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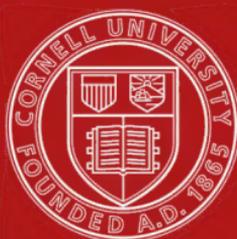


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LOUIS BENNETT BISHOP

LIFE-HISTORIES
OF
Birds of Eastern Pennsylvania,
VOL. I.

LIFE-HISTORIES

OF THE

BIRDS OF EASTERN PENNSYLVANIA,

BY

THOMAS G. GENTRY,

MEMBER OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, AND OF
THE CANADIAN ENTOMOLOGICAL SOCIETY OF TORONTO.

IN TWO VOLUMES. VOL. I.

PHILADELPHIA :

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H. SMITH, PRINTER,
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TO MY WIFE,

THIS VOLUME

Is most Affectionately Inscribed,

BY HER HUSBAND,

THE AUTHOR.

Close by the busy haunts of man,
Within the shelt'ring leaves
Of some tall pear-tree, low down
Where thorny branchlets meet,
The King-bird builds her cosy nest;
Without, of sticks and grasses coarse
And blossomed weeds of divers kinds
Variously intermingled,
And in the neatest style arranged;
Within, of feathers soft, and down,
The cast-off plumes of distant kin.
Here she rears her tender offspring
And teaches them the mysteries
Of bird-life. Woe to the wretch
In feathered dress who dares invade
The realm wherein she sways the rod
And sceptre!

GENTRY.

PREFACE.

Since so much has been written upon the subject of American ornithology, it becomes the author to state succinctly the reasons which have prompted him to repeat observations on supposed well-known species. The lack of anything like satisfactory information upon the food and breeding habits of many of the birds of Eastern Pennsylvania, as well as the desire to reconcile if possible, the contradictory statements of many authors, abundantly justify in his opinion, additional investigation. It is also well to record these habits again, because of the value of testimony to uniformity or change of habits in birds, to questions of metaphysics. The value of exact knowledge of food to the development of the law of natural selection, as well as to agriculturists, is sufficiently obvious.

The facts contained in this work are the results of observations carried through a period of six years, and have been derived from observations in the field, and careful and elaborate examinations in the studio. Upwards of five hundred

in awakening new life and vigor in this much slighted department of ornithology. The second volume of this work will in all probability be ready for the press during the coming summer.

THOS. G. GENTRY.

February 28th, 1876.

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ERRATA.

- For *examples* read *cramples*, line 5, page 30.
knoweledge read *knowlledge*, line 2 from bottom, page 30.
occasionally read *occasionally*, line 2, page 31.
subsistance read *subsistence*, line 6, page 56.
diverse read *divers*; line 8 from bottom, page 72.
acilities read *facilities*, last line, page 92; *inth* read *inch*, line 18, page 99.
unmistakeable read *unmistakable*, line 13, page 100.
approximating read *approximating*, line 4, page 136.
noticable read *noticeable*, line 6, page 142; *form* read *from*, line 25, page 150
sotthern read *southern*, line 16 page, 167.
trussock read *tussock*, line 20, page 171.
requisite read *requisite*, line 11, page 193.
worought read *wrought*, line 15, page 200; *tuely* read *truly*, line 21, page 209
hessitate read *hesitate*, line 23, page 200.
metorological read *meteorological*, line 22, page 202, and line 14, page 257.
mosquitos read *mosquitoes*, line 29, page 202.
pendant read *pendent*, line 17, page 213; *insect* read *insect*, line 13, page 221
forgeone read *foregone*, line 13, page 236.
retireing read *retiring*, line 5, page 251.
Philadeiphia read *Philadelphia*, line 11, page 251.
Nulata read *Nulato*, pages 255 and 298; *pupa* read *pupa*, pages 255 and 333
Artic read *Arctic*, page 270, *Allan* read *Allan*, pages 278 and 334.
whiteish read *whitish*, line 16, page 308; *asy* read *ashy*, line 4, page 341.
Omit *Mr.* line 8, page 386.

LIFE-HISTORIES
OF
BIRDS
OF EASTERN PENNSYLVANIA.

CHAPTER I.

Subclass I. Aves Aëreæ, or Insessores.
Aërial Birds, or Perchers.

OF the three primary divisions constituting the class *Aves*, the above ranks as first in importance and highest in position, and embraces all existing species down to the *Gallinæ* or gallinaceous birds. Without entering into a full definition of its external characters, suffice it to say, that with rare exceptions, the toes occupy the same plane and touch the same support throughout, thus adapting them for grasping or perching. The members of this extensive group are now usually placed in *five* orders of which the first is the

Order Passeres. Perchers proper.

The low insertion of the hind toe and its length; its great power of opposability to the front toes, and the superior mobility of the same which is secured by the separation of its principal muscle, from that that flexes the other toes collectively, perfectly adapt the feet for *grasping*. The hind toe is ever present and never directed anteriorly or laterally. The feet are never zygodactyle, syn-

dactyle, nor semipalmate, although the anterior toes for a part or the entire length of the basal joints, are ordinarily immovably joined to each other. For further ordinal characters our readers should examine some standard work upon classification.

The species belonging to the above order are the typical *Insesores*, and represent the highest grade of developmental structure, as well as the most complex, of the class. They possess high physical irritability, the result of a rapid respiration and circulation; of all birds they consume the most oxygen and live the fastest.

The *Passeres* constituting the *Insesores* proper of most ornithologists, comprehending the great majority of birds, are separable into two groups ordinarily designated suborders, from the structure of the inferior larynx; in one, this organ is a complicated muscular vocal apparatus; while in the other, it is less developed, rudimentary or lacking.

Suborder **Oscines.** *Singing Birds.*

The above constitutes the higher of the two suborders previously referred to; comprising species which possess a more or less complicated vocal apparatus, consisting of five sets of muscles; but many of them are unable to sing. Ornithologists are not agreed which of the numerous Oscine families, should occupy the head of the series; but Dr. Coues inclines to the belief that some member of the oscine family with the possession of nine primaries—as the finches or tanagers—will eventu-

ally assume the leading position. Here we will follow usage.

Family Turdidæ. Thrushes.

The nostrils are nearly or quite oval, but uncovered by feathers. In all our genera, there exist bristles about the rictus and base of superior mandible. The toes are deeply cleft; the inner one nearly to its base, and the outer to the extremity of its basal joint. There are twelve caudal feathers, ten primaries, of which the first is considerably abbreviated or spurious, and the second shorter than the fourth. The two subfamilies of our fauna are rigidly defined by the character of the tarsus.

Subfamily Turdinæ. Typical Thrushes.

The Typical Thrushes are easily distinguished in the adult condition by the continuous plate, formed by fusion of all the scutella, except some two or three just above the toes which envelop the tarsus. Upwards of one hundred and fifty species are ordinarily assigned to this subfamily, principally referable to the genus *Turdus* with its subgenera. They are nearly cosmopolitan, and attain a considerable development in subtropical America where the subfamily is represented by forms intimately related to the *Turdus* proper. More aberrant types of different genera are found in the old world. In the United States we have but one genus, to which the Robin belongs, and which embraces several common and familiar species. They

are migratory and generally diffused over the woodland regions of our country; insectivorous, but like many other insect-feeding birds, feed considerably upon berries and such like. Although not strictly gregarious, some, the robin for example, collect in troops during feeding, or migrate in companies. They are all vocal, and some exquisitely melodious, as the wood-thrush.

Turdus migratorius. Linn.

Scarcely any of our ordinary species is so abundant in Eastern Pennsylvania as the Robin, which is the subject of the present sketch. Within a circle of country scarcely exceeding one half-mile in diameter, sixty families have been frequently observed. In one particular instance, at least six occupied nests were noticed upon an acre of ground; besides a few of the cat bird, wood-thrush, song and tree sparrows, making fifteen in all. In the month of February small flocks of a dozen and even more have been observed on open grounds, flying from tree to tree, doubtless the scenes of past associations. In the small valleys among the hills of the romantic Wissahickon, where the piercing winds and drifting snows of winter do scarcely visit, many of these birds discover comfortable shelter. We venture this opinion for the following reason: On certain warm days in February, which remind us of the genial days of April, small flocks have often been seen by the author in such situations. These could hardly have migrated from

more southern latitudes, for the obvious reason that the three or four days preceding their observance indicated a low degree of temperature; but on the supposition that they were birds which had been left behind in the autumn, when their brethren had taken up their southward-bound journey for pleasanter climes, their occurrence need not excite comment or surprise. According to Dr. Brewer many of this species are permanent residents in various parts of the country.

Nidification commences occasionally during the middle of March, often when there is snow upon the ground, and days before the trees have donned their foliage. Ordinarily, building operations are entered into with considerable vigor about the first of April; and by the tenth of the month everything is in readiness for oviposition. A pair of birds will usually construct a nest in from three to seven days, if working under the most favorable auspices. Two or three days elapse however before oviposition commences; the birds meanwhile being engaged in various manœuvres as if felicitating each other on the successful accomplishment of their task. Ordinarily the nest is placed upon the stout limb of an apple-tree. In the selection of a site some birds manifest little judgment so to speak. Before us is a nest which was found in Northumberland County, Pennsylvania, built in the hole of an upright post. In contour it is nearly elliptical.

Last spring, our attention was directed to a

nest which had been built upon a mass of tangled grasses and roots that had accidentally lodged within the angle formed by two branches of a grape-vine. Again, as if to show their confidence in man, a pair had selected for the site of a nest, a small vine which had been trained against the side of a door which commanded the entrance to an occupied dwelling. Still more anomalous situations have fallen under our observation. A nest was discovered upon the ledge of a window of an occupied dwelling, which was carefully sheltered from the weather by projecting eaves of considerable depth; and, lastly, another was found upon the horizontal timber which supports the rafters of an outhouse; a situation that afforded the necessary shelter and concealment.

The typical nest is composed of a base of straw, leaves, grasses, mosses, roots, etc., upon which a cup-shaped fabric of clay or mud is built; the interior is lined with fine roots and grasses.

In the last two nests referred to, the cup-shaped fabric is an unnoticeable feature. The bottoms are provided with a moderately thick layer of mud, so that they might rigidly adhere to the smoothed surfaces upon which they reposed. A similar layer of clay has been frequently noticed in the nests of the Wood Robin, the *Turdus mustelinus* of Gmelin. That compactness of structure which is so eminently characteristic of the normal form was lacking. This is readily accounted for. In unexposed situations there seems to be no necessity for that

binding of materials together, which open places would seem to require; consequently, the mud or clay which ordinarily constitutes the rim of a typical nest and serves to join the inner and outer fabrics more intimately together, is entirely dispensed with. By an intelligent selection of locality the birds have saved considerable time and labor, and also have constructed their nest none the less tastefully and symmetrically.

Many nests of the Robin frequently betray unmistakable resemblances to those of a closely allied species, the *mustelinus* of Gmelin. These latter are undoubtedly the unskilled labor of young birds and adults that have never risen to eminence in the art of nest-building. Many of these nests might be taken as fair samples of the workmanship of the Wood Thrush. In this interpretation of facts, we should expect to meet with some evidence that *migratorius* is a higher type of *avis* than *mustelinus*. It is well known that the young of the former, or the Robin, has the breast spotted precisely like the latter, or Wood Thrush in its adult plumage; but this condition of plumage is of short duration and gradually merges into the uniform tints of the mature bird.

With this light upon the subject, we are prepared to understand why resemblances should obtain between certain nests of the Robin and the typical ones of the Wood Thrush. Among birds, as among the human species, there exist individuals of lazy and careless habits; and others, dull

and stupid in nature. Granting the existence of such classes, for the sake of argument, may we not assume with some show of reason that those structures which deviate materially from the typical form, are the workmanship of unskilled mechanics.

Oviposition commences on the third day subsequent to the completion of the nest. But a single egg is deposited daily. Whilst the female is engaged in incubation, which shortly ensues, the male is extremely devoted and attentive. He stations himself upon an adjoining tree or bush, when not engaged in supplying her physical wants, in full view of the nest. Ever on the alert he permits no intrusion within the territory over which he has chosen to exercise jurisdiction. When his dominions are encroached upon by any of his feathered brethren, with almost deafening clamor he repels the intruder. On the approach of human footsteps he instantly sounds the alarm, beats around the head of the supposed enemy with his pinions, taking due care to keep at a safe distance, and with loud and rapid cries of mingled complaint and fear, endeavors to cause him to desist from any contemplated annoyance.

This watchfulness is mainly relaxed when the nest is placed beyond the reach of danger. Whilst writing (May 12th), a nest very snugly reposes upon the window-ledge of a neighboring dwelling. But three days were spent in its construction. Subsequent to receiving its plaster of

mud on the inside, which in this case was much less than what more exposed nests require, the female was observed to resort frequently to a pool of water and after having saturated her plumage, to repair to the unfinished nest, and by a series of bodily evolutions which she practised, impart thereto a smoothness and symmetry of outline. At the time of writing the female is engaged in sitting. Her partner seldom visits the nest, and is rarely to be discerned in the immediate vicinity. The female is compelled to provide her own sustenance which she regularly does every morning. Actuated by a true motherly instinct, she barely allows time to satisfy the cravings of appetite before resuming her labor.

The period required for the hatching of the young ranges from 13 to 14 days. The usual complement of eggs is four. We have frequently discovered nests with three eggs, and occasionally others with five. The full number is ordinarily hatched where the female is not interfered with. The eggs are of a uniform greenish-blue color, liable to fade on exposure to light, but when fresh exhibit a bright and distinct tint. They vary in size, but the average measurement is 1.18 by .81 inches.

Both parents are very attentive to their helpless charges, and alternate usually in fetching food to satisfy their rapacious appetites. During the temporary absence of the parents on such missions which occasionally occurs, the young are

objects of special regard by the Purple Grackle, which visits the nest and carries off the tender fledglings as articles of diet. The parents provide for their physical wants during a period of 18 days, when they are driven from the nest to earn their own livelihood.

The following insects constitute an important part of the food of the young: Earth worm (*Lumbricus terrestris*), ground beetle (*Lachnosterna quercina*), measuring worms (*Geometra catenaria* of Harris, *Anisopteryx vernata*, *Eufitchia ribearia*), *Dryocampa rubicunda*, rose slug (*Selandria rosæ*), sulphur butterfly (*Colias philodice*), cabbage butterfly (*Pieris oleracæ*), in their larval condition; besides various dipterous insects as the house fly (*Musca domestica*), white-lined horse fly (*Tabanus lineola*), stable fly (*Stomoxys calcitrans*), mosquito (*Culex tæniorhynchus*), and others. Add to these the fruits of the several varieties of cherry (*Prunus cerasus*), the strawberry (*Fragaria virginiana*), and the various species of *Rubus* or blackberry, and you have a bill of fare not to be despised. As the young increase in size and strength other articles are added to their diet.

Of all species the Robin is pre-eminently insectivorous. It is true that it will feed upon seeds and berries when insect-food cannot be obtained. Besides the berries mentioned above we have found it feeding upon *Rubus villosus* and *Rubus canadensis* among blackberries; the wild choke-cherry (*Prunus serotina*), the cedar (*Juniperus*

virginiana), its near cousin the common juniper (*J. communis*), and the sweet gum (*Liquidambar styraciflua*). In early spring various species of beetles constitute its principal food. An examination of the stomachs of several birds, revealed traces of the following coleoptera which mostly dwell underneath stones, logs and the bark of trees. For want of common names we are compelled to place before our readers their scientific appellations; reserving for a future work, plain and simple descriptions of the configuration and markings by which the uneducated in science may be able to identify them. The most common forms are *Dicælus dilatatus*, *Harpalus pensylvanicus*, *H. compar*, *Pangus caliginosus*, *Scarites subterraneas*, *Casnonia pensylvanica*, *Platynus cupripennis*; larvæ and imagos of *Lachnosterna quercina*, *Cratonychus cinereus* among beetles; *Musca domestica*, *Tabanus lineola*, *Stomoxys calcitrans*, *Culex tæniorhynchus*, whose common names have been given above, crane fly (*Tipula ferruginea*), *Syrphus obliquus* and *Scatophago furcata* among diptera; *Formica sanguinea* among hymenoptera; *Ædipoda nebulosa*, *Æ. sulphurea*, *Caloptena femurrubrum* among grasshoppers, and the black cricket (*Acheta nigra*; larvæ of *Anisopteryx vernata*, *Eufitchia ribearia*, *Geometra catenaria* of Harris, corn worm (*Gortyna zœæ*), *Pieris oleraceæ*, *P. rapæ*, *Colias philodice*, *Spilosoma virginica*, apple borer (*Penthina pomonella*), and *Harrisina Americana*; besides the earth worm (*Lumbricus terrestris*).

The flight of the Robin is low, heavy, firm and tolerably well sustained. Its movements upon the ground like most of the *Turdidæ* or Thrushes, is a slight jump rather than a hop, both feet being elevated and depressed at the same instant.

Its song varies somewhat in different individuals. It is pronounced in a clear, distinct manner and with a pleasing intonation; and consists of the repetition of two short syllables pitched in the same musical key, and succeeded by others more melodious and pleasing which are uttered with a gradually rising modulation. Occasionally these last syllables are altered, thus producing a marked variety and charming effect. The following language is a tolerably accurate expression in syllables of the notes of an individual which passes for a capital singer:—*t-wūh-t-wūh-tēō-cē, t-wūh-t-wūh-tē-oui*; this last syllable has the sound of the French word *oui* meaning yes, moderately prolonged. Whilst feeding in low damp meadows, and even in cultivated fields, its notes vary and sound much like the syllables *tē-t'wūh tē-t'wūh-tēcē*, the last syllables being uttered very sharply, and considerably prolonged. The ordinary call-note is a sharp *twī* produced at irregular intervals. Surprise is expressed by the syllables *twī-tī-kī-kī-kī-kī* pronounced very quickly and with a rising intonation. Its song is chiefly heard in the morning and in the evening, but seldom during the heat of the day. It is heard more particularly during the mating season.

In closing this brief but necessarily imperfect sketch, an incident which was related to us by a thoroughly reliable friend is deserving of notice. Having taken a pair of young Robins from their nest, he confined them in a cage and placed the latter upon a tree at a short distance from his residence, supposing that the old birds would supply their wants. For a brief period they were carefully fed by the latter, but after repeated unsuccessful efforts to free them from incarceration, early one morning the parents were seen to visit the cage and administer what appeared to be large green caterpillars of irritating properties. In a short time both birds which up to this period were full of life and energy, became lifeless bodies. A similar statement in connection with the history of the Mocking Bird has been reported to us by reliable parties who have been eye-witnesses. But the above is the only instance of a not dissimilar action upon the part of the Robin.

Turdus mustelinus, Gmelin.

Unlike its near cousin whose history has been briefly delineated, the Wood Robin as the above species is fitly designated, is a rather late visitant. At least, it has never been observed by us until Spring has thoroughly re-asserted her supremacy. It ordinarily visits the latitude of Philadelphia, during the last week of April or the beginning of May; often as late as the eleventh day of the latter month. Its presence is announced by the

agreeable gushing tinkling notes which greet the ear from the tallest tree tops, long before the sun has arisen in the East. The same delicious strains are re-assumed a little before sunset, and prolonged for more than an hour with scarce an intermission. It is the males who are thus occupied, doubtless, with the view of attracting their partners who have not yet arrived from their Southern homes; for it must be born in mind that the former precede the latter by several days. This song continues in all its vigor until mating is accomplished, when it measurably diminishes.

Writers on ornithology have spoken of this Thrush as being of a shy and retired nature. In the latest work on North American birds, instances are cited where the species has displayed considerable confidence in man by building in close proximity to his habitation. For several years past we have noticed greater predilection for the busy haunts of life, that for more sequestered situations. As time progresses, the species will become more eminently social and trustful. The current of events is tending in this direction. In thickly-wooded regions there is still a prevalence of this same feeling.

Besides the haunts of man, dense forests, the outskirts of thickets, and borders of waste fields are noted places of resort. We have never known individuals to nidificate "in low damp forests, shaded by large trees," as affirmed by the writers previously alluded to.

The flight of the Wood Robin is but slightly elevated, and less sustained than that of the common Robin; but decidedly more graceful. Unlike the latter much of its time is spent upon the ground in foraging for food. Later in the season when caterpillars and berries are abundant, it is less terrestrial and more arboreal.

Like the Robin it frequently visits our orchards while in bloom, not more for the insects that lurk in the blossoms of the cherry and apple, than for the tender stamens and immature ovaries themselves. Besides the fruits of the above plants which it esteems a great luxury, it possesses a decided relish for those of the cultivated varieties of *Fragaria* and the wild *Rubus*. The berries of the Red Cedar and Common Juniper are also devoured with a *gusto*, together with the seeds of many of our commonest weeds and grasses. The accompanying list embraces a few of the many insects which it aids its fellow-creatures in holding in check. Among beetles may be enumerated *Harpalus pensylvanicus*, *H. compar*, *Pangus caliginosus*, *Cratonychus cinereus*, *Casnonia pensylvanica*, *Scarites subterraneus*, *Platynus cupripennis*, *Lachnosterna quercina*, *Thaneroclerus sanguineus*, *Ptinus humeralis*; among orthoptera, the young of *Ædipoda sulphurea*, *Ænebulosa*, *Caloptenus femurrubrum*; among the diptera or two-winged flies, *Musca domestica*, *Tabanus lineola*, *T. cinctus*, *Syrphus obliquus*, *Stomoxys calcitrans*, *Culex tæniorhynchus*; among lepidoptera which em-

braces butterflies and moths, the larvæ of *Anisopteryx vernata*, *Eufitchia ribeària*, *Gortyna zea*, *Colias philodice*, *Pieris rapa*, *P. brassicæ*, with the imagos of the same, besides earth-worms and ant.

The nest is generally built according to our experience, upon the horizontal branch, and occasionally within the crotch of some species of *Pinus*, at an elevation of less than two feet above the ground. We have taken nests at an elevation of fifteen feet above the soil; but rarely.

A normal structure is described as being chiefly composed of decayed deciduous leaves closely aggregated, as if combined while in a humid condition; the entire fabric assuming considerable firmness and compactness. It then presents the appearance of paste board that has been soaked and compressed until thoroughly dried. These are intermingled and strengthened by a few dried sticks, and lined with a layer of fine roots and grasses. In lieu of the dried impacted leaves, a deposit of mud is occasionally used.

After careful analyses of several nests, we are satisfied that the above description which is substantially that of Dr. Brewer's as given in "North American Birds," needs some modification. But in the language of one of our best ornithologists, "the horizon of one man is at the best very limited, and many ornithological facts occur that are not dreamed of in his philosophy."

Our dissections of many nests clearly show

that the typical nest is constituted of a basis of leaves, chiefly of *Quercus* and *Fagus*, loosely arranged in the bottom, and gradually increasing in compactness from below upward; strengthened and secured in a partially hemispherical attitude by the aid of small twigs. This is surmounted by a superstructure which consists of a heterogeneous mass of plant-stems in an advanced state of decomposition, decayed fragments of wood resembling pine, a *modicum* of mud closely impacted, instead of decayed deciduous leaves according to the authority of the above eminent ornithologist; over all is a layer of roots intricately arranged. No further amendment seems necessary.

The environment of this Thrush like that of the Robin, occasionally determines a marked deviation from the normal structure. In a nest which we have before us, which was built upon the horizontal branch of a species of *Pinus*, along a carriage drive which was daily the scene of much bustle and clatter, there is lacking the internal parchment-like layers. Externally there is a layer of the dried leaves of *Quercus* and *Fagus*, the inner bark of trees, and largely of the blades of grasses possibly of *Dactylus glomerata* or Orchard-grass; occasionally, scraps of paper form a noticeable feature. Interiorly there is a thick lining of small roots and grasses. Five or six days of steady application by both sexes, are ample for the construction of a nest.

The period of incubation commences not earlier

than the 12th of May and continues about thirteen days. Its duties devolve exclusively upon the female; the male like a devoted husband meanwhile attends with marked assiduity to her necessities. Both parents assist by turns in supplying the young with food.

Earthworms, the larvæ of *Cratonychus cinereus*, *Lachnosterna quercina*, *Anisopteryx vernata*, *Eufitchia ribearia*, *Clisiocampa Americana* or Tent-caterpillar, *Colias philodice*, *Pieris rapæ*, *Musca domestica*, *Tabanus lineola*, *Tabanus cinctus* or Banded-horse-fly, *Scatophago furcata*, *Stomoxys calcitrans*, *Culex teniorhynchus*, and other dipterous forms; small moths and beetles when such food is adapted to their age and condition, besides the berries of *Prunus cerasus*, *P. serotina*, *Fragaria Virginiana*, and the various species of *Rubus*.

The parent-birds manifest considerable solicitude for their progeny. When the nest is assailed both birds labor vigorously by their clamor and threatening attitudes to excite fear into the assailant. The young are carefully nourished by their parents which vie with each other in rendering every needful attention.

But a single brood is reared in a season. Nests with eggs have been taken by us as late as the 15th of July; but these were doubtless the labor of birds whose early efforts had been frustrated. Their departure for Central America, the home of their winter diversions, is apparently regulated by the abundance or scarcity of food-stuffs. We

have known them to remain with us as late as the first of November, when the season has been unusually propitious. The same agreeable strains are heard in the morning and evening twilight during their autumnal stay, as marked their vernal advent.

The song of this Thrush is one of its most pleasing characteristics. No lover of music can fail to appreciate it; and having ascertained its source, no one can fail to recognize it when heard again. The melody is one of great sweetness and power, and consists of several parts. The conclusion resembles the tinkling of a small bell, though ending somewhat abruptly. Each succeeding strain seems more pleasing than what went before. The following language will convey to the minds of our readers, a tolerably clear idea of its syllabic expression:—*ki-ki-ke-wil-āh-tēē, ke-wil-āh-tīīī, twitiki-ke-wil-āh-twīīī, ke-wil-āh-tēē, ke-wil-āh-tīīī, tur-kwillāh*. The ordinary call-note is *twīīī-kū-kū* pronounced very quickly and with a sharp intonation.

The eggs of the Wood Thrush are usually four in number. We have never observed five in a nest, but have occasionally met with three. They are of a uniform deep blue color, with enough of yellow to impart a greenish tint. The average measurement is .99 by .75 of an inch.

Turdus Pallasii, **Cabanis.**

The "Ground Swamp Robin" or Hermit Thrush

as the above species is commonly designated, is a common visitant in the latitude of Philadelphia. At the time of writing, April, 1875, it is unusually abundant. It migrates in small straggling parties ordinarily, but on the occasion referred to above, solitary male individuals were alone discerned.

This Thrush delights in open fields and the borders of dense forests. In these situations it frequents young trees of *Abies canadensis* principally, among the nethermost branches of which it reposes when not engaged in foraging among the underlying leaves for the insects and seeds which constitute its diet. In one instance we captured a specimen close to our habitation.

Though generally a frequenter of retired localities, it cannot be accused of shyness and timidity. Nothing is more remote from its nature. It has proved itself to be the most confiding and unsuspecting little creature with which we are acquainted, except *Ægiothus linaria*. When closely pursued, it is the same quiet confiding creature, as when gleaning among the fallen leaves. To test its disposition in this particular, the writer stationed himself at the termination of a clump of small trees, where a single bird was feeding, and requested a friend to place himself in its rear and to proceed directly towards the spot where he was standing. He did so, driving the bird before him. The latter advanced within a few feet of the writer, and perched upon a small twig with the utmost gravity. From this position it calmly sur-

veyed us without the slightest betrayal of fear or alarm. After a few moments thus spent, the writer stretched forth his hand, when with an air of the most startling unconcern, it hopped carelessly aside. Whilst in the pursuit of food, this Thrush does not utter a single note. Its lack of song during the intervals of feeding, is one of its most natural characteristics. In other species these intervals are marked by occasional articulations of short and apparently meaningless syllables. This feature of the Hermit Thrush, constitutes it an interesting exception to its exceedingly loquacious brethren of the subfamily *Turdinæ*.

Several years of experience have convinced us that this species can by no means be considered as rare in this latitude. Its sojourn with us seldom exceeds the limit of a week, when it repairs farther north to breed. On its return in the autumn it frequents secluded situations, but its stay is of short duration.

Its food consists of the seeds of grasses and various small beetles and diptera. The accompanying list gives a correct and tolerably complete idea of the coleopterous insects which constitute its diet during its temporary sojourn. This list is based upon careful examinations of many stomachs:—*Dicælus dilatatus*, *Platynus cupripennis*, *Scarites subterraneus*, *Cratonychus cinereus*, *C. pertinax*, *Harpalus pensylvanicus*, *H. compar*, *Rhynchæus pini* or Pine-weevil, *Saperda bivittata* or Apple-tree-borer, and *Corymbites Æthiops*. Various species of

ants with the common earthworm are also devoured with avidity.

The flight of this species is low, resembling that of *Turdus mustelinus*, but slightly less sustained. Its ground-movements are accomplished by short hops or jumps properly speaking, and do not differ in this respect from those so eminently characteristic of the Thrushes.

As its habits of feeding are pre-eminently terrestrial, and generally in secluded places underneath coniferous trees, one little acquainted with its nidification might reasonably look for its nest in similar situations. In fact it is precisely in such places that it breeds according to the testimony of able writers. It may be true as a rule, though subject to some exceptions however, that the nidifying habits of a species, whether terrestrial or arboreal in character, bear a definite relation to its habits of feeding. Ground-feeders mainly construct their nests upon the soil, or among the branches of low shrubbery. On the contrary, those that seek their food among the branches of trees, or within the crevices of bark, are usually tree-builders.

This Thrush does not nidificate in our latitude. According to Dr. Brewer its nest is "built on the ground, most generally either under the low bushes, or in the open ground, rarely, if ever among thick trees, and for the most part in low swampy places." It is said to resemble the nest of *Turdus fuscescens*, and is "composed of decayed

deciduous leaves, remnants of dried plants, sedges and grasses intermingled with twigs, and lined with finer grasses, sedges and strips of bark. The nests are 3 inches in height and 5 inches in diameter, with a cavity $3\frac{1}{4}$ inches wide by $1\frac{3}{4}$ deep."

The young birds are readily domesticated and become quite cheerful and playful; but are so uncleanly in their habits as to make not very desirable favorites.

When the nest is visited, these Thrushes silently retire to a short distance; but when it is assailed by the hawk, both birds unite to drive away the intruder, uttering all the while "loud and clear chirps and peculiarly twittering sounds."

The eggs vary in length and measure on the average .82 with a width of .62 of an inch, and are of a uniform bluish-green hue.

Turdus fuscescens, **Stephens.**

The Tawny or Wilson's Thrush as this species is popularly designated, revisits us not earlier than the middle of May. Being of a retired disposition and chiefly a frequenter of copses and open fields, its presence is not ordinarily observed in situations which its congeners love to visit.

Its flight is moderately elevated and tolerably well-sustained. Its habits whilst feeding are both terrestrial and arboreal. In this respect it differs materially from *Pallasii* and approximates *mustelinus*.

Its diet is both vegetal and animal. The seeds of grasses and the berries of the red-cedar, common-juniper, *Rubus villosus*, *Prunus serotina*, *Fragaria Virginiana*, and *Viburnum Lentago* constitute the former; while the latter includes such insects as *Harpalus compar*, *H. pensylvanicus*, *Pangus caliginosus*, *Cratonychus cinereus*, *C. pertinax*, *Platynus cupripennis*, *Rhynchœus pini*, *Formica sanguinea* and *F. subterranea*.

The song of this Thrush is quaint but not unmusical; variable in character, changing from a monotonous whistle to quick and shrill notes at the conclusion. It consists of an indescribably delicate metallic articulation of the syllables *ta-weel'-ah*, *ta-weel'-ah*, *twil'-ah*, *twil'-ah* followed by a fine trill which renders it truly enchanting. The above syllables expressive of the language of its melody, which are those of Mr. Ridgway, are tolerably correct representations in our judgment.

Its nest is commonly built during the early part of June in a clump of grasses, so carefully hidden as to escape observation. Indeed, there would be little possibility of discovery, did the female exercise the slightest degree of precaution. Instead of maintaining silence on the approach of danger, her over-solicitude betrays her, and thus reveals the tale. So rare is this species of *Turdus* that we have never discovered more than a half dozen nests in three square-miles of territory.

In compactness and also in the variety of materials which are utilized, considerable variation

is observable in nests. Most nests are rather compactly built. A heterogeneous medley of fine and coarse grasses, skeletonized leaves, fragments of corn leaves and husks, are conspicuous exteriorly; while interiorly, there is a thick lining of slender dichotomously-divided branches of *Panicum capillare*. The dimensions vary but slightly from what has been recorded by others.

A single specimen which we have by us, in details of structure and elements of composition, bear a close resemblance to a published description of the *Turdus Pallasii* of Cabanis. This nest is loosely constructed. The situation in which it was found, *to wit*, a tussock of grasses would seem to render a more durable fabric unnecessary. Exteriorly it is composed of the leaves and culms of coarse grasses, fragments of corn husks and leaves of the same, dried leaves of *Quercus*, *Fagus* and *Castanea* in abundance, inner bark of various trees, besides a species of moss probably *Sphagnum squarrosum*. The interior is constituted of fine leaves, slender stems of *Panicum*, and a superabundance of slender dark rootlets of *Aristolochia serpentaria* or Virginia-snakeroot. *In situ*, the dimensions of the fabric vary a trifle from the typical form.

The period of incubation of this species, owing to its various and secluded habits, we have not been able to determine.

The eggs, usually four in number, seldom more, are of a uniform green color, slightly tinged with

blue, and measure on the average .93 by .65 of an inch in diameter.

We are convinced that its autumnal migration is much earlier than its near relatives. It has been missed by the latter part of August. In the summer of 1873, during the first week of September, small flocks were seen along the eastern shore of Delaware Bay, feeding upon the seeds of *Paspalum setaceum*, which grows luxuriantly in sandy soils. On the succeeding morning, no traces of them were to be seen. It was observed on this occasion that the birds were exceedingly unsuspecting, and would permit a near approach without the least manifestation of fear or alarm.

Subfamily Miminæ. Mocking Thrushes.

The Mocking Thrushes as a group are chiefly southern, scarcely passing beyond the borders of the United States. They attain their maximum development in Central and South America. The *Miminæ* are properly restricted to the American representatives of the genera *Mimus*, *Harporhynchus*, and several closely allied forms. More than forty species are recorded, about two-thirds of them being genuine. The genus *Mimus* embraces nearly one-half of the current species, while *Harporhynchus* is represented, within our limits, by all known species, with a single exception. In general habits they resemble the true Thrushes.

Mimus polyglottus, Boie.

The Mocking Bird by which our readers most

generally recognize this species, has been rare in Eastern Pennsylvania, of late years. Formerly, it was more abundant. In some obscure and unfrequented nook, we have occasionally observed a mated pair. Such retirement as is met with in the small valleys which nestle among the Wissahickon hills, is its chief delight. Unlike its former self, it now shuns rather than courts the society of man. A friend of considerable experience informs us, that twenty years ago it was exceedingly common in Germantown, before the arts and appliances of a spreading civilization had usurped the wild retreats of nature. Then it would occasionally charm us with its choicest songs, and favor us with its presence by building within our orchards.

It certainly is a late comer; its presence being unobserved before the beginning of May. On its arrival it seeks a partner and commences nidification. But a single brood is reared in a season. In details of structure and in nest-materials, a marked resemblance to the Cat Bird, the *Mimus carolinensis* of Gray, is distinctly noticeable.

Both parent-birds are strongly attached to each other, and extremely sedulous in their attentions to their young. During incubation and subsequently, they display great pertinacity and courage when assailed by enemies. Diptera, mosquitoes, butterflies, larvæ of non-irritating properties, earthworms, and berries of divers kinds, constitute their dietary. The period of incubation

differs but little if any from that of the common Cat Bird.

The vocal powers of the Mocking Bird surpass in their imitative notes and natural melody, those of any other species. Its song is full, firm and musical, and capable of considerable variation in its modulation. The scream of the Eagle, and the soft delicate notes of the Blue Bird, are imitated with great precision, and with equal facility. Notwithstanding its remarkable powers of imitation, it possesses a natural song which for sweetness, force, and volume, cannot be excelled.

The eggs are mostly four in number, but occasionally five. They vary in length from .94 to 1.06 of an inch, and in breadth from .81 to .96 of an inch. Considerable variations are exhibited in the combinations of markings and tints. The ground color is ordinarily a light greenish-blue, varying from a light to a decided blue, with a somewhat greenish tint. The markings consist of purple, chocolate brown, russet and a decided dark brown.

Mimus Carolinensis, Gray.

This widely detested and much persecuted species, the Cat Bird, makes its annual visit from the genial climate of Central America, in small flocks during the latter part of April; but more generally in the beginning of May. For some time after its arrival, it seeks sequestered situations, spending much of its time upon the ground

among underbrush. Seemingly it prefers concealment, if its actions afford any criteria. But later, when the buds begin to burst and the leaves to expand, it becomes less suspicious, and emerges from its obscurity and charms us by the sociability of its manners and the variety and loveliness of its melodies.

Its flight is low, moderately firm, slightly undulating, and but feebly sustained. Whilst feeding it is both arboreal and terrestrial, but chiefly the latter; never gleaning among the topmost boughs of tall trees, but among low bushes and trees of short stature.

During its temporary residence it subsists upon berries and insects. Among the former, the fruits of *Juniperus Virginiana*, *Rubus villosus*, *Vixburnum lentago*, and the seeds of grasses constitute an important part of its diet. The flowers of the apple and cherry are often visited for the insects which lurk in them; possibly, the authers and ovaries are as much a source of attraction. A careful examination of the stomachs of many individuals, reveals besides perfect specimens, recognizable fragments of the following insects:—*Pangus caliginosus*, *Harpalus pensylvanicus*, *H. compar*, *Platynus cupripennis*, *Plinus humeralis*, *Bostrichus pini*, *Formica sanguinea* *Lumbricus terrestris* and a species of *Tulis*. The above insects constitute its food early in the season; but as it advances, and the various dipterous and lepidopterous types of articulate existences come

into being, its bill of fare is augmented. Complete specimens of the diptera have been identified, of which *Tabanus lineola*, *T. cinctus*, *Musca domestica*, *Stomoxys calcitrans*, and species of *Ortalis* and *Anthomya*, are examples. Among lepidoptera, the larvæ of *Pieris rapæ*, *Eufitchia ribearia*, *Gortyna zecæ*, *Anisopteryx vernata*, and others of the *Phalænoidæ*, *Clisiocampa Americana*, and the smaller *Noctuids*, *Tortricids* and *Tineids*.

The Cat Bird's power of memory though circumscribed and imperfectly exercised, is nevertheless very amusing. The more complicated notes it seldom attempts to copy, for when it does, it signally fails. The note of the Quail, the refrain of the Towhee, the simple strain of the Pewee Fly Catcher, it imitates so faithfully that it is difficult to distinguish them from the original. Besides these, we have heard snatches of songs of the Field and White-throated Sparrows, as well as the surprise notes of the Robin.

Unlike the Long-tailed Thrush when it essays a song, the Cat Bird is not over-nice in its choice of position. It generally seeks low bushes and small trees, but will occasionally like the Blue Bird pour forth its choicest strains from the ground, a decayed log, or perched upon a fence-rail. It is one of the earliest and most persevering of our songsters, regaling us with its varied notes, except at brief intervals, during the livelong day. With its extensive store of notes and meagre knowledge of the rules of harmony, it but excites amusement

by its mirth-provoking arrangements. Its notes are often well selected; but it occasionally happens that its well-tuned unisons are unavoidably marred, it seems to us, by the introduction of some misplaced or ridiculous passage.

The following syllables express a tolerably accurate representation of a portion of the song of what might be deemed a capital singer:—*twür-twě-î-twîch-twîch-twě-î-twîîîî*, *t'wā-wēēt*, *kēē-t'kāre*, *kwēēr*, *t'wūh-chîck-tîîîî*, *pēē-dēē*, *chou*, *chē*, *msē*, *twîîî*, *chē-chē-chē*. When alarmed by an intruder, a harsh disagreeable sound which has been likened to the cry of a cat is heard; this note is also repeated on the approach of any object of fear or disgust. It may be somewhat accurately expressed by the syllable *mēyăh*.

When mating is over, much time is spent in selecting a locality for building purposes. The injudiciousness of the selection is not always foreseen, and a nest is often nearly completed before the mistake is discovered. In this predicament, instead of "making the best of a bad bargain," the birds totally ignore the site for another better suited to their taste.

Few species will tolerate for any considerable time the scrutiny of human beings whilst engaged in nest-building, but will rather suspend operations until the annoyance has disappeared. Not so with the Cat Bird; where accustomed to man, it will work fearlessly and resolutely under his very eyes.

Ordinarily nidification commences about the 18th of May. Both birds work diligently during the cooler hours of the morning and evening, until the nest is completed, which is the labor of five or six days. We have known cases where the birds have continued to labor until after dusk, but then on moonlit evenings.

We have frequently amused ourselves in watching for hours the building process. When a suitable article has been found, the bird does not fly immediately to the nest and adjust the piece, but indulges in short flights from one object to an adjoining one, carefully surveying the premises all the while, until within a few paces of the nest, when she rapidly flies thither, and having satisfactorily adjusted it, goes off in quest of other materials.

For building purposes a bush or small tree in close proximity to a stream of water is ordinarily selected. The common alder, spice wood, juniper, and wild *Rubus*, are most commonly chosen for the site of a nest. We have often observed nests upon bushes close by dwellings, and in places where travel was of common daily occurrence.

"The usual materials for nests are dried leaves for a base, slender strips of long dark bark, small twigs, herbaceous plants, fine roots, and fine stems. They are lined with fine dry grasses and sedges. The nests average 4 inches in height, by 5 inches in diameter. The diameter and depth of the cavity are $3\frac{1}{2}$ inches." The above description

has been borrowed from "Birds of North America" by Baird, Brewer and Ridgway.

In many nests which we have examined, there has been a heterogeneous commingling of various vegetable substances constituting an exterior. Leaves of *Quercus*, *Fagus*, and *Populus*, stems of *Chenopodium album*, coarse strips of the outer bark of the vine, inner bark of the poplar, husks of corn, composed the outer fabric. The strips of bark served to bind the other materials firmly together. A thick layer of rootlets constitute the inner structure.

Another nest which we have examined, in addition to the above materials, exhibited fragments of vines of *Convolvulus arvensis*, a species of Bindweed, and the Wild-bean, *Apios tuberosa*; liber of trees of dingy whiteness, three-fourths of an inch in width; and discolored pine shavings. Few leaves were noticeable in the exterior. Interiorly, there was a close lining of the roots and stems of herbaceous plants. In contour, the nest was very irregular, with the base obliquely inclined to the mouth. The structure bore a near resemblance to the nest of the Maryland Yellow Throat, save that it was somewhat shorter. From its marked deviation from the typical nest which is hemispherical, beautifully symmetrical and moderately compact, we presume it to be the workmanship of young birds or those of indolent habits.

The ground-structure of a nest in our possession,

is mainly composed of the culms of grasses, with a slight intersprinkling of leaves and rootlets. Within, there is an excess of the stems of grasses and a few rootlets. The entire fabric is carelessly arranged with little evidence of design. But for the strips of bark that cover the outside, the nest unsupported by the branches upon which it was built, would be shivered to pieces by the gentlest breeze.

The most beautiful fabric we have seen was constructed close to a human habitation. The outside of this cozy and beautiful structure is composed of wool, raw cotton, strings, fragments of lamp wick, a slight intermixture of tangled silk, fragments of lichen possibly *Cenomyce rangiferina*, held *in situ* by strands of silk. Upon this basis, is built a superstructure of fine rootlets, intermingled with patches of wool. For a lining internally, small dichotomously-divided branches of *Panicum capillare* and wool were used. This nest is the most unique specimen of architecture of the Cat Bird which we have ever seen. Nothing of the kind have we seen described in books. It was certainly the work of superior mechanics.

The foregoing fact with others of a similar character which we have noticed, conclusively shows that birds are not the dull routine-loving beings which we have often depicted them to be; such of us as have some pet theory to support. It is evident from a thousand circumstances, that they often reason *a-priori* from cause to con-

sequences, providently managing with a constant aim for future comfort, convenience and necessity.

Let us now recur to other facts of nidification. The nest being completed, which is ordinarily the case in five days, a short time intervenes prior to oviposition. But a single *ovum* is deposited daily. After the full complement of eggs is laid, the female immediately assumes the duties of incubation, which happen in the beginning of June, and continue for a period ranging from 12 to 13 days. The male bird seldom departs any considerable distance from his partner, except to provide himself and her with food; but we have never known him to relieve her during incubation. Should any being approach the nest, he assails the intruder with commendable boldness. Various species of serpents, particularly the black-snake, the *Bascanion constrictor* of naturalists, have a decided *penchant* for the eggs of the Cat Bird. On occasions of visits from these snakes, the birds heedless of their own safety, frequently fly into the very jaws of their enemy. In the case of a human foe, knowing that resistance would be futile, they seek to deter him from any supposed attack by the most discordant cries and frantic gestures.

The young are not very fastidious. Earthworms, spiders, diptera, caterpillars of non-irritating properties, together with such berries as the season affords, constitute their fare. In about 12 days after being hatched, the young leave the nest, and in 6 days more are ready to be initiated into the

mysteries of flight. The duties of preceptor necessarily devolve upon the male-parent. A single brood is reared in a season. The young are the objects of parental solicitude long after they are fitted to look after their own welfare. The autumnal stay of this species is of short duration. It generally retires to the sunny South during the latter part of September.

The eggs are ordinarily four in number, and of a uniform deep bluish-green color. They measure .97 in length and .68 of an inch in width.

There is one trait which detracts from the character of this species. Of an exceedingly jealous and selfish nature, it persecutes in the most violent manner, other species which chance has brought within its territory. Not unlike the Blue Jay, it has a passion for fresh eggs and will not scruple to tear from their nests the young of other species during the temporary absence of the parent-birds. It is a constant source of annoyance to the Robin as we well know. An overweening love for its young has doubtless superinduced this passion; the destruction of the young of other species, doubtless augmented its chances of preservation in the "struggle for existence." From this habit has originated, it seems to us, the appropriation of the eggs and young of other birds as articles of diet.

Harporhynchus rufus, **Cabanis.**

A reference to my notes reveals the fact that

this somewhat retired species, which in popular parlance is designated the Brown Thrasher, revisits its accustomed haunts in the beginning of May. Though a lover of sequestered localities, it does not necessarily follow that it is a shy species. We cannot perceive that it is more timid than *Turdus mustelinus*, which commonly builds within the trees that grace our lawns. Though it delights chiefly in waste grounds overgrown with brier bushes, and heavily-timbered regions with a dense underbrush, it nevertheless lacks timidity, and permits near approaches without exhibiting the slightest fear.

In early spring, the males are slightly rasorial. They may often be seen scratching away the leaves that repose upon the soil, for insects and seeds. It is arboreal as well, seldom visiting the tops of lofty trees, but mainly foraging among the leaves of shrubbery.

Like most of its congeners, it is highly insectivorous. An examination of the stomachs of many individuals shows that its diet during the first three or four weeks of its visit, is of a coleopterous character. We have found the remains of *Harpalus pensylvanicus*, *H. compar*, *Cratonychus cinereus*, *Lachnosterna quercina*, *Tenebrio molitor*, *Scarites subterraneus*, *Pangus caliginosus*, *Cetonia inda*, *Chlœnius sericeus* and *Platynus cupripennis*. Among other types were noticed *Formica sanguineus*, *Ædipoda sulphurea*, *Æ. nebulosa*, *Caloptenus femur-rubrum*; later in the

season, the larvæ of *Anisopteryx vernata*, *Eufitchia ribearia* and others of the same family, *Clisiocampa Americana*, *Gortyna zeæ*, *Colias philodice*, *Harrisina Americana*, *Callosamia pomonella*, besides mature forms of the *Tortricids*, *Tineids* and *Noc-tuids*, which are eagerly hunted and devoured with a *gusto*. Various berries contribute no mean portion of its diet. The wild-cherry, *Rubus villosus*, *Viburnum Lentago*, *Juniperus Virginiana* and *J. communis* constitute great luxuries.

Pairing begins about the 25th of May; but a week elapses before a suitable locality is selected for nesting purposes. Ordinarily a brier-bush is chosen as the site of a nest. A pile of brush, as affirmed by Dr. Brewer, is occasionally made the site of a nest. In one instance, we discovered a nest snugly hid away among the accumulated leaves within a patch of brier-bushes. This fabric reposed upon the bare soil, and was so artfully concealed, that its presence would have escaped detection, had not the authors unwittingly revealed its whereabouts by their worried movements and piteous cries.

We have never observed this species to build in close proximity to human habitations. More remote situations are, however, preferred. After the selection of a suitable site, both birds set diligently to work until a nest is completed, which is the result of four or five days' steady labor. In size, the nest is nearly equal to that of the Red-shouldered Black Bird, *Agelaius phœni-*

ceus, and like the same is rudely constructed, but lacks its compactness. In "North American Birds" by Baird, Brewer, and Ridgway, it is positively affirmed that the "base is usually made of coarse twigs, sticks and ends of branches, firmly interwoven."

A fair sample which we have beside us, and which may be considered as the normal type in our latitude, presents considerable variation. Dry leaves of *Quercus*, *Fagus* and *Castanea* sparingly, with the culms and leaf-blades of *Phleum pratense* the common Timothy, and other graminaceous plants, in abundance, constitute its basis. These are slightly interwoven; but the firmness of the fabric is due in a great measure to the previous condition of the materials utilized. Moistened with water and plastered with mud, they become firmly agglutinated so as to require great effort to detach them from the fabric. Sticks are but seldom used. The inside is lined with the stems of fine grasses, having a weather-beaten appearance. Its thickness which is nearly $1\frac{1}{4}$ inches, adds very materially to its firmness.

Oviposition is closely attendant upon nidification, and lasts nearly a week. In the performance of the duties of incubation, the male takes no direct share. Indirectly he aids in providing his partner with food, and in exercising a rigid surveillance over the nest. The period of incubation ranges from 13 to 14 days. It is worthy of remark in this connection, that the time depends in an appreciable degree upon atmospheric mutations.

The male-parent during the breeding season is bold and daring, and wreaks instant vengeance upon any feathered creature whom presumption and curiosity may have brought within his territory. Both parents are extremely fond of their progeny, and sedulous in their attentions.

The larvæ of beetles and lepidoptera constitute their early diet. The grubs of *Lachnosterna quercina*, *L. hirticula*, *Cratonychus cinereus*, *Cotalpa lanigera*, and the caterpillars of *Anisopteryx vernata*, *Eufitchia ribearia*, *Gortyna zeæ*, *Pieris rapæ*, with mature forms of *Tortricids* and *Tineids*, diptera, and the ordinary earthworm, are notable articles of food for the young.

We have never known more than a single brood to be raised in a season. The young are the objects of parental care long after they are able to supply their own necessities.

The eggs are ordinarily four, sometimes five in number; but never more, according to our experience. The ground-color is white, and marked with reddish-brown spots which are confluent at the larger end. In some specimens these dots constitute a broader *annulus* around the crown. Dr. Brewer affirms that the ground-color is sometimes a light green. We have never observed this variety in the many specimens which we have seen and examined. Their length varies from .98 to 1.12 inches, with a mean of 1.05. Their breadth ranges from .77 to .87 of an inch; the mean being .82.

The Brown Thrasher possesses great beauty and variety of song, which is uttered in a loud, clear and emphatic manner. It is never imitative, and can be easily recognized when once heard. It is a steady performer and sings for hours at a time without changing its posture. When in the full glory of song, the presence of a human being upon the scene, does not divert its attention one tittle from the performance. The following syllables will express its song with as much accuracy as is possible for pen to do:—*twē-twīt-t'wēēt, tī-wēēt-tūr, kīīī, t'chīkīīīī, twā-tūr, kāw-kāw-kāw-kwā, tchkū-kū-kū-, twīīīī-twīt, kēāh-kē, kwēr-kū-oo, kēr-kēr-kēr-tsī, chē-chē-chē, tē-tē-wā, pēē-pēē-pēē, tsē-tsē-tsē, kēē-wā-kā-tē-oo-tē-oo, kā-wā, keou, koo-koo, t'wā-wēēt, tā-kāre-kē-wā, pēē-wēē-tē-tī-wāh-tē, tē-wāh-tī, twēēt, &c.*

At no time is this bird gregarious in the strict sense of the word. It arrives singly and departs as it came. When the breeding period is over, the ties which bound the sexes become dissolved, and an overweening love for self, triumphs over every other feeling. The period of departure varies with meteorological and dietetic changes, An abundance of food-stuffs prolongs its stay, while a paucity, on the other hand, perceptibly diminishes it. Ordinarily its retirement takes place in the early part of October.

CHAPTER II.

Family Saxicolidæ. Stone-chats and Blue Birds.

The species comprehended in the above family are chiefly residents of the Old World. It is represented in North America by one European straggler, the White-ear or Stone-chat, which reaches the Atlantic coast *via* Greenland, and the North Pacific by way of Asia; and the familiar Blue Birds which are placed in the genus *Sialia* of Swainson. Out of the three species which inhabit this Continent, but one inhabits the United States east of the Rocky Mountains. Of the others one is an Arctic, and the other a Western species.

Sialia Sialis, Baird.

The Blue Bird claims more than a passing notice. By its confidence and familiarity it wins our favor and esteem; and few species are more encouraged to build in our yards and orchards. While the Robin and Orioles do immense service in the destruction of numberless insects of injurious habits, they offset this good character in a measure, by the mischief which they commit to our fruit-trees in nipping the tender stamens and juicy ovaries of the blossoms, which they relish with apparent satisfaction. Not so with the subject of the present sketch. We can heartily recommend it as the non-possessor of such an unenviable trait.

A very early visitor, we have often observed it about the middle of February, while the ground was covered with snow, returned from its winter home, to enjoy once more the delights and associations of its northern habitat. So warmly attached to the place in which it has successfully reared its tender broods, it returns thither, year after year, unless driven away *per force*.

Its soft and plaintive notes, produced in a minor key, are singularly pleasing, and awaken a sympathetic feeling in the bosom of relentless man. The following syllabic language is a nearly accurate representation of the male's song, during the season of courting:—*tür-r-r-r-wā, tür-wüh-tur-r-r-wā, tür-r-r-h'wēt*. His movements while thus engaged are perfectly amusing; after entertaining the female awhile with his best performance, he makes a few graceful movements in front of her, and then alights to ascertain what effect has been produced upon her. This is repeated at regular intervals, until the female becomes so impressed with his charms, that she is led a willing captive.

The love of offspring is so strong and predominant, that building-operations are frequently commenced as early as the 10th of March. For the site of a nest, a decayed branch, the deserted nest of a Woodpecker, or a box which has been put up for its accommodation, is generally selected. In a few instances the security which the above places afford has not been taken advantage of. Nests have

been found by us, securely located within the forked branch of an apple-tree.

Why should the Blue Bird select a hollow or perforated limb for its nest? The answer to this query is not far to reach. Being an early visitor, such situations secure the requisite warmth and shelter for the eggs and young. They also guarantee protection from rapacious birds. But other species of equal size and less brave, nidificate in open and exposed situations, without encountering more than ordinary opposition. The bright azure blue of the female, which is triflingly less than that of her partner, would render her a conspicuous object to the keen gaze of rapacious birds. Therefore, to insure security against attack, advantage has been wisely taken of hollows in the trunks and branches of trees.

The female Indigo Bird contrasts as favorably with the male. Now this species constructs its nest in thick brier-bushes ordinarily, and fares equally well. May not such bushes secure the same protection? We think they do.

From facts which we shall shortly present, we incline to the opinion that in primitive times, hollow trees were more generally chosen than at present, on account of the security which they guaranteed against the predacious attacks of birds and the inclemency of the weather. *Sialia Mexicana*, the nearest relative of our eastern species, according to the authorities of Drs. Cooper and Kennerly, are common in our Western Territories

during the months of November, December, and January. During the rigor of these months it cannot be doubted but that the species discovers in hollow trees the warmth and shelter which it requires. Many of our winter denizens select similar situations in order to escape the cold. It is worthy of remark here, that these to a considerable extent, nidificate in like situations. We might instance *Lophophanes bicolor*, *Parus atricapillus*, *Certhia Americana*, *Sitta Carolinensis*, and the *Picidæ* as dwelling in hollow trees during the inclemency of winter, and utilizing similar situations for nesting-purposes.

From these data we argue that our eastern species of Blue Bird, learned to build in hollow trees by first using such places for shelter during the inclemency of weather which prevailed on their early arrival; and perceiving the comfort and convenience of such situations, have come to regard them as appropriate quarters for nesting purposes. Thus what was merely accidental, has become intuitive and habitual.

Coming back from this digression, after a judicious selection of locality, the birds set to work to collect nesting-materials. Soft grasses, hair, feathers, and wool when the latter is obtainable, are gathered and arranged with little regard to design. The time required seldom exceeds five days at the utmost. Shortly after the completion of the nest, oviposition commences; the usual complement of eggs being laid within a

week. The male occasionally relieves his partner of the duties of incubation. When not thus engaged, he is very attentive to her slightest wishes, and often cheers the monotony of her task by a soft, agreeable warble. He is also now very jealous. Not a bird is permitted to trespass upon his premises; even individuals of the same species are treated with the same incivility.

For his tenderness and devotion to his partner, the male is unsurpassed. We were once a witness of the endeavors of a pair of Robins to take forcible possession of an apple-tree in which a pair of Blue Birds had located themselves. After repeated efforts they were compelled to abandon the purpose. The cavity which the Blue Birds occupied, had been in survice for five years; but whether or not by the same birds, we are unable to say; but judging from the strong attachment which the species ordinarily possesses for the scenes of past associations, as evidenced by recorded instances, we feel safe in concluding that either the same pair or some of its progeny had held it during the aforementioned time.

One of the most inveterate foes with which the Blue Bird has to contend, is the mischievous and half-provoking House Wren, the *Troglodytes Ædon* of Vicillot. While the former is absent, it enters the nest and either despoils it, or ejects the materials and remains in possession.

We have known three broods to be reared in a single season. When the nest has been befouled

by the first brood, the soiled materials are thrown out, and a fresh supply introduced. Sitting commences about the 25th of May, and lasts until the 5th of June; thus making the period of incubation between 11 and 12 days.

The young when hatched are alternately fed by each parent. Their food consists of earthworms, diptera, coleopterous and lepidopterous larvæ, with berries occasionally when in season. As they increase in size and strength, their bill of fare is augmented. Beetles and moths of the smaller kinds are in great demand.

When the young birds are nearly able to shift for themselves, they are entrusted to the care of the male, while the female busies herself in preparing for a second brood. Thus it happens that the male is charged with double duty. Upon him devolve the maintenance of his mate and the care of the older children. On their arrival, the Blue Birds subsist principally upon insect-food, yet the few remaining berries of the cedar and common-juniper which may be clinging to their branchlets, together with the seeds of *Chenopodium album*, *Amarantus albus*, *A. hybridus*, and others, are keenly relished. In the stomachs of several individuals we have discovered traces of *Pangus caliginosus*, *Harpalus pensylvanicus*, *Platynus cupripennis*, *Cratonychus cinereus* among beetles; *Ædipoda sulphurea*, *Æ. nebulosa* among orthoptera, besides ants and earthworms. As the season advances, *Musca domestica*, *Tabanus lineola*,

Stomoxys calcitrans, *Scatophago furcata*, and the smaller dipterous forms which swarm in the atmosphere and in humid situations; the small *Noctuids* which welcome returning spring the first, and which delight in waste ground and thickets; the *Tortricids* and *Tineids* together with the larvæ of *Eufitchia ribearia*, *Anisopteryx vernata*, *Gortyna zea*, *Harrisina Americana*, many of the *Agroti* or Cut-worms, *Pieris rapæ*, *Colias philodice*, and others.

For two weeks after its arrival it frequents the borders of thickets and waste fields. Its habits are then terrestrial and gregarious. But as the season advances and the trees become clothed in beautiful green foliage, it deserts its former haunts for the habitations of man. The change is evidently determined by the question of food.

The flight of the Blue Bird is low, less firm than the Robin's, and but slightly sustained.

The exceptional nest to which we referred above, is composed externally of a few leaves, fragments of tendrils of the vine, stems of grasses and of a species of *Sinapis*, and horse hair, variously intermingled. Internally there was noticeable, stems of *Chenopodium*, slender grasses, stems of a species of *Poa* with the seeds attached, and an intermixture of wool.

An interesting episode in the life of this species cannot be out of place. A friend having placed a tomato-can upon an upright post to attract some passing *avis*, was amply rewarded by

seeing a pair of the Great-crested Flycatchers occupy it. A nest was soon constructed of leaves, feathers, and human hair, and the ordinary complement of eggs deposited.

At this crisis, a pair of Blue Birds came upon the scene, and sought to expel the rightful occupants. The Flycatchers made a determined resistance. The property-owner wishing to preserve the latter, shot the female Blue Bird, thinking to put an end to the disturbance. The male instantly abandoned the contest and flew away. In less than a half-hour he returned with two females and renewed the contest. Victory was soon decided in favor of the Blue Birds. The Flycatchers, however, did not retire until they had thrown out the nesting-materials, a portion of which they afterwards carried away to use elsewhere.

After the defeat of the Flycatchers, the male Blue Bird instantly selected a partner from his aids; the *unfortunate* female retiring into the obscurity whence she came. This fact shows that there are females which necessity compels to lead lives of solitude, and which only enter into matrimonial relationship on the creation of vacancies. The same may be, doubtless, said of the males. Or there may be males and females which prefer a life of celibacy.

The proprietor of the premises, perceiving a strong predilection upon the part of the Blue Birds for the can, determined to annoy them awhile,

to ascertain the effect of such treatment. He, therefore, fastened a lath over the aperture of the can, and retired to a short distance to watch the result. The birds went to work, and by their persevering efforts, the piece was soon dislodged. All hindrances being now out of the way, they applied themselves diligently to work, and in a short time raised a brood of five young birds. On this occasion it was discovered that the young were fed almost exclusively upon the larvæ of *Pieris oleraceæ*, *P. rapæ*, and the wingless bodies of *Spilosoma Virginica*.

The eggs of the Blue Bird are usually four in number; sometimes we have observed nests with five. They are of a uniform pale blue, measuring about .82 of an inch in length by .61 in breadth.

After the breeding period is over, preparatory to migration, the birds collect in small parties and feed indiscriminately upon the seeds of *Panicum capillare*, *Poa annua*, berries of *Juniperus Virginiana*, diptera, and the larvæ and imagos of small lepidoptera. They are now more arboreal than in the spring, frequenting small trees and bushes, but are never known to seek the topmost boughs of lofty trees.

Among the earliest of our vernal migrants, they are among the latest to return in the autumn. Their departure is quite variable, depending upon climatic and dietetic causes. During unfavorable autumns, their presence has been missed by the last of September; but, when the weather has been

very propitious, and there is an abundance of food-stuffs in consequence, the migration has been delayed until the middle of October.

Family Sylviidæ. Sylvias.

The birds constituting this large family are chiefly denizens of the Old World, but sparingly represented in the New. Three subfamilies occur in North America; one of them, *Poliptilinae*, peculiar to this country, was formerly associated with the *Paridæ*, with which it has no special affinity; another, *Regulinae*, is merely warblers with booted tarsi; a third, *Sylviinae*, constitutes an immense assemblage of more than five hundred recorded species. The *Sylviinae*, the typical Old World warblers, is represented in North America by a single Asiatic waif, Kennicott's *Sylvia*, which was discovered by Dall in our newly acquired territory of Alaska.

Subfamily Regulinae. Kinglets.

There are about ten species of the following genus resident in Europe, Asia, and America; two of them are quite abundant in our woods and orchards.

Regulus calendulus, Licht.

The Ruby-crowned Kinglet as the above species is popularly designated, is a permanent resident in this latitude. It is an exceedingly active creature, and has been observed by us from early October until the dawn of June. During

the dreary winter-months, it frequents the pine-forests along the Wissahickon, where it meets with food and shelter. Several years of experience have convinced us that hills with a southern exposure are more particularly chosen.

It delights in the company of *Regulus satrapa*, *Lophophanes bicolor*, *Parus atricapillus*, *Certhia familiaris*, *Sitta Carolinensis*, and *Anorthura troglodytes* which are common in similar situations.

Whilst feeding, it is the very impersonation of agility. Its movements contrast most strikingly with its less active congener, the Golden-crowned Kinglet. The tallest tree-tops are its delight, where it may be observed during the entire day, probing within their fissured bark for the eggs and imagos of insects, as the small *Picidæ* and *Certhiidæ* do; occasionally, it may be seen suspended head downward from the nether surface of a horizontal branch, after the fashion of the little Black-capped Titmouse. On occasions of feeding, its movements are hurried; scarcely remaining a minute in the same situation, but moving from branch to branch, and from tree to tree with commendable zeal.

Its flight is ordinarily elevated, firm, and well sustained. In the spring it descends from its lofty eminences, to the low trees and shrubbery along water-courses. It is now less retired, and is a common visitor to our lawns and gardens, attracted to such places by the maple and cherry-blooms that afford convenient lurking-places for the small

insects upon which it feeds. We think that the tender stamens and unripe ovaries receive their share of attention. Indeed, we are confirmed in this belief, by the discovery of these floral organs within the stomachs of several individuals.

In the intervals of feeding, and also when annoyed, we are reminded of its presence by a loud, sharp, rattling noise, repeated at irregular intervals, and in a hurried, excited manner. These notes may be expressed with considerable accuracy by the syllables *kī-kī-kī-kī* pitched in a moderately high key, and gradually increasing in intonation to the close. The song of this Kinglet is affirmed to be an agreeable ditty, neither lacking power nor variety; it is but occasionally heard, and then just a brief time before its retirement from the busy haunts of civilized life.

Its food varies with the seasons. During the winter it feeds upon the seeds of grasses, with the few insects which it manages to extract from creviced bark. The berries of the common-juniper and the seeds of *Amarantus hybridus*, *Ambrosia artemisiæfolia*, and various *Panicums*, constitute its vegetable diet. In the spring, it is eminently insectivorous, and subsists upon *Formica sanguinea*, *Casnonia pennsylvanica*, *Rhynchæus pini*, *Harpalus compar*, *Mycetocharis basillaris*, *Platynus cupripennis*, *Haltica chalybea*, *Musca domestica*, and *Stomoxys calcitrans*; besides the ordinary earthworm.

While engaged in the procurement of food, it is

very tame and unsuspecting, and will permit a near approach without manifesting the least fear. It has often exhibited in our presence, those social traits so characteristic of the House Wren, a very distant relative. During inclement weather and the dreary winter nights, it shelters itself in the deserted nest of some species of woodpecker. When the cold is unusually severe, its presence is conspicuously scarce; but on the return of mild days, it is tolerably abundant.

During the early vernal and autumnal months it freely associates with the song and tree-sparrows, and often condescends to come down from its airy heights, to grovel with the latter; and when sorely pressed will partake of the fare which the kind-hearted cook has thrown out for her feathered pets.

We have been informed by Mr. John Strouse, of Chestnut Hill, that males and females of this species have been observed by him during every month of the year. When the warm days of May have returned to gladden the earth, it is no longer to be seen in our yards; but has retired to the gloomy thickets where it pursues its ever busy life. It, doubtless, breeds amid the forests that crown the hills of the Wissahickon, as it has frequently been seen in them by the gentleman just referred to, during the breeding-period.

Much yet remains to be learned concerning the nesting-habits and distribution of this species during the breeding-season. It is discovered at

varying periods in all parts of North America from the Gulf to the Arctic seas, and from the Atlantic to the Pacific ocean; but its occurrence during the productive period in northern latitudes, indicates with tolerable accuracy the extent of its range. None of our ornithologists have ever met its eggs and nest, and are inclined to believe that it constructs a pensile nest after the manner of its European cousin.

Regulus satrapa, Licht.

The Golden-crowned Kinglet, like its near congener, whose habits have just been described, is a permanent resident. It will be found to nidificate in the tall trees which crown the hills of the stream so often alluded to, as individuals of both sexes apparently paired, have been observed under very suspicious circumstances. When its nest is discovered, we shall venture to assert that it will be found to occupy a cavity in a tree, in some solitary locality, which may be the reason that it has so long escaped detection.

In the winter it is an occasional companion of the preceding species; but seems to be more partial to the society of the little *Parus atricapillus*. When the one is alarmed and seeks security in flight, or is necessitated to change its base of supplies, the other does likewise. On warm sunshiny days in mid-winter, it may often be observed climbing along the horizontal boughs of a tall oak or pine, or clinging to their under surfaces in an inverted

manner with the pertinacity of a Creeper, in its search for eggs and small insects. Though a very active creature, it lacks, however, the nimbleness of its cousin, the Ruby-crowned. Scarcity of food impels it to visit our yards, in the company of the Black-cap, where it derives a partial subsistence from the discarded crumbs of the table.

Within its natural haunts, it frequents the light of the tallest trees, and can then only be approached with the greatest caution. About the time the Red Maple arrays itself in purple garments, this little creature may be seen along the borders of fields, and within our orchards and gardens, in the enjoyment of the most perfect felicity. It is now exceedingly tame and confidential.

Though chiefly arboreal in its habits of feeding, in the spring it freely descends from its aerial heights, to seek its food upon *terra firma*. The small insects which are attracted by the blossoms of the tulip-poplar (*Liriodendron tulipifera*), which manifest themselves in early June, afford it a rich repast. The ova and larvæ found in fissured bark are captured with nearly the skill of a Creeper, and relished with a *gusto*. The following insects have been found in the stomachs of several individuals which we have examined:—*Cratonychus cinereus*, *Rhynchoæus pini*, *Bostrichus pini*, *Harpalus compar*, *Platynus cupripennis*, *Donacia metallica* *Chrysomela cæruleipennis*, besides *Formica sanguinea*.

This species is an expert fly-catcher and cap-

tures insects upon the wing with nearly the skill and address of the Wood Pewee. The smaller diptera and hymenoptera contribute no mean portion of its diet.

Its flight is usually lofty, gracefully undulating, rapid, and tolerably well sustained.

During its friendly stay around our dwellings, the only notes which we have heard it essay to utter, may be happily expressed by the syllables *tsi-tsi-tsi* pronounced very quickly, rather loudly and with a gently rising intonation. It lacks the ability to produce as powerful a note as the species last described. Besides the above, it possesses a succession of pleasing sounds which we have frequently heard during the most inclement weather in mid-winter, and which have been continued with scarce an intermission for hours together.

But little is known respecting its breeding-habits, and its nest and eggs have never been described. The presumption is that it builds a penſile nest like its European congener, and lays eggs finely sprinkled with buff-colored dots upon a white ground, and nearly equal in size to those of the Humming Bird. It has been inferred that two broods are reared in a season, from the fact that it spends so long a period in its summer abode, and because full-fledged young werè seen by Mr. Nuttall as early as May.

Family Paridæ. Titmice or Chickadees.

This family is distributed over the whole of

North America, but the crested species are rather Southern, and all but one is Western. They are mostly hardy birds and endure the rigors of winter without inconvenience, and, in consequence, are not migratory; musical after their own fashion, active, restless, and heedless of the presence of man. They are very prolific, laying many eggs, and rearing more than a single brood per season. The young closely resemble their parents, and there are seasonal or sexual variations of plumage.

Subfamily Parinæ. True Titmice.

With few exceptions, they are birds of the Northern Hemisphere, and abound in Europe, Asia and North America. Larger proportion of the genera and species occupy the Old World; all these occur within our limits, except *Psaltriparus melanotis* and *Parus meridionalis*, two Mexican species, which have been recently comprehended in our systematic works; the former is a distinctive and beautiful species, while the latter is probably only a seasonal variety of *Parus atricapillus*.

Lophophanes bicolor, Bonap.

The habits of the Crested Titmouse differ very materially, in some respects, from those of *Parus atricapillus*. It is a solitary and retired species, seldom venturing within the domains of man,

where its near ally loves to congregate with snow-birds, for the refuse-matter of the kitchen.

The topmost boughs of the tallest trees in its natural haunts, are its delight, because there it is out of danger, and can feed upon the eggs, larvæ and small insects which are found in creviced bark, with perfect complacency. It is very shy and can be approached only with great difficulty. In quest of food, its movements are imitative of the *Certhiidae* and *Muscicapidae*. Being very agile, it moves along the branches with facility, now above and then suspended head downward; and ever and anon, darts forward with the utmost celerity to seize some luckless fly or beetle as it flits by on rapid wings. According to the authority of Mr. Ridgway, this Titmouse is pre-eminently gregarious, and often becomes a "positive nuisance" from its vehement scolding as it appears to follow the hunter in troops through the woods. In our latitude we have always found it solitary. A noticeable feature is its protracted silence in the intervals of feeding.

Its disposition to congregate with other species of birds, is chiefly noticeable during the spring and autumn, when the tide of migration has set northward. There are but few of our permanent residents that are thus addicted. We have observed that some which have always been regarded as eminently gregarious in certain quarters, are gradually losing this tendency, and usually pass the winter in flocks of a half dozen

while foraging, and even in isolated pairs. The Kinglets and our common Chickadee very often travel and feed in pairs; but the Cedar Bird which is a common as well as a variable species, often collects in flocks of fifties and sixties; but this is an exceptional illustration. Where food is abundant, this disposition to flock is easily accounted for; but when there is a scarcity, and only obtainable under great difficulties, it is not strange a solitary life should be preferred.

So extremely shy is this species, that even the slightest rustling of the forest leaves will inspire fear and lead to its hasty departure. When wounded or in danger of being captured, the most determined opposition is exhibited. With glistening eyes of anger and extended claws, it bids defiance to its assailants.

Its lack of song while dwelling in our midst, may possibly be attributed to the life of solitude which it leads. Later, when the benignant influences of returning spring sends the blood tingling through its accustomed channels, this Titmouse will frequently pause from its insect-pursuing labors, and essay a few notes which are uttered in a loud distant manner, and resemble *pētō-pētō-pēto*. We have never heard its full song which it probably utters in its more northern habitat, where it delights to nidificate. Mr. Nuttall describes it as representing the syllables *whip-tom-killy-killy-dāy-dāy-dā-it-tschica-dēē-dee* varied with *kāi-tee-did-did-did*, etc.

During inclement weather, it spends the day and night in hollows of decayed trees or deserted holes of Woodpeckers, and in such localities delights to place its nest, and has often been known to excavate a place in hard wood for this purpose. The nest is but a rude lining of soft, warm materials. A single brood is reared in a season. As soon as fledged, the young hunt in common with their parents and remain associated with them until spring.

The eggs are round-oval, densely sprinkled with minute brownish dots, interspersed with larger spots of lilac upon a white back-ground. From 6 to 8 constitute a sitting, which average .74 inches in length and .56 in breadth.

Its flight is lofty, moderately firm and well sustained.

The food consists of the eggs, larvæ, and imagoes of *Cratonychus cinereus*, and perfect insects, of *C. pertinax*, *Harpalus pensylvanicus*, *Platynus cupripennis*, *Bostrichus pini*, and *Formica sanguinea*. The seeds of various grasses constitute its vegetable diet.

Parus atricapillus, Linn.

The habits of the Black-capped Titmouse as this species is commonly called, are so well known as scarcely to need more than a passing notice. It is a permanent resident in our latitude. Though a lover of woodland retreats and scenery, it often ventures in the heart of winter into our yards,

and ingratiates itself into our favor and esteem by its familiar manners and winning actions; becoming so tame and fearless as even to visit our very door-ways for the crumbs which have fallen from the table, unheeding of the near approach of human beings. Again, it will descend to the ground and mingle with the common barn-yard fowls for its share of cracked corn. If the wood-house door is carelessly left open, it will gratify its curiosity by entering, and having satisfied it quietly retire. Its appetite at these times is far from being fastidious. Almost all things edible are devoured with avidity; even the bacon which is used to grease the saw, and which is a noticeable feature of every wood-house, disappears before its keen appetite.

Within its sylvan retreats it is more retired. Few species are more active in the pursuit of insects than the subject of the present sketch. It is the very impersonation of agility, and combines in a remarkable manner the twofold character of an expert Creeper and skillful Flycatcher; moving circuitously up the trunk and along the horizontal branches, freely suspending itself in an inverted manner by the aid of its claws, with the nimbleness and gracefulness of the Brown Creeper.

Ever restless it moves with rapidity from tree to tree. Unlike the Crested Titmouse, it generally travels in pairs which prove to be male and female. If either in its eager pursuit of food, unknowingly

strays from the other, as soon as it becomes conscious of the fact, it utters its usual call-notes which are instantly responded to by the other, when within hearing distance. A similar succession of notes is heard when a booty is discovered to which it desires to summon the other. We are informed by a friend of considerable experience, and whose reliability is unquestioned, that other species frequently respond to these calls.

Its flight is high, well sustained, and characterized by notable firmness and celerity.

The syllables *tschīca-dēē-dēē-dēē* repeated quite loudly and with a clear, distinct, and resonant expression, are often heard in the intervals of feeding. When alarmed even by the movements of the squirrel or other small animals, these notes are exchanged for the hoarse cries of *dāy-dāy-dāy* which are often taken up by many individuals at once, producing a perfect medley of inharmonious sounds.

The food of the Black-cap consists principally of insects. Their eggs, larvæ and imagos are sought after and devoured with avidity. Even chrysalides, however large, do not resist its assaults. The following beetles constitute a conspicuous portion of its diet:—*Rynchæus pini*, *Bostriachus pini*, *Cratonychus compar*, *Chrysomela cæruleipennis*, *Platynus cupripennis*, *Harpalus caliginosus*, and others. Among lepidoptera, *Clisiocampa Americana*, *Anisopteryx vernata* and other geometers, besides many of the *Noctuidæ* and

Tortricidæ, both in the larval and pupal stages, are eagerly devoured.

The period of nidification commences during the latter part of April, or the beginning of May. For the accommodation of a nest, the hollow of a decayed tree is ordinarily selected. When this is not to be obtained, the birds will not hesitate at much expense of time and labor, to excavate one either in decayed or solid wood. We have never known it to build in trees in close proximity to human habitations, but always in well-wooded regions. That feeling of sociability which characterized the species during the inclement weather of winter, is now merged into the all-absorbing one of paternity.

The nest is a warm, soft, felted mass of hair and fur of small quadrupeds and down of birds; fine, dry grasses and mosses line the cavity, which are placed and contracted into a purse-like opening when the cavity is unnecessarily large.

The period of incubation has not been definitely determined, but we are inclined to the opinion that it does not exceed 10 days. The young birds are objects of the tenderest solicitude upon the parental part. When the nest is assailed by other than human enemies, the most determined pertinacity and bravery are displayed; but in the case of a human foe, the parents remain silent and passive spectators of the violence committed. A single brood is raised in a season, according to our experience; although some ornithologists consider the species double-brooded.

The eggs never exceed eight in number. The ground-color is white, with reddish-brown marks which are sometimes gathered into a ring around the larger end; in others, the spots equally distributed over the entire surface. Length on an average is .58 inches and width .46.

A singular degree of affection subsists between the sexes, which is marked by the most endearing attentions and earnest efforts to promote each other's happiness.

We have remarked that in severe winters some individuals forsake their natural haunts, driven by necessity for those of man, but afterwards return thither on the approach of mild weather; but in the last great work on the birds of North America, we are told that a post or hollow tree contiguous to human habitations, are occasionally selected for nidificating purposes. This fact does not accord with our experience. Perhaps, in certain sections where the forests have disappeared before the face of an advancing civilization, this is the case; but, in situations where nature has not been interfered with, and still retains its primitive form and grandeur, the old order of things prevails, obviously, for the security thus afforded. Such situations almost in immediate presence of man, once chosen, would continue to be occupied so long as the conditions of the *environment* remain unaltered.

Family Sittidæ. Nuthatches.

These birds differ in so many particulars from

the Creepers and Titmice, with both of which they have been affiliated, that Dr. Elliott Coues preferred to give them an independent family rank. They are the most active and adroit of creepers, and scramble about and hang in every conceivable position, and even without the support of the tail, but by the aid of the entire *tarsus*. They are principally insectivorous, but readily subsist on hard fruits, and receive their English appellation from their habit of fastening nuts and seeds in the crevices of bark and hammering with the bill until broken. They are active, restless, and sociable creatures, and chiefly gregarious.

This family contains no less than 30 species; among them exists a single remarkable Madagascar form, *Hypherpes*; the genus *Sittella* indigenous to Australia, and one confined to New Zealand, *Acanthisitta*. It is chiefly represented by *Sitta*, which embraces from 12 to 14 species; 8 or 9 of which are European, while the remainder are confined to this country; one of the latter being found in this latitude.

Sitta Carolinensis, Gmelin.

Few species display greater activity than the Carolina Nuthatch, whose habits we shall now portray. From early morning until sunset, it is busy gathering food. Its winding movements up the trunks and along the horizontal branches of trees, and the inverted suspensory position which it readily assumes, ally it in habits very closely to

the *Certhiidae*; still there are some points of resemblance to the *Picidae*. Like the latter, it is occasionally seen to tap the bark of trees, then to assume a listening attitude as if to discover the whereabouts of some undermining larva, which, if successful, it endeavors to transfix by its sharp bill.

Unlike the species whose history we have just described, this Nuthatch is very shy, and loves retirement. It prefers the solitude of dry, high thickets to the noise and bustle of civilized life. We have never known it to desert its solitary haunts for those of man, even during the most rigorous winters. Isolated individuals sometimes occur, but most generally males and females are seen together. The same devotion characterizes the sexes as those of the little *Parus atricapillus*.

Whilst engaged in feeding, it frequents the uppermost and middle branches of tall trees, seldom descending to the lower branches, as is the case with our common Brown Creeper. During the winter, great numbers of the ova and larvæ of coleoptera which occupy the crevices of bark, and fully developed elaters and buprestians, the *Elater cinereus* of Weber now referred to the genus *Cratonychus*, and *Buprestis Virginica* of Drury, also referred to the genus *Chalcophora* by Dr. Leconte, constitute an important part of its diet. As winter lapses into spring, and insect-life becomes more plentiful, its bill of fare is considerably enlarged; *Cratonychus pertinax*, *Rhynchæus*

pini, *Bostrichus pini*, *Chrysomela cæruleipennis*, *Buprestis lurida*, among beetles, and *Formica sanguinea*, among hymenoptera.

Whilst feeding, the male keeps up his peculiar nasal cry of *hönk-hönk*, repeating it at irregular intervals as he climbs around the trunks and over the branches of trees.

In the spring when the tulip-poplar is in blossom, it is a constant visitor thereto, for the small insects which have been attracted thither by the honey of its flowers. Its cone-like seed vessels are freely visited during the winter for the seeds which they contain. It has been supposed by some writers, that this species like its European congener, collects and stores away the fruits of nut-bearing trees. This fact cannot be disputed if we are to rely upon the statement of Mr. Strouse, of Chestnut Hill. He informs us that he has observed the fruits of various species of *Quercus* very securely wedged in between the bark and outer woody layers of trees, and Nut-hatches in such positions as to lead to the suspicion that they had placed them there.

From many years of experience, we are satisfied that the species does not breed in our latitude. We are told by Dr. Brewer that the birds labor together in the construction of a cavity for a nest; one carrying away the chips while the other is engaged in the perforation, and *vica versa*. The nest is not unfrequently placed at a depth varying from 15 to 20 inches, and is composed of warm and

soft materials, such as fur, down, hair, and feathers, somewhat loosely thrown together. Soon after the young are hatched, we are told by the same authority, that they climb to the opening to receive their food, and even venture upon the trunks to try their legs and claws, before their alar appendages are prepared for use; then retire at night.

The eggs present a beautiful roseate tinge when fresh, and also a reddish hue from the spots and blotches of ferruginous and purplish with which they are closely covered; these markings vary in size, from fine points to well-marked blotches. The average demensions are .80 by .62 of an inch.

As we have never met the Red-bellied Nuthatch, a near kin of the preceding, in our latitude, we pass on to the next Family which has representatives in our fauna.

Family Certhiidae. Creepers.

This is a very small and well characterized group of a dozen species included in four or five genera, which fall into two subfamilies; one of these is *Tichodrominae* represented by the European creeper, and a small number of species chiefly Australian of the genus *Climacteris*; while the genus *Certhia* embracing five or six species and varieties, inclusive of one or two allied genera, chiefly belonging to the Old World, constitute the

Subfamily Certhiinae. Typical Creepers.

Our representative species may be readily recognized by its stiff acuminate tail-feathers like a woodpecker's. It is a restless little creature which obtains a living by picking insects from the crevices of bark. In scrambling about, the tail serves as a support.

Certhia familiaris, Vieillot.

This Creeper is one of our commonest winter occupants. It is almost exclusively confined to dense forests, remote from human habitations. It has been said by Dr. Brewer to visit the haunts of man in the city of Boston, during the winter, where it manifests all the tameness and confidence of *Parus atricapillus*. We have yet to record a single instance in which it has shown such trustfulness. It has always proved itself, according to our observations, to be a very suspicious and retired species, seeming to shun rather than to court man's society.

Fond of the society of the common Chickadee and the smaller *Picidae*, among which it is usually found, and despising the companionship of its own *kith* and *kin*, its character appears singular and exceptional. Instances are known to us where individuals have led a comparatively solitary and isolated existence. It is a curious and interesting fact, that its fondness for stranger species, closes with the return of night. The following testimony shows this to be the case. In a dense thicket called "Dunnett's Woods," on the outskirts of Phil-

adelphia, stands a certain hollow birch-tree, which has afforded lodgings for a half-dozen individuals of this species, for several successive winters. On the return of night, the birds will precipitate themselves into the cavity, and closely huddle *en masse*, until day-break. This habit is not the teaching of a mere blind instinct, but the prompting of a reason, similar in kind but different in degree from that which human beings possess.

Why so many seek the same cavity is a question which presents itself for solution. May it not be that the above number constitutes the entire family, parents and offspring of the preceding season? As a birch-tree is frequently selected for the site of the nest, this fact lends some aid to the foregoing supposition.

Another query offers itself for consideration. Why does this species lead a solitary life during the prevalence of winter, and seldom, if ever, hunting in pairs as is the case with *Parus atricapillus*, but generally found associated with the latter, and the smaller *Picidæ*? The answer must necessarily be of a speculative character. The facility with which Woodpeckers discern the lurking places of insects, doubtless, is the cause of this singular association. Experience has taught it the wisdom of such associations, and the advantages which flow therefrom. That its selfish propensities should frequently triumph over its better nature, need not be a matter of much surprise. When there is a scarcity of food and its procurement is attended with con-

siderable difficulty, it is natural that the feeling of affection so strong and ardent during the breeding season, should be temporarily merged into the all-absorbing pursuit of the means of support.

Whilst securely intent upon feeding, the faintest noise is instantly perceived. When apprised of its cause, and danger is imminent, retreat is precipitate. We have often been amused while watching its movements on descrying a human being. As though unperceived, or thinking to conceal itself, on such occasions it would pass round to the opposite side of the tree from him, and by an almost vertical course, direct its way to the topmost boughs, and, then, as if actuated by a sudden impulse, fly quickly away.

During the rigor of winter, the eggs, larvæ and imagos of coleoptera which it manages to draw from the cracks of bark, constitute mainly its diet. We have frequently seen it upon the evergreen branches of the hemlock, spruce, and the yellow-birch, feeding upon the seeds which occupy the loose cones of the former and the catkins of the latter. Later in winter and during the early spring diverse beetles are eagerly devoured. We have found in the stomachs of several individuals the remains of *Cratonychus cinereus*, *C. pertinax*, *Rhynchæus pini*, *Bostrichus pini*, *Platynus cupripennis*, *Harpalus compar*, *Formica sanguinea* and *F. subterranea*.

In its rapid movements from tree to tree in quest of insects, we are reminded of its presence by its

peculiar cry which may be quite accurately expressed by the syllables *krēē-krēē-krēē-krē-ēp*, pronounced sharply and hurriedly. Although a common winter resident, it does not remain long enough in the spring to gladden us with a song.

Its nest in more northern latitudes consists of a loose aggregation of soft warm materials, such as the fur of small animals, and feathers, with an intermingling of decayed wood, but with so little consistency of form as to render removal without violating the structure, utterly impossible; it is placed in the deserted holes of the Woodpeckers, and in the rotten stumps and branches of trees.

The birds are strongly attached to their nest, and are reluctant to leave it even when assailed by human enemies. When rifled of their treasure, they hover around the head of the delinquent, uttering the most reproachful cries. Not a trace of timidity is discoverable during such times, but an exhibition of the most reckless devotion.

The eggs, when compared with the size of the bird, are proportionally small. They are almost oval in configuration, and display a sprinkling of small minute reddish-brown spots upon a grayish-white back-ground. They measure .55 by .43 of an inch.

Family Troglodytidæ. Wrens.

This family embraces a number of forms exceedingly variable and difficult of precise definition. They are intimately related to the last two fami-

lies, but are distinguished therefrom by the non-acuminate tail-feathers and exposed nostrils. The *Troglodytidae*, with the exclusion of the Old World forms which are ranked with the Wrens, and which are better assigned elsewhere; and excepting the European Wren and its congeners, are limited to America. There are one hundred recognized species belonging to sixteen genera or subgenera, mostly tropical American. Of the North American forms, three genera are exclusively western, while species of all our other genera, are common eastern birds.

Thryothorus ludovicianus, **Bonaparte.**

The above species, which is commonly surnamed the Mocking Wren from its remarkable powers of mimicry, is not a rare visitor in our latitude, and has been observed on frequent occasions. In Delaware County, Pa., it is quite abundant during breeding-period, from which we infer that it breeds there.

Like its congeners, it displays a lack of shyness and timidity, and permits a near approach without fear or alarm.

The food of the Carolina Wren consists mainly of coleoptera, diptera, lepidopterous larvæ and the small forms of neuropterous life which inhabit low aqueous situations, besides the seeds of graminaceous plants, and the berries of *Juniperus Virginiana*.

It is noted for the variety and power of its song.

emarkably imitative, the rattle of the Kingfisher, the liveliness of the Tufted Titmouse, the refrain of the Ground Robin, with the notes of the Grakles, Meadow Lark, and Blue Bird, are produced with astonishing exactness.

Nidification commences about the beginning of June. Low swampy grounds ordinarily surround the tree which marks the site of the nest. This experience agrees with Audubon's. Instances have been recorded of nests being built in close proximity to human dwellings; but these are, doubtless, exceptional occurrences. The cavity which is occupied, measures five or six inches in depth; and the entrance is just large enough to admit but one bird at a time. The materials employed are leaves, hay, grasses, horse-hair, and feathers, on the exterior, with a warm and soft lining of hair and feathers. We have never known more than a single brood to be reared in a season, although the experience of others proves the species to be occasionally triple-brooded.

The fact that sequestered situations are chosen for nidificating-purposes, is not always proof that the species is shy. Both before breeding and after we have observed birds in retired situations, and have not seen the least betrayal of timidity. In primeval times, when dense forests and impenetrable underbrush covered what is now arable ground, there was no choice of locality; but since their disappearance by the magic wand of civilization, some have deserted their natural haunts for

those of man, but the majority still linger in the "old beaten ruts of habit." It is probable as the encroachment of civilization still advances, and sylvan scenes become transformed into fertile fields, the species will embrace the altered conditions, and by frequent intercourses with the "lords of creation," learn to regard them in the same light as the little House Wren which is the very impersonation of sociability.

As before remarked, the Mocking Wren's nest is ordinarily placed within hollow trees and stumps, and occasionally in open situations, with no other covering than what the foliar appendages of bushes can give. When a cavity is chosen which does not secure the requisite protection and immunity from inclement weather and excessive heat, an artificial covering is appended.

The eggs are usually 6 or 7 in number, and vary in dimensions and configuration. They are spheroidal-oval in shape, and measure .75 to .70 of an inch in length; the greatest breadth being .60 to .65. The ground-color is reddish-white with blotches of purple and reddish-brown, thickly and pretty equally diffused over the outer surface.

Troglodytes ædon, Vieill.

This bold and venturesome little creature arrives in our midst during the early part of May. At this time it is mostly paired. Whether it leaves its southern habitat already mated, we cannot say with certainty. From evidences of a reliable

character we are inclined to think that the sexes live at the same time.

Shortly after their arrival, they set to work to cover a suitable situation for the purposes of incubation. In this work they display little judgment and taste. Almost any object with a suitable texture and a moderate capacity of interior, and well adapted to secure the requisites of shelter and comfort, is taken possession of and made to serve its purposes.

Before us is a nest of the Baltimore Oriole which is composed of strings beautifully and artistically interwoven. Within, this structure is occupied by the nest of the species under consideration. The coarse sticks of the latter which are nearly one-eighth of an inch in thickness, project in every direction through the meshes of the former. At the entrance, these sticks are piled up in an unsymmetrically conical heap, with a circular opening just large enough to admit the passage of a Wren. It seems to us that so cozy a nest as the Oriole's, which the most competent *noisseur* of birds' nests would certainly pronounce the perfection of art, would scarcely be used by a species whose artistic skill is so decidedly inferior. But such is often the case as the present instance amply attests. Howsoever shrewdly and uncouth the structure, the House Wren prefers its own workmanship to that of a stranger's.

The Common Pewee delights to build its nest

within outhouses, and 'even stuck up against the rafters of porches. Before us is a fabric which is chiefly composed of mud-pellets with an intermixture of divers mosses. The cavity of a Pewit's nest is ordinarily shallow. Within the preceding nest is placed that of the Wren. As the sticks which constitute its exterior, extend nearly to the bottom of the Pewee's nest, it is obvious that a considerable moiety of the interior of the latter, has been wrought out by the Wrens to make the necessary room.

The exteriors of both these nests are wholly composed of sticks of considerable thickness. The interiors are lined mainly with feathers and mosses. When constructed in a hollow or perforated tree, the property of some previously existing Woodpecker, similar elements enter into their composition.

When a box, or its substitute is at hand, selection is usually made thereof. But when such is wanting, a hollow-tree is made to serve its purpose. When pressed by the irresistible desire to nidificate, the House Wren will not scruple to take possession of the nest of a dissimilar species, either forcibly or during the temporary absence of its rightful occupants. When the nest of a Woodpecker has been captured, the most artful stratagems are practiced to frustrate the endeavors of the injured parties to regain possession. This mischief-loving habit of the Wren has become proverbial. Its natural *penchant* for the commis-

sion of mischief is so rampant, that while abroad in quest of food, the gratification of this unenviable trait often brings it into trouble. The Blue Bird is especially the object of its annoyance. During the temporary absence of the latter, the Wren will enter her home and despoil it; then, as if awakened by a sense of guilt, and fearful of detection, instantly beats a cowardly retreat.

The male is quite active in building, and apparently executes the task alone, while his partner stands aloof with the utmost complacency; ever and anon she enters the box or cavity to inspect the character of the work. Nidification commences about the 16th of May, and continues during a period of 14 days. If a human being or quadruped should stray into the vicinity, the most vehement scolding ensues, and the utmost efforts are exerted to expel the intruder. Oviposition closely follows nidification. A single egg is daily deposited, until the entire number which ranges from seven to nine, has been laid. Whilst the female is engaged in incubation, the male carefully administers to her necessities, and in times of danger, imperils his own life in her behalf. He is a most jealous and attentive husband.

When not thus occupied, he freely enlivens her tedious moments by an agreeable ditty. Should he be disturbed while thus employed, by any of his feathered brethren, he will suddenly break off in the midst thereof, and seek to castigate the offender for his insolence and temerity.

The period of incubation is ten days. A little longer time elapses, and the young which are objects of the tenderest solicitude by their parents, are ready to vacate the nest. Their parents work diligently to supply their wants. At first their food consists chiefly of diptera and the larvæ of the smaller lepidoptera; other kinds are added as age demands. But a single brood is raised in a season. After the young are able to shift for themselves, they are still the objects of parental care.

The House Wren is pre-eminently insectivorous, and destroys an immense number of insects for a bird of its size. During the early part of its sojourn, its food consists of the immature forms of *Ædipoda sulphurea*, *Æ. nebulosa*, *Caloptenus femur-rubrum*, among orthoptera; *Harpalus pensylvanicus*, *H. compar*, *Platynus cupripennis*, *Bostrichus pini*, *Chrysomela cæruleipennis*, among coleopters; *Formica sanguinea*, and *F. subterranea*, among hymenoptera; *Syrphus obscurus*, *Tabanus lineola*, *Stomoxys calcitrans*, *Culex tæniorhynchus*, and other dipterous forms; and *Eufitchia ribearia*, *Anisopteryx vernata*, *Clisiocampa Americana*, and various species of larval *Noctuids* and *Tortricids*.

The song of this Wren is lively and pitched in a sharp key. The following syllables express with tolerable accuracy its literal representation:—*twit-twit-twit-t' chiiiii-hwit-tiiii-kē-āh-twoo-twē-kēāh*. Its ordinary call note is a simple *twit*. When provoked its cry resembles *twit-ī-chiēē*. The notes of affection which the male addresses to his partner,

are *tīīī-twīt-twīt*; disgust and petulence by *chēē-chēē-tchēēp*. The song of the young is represented in syllabic language by *twīt-tī-tī-tī*, *twīī-twī-twī-twī*. Throughout its entire stay, it is the same cool, intrepid, and saucy little creature. Far from manifesting any shyness, it seems to prefer the society of man, for the many advantages which are secured. Secluded situations are seldom chosen for nidification. During the latter part of September, sometimes earlier, it repairs to its winter-quarters, long before its appropriate food-stuffs have become scarce.

The eggs are from seven to nine in number, round-oval in configuration, and nearly as broad as long in some instances. They are usually colored white, and marked with fine points of reddish-brown, with occasional purplish ones so as to conceal the ground-color. Some are .60 inches in length by .55 in breadth; others measure .65 inches in length with the same breadth.

Anorthura troglodytes, **Rennie.**

In our latitude, the Winter Wren is quite common during its winter stay. Within the small valleys along the Wissahickon, it has been frequently observed at this time. It leads a solitary existence; its chances of subsistence being thereby considerably enhanced.

Unlike the Golden-crowned *Regulus*, and its nearest congener, previously described, which forage among the topmost boughs of the tallest

trees, the subject of our sketch seldom aspires to such loftiness, but rather delights in low situations, where among the small bushes that line our water-courses, it derives a scanty and precarious subsistence; these places it occasionally deserts for a pile of brush, or the prostrate trunk of a decayed tree. The larvæ and small beetles which are found in decomposed wood, constitute an essential part of its food; the debris which accumulates in such places, affording a suitable *nidus* for insects. When there is a paucity of the latter, the seeds of various plants, particularly those of asters and panicums, are devoured with avidity.

In valleys having a southern exposure and hemmed in by high hills, we have seen both males and females, but always isolated from each other. It is well known that animals are prone to congregate in times of plenty; but when a scarcity of food-stuffs prevails, a disposition to dissolve into small parties, or pairs, or even into solitary individuals, exists. In view of these facts, may it not be inferred that the subject under consideration, has been brought to its present mode of living, in conformity to the scarcity of nutrient materials in its *environment*? Solitary individuals in their "struggle for existence," would thus be better able to survive.

When spring approaches, the sexes freely associate. Pairing, however, does not take place until the breeding district has been reached.

According to the opinions of leading ornitholo-

gists, this Wren breeds in mountainous places. Mr. Audubon in his rambles, never discovered but a single nest; and this he found in a hollow protuberance overgrown with mosses and lichens which presented to the eye of a spectator, even at a short distance, the semblance of an excrescence. This nest was discovered in a dense forest in the state of Pennsylvania.

In the small valleys which nestle among the hills of the Wissahickon, paired individuals have been seen late in the spring, when most of our resident species are engaged in nidification or incubation; from which we have been led to infer that a few individuals possibly remain to breed; but we have never discovered the slightest evidence of a nest.

A nest of this bird met with by Mr. William F. Hall in the central-eastern portion of Maine, is described as being "built in an unoccupied log-hut among fir-leaves and mosses, in a crevice between the logs," and was composed exteriorly of mosses, and lined internally with the fur of small quadrupeds and the feathers of birds. It was pouch-shaped with a neatly-framed entrance constructed of pine sticks. The walls were firmly impacted and interwoven, with a thickness of two inches; and the cavity possessed a width of one and a quarter inches, and a depth of four inches.

The eggs are ordinarily six in number, and measure .64 of an inch in length by .48 in width. They resemble slightly those of the Black-capped

Titmouse, and compared with its European congener are larger, less oval, and possess spots characterized by greater distinctness. Their ground-color is white which is spotted with clear reddish-brown and indistinct markings of purplish-slate.

Its earliest appearance dates from the beginning of November. During the prevalence of unusually severe weather, which often occurs in the months of January and February, many individuals are driven from their coverts when the ground is covered with snow, and there is a consequent scarcity of food-stuffs, to seek the abodes of man. During its stay it is devoid of song. Audubon describes its song as being full of force and melody, and superior to that of any bird of a similar size of his acquaintance. Its power of endurance is affirmed to be truly astonishing.

Telmatodytes palustris. **Baird.**

The long-billed Marsh Wren as we popularly designate this species, is occasionally met with in Eastern Pennsylvania, and delights in marshy situations. Among the tall sedges and grasses that thickly border the streams of Southern New Jersey, however, it is uncommonly abundant. But in the salt-water marshes of Atlantic County, of the same State, which extend landward from the beach for nearly a half-mile, it occurs in vaster numbers. Within an acre of territory at least fifty nests have been counted of recent construction.

In July, 1874, during a second visit, many occupied nests were seen with many others that showed evidences of recent occupancy. As this species reaches its breeding-quarters early in May, and instantly repairs to nest-building, it is safe to affirm that these constituted second broods; the first having already matured and quitted their nests.

From the character of the situation and its remoteness from human habitations, it might be supposed that this Wren is exceedingly shy and timid. But this is no argument for timidity. Our experience clearly shows its unsuspecting character, as in frequent instances we have been permitted to approach within a few paces of birds, as they gracefully swayed to and fro upon the flexible reeds.

It is probable that the species prefers marshy situations on account of the advantages which they secure, so far as food-stuffs are concerned. Its appropriate articles of diet consist of aquatic insects as mosquitos and libellulas, besides small mollusks.

In "North American Birds," the nest is described as being built in low bushes, but a few feet from the ground. Howsoever accurately this description may apply to some localities, it differs from our general experience. In a single instance we have observed a nest built upon a bush. In details of structure, all the nests which we have seen and examined to the number of fifty, compare favorably with the published description of the nest of *Cistothorus stellaris*, in the work just mentioned.

We are positive upon this point, for the following reasons. The occupancy of nests by the Long-billed Marsh Wren; the presence of eggs thickly marked with blotches and spots of a deep chocolate brown, so as to present an almost uniform color so strikingly contrastive with the pure white eggs of *C. stellaris*; and, lastly, the great numbers of *T. palustris* everywhere seen; form an array of evidence not to be lightly considered.

It may be argued that the nest of a very close ally has been forcibly taken possession of. The absence of any positive knowledge tending to show the existence of such a pilfering propensity, nullifies any such presumption. It is true that the cavity which a hard-working Woodpecker has constructed at infinite pains, is appropriated by a different species, in a few instances. But we have yet to meet with a case, for example, where the Baltimore Oriole has stolen and occupied the nest of *Icterus spurius*. This would be an anomalous occurrence. Birds, as a rule which admits of no variations, prefer their own workmanship to those of strangers'.

The typical nest of this species is described as being "made externally of coarse sedges firmly interwoven, the interstices being cemented with clay or mud." Further, it is said, "a small, round orifice is left in one side for entrance; the upper side of which is also protected from the rain by a projecting ledge."

Audubon describes it as built among sedges,

and ordinarily partially constructed of the sedges among which it is placed. So far his description agrees substantially with our experience.

In a criticism of Audubon's description, Dr. Brewer says, "in the localities in which they" (*T. palustris*) "breed near the coast, being subject to irregular heights of tides, it could not be done with safety."

With no wish to dispute the truth of this last statement, coming as it does from such high authority, our plea for so doing as necessitated by facts, is an earnest desire that truth and justice shall prevail.

Our experience confirms Audubon's published statement. As nidificating habits vary in particular localities, in correspondence with surrounding conditions, this fact will, doubtless, reconcile the two statements. It seems to us that irregularities in tidal elevation cannot materially affect nidification. The nests which we have examined were mostly built in tussocks of sedges, at elevations varying from two to two and a half feet, and thickly and compactly made of interwoven grasses, with a dense lining of feathers, almost proof against the permeation of water.

Before us is a fabric which was built in a tussock of sedges, at an elevation of two feet above the marshy ground. It was completely enveloped by sedges, many of which were woven into its structure. In shape, it resembles a cocoon, and is nearly of the size of a fair specimen. The

aperture is located near the top, and in some specimens is almost entirely hidden by the enveloping sedges, which at this point are closely arranged. On entering, the sedges are pushed aside, and carefully re-adjusted when the bird is once in the nest. On retiring therefrom, the *modus operandi* is analogous.

Exteriorly, the nest is constituted of the foliar appendages of *Scirpus maritimus*; interiorly, of the leaves of grasses of remarkable fineness; the *dermis* of weeds in broad patches; and over all, a mixture of soft feathers and wool.

While most of the nests we have examined, correspond in the main with the above description, we have noticed occasional exceptions. A nest in our collection bears a very close resemblance to that of *Geothlypis trichas*, in being nearly oven-shape. The opening occupies the anterior aspect, and has a breadth of two inches. The materials which enter into its composition, vary but little on the exterior from the typical form, but, within, they consist of fine grasses and silk-like threads of vegetable origin. The peculiar shape of the nest leads us to infer the character of its site which we have reason to believe was a cavity in the earth, perhaps, at the base of a clump of grasses.

The flight of this Wren is ordinarily low and but slightly sustained; having much in common with the other members of its family.

Its food consists of the larvæ of aquatic insects which are found abundantly in its natural haunts;

mature forms of *Tabanus lineola*, *T. cinctus*, *Tipula ferruginea*, *Culex tæniorhynchus*, among diptera; and *Anisopteryx vernata*, *Clisiocampa Americana*, *Spilosoma Virginica*, *S. acræa*, and many of the *Noctuidæ* and *Lycænidæ*, in the condition of imagos; besides coleoptera and minute mollusks.

The note of the Long-billed Marsh Wren is a harsh, grating cry, lacking in power and harmony, and resembling more nearly the sounds of an insect than those of a bird.

It is an early, autumnal migrant, usually retiring to its winter quarters in the beginning of September, long anterior to the growing scarcity of food-stuffs.

The eggs of this species range from six to nine in number, are oval in shape, but occasionally spheroidal. They are thickly marked with blotches of a deep chocolate-brown, so as to present an almost uniform appearance. The average length is .65 of an inch, and breadth .50.

CHAPTER III.

Family Sylvicolidæ. American Warblers.

All the *Sylvicolas* are small birds not one being over six inches in length, if we except *Icteria* and probably a species of *Seiurus*. They are mostly clad in variegated colors. The sexes are generally unlike, and the variations of plumage so striking with respect to age and season of the year, that most careful discrimination is absolutely essential. Some of the Warblers possess the habits of Titmice or Wrens; others, imitate the Creepers or Nuthatches; the *Seiuri*, in many particulars, resemble the Titlarks; while the Redstarts simulate so completely the true Flycatchers, that they were formerly classified with the *Tyrannidæ*.

The Warblers graduate so completely into the Tanagers, that they have been constituted a sub-family of *Tanagridæ*; their affinity with the *Cærebidæ* is so intimate, that a clear line of demarcation is not possible.

The *Sylvicolidæ* as now constituted, comprehend more than a hundred genuine species, and in America to which they are restricted, may be considered as representative of the *Sylviidæ* of the Old World. Dr. Coues separates them into three subfamilies:—*Sylvicolinæ*, *Icteriinæ*, and *Setophaginæ* which are distinguished from each other by certain structural peculiarities.

Subfamily Sylvicolinæ. Warblers.

The above group is especially characteristic of North America; the entire genera with the major part of the species, being summer residents, which mostly winter in Mexico, West Indies, and Central America. The genus *Dendræca* is characteristic of the Eastern United States. They may be classed as *creeping warblers* which have the posterior digit longer than its claw, and the anterior toes more completely united at base than in other types; *ground warblers* with the feet relatively stouter than the remainder; *worm-eating warblers* which are devoid of rictal bristles; and *wood warblers par excellence*. They are all strictly insectivorous, possess some ability as songsters, particularly in springtime, and are, also, migratory.

Mniotilta varia, Vieillot.

This happy and genial Warbler which is known in common parlance as the Black and White Creeper, revisits us during the early part of May, and, doubtless, breeds in our midst; although we have never been able to discover the situation of its nest. In general habits it closely resembles the *Certhiidae*, while its song which is a pleasing yet somewhat monotonous ditty, bespeaks it a position among the Warblers.

Its movements whilst feeding, recall the agility of *Certhia familiaris*. It moves up and down the trunks of trees in a circuitous manner, along their

horizontal branches, often clinging to their under surfaces in an inverted position, and probing the creviced bark for insects that lurk therein. Ever and anon it intermits the busy task, and indulges in a rustical ditty. Whilst thus engaged, it passes from tree to tree with moderate celerity.

Though mainly arboreal whilst foraging, yet an examination of the contents of several stomachs affords convincing evidence of the fact that it frequently descends from its lofty heights, to grovel in the dust; beetles of exclusively terrestrial habits have been found therein. Timidity and suspicion form no part of its disposition. We have frequently approached it within a few paces, and without the least caution being exercised, and could not discern the slightest evidence of distrust or alarm. When the tulip-poplar is in blossom, it may be seen in company with the Kinglets, gleaning among the flowers for the small insects which have been attracted thither in quest of honey. Except when the passions are excited through amatory influences, a solitary life is preferred. It is never gregarious in the strictest sense of the word. At the termination of the breeding-period it relapses into solitude.

During the entire months of June and July, paired individuals have been frequently observed within the dense underbrush that covers the Wisahickon hills, which fact inclines us to the belief that its nest may yet be found in such situations. In open and exposed places, there would be better facilities for discovery.

The food of this species as far as we have been able to determine, is principally coleoptera. The accompanying list embraces a few of the commoner kinds:—*Cratonychus cinereus*, *C. pertinax*, *Harpalus pensylvanicus*, *H. compar*, *Platynus cupripennis*, *Rhynchæus pini*, *Bostrichus pini*, *Chrysomela cæruleipennis*, *Donacia metallica* and *Haltica chalybea*. Earthworms, diptera, and ants, also constitute a share of its diet.

The song is moderately loud and but slightly prolonged. It is a simple monotonous ditty which is uttered with a strong, shrill, and grating intonation. The following syllable will convey to the mind a pretty accurate representation of its expression:—*tsi-tsi-tsi-tsi-tsi-tsi*. The whole is sung *crescendo*, and has an abrupt termination. As the season advances, the foregoing notes become more mellow and warbling; and though feeble, are yet pleasing. It commences to sing from its first appearance in May, and continues its refrains, at brief intervals, until its departure in September.

The nests of this bird as described by Dr. Brewer, are "strongly and compactly built externally of coarse strips of various kinds of bark, and lined within with hair and fine stems of grasses." In several instances, they have been known to be roofed over after the fashion of the Golden-crowned Thrush. Mr. Nuttall speaks of the nest as being built upon the ground "on the surface of a shelving rock," and constructed of "coarse strips of the inner bark of the *Abies canadensis*

externally, and internally, of soft, decayed leaves and dry grasses, and lined with a thin layer of black hair." Mr. Burroughs speaks of a nest which he discovered as being "placed upon the ground at the foot of a stump, and in such a position that the color of the young harmonized perfectly with the bits of bark, sticks, etc., lying about."

The parents are both affectionate and considerate toward their young, and manifest no uneasiness in the presence of strangers.

The eggs vary in configuration from a rounded to an oblong-oval. Their ground-color is a creamy-white with an apparently pinkish tinge, which is imparted thereto by the bright red dots and blotches which are scattered more or less profusely over their surfaces. In size they vary from .70 to .75 in length and from .50 to .52 of an inch in breadth.

Parula Americana, Bonap.

The Blue Yellow-backed Warbler is one of the most attractive of its family. It arrives in Philadelphia during the first week in May, and by the 28th of the same month, it has retired to its more northern breeding-quarters.

During its early stay, it is a frequenter of high, open woods, bordering swampy grounds, where amid the blossoms and foliage of the tallest trees it delights to forage. A true Warbler in most of its attributes, it possesses many of the

habits of the *Paridæ*, in the comparative ease with which it moves along the trunks and branches of trees, and the gracefulness and freedom with which it suspends itself from a swaying bough. •

Few species display less timidity and suspicion. During the month of May when our ordinary *Pyrus malus* is in bloom, it leaves its accustomed haunts for our gardens and orchards, where it derives an ample subsistence.

Mr. Audubon in speaking of this bird, alludes to its habit of flitting over humid localities, the borders of ponds, and small streams, in quest of prey which it pursues with considerable ardor. This allusion would aptly apply to the little Maryland Yellow Throat in every particular, but has never been observed in our study of the species under consideration. It is impossible to say what course of action a change of environment would determine.

During its vernal stay, we have never heard its song, although our opportunities have been many and frequent. From beginning to end it remains the same songless but energetic little creature.

Its flight is generally lofty, quick, and moderately sustained. Its movements whilst feeding are characterized by wonderful agility.

Insects constitute its principal diet; but the pollen with the disrupted anthers of apple and pear blossoms, and others, form an important part. The following list is but a small fraction of its voluminous bill of fare:—*Feronia chalcites*, *Platynus cupri-*

pennis, *Thaenroclerus sanguinalis*, *Harpalus compar*, *H. pensylvanicus*, *Chrysomela cæruleipennis*, *Formica sanguinea*, *Apis mellifica*, *Aphis mali* in profusion, and innumerable small spiders. We have often witnessed its capture of small bees and diptera, which it accomplishes with nearly the adroitness of the *Muscicapidæ*.

Mr. Trippe describes its song as being sharp and lisping, yet varied and agreeable.

The nests are occasionally fastened to the trunks of trees, but more generally are suspended from branches at an elevation of a few feet above the ground. They are beautifully and ingeniously wrought of long grey lichens which depend from the trees upon which the fabric is built. An elaborate intertwining of these fibres constitutes the major part, if not the entire structure. Whilst the female is employed in incubation, when not engaged in the procurement of food the male devotes his spare moments to the improvement and enlargement of the nest.

The eggs are four, sometimes five in number, with a few markings of reddish-brown, purple and lilac upon a pure white background. They have an average length of .64 of an inch, and in breadth range from .49 to .50.

It returns during the first week in September, and remains with us until the middle of October, when it takes up its southward-bound journey. During its autumnal stay it is a resident of high woodlands, and forages among the leaves and branches of the tallest trees.

Helmitherus vermivorus, Bonap.

The Worm-eating Warbler has never been seen by us within the precincts of Philadelphia, though we have diligently scoured the country in quest of it. In Chester County we have observed solitary individuals during the early part of May. It makes the most unfrequented part of the woods its home, beyond the precincts of which it is never seen.

It is the most agile of its family, darting about hither and thither, wherever there is a probability of capturing a spider for which it affects a great fondness. It is principally arboreal in its predilections, but occasionally descends to the ground and rummages among the fallen leaves for insect-life.

Their notes and habits are said by Nuttall to resemble those of *Parus atricapillus*. The same writer also remarks that they are continually uttering a call of complaint which sounds like *tshē-dē-dē*.

The nest is said by Mr. Jackson of Westchester, Penn., to be located "in a hollow in the ground," and completely concealed from view by dry leaves which thickly strewed the ground. It was composed externally of dead leaves, mostly of beech, while the interior was prettily lined with fine thread-like stalks of the hair-moss, (*Polytrichum*).

The usual complement of eggs is five, while nests have often been found with but four. They are round-oval in configuration, with a clear

white ground, and marked with minute spots of reddish-brown which are more numerous and confluent at the larger end. They measure on an average .74 of an inch in length and .55 in breadth.

Helminthophaga chrysoptera, Caban.

The Golden-winged Warbler as this species is popularly called, is by no means a very common migrant in eastern Pennsylvania. It arrives among us during the first week of May, and usually lingers until the fifteenth of the same month. It is notably tame and unsuspecting, and of easy approach. It is a common visitor to our orchards and gardens, where it delights to glean among the leaves and blossoms of the apple and cherry for insect-life. It has but little preference for woodland scenery.

Among the foliage and branches of trees it displays surprising agility, and manifests many of the attributes of the Titmice and Flycatchers. It, however, measurably lacks the address of *Parula Americana*.

Whilst feeding not even a simple call-note, much less a song does it essay to utter, during its transient stay.

We have discovered in the stomachs of several individuals traces of *Platynus cupripennis*, *Harpalus compar*, *Cratonychus cinereus*, *Chrysomela cæruleipennis*, *Formica sanguinea*, *Aphis mali*, and others of the *Aphidæ*.

The nest of this Warbler is built upon the ground, and is unusually large for so small a bird, being five inches in diameter and four inches in height. A nest discovered by the late Dr. Alexander Gerhardt, in Georgia, was composed externally of the desiccated leaves of divers deciduous trees variously interwoven with dry sedges, black vegetable roots and fine strips of bark, and the entire structure lined with fine leaves, grasses, and roots interlacing each other. According to the authority of the lamented Gerhardt, these nests are built under tussocks of grass, in clumps of bushes, and on the ground.

The eggs are from four to five in number, of a pure white, with a few reddish-brown spots encircling the larger end. Their relative size varies with the latitude. Some measure nearly .70 of an inch in length and .53 in breadth; others have a measurement of .63 by .48 of an inch.

Dendroica aestiva, **Baird.**

This beautiful and attractive species, the Blue-eyed Yellow Warbler, is a not uncommon migrant. It reaches our latitude during the first week of May. Remarkably trustful it prefers man's society to the wild retreats of nature. By its agreeable ditty and familiarity it has won our favor and esteem.

Within the maples and horse-chestnuts that line our principal thoroughfares it delights to dwell, making them vocal with music. Upon the

nethermost branches just above the head of a pedestrian it frequently perches, and all enraptured with the spirit of sweet song, pours forth its dulcet strains unmindful of passing footsteps. Though chiefly arboreal in habits, it is sometimes driven by necessity to grovelling pursuits. It seldom aspires to lofty heights. In general habits there is a striking resemblance to *Chrysomitris tristis*, notwithstanding their remote affinities.

The flight of this bird is low, quick, and moderately sustained. Among the foliage of trees its movements are rather sprightly, and betray unmistakable similarity to the Titmice.

Its song is simple and pleasing, and sustains a close resemblance to the Maryland Yellow Throat. After a careful study we are prepared to represent its syllabic expression with considerable exactness. The syllables *whit-ti-tēē-tēē-tēē-tēē* uttered loudly, forcibly, and with a gradually rising cadence, will convey a clear idea of its language. In early morning the song is heard in its full vigor, and continues until the sun has attained the zenith of his power, when it perceptibly diminishes in force and frequency.

Small beetles and diptera constitute its food early in the season; but, later, the larvæ and imagos of lepidoptera are in great demand. Several stomach-examinations reveal reliable evidences of *Chrysomela cæruleipennis*, *Donacia metallica*, *Bostrichus pini*, *Platynus cupripennis*, *Harpalus sompar*, *Casnonia pennsylvanica*, *Haltica*

chalybea, among coleoptera; *Syrphus obliquus*, *Stomoxys calcitrans*, *Scatophaga furcata*, *Culex tæniorhynchus* and *Tipula ferruginea*, among diptera; besides ants and aphides. As the season advances, the larvæ of *Anisopteryx vernata*, *Eufitchia ribearia*, *Gortyna zeæ*, *Dryocampa rubicunda*, and mature forms of *Spilosoma Virginica*, *Harrisina Americana*, *Lithosia miniata*, *Orgyia leucostigma*, *Penthina pomonella*, and many of the *Tortricids* and *Tineids*. Still later in the season, seeds and berries in great quantities are eaten. We have often observed this species subsisting upon the ripened seeds of the various species of *Cirsium* with *Chrysomitris tristis*. The berries of *Juniperus Virginiana* constitute a racy viand.

Nidification begins about the middle of June and is the first labor of the sexes. They work with commendable diligence until the completion of their task. The nest is invariably suspended from several twigs to which it is firmly attached. It is neatly, tastefully, and skilfully constructed. A variety of materials is utilized in nest-fabrication; though the same nest is quite homogeneous in the elements of the composition. In a fair sample before us, this homogeneity is carried to an extreme degree. The exterior is almost wholly a mass of vegetable fibres, with a slight interlacing of the flexible culms of grasses. A careful examination of these fibres, exhibits remarkable structural uniformity, as if they had been plucked from a single or several closely allied plant-species.

Two grades of fibres are readily identified, differing slightly in color and texture; perhaps the products of *Linum virginianum*, and possibly of *usitatissimum* which is occasionally spontaneous in cultivated grounds. The interior is lined with the woolly furze of *Eriophorum virginicum*, and that of various ferns, which render the fabric both cozy and comfortable.

To build a nest is the work of three days. Oviposition follows close upon its completion. After the full complement of eggs is laid, incubation immediately follows, and continues during a period of 11 days. This Warbler is famous for its devotion to its young and the anxiety which it manifests even when the nest is unoccupied; this latter feeling frequently betraying its whereabouts. In this latitude two broods are generally raised in a season, although instances are known, where a third has been successfully raised. The middle of September is fixed upon as the date of their departure for more genial climes.

The eggs of this species are ordinarily five, and occasionally six in number. They have a light green ground-color, and are variously marked with light purple, purplish-brown and lilac dots and blotches. They vary in length from .61 to .70 of an inch, and from .48 to .52 in breadth.

Dendræca virens, **Baird.**

The Black-throated Green Warbler is rather abundant in Eastern Pennsylvania during its ver-

nal migration, making its appearance not earlier than the 10th of May, and then only in high open woodlands where it is a busy gleaner among the foliage and branchlets for various insects. It is an exceedingly active little creature, and in habits resembles both the *Paridæ* and *Vireonidæ*. With the nimbleness and gracefulness of *Parus atricapillus*, it clammers about, freely suspending itself from the under surface of a branch, and ever and anon being diverted therefrom by a passing insect which it seizes with great adroitness, after the fashion of the Vireos.

Whilst in wooded regions its foraging is restricted to the uppermost branches, and is prosecuted with considerable celerity, from branch to branch, and from tree to tree. But as its stay is prolonged, it changes its base of operation; about the time the apple is in blossom, it visits our orchards and lawns for the insects which are attracted to their bloom. It now becomes notably tame and unsuspecting and easy of approach.

. Its food consists almost wholly of small beetles which it gleans among the leaves, and various small diptera which Vireo-like it captures on the wing. Although chiefly arboreal, it is not exclusively so, as it occasionally descends to the earth to complete a meal. We have found within its stomach, larvæ of, *Cratonychus cinereus*, mature forms of *Chrysomela cæruleipennis*, *Platynus cupripennis*, *Cymindis viridipennis*, *Harpalus compar*, *Bostrichus pini*, *Formica sanguinea*, *Apis mellifica*, a species

of Cynip, *Aphis mali*, *Musca domestica*, *Tabanus lineola*, *Tipula ferruginea*, *Anthrax clongata* and *Stomoxys calcitrans*.

From its first appearance till its departure to more northern habitats for breeding-purposes about the 26th of May, it is the same busy, songless creature. Its silence should not excite comment nor provoke surprise. With its attention so completely concentrated upon selfish gratifications, the finer feelings of its nature, have a poor chance to develop themselves. The song of the male is described by Mr. Nuttall as a simple chant resembling the syllables *tē-dē-teritse-a*, with a loud, drawling and plaintive enunciation. We may add in this connection, that the birds were nesting at the time when Mr. Nuttall surprised the male thus engaged, from which we infer that, like many others, it becomes empowered with song only when actuated by amatory influences.

The birds generally nidificate in tall trees within dense thickets; but Mr. Nuttall describes one which he found in a low and stunted juniper, (a somewhat unusual location). According to Dr. Brewer they are "small, snug, compact structures, built on a base of fine strips of bark, bits of leaves and stems of plants." The upper rims are a circular intertwinning of fine slender twigs, interwoven with a few fine stems of the most delicate grasses. The inner portions of these nests are very softly and warmly bedded with the fine down and silky stems of plants. They have a diameter

of three and a quarter inches, and a height of one and a half. The cavity is two inches in diameter and one and a half in height.

The eggs are usually four in number, with numerous dots and blotches of purplish-brown upon a white or flesh-colored background, scattered over the entire surface, but mainly about the larger end.

Dendroæca cærulescens, **Baird**!

The Black-throated Blue Warbler as this species is called in unscientific language, is neither very rare nor very abundant. It arrives early in May, and retires to its breeding-quarters not earlier than the 27th of this month, its stay being prolonged a trifle over three weeks. Its habits of feeding are solitary, mostly arboreal, and mainly restricted to dense forests, where among the smaller trees and bushes it gleans a scanty subsistence. When driven by necessity to the taller trees, unlike its near congener whose history we have just detailed, it never visits the topmost boughs, but restricts itself exclusively to the lower branches.

As the season advances, attracted by the blossoms of the apple and cherry, it retires from woodland scenery and seeks the haunts of man, where it fares more luxuriously, and with less outlay of strength. There is now a marked change in its demeanor. Confidence and courage have given place to suspicion and timidity.

In habits there is a closer resemblance to the *Muscicapidæ* than to the *Paridæ*. Along the trunks and branches of trees it moves, and freely suspends itself therefrom with comparative ease, but with less gracefulness and dexterity than is noticeable in *Dendroeca castanea*. In the capture of insects it particularly excels. The peculiar clicking noise which is heard after a racy *tidbit* has been engulfed, is characteristic of the Fly-catchers.

Its flight is moderately elevated, gracefully undulating, and but poorly sustained.

The song of this Warbler which we have frequently heard and carefully studied, may be fitly expressed in language by *tsē-āh, tsē-āh, tsē'* pronounced loud and quick; the last syllable ending very abruptly. Whilst feeding it will occasionally stop, peer around, utter a low, simple *twitch*, and resume operations.

Traces of *Cratonychus cinereus*, *C. pertinax*, *Haltica chalybea*, *Cymindis viridipennis*, *Chryso-mela formosa*, *Formica sanguinea*, small spiders and various aphides have been found among the undigested contents of several stomachs. Like many others of its family-relations, the ripened anthers and immature ovaries of apple and cherry blossoms it considers a great luxury.

This species is not known to breed in Pennsylvania. Several pairs were observed by Mr. Nuttall among the Alleghanies near Farranville, Pa., under rather suspicious circumstances. Further

north in New York, Massachusetts, Nova Scotia, and south, occasionally in Cuba, according to the authority of De la Sagra, its breeding-quarters have been discovered. To our knowledge of its nest and eggs we are indebted to Mr. John Burroughs, who with his nephew Mr. C. B. Deyce, first discovered it breeding in a thicket of hemlocks in Roxbury, Delaware County, N. Y., early in July, 1871. The nest was built in the fork of a small hemlock, at an elevation of fifteen inches above the ground. Externally it was composed of strips of decayed liber, chiefly of basswood, somewhat loosely arranged and strengthened by rootlets, fine twigs and fragments of wood and bark. Within this fabric was placed a compact, well-woven nest, consisting of small roots, pine-needles, twigs and hair, elaborately interwoven. The cavity was capacious, two and a third inches in diameter at the rim, and one and a half in depth.

The eggs are oval in shape, narrower at one end, marked with an umber-brown circle at the larger end, with lighter markings of reddish-brown and obscure purple upon a grayish-white ground which is pinkish in the unblown egg; a few dottings of the above shades are sparingly scattered over the rest of the egg. They are from four to five in number, and measure .70 of an inch in length and .50 in breadth.

During the breeding-period, the parents are remarkably suspicious and endeavor by an assumed confidence to mislead intruders from the exact

location of the nest. When the nest is discovered, the birds manifest the utmost consternation, and with a recklessness that knows no bounds, throw themselves down at the very feet of their assailants.

Dendræca cærulea, **Baird.**

The Cærulean Warbler is an exceedingly rare species and but little known. Of its breeding-habits we need more information to enable us to detail its history with any degree of exactness. It makes its appearance in our midst during the first week of May, and retires further north, after a brief sojourn.

They delight in low grounds and the borders of streams; which they occasionally desert for high wooded regions where they may be seen gleaning among the branches of the tallest trees. They are excessively timid and suspicious, and not easily obtainable. Their habits remind us of the Fly-catchers especially, although in some particulars, they imitate the Titmice. Its only note in the intervals of feeding is a simple *chēēp*.

We have never heard its song; the birds in this particular maintaining the most astonishing passivity. Mr. Audubon speaks of it as being neither loud nor prolonged, but exceedingly sweet and mellow.

The food of this species consists of the following insects:—*Chrysomela formosa*, *C. cæruleipennis*, *Cratonychus pertinax*, *Haltica chalybea*, *Cymindis viridipennis*, and others not identified, besides spiders and diptera, unrecognizable.

The nest is described by Mr. Audubon as being built within the forks of a low tree or shrub, partially pensive, projecting beyond attachments superiorly, and extending inferiorly to a depth of two inches. It is composed of the stalks of herbaceous plants, fibres of the vine, and rootlets arranged circularly, and lined with the dry threads of the Spanish moss. The nest from which the above description was made, was taken in the State of Louisiana.

When the female is annoyed during the incubating process, she is said to trail along the branches with fallen wings after the fashion of *D. æstiva*, uttering the while the most plaintive notes. The young have a strong partiality for tree-tops which are thickly enveloped with grapevines; occasionally they alight upon tall weeds and subsist upon their seeds. On retirement from the nest, they forage together in company with their parents, evincing surprising agility in the pursuit and capture of insects.

The eggs are five in number, of a beautiful white, with a sprinkling of reddish spots about the larger end.

• *Dendræca coronata*, **Gray.**

This species, commonly designated the Yellow-rumped Warbler, is the most abundant of all our migrants, and also the earliest, making its appearance often during the second week of April, but never later than the third. In small flocks of a dozen

or more it may be seen among the low trees and bushes along our water-courses. Isolated individuals have been observed by us on the outskirts of dense woods, gleaning for insects among the leaves and branches of the tallest trees. Just before their departure, they visit our haunts in great numbers, where they derive a ready subsistence. Unlike the Red Poll, their stay is brief. With a most voracious appetite they hurry from tree to tree and are soon out of our midst.

Its habits are those of the *Muscicapidæ*, being less expert, however, than many of its congeneric relations.

The flight of this species is low, slightly undulating, and moderately sustained.

The only note which it essays to utter during its short stay, is a simple *twēēt*, which is heard at irregular intervals during the passage from tree to tree.

Notably unsuspecting even in its natural haunts, the subject of the present sketch will permit the closest approach without betrayal of fear or alarm.

During its vernal stay, its bill of fare is as various as it is voluminous. We have detected indubitable fragments of the following insects, in the stomachs of the numerous individuals which we have been permitted to examine:—*Cratonychus cinereus*, *C. pertinax*, *Scarites subterraneus*, *Harpalus pennsylvanicus*, *H. compar*, *Casnonia pennsylvanica*, *Platynus cupripennis*, *Corymbites Æthiops*, *Chrysomela cæruleipennis*, *Bostrichus*

pini, *Donacia metallica*, *Formica sanguinea*, *Apis mellifica*, *Tabanus lineola*, *Scatophaga furcata*, *Tipula ferruginea*, and the common earthworm. It is evident from the many terrestrial beetles which add materially to its diet, that it is far from being exclusively arboreal. During its autumnal stay, the seeds of various weeds and grasses, with the berries of *Juniperus Virginiana* are eagerly devoured.

We can find no evidence that this Warbler breeds in the United States, although it is highly probable that future explorations will show that it does so in our northeastern States, to a limited extent. Neither Wilson, Nuttall, nor Audubon appears to have met with its nest, although the latter received one from Prof. McCulloch, of Halifax.

To Dr. Brewer, of Boston, we are indebted for a description of its nest. Early in July, 1855, he obtained a nest of this species in Parsboro, Nova Scotia. It was located upon a low bush in the heart of a small village. The smaller branches of the horizontal limb upon which it reposed were interwoven into its structure, thus strengthening it materially. Exteriorly, it was formed of fine stalks of grasses, and slender twigs and roots; within of fine grasses, downy feathers, and the hair of small mammals. It measured two inches in depth, and four and a half in diameter, with a cavity one and a half inches deep, and two and a half wide.

The eggs are rounded-oval in shape, and marked with reddish-brown, purple and dark-brown blotches and spots, upon a white ground-color which often presents a bluish tinge. They are six in number, and average .76 of an inch in length and .53 in breadth.

During incubation the parents are exceedingly shy, and can be approached only with the greatest difficulty.

Dendroica blackburniæ, **Baird.**

The Orange-throated or Blackburnian Warbler is a very late migrant which reaches the latitude of Philadelphia not earlier than the 15th of May, and retires about the 22nd of the same month. Its early presence is restricted to tall open woods with a slight undergrowth, which it subsequently deserts for the borders of fields and thickets, where it may be found foraging high up in the tulip-poplar, for insects. Mainly arboreal whilst feeding, we have seen it busily searching a heap of freshly-turned earth for food, and even using its feet like the Brown Thrasher which is exceedingly rasorial.

In woods it delights in the tallest tree-tops where it may be seen for long periods, gleaning with all the address and perseverance of a Flycatcher, and moving about with the wonted agility of a Titmouse. Few species exhibit greater activity and nimbleness than the one under consideration. It will sometimes descend from its leafy height to mingle

with its less ambitious brethren in the lower walks of life.

When driven by necessity to humbler fields it permits the nearest approach with the least manifestation of timidity.

It is a solitary feeder, except when brought into the presence of its own *kith* and strangers, by the merest chance. As it comes, so it departs.

The flight of this species is high, gracefully undulating, and tolerably well sustained.

During its stay it is devoid of song. According to Mr. Audubon it has a very sweet song of five or six notes, comparatively loud for the size of the bird.

Its area of reproduction is not accurately known, but its southern limit is supposed to be the high wooded regions of Pennsylvania, New York, and New England. Its most northern summer habitat is probably Greenland, as a young bird was captured by Holboll, October 16, 1845, at Fredericks-haub; Dr. Bachman has discovered it nidificating in Lansingburgh, N. Y.; Mr. Audubon has found it breeding in northeastern Maine, in New Brunswick, in the Magdalene Islands, and in Newfoundland and Labrador; Mr. Allen supposed it to breed in the vicinity of Springfield, Mass., as individuals have been obtained as late as June 24; and Prof. Verrill affirms it a summer resident of western Maine.

A nest presented to Mr. Audubon by Mr. McCulloch, was built in the small fork of a tree

at a height of five feet above the ground, and close by a small stream of water. It was constructed, externally, of divers materials, and lined with fine pieces of bark and a dense layer of feathers and horse-hair.

Another nest which was obtained in a wild, sequestered portion of Roxbury, Mass., in the summer of 1838, was located in a bush a few feet from the ground. This structure, in some particulars, resembled, externally, a nest of the Maryland Yellow-throat, being formed of coarse, dry grasses; but, internally, it was more cozily lined with soft fur and feathers, than is ordinarily the case in the nests of this species.

The eggs in this last nest were of a crystal whiteness, and marked with dark purple at their larger end; and, but for the smallness of their size, might have been readily taken for those of *G. trichas*.

Its food consists of various small insects, mostly coleopterous, which it gathers in its hurried movements. We have discovered in the stomachs of several individuals, almost perfect remains of *Bostriachus pini*, *Chrysomela cæruleipennis*, *Cratonychus pertnax*, *Platynus cupripennis*, *Formica sanguinea*, *Apis mellifica*, aphides, small diptera, and the various small spiders that infest the bark and leaves of trees.

Dendroæca striata, Baird.

The Black-poll Warbler though a beautiful, and

familiar species in New England, is according to our experience, an occasional visitant in Eastern Pennsylvania. In Southern and South-western New Jersey it is more abundant. It makes its appearance at the earliest, from the 15th to the 20th of May, and lingers usually with us until the 5th of June when it suddenly disappears.

Its habits remind us of those of the *Mniotilta varia*, in the facility with which it moves around the trunks of trees in quest of insects; it is, besides, an expert Flycatcher, capturing insects after the fashion of the Wood Pewee. It is an active, restless creature, seldom remaining any considerable length of time in the same locality.

The duration of their stay depends mainly upon the abundance of insect-food. Though chiefly denizens of low swampy woods and waste fields overgrown with bushes and a few scattering trees, during the greater part of their stay, they sooner or later forsake these haunts for the habitation of man, where in the adjoining orchards they glean a ready subsistence. They now manifest considerable tameness, and permit an easy approach.

Their food consists of the larvæ and pupæ of insects which they obtain from creviced bark, besides, mature forms of different kinds. Among the latter, may be mentioned *Chrysomela cæruleipennis*, *Cymindis viridipennis*, *Bostrichus pini*, *Aphis mali*, *Apis mellifica*, *Musca domestica*, *Tabanus lineola*, *Anisopteryx vernata*, and others common to the season.

Wilson regarded it as a silent bird, which has also been our experience in this latitude. A busy and solitary feeder, it seems to have no time for song. This, however, may not be the case as it nears its breeding-quarters, when it becomes actuated by amatory influences, and pours out the very soul of its being, in a flood of song. It is said to be a varied, pleasing, yet powerful singer. Mr. Trippe characterizes its song as faint and lisping, and made up of four or five syllables.

We have never expected to find its nest in this latitude, although Mr. Wilson entertained such a hope. Mr. Audubon describes a nest from Labrador. Mr. Lockhart procured a nest and eggs at Fort Yukon, and they have also been taken in the vicinity of Eastport, and at Grand Menan. They are usually placed within trees, at a slight elevation above the ground; in a few instances, they have been actually built upon the ground.

According to Mr. Audubon, the nest is composed on the outside of green and white moss and lichens, with an intermixture of coarse grasses; and is carefully lined with dark-colored mosses, and a thick layer of soft feathers of the willow-grouse and ducks. Its internal diameter was two, and its depth one and a half inches. It was built in the fork of a small branch, close to the main axis of a species of fir, about four feet from the ground.

Dr. Brewer describes the nest as being "built in thick spruce-trees in the midst of foliage so

dense as hardly to be noticeable." Those which he found around Eastport, and at Grand Menan, were large and bulky, nearly five inches in diameter, with a depth of three. They were built principally of the tender ends of the branches of firs, pines, and spruce, variously interwoven, and bound together by slender, herbaceous roots, finer carices, and elongated branches of the *Cladonia* lichens; strongly, compactly, and homogeneously made, and elaborately lined with fine straw and paniced grasses.

Of the precise time of nidification and incubation we are ignorant. Nests with eggs have been procured as early as June 9, and in a solitary instance, a nest was taken containing well-developed embryos on the first of the same month. From these data, we infer that nest-building takes place as early as the middle of May; reasonable time being allowed for the completion of the nest and the laying of the eggs.

The eggs of this species are oblong-oval, beautifully white in ground-color, but slightly tinged with pink when fresh, and spotted and blotched with a profusion of markings of subdued lavender and profounder markings of dark-purple, intermingled with lighter spots of reddish-brown. They measure .72 by .50 of an inch. The usual complement is five, though six are occasionally found.

Dendroæca castanea, **Baird.**

The Bay-breasted Warbler, one of our most

usual migrants, occasionally revisits us as early as the 25th of April, but generally not earlier than the first of May. It is pre-eminently solitary, and occupies chiefly high, open woodlands, where it is an active insect-hunter, and enlists the attention by its agility, as it darts among the foliage, or suspends itself from twigs with fluttering wings. It frequents the loftiest trees in quest of food, occasionally descending to the lower branches as necessity impels. When it deserts its natural retreats for civilized haunts, which it not uncommonly does, it delights in small trees, particularly the apple and cherry, amid the foliage and blossoms of which it gleans a luxurious subsistence. It manifests on such occasions very little of timidity. Instances are known to us, where visits have been paid to trees overhanging doorways which were in daily use. Its lack of fear and of comparative distrustfulness reminds us of the little Blue Yellow-back whose history has been previously detailed.

In habits and manners, a close resemblance to *Dendræca pennsylvanica* is noticeable; but it is less active. Its flight is generally lofty, and but slightly sustained.

During its brief stay of two weeks, it is devoid of song. Whilst moving from tree to tree in pursuit of insects, it does not produce a single note. It retires as it comes, singly and alone.

Its food consists of the small beetles and other insects which it gleans among the branches, foliage,

and blossoms of trees. The accompanying list will convey a brief though meagre idea of the essential articles of diet during its restricted stay:—*Chrysomela formosa*, *Cymindis viridipennis*, *Bostrichus pini*, *Harpalus compar*, *Cratonychus cinereus*, *Platynus cupripennis*, *Donacia metallica*; among coleoptera; the smaller ants, *Selandria rosæ*, *Apis mellifica*, and *Lophyrus abietis*, among hymenoptera; aphides, diptera, and larvæ of many of the *Phalænoïdæ*, which appear during its stay.

This species was regarded by Wilson as exceedingly rare, and so far eluded the observation of Audubon as to prevent him from describing its habits. Mr. Nuttall noticed its passage through Massachusetts, about the 15th of April.

It breeds in northern latitudes, eggs having been obtained by Mr. George Bush, at Coldwater, near Lake Superior; by Maynard, it is considered the most abundant of the *Sylvicolidæ* at Lake Umbagog where he discovered it breeding.

Nidification commences according to the last named authority, in June; a nest having been found on the 3rd, just completed in a tree, alongside of a cart-path, in a thicket. This was placed upon a horizontal branch of a hemlock, at an elevation of twenty feet above the ground. Another was built in a similar locality, but fifteen feet from the soil. These fabrics were unnecessarily large and bore a close resemblance to those of *Carpodacus purpureus*. Exteriorly they were composed of slender twigs of the hackmatack, with an intermingling of long

pendent *Usnea* mosses. Interiorly, they were smoothly and elegantly lined with the seed-stalks of *Cladonia* mosses, dark fibrous roots, and a sprinkling of hairs. They measured six inches in diameter, and two and a half inches in height, with a cavity three inches wide, and one and a quarter deep.

The eggs are oblong-oval in configuration, and vary in length from .70 to .65 of an inch, and in breadth from .52 to .50. They are closely marked with brown upon a greenish-blue background, and generally possess an *annulus* of brown and lilac blotches around the larger end.

We have never observed this species in the autumn, from which fact we infer that it does not stop during its southern migration.

Dendræca pennsylvanica, Baird.

The Chestnut-sided Warbler is an early migrant which appears during the first week of May, when the woods resound with the melodies of the Redstart and the Black-throated Blue. Like most of its near relatives, it is never gregarious, but feeds singly and alone. At first, it forages almost entirely among the slender branches and foliage of lofty trees, in high and open woods; but as the season advances, our gardens and orchards are the recipients of its visits, where it delights to revel amid apple and cherry blooms. Like the last described species, it manifests considerable

confidence in man, permitting near approaches without the least fear.

It is extremely agile in its movements, and like its congeners, combines many of the traits of the *Certhiidae* and *Paridae*, in a remarkable degree; superadded to which, is the possession of many of the attributes of the *Muscicapidae*, being able to capture insects upon the wing, with nearly the adroitness of the members of this family. Being less erratic than most of its kindred, it remains for long periods gleaning among the foliage of the same tree.

Not unlike the Bay-breasted Warbler, this species certainly reserves its powers of song until it has attained its northern quarters. Not so much as a single note has it been heard to utter. Its departure usually occurs about the 22nd of May, making the length of its stay nearly three weeks.

Divers kinds of insects constitute its dietary. We have detected remains of the following in the stomachs of several individuals:—*Rhynchænus strobi*, *Chrysomela cæruleipennis*, *Cratonychus cinereus*, *Harpalus compar*, *Platynus cupripennis*, among beetles; *Musca domestica*, *Tabanus lineola*, *Syrphus obscurus*, among diptera, besides *Aphis mali*, *Formica sanguinea*, earthworms and a single species of cut-worm. The results of these examinations conduct to the conclusion, that in habits it is not strictly arboreal, but occasionally terrestrial.

This species was formerly regarded as rather rare by our older ornithological writers. Wilson

could give little description of its habits; the most of what he says being conjectural. Audubon knew nothing of its habits or distribution; he having met but a single individual. Nuttall's description is in a measure hypothetical and inaccurate. Its song he represents by the syllables *tsh-tsh-tshyia*, given at short intervals, and frequently responded to by the female from her nest. He perceives a resemblance to that of *D. æstiva*, being somewhat louder and less of a whistle.

According to the authority of Mr. Allen, it breeds in western Massachusetts, where it arrives about the 9th of May, frequenting low woods and marshy thickets, and nesting in bushes. Prof. Verrill has found it breeding in western Maine, and Mr. Ridgway in the oak-openings and prairie-thickets, of southern Illinois. J. Elliot Cabot, Esq., was the first to discover in June, 1839, its nest and eggs, in Brookline, Mass. The nest was compactly built, elastic and shallow, and composed externally of strips of red-cedar bark, and lined with coarse hair. Mr. Welsh, of Lynn, Mass., has discovered a number of nests situated within barberry-bushes, which were constituted, exteriorly, of the bark of the smaller vegetables loosely intertwined, reinforced by stems and fragments of dry grasses, and lined with soft hairs of the smaller animals and vegetable wool. These nests varied from two and a half to three inches in height, externally, and possessed a diameter ranging from three to four inches. They were securely

fastened to small branches by means of the silk of divers kinds of cocoons. The situations chosen for nidification, are affirmed to differ not materially from those selected by the Golden Warbler, being in open grounds, and also low marshy localities.

The eggs are oblong-oval in shape, creamy-white in the background, and beautifully marked with shades of purple and purplish-brown principally about the larger end. The dimensions are .64 by .48 of an inch.

Dendroæca maculosa, **Baird.**

The Magnolia Warbler is very abundant in eastern Pennsylvania, and one of the most attractive members of its genus. It appears not earlier than the 10th of May, along the borders of cultivated fields, and within our gardens and orchards, where the blooms of the apple, cherry, and maples are sources of attraction. In high open thickets, which its congeneric relatives delight to visit, it is exceedingly rare. During the past season it might have been reckoned by fifties in cultivated sections, whereas not a single individual was observed in secluded situations.

Like most of our Warblers already described with the single exception of *D. coronata*, it never flocks during its vernal migration, but prefers to lead a solitary existence. Few species manifest freer confidence, and less fear than the one under consideration. In this particular, it emulates

Parula Americana. We have frequently advanced within three or four feet of an individual, though not unperceived, without awakening distrust or exciting alarm.

In common with most of its brethren, this Warbler beautifully blends the attributes of the *Paridæ* with those of the *Muscicapidæ*. Insects in their various stages, compose its diet. These it procures in its perambulations along the trunk and branches, adherent to the bark or concealed within fissures, or expertly captures while on the wing. It is equally dexterous in hovering over the expanded bud and examining the opening leaves.

Its flight is low, gracefully undulating, and moderately prolonged.

During its entire stay it is devoid of song. Its only note is a simple *twēā*, produced quickly and with a sharp, grating articulation, in the intervals of feeding. Dr. Brewer in speaking of its song says, it "is clear and sweetly modulated, and surpasses that of most of this family," and is "chiefly heard during the early summer" in low woods, whilst searching Vireo-like for insects.

The accompanying list will convey to the mind some idea of the services which it renders to man in the destruction of injurious insects. In several stomach-examinations we have discovered evident traces of *Chrysomela cæruleipennis*, *C. formosa*, *Cymindis viridipennis*, *Bostrichus pini*, *Harpalus pennsylvanicus*, *H. compar*, and *Platynus cupripen-*

nis; besides a variety of small spiders that reside temporarily within the flowers and upon the foliage of plants; aphides, especially *Aphis mali*, and also our commonest ants. The stamens and ovaries of blossoms, with fragments of corollas, have been found within the stomachs of several individuals.

This last cited fact materially lessens the esteem in which it is held, and proves in this, as in many instances, that no species can be considered as an unmixed good.

We have never observed this species in the autumn, and are led to believe that it does not stop from its southward-bound journey.

During the breeding-period throughout North America, it resides "east of the Great Plains between latitude 44° and Fort Simpson in the fur country," (*Vide* North American Birds, page 233). Mr. Audubon describes the nest as being built of lichens and moss, externally, and lined with fibrous roots and feathers, and as being placed