachypteryx caingula. Golden-eyed Duck. Migrant. Common.

" *albeola*. Buffle-headed Duck. Migrant. Abundant.

Harelda glacialis. Long-tailed Duck. Winter visitor. Rare.

Histrionicus torquatus. Harlequin Duck. Accidental in winter.

Somateria spectabilis. King Eider. Accidental in winter.

Oedemia fusca. Velvet Scoter. Winter visitor. Rare.

Erismatura rubida. Ruddy Duck. Migrant. Common.

Mergus merganser. Merganser; Goosander. Migrant. Common.

" *serrator*. Red-breasted Merganser. Migrant. Not common.

" *cucullatus*. Hooded Merganser. Summer resident. Common.

The food of this family is various, and consists of grass, corn, acorns, grains, wild rice and other seeds, berries, aquatic plants and other vegetables, fish, crustacea, small mollusks, spawn, worms, insects and larvæ. While none of these birds are exclusively vegetarian in diet, the order in which they are arranged expresses pretty nearly the proper order in which they should be arranged to show their food habits—the swans and geese being most herbivorous in habit, while the mergansers subsist almost exclusively on fish, crustacea and mollusks. The line dividing those whose food is chiefly vegetable from those otherwise may be drawn with a tolerable degree of accuracy between the genera *Aix* and *Fuligula*.

Family PELECANIDÆ. Pelicans.

Pelecanus trachyrhynchus. White Pelican. Migrant. Not common.

Feeds almost exclusively on fish and crayfish.

Family GRACULIDÆ. Cormorant.

- Graculus dilophus*. Double-crested Cormorant. Migrant. Not common.
 “ *var. Floridanus*. Florida Cormorant. Summer resident. Common.

The Cormorants feed almost exclusively on fish.

Family LARIDÆ. Gulls, Terns, etc.

- Larus leucopterus*. White-winged Gull. Winter visitor. Rare.
 “ *marinus*. Great Black-backed Gull. Winter visitor. Rare.
 “ *argentatus, var. Smithsonianus*. Herring Gull. Migrant. Common.
 “ *Delawarensis*. Ring-billed Gull. Migrant. Common.
 “ *tridactylus*. Kittiwake Gull. Winter visitor. Rare.
 “ *atricilla*. Laughing Gull. Summer visitor. Not common.
 “ *Philadelphia*. Bonaparte's Gull. Migrant. Common.
Xema Sabinei. Fork-tailed Gull. Accidental in winter.
Sterna anglica. Gull-billed Tern; Marsh Tern. Migrant. Not common.
 “ *hirundo*. Common Tern; Sea Swallow. Migrant. Not common.
 “ *Forsteri*. Forster's Tern. Migrant. Not common.
 “ *macroura*. Arctic Tern. Migrant. Not common.
 “ *paradisæa*. Roseate Tern. Migrant. Rare.
 “ *superciliaris*. Least Tern. Migrant. Not common.
Hydrochelidon fissipes. Black Tern. Summer resident. Common.

The food of the Gulls consists of fish, carrion, mollusks, spawn, worms, ants, moths and other insects, larvæ and refuse. The Terns feed upon small fish, grasshoppers, beetles, crickets, moths, spiders, and other insects.

Family COLYMBIDÆ. Loons.

- Colymbus torquatus*. Loon; Great Northern Diver.
 “ *septentrionalis*. Red-throated Diver. Winter visitor. Not common.

These feed chiefly upon fish, but also devour other aquatic animals, and sometimes vegetables.

Family PODICIPIDÆ. Grebes.

- Podiceps cristatus*. Crested Grebe. Migrant. Not common.
 “ *greiseigena, var. Holböllii*. Red-necked Grebe. Migrant. Not common.
 “ *cornutus*. Horned Grebe. Migrant. Common.
Podilymbus podiceps. Pied-billed Dabchick. Summer resident. Abundant.

The Grebes feed upon fish, eels, mollusks, beetles, worms, and aquatic vegetables.

From the above it will be seen that birds may be divided into three classes—those feeding entirely on animals, those whose food consists entirely of vegetable substances, and those which eat both. The latter class is the greatest, and the class comprising those feeding upon animals is larger than that of the vegetarians, which includes only the Paroquet and Pigeons.

In view of the fact that great differences of form and structure are in-

cluded in each of these classes, while no great difference of form and structure separate them, we find that the structure of birds is not so modified in accordance with their food habits as to be available for purposes of systematic classification, and we thus arrive at, though indirectly and in part, the same conclusion which has been reached by Prof. Gill, who finds that among recent (existing) birds divisions cannot be formed of equivalent value to those which constitute orders in other classes, as, for instance, Rodents and Carnivora among Mammals.

The reason for this will be more evident if we consider that birds are wanting in one very important element in the classification of Mammals—*teeth*. The mouth of birds presents but little modification throughout the class, and this only such as is required for the taking and suitable division of food preparatory to its being immediately swallowed. Lacking fleshy lips and tongue for tasting, teeth, and to a great extent salivary glands for masticating, the food is simply reduced to a proper size and swallowed. The stomach is obliged to take upon itself the mechanical offices which are usually performed by teeth, and in so far as the food of the bird consists of hard substances, whether animal or vegetable, it will be found a strong muscular gizzard. A moment's reflection, then, accounts for so many birds using so many and so diverse articles of food; not that they are specially adapted to each kind, but because they are not so differenced as to prevent them from eating many kinds.

Having shown what constitutes the food of each of our birds, we might rest the case with those most interested, were it not that popular opinion regards insectivorous birds as beneficial and granivorous birds injurious to agriculture. This is almost equivalent to saying that all insects are injurious and all vegetables beneficial to agriculture, which is not the case either as regards the one or the other. Birds which feed upon insects do not discriminate between insects which feed upon vegetables, or have other habits which are injurious, and those which prey upon other insects and may for this reason be highly beneficial. Neither do those which feed upon seeds discriminate to any noteworthy extent between the seeds of noxious weeds and cultivated grains.

Insects, themselves, assist to maintain the balance of life in the insect world much more than birds, and often in a manner very different from our preconceived notions. For example, we have noted that the Martin devours wasps, which seems a very commendable trait, for this insect is noxious and often harmful to man. But if we study the habits of the common mud-wasp we find that it fills up the cell in which its egg is laid with spiders, which it paralyzes but does not kill, for the food of its undeveloped young. But the spider, too, is a noxious insect, and in our par-

tial judgment we may be willing that a single wasp should live if it causes the death of a dozen spiders. The spider, however, lives upon other insects, and we must discover, if possible, whether these are injurious or not before we are competent to pass judgment upon the merits of the Martin which destroyed the wasp. In fact, the forms of insect life seem to be about equally divided into those which are injurious, and those which are beneficial by arresting the too rapid multiplication of injurious species. Some of the latter effect this by devouring adult insects, others the larvæ or eggs, and still others are external or internal parasites. When we view the relations which one portion of the class sustains to the other in this respect, the destruction of insects by birds sinks into comparative insignificance. Many more grasshoppers, in all probability, are destroyed by spiders alone than by all species of birds, while still more are destroyed by parasitic animals than by spiders.

The consideration of this portion of the subject belongs to the entomologist, and it is to be regretted that our legislators, who have shown sufficient zeal in protecting birds for their good qualities, have not deemed the determination of what are and what are not beneficial insects worthy of their consideration. In my opinion, the benefit derived would amply compensate for any outlay of money, time and skill employed for this purpose. Other States have their State Entomologist, and upon them Ohio is dependent for all she possesses of useful knowledge on this subject.

Having thus traced the influence of insectivorous birds to the only conclusion which we can consider legitimate at present, it will not surprise the reader that a similar conclusion awaits us respecting those which are gramnivorous—simply that they are useful so far as they destroy the seeds of weeds and noxious plants, and injurious only in their destruction of cultivated seeds.

In the consideration of this subject the influence of agriculture upon birds must be taken into the account. The clearing and cultivation of land, and the draining of swamps and marshes, have produced some changes in the bird-fauna of the State worthy of notice. The Carrion Crow, Swallow-tailed Hawk and Carolina Parrot have apparently ceased to visit us. The Pileated Woodpecker, Turkey Buzzard, Wild Pigeon, Turkey, Pinnated and Ruffed Grouse are much less common than formerly throughout the State. To these might be added several other species which are rarely seen in localities where they were once common. In the vicinity of Columbus the Marsh and other Hawks (except the Sparrow Hawk) the Owls, Herons, and in fact nearly all the larger birds, have greatly diminished in number. Even the Pewee is much less numerous

than formerly, probably for the reason that modern improvements have taken the place of his favorite breeding places. Very few water-fowl remain during the summer, compared with the number which formerly bred with us. As intimated, this is, no doubt, due more to the changes in the face of the country than to the fear of man or direct destruction by him.

On the other hand, many birds have increased in numbers, and some have made their first appearance in the State within the last thirty years. Prominent among these are the Rough-winged Swallow, Loggerhead Shrike, Lincoln's and the Lark Finch, Bobolink, Cow-bird, Black-throated Bunting, King-bird, Quail and Woodcock. It will be noticed that all the birds of these two groups are resident or summer resident, none of the birds which do not, or have not, bred with us being especially affected. I may further call attention to the fact that nearly if not all of the birds of the first group nest on trees or in secluded forests, while those which are increasing in number nest upon the ground or on low trees and bushes in open land.

To recapitulate, we find that the food of birds is very largely of two kinds, insects and seeds, but that comparatively few birds are confined to either of these kinds, and we also find that the food habits of many species varies in such a manner that they are insectivorous in spring and summer, and granivorous in fall and winter.

The food of birds is so abundant that the vast number of insects and seeds does not appear to be materially lessened during the times when birds are present in greatest numbers. So that if they confined themselves only to such as are injurious, their influence in reducing the number of these is less than that of innumerable other causes usually overlooked.

And finally, by the changes brought about through the agency of man, a relation is shown to exist between birds and vegetation which appears to be self-regulating and favorable to agriculture.

SEPTEMBER 1, 1875.

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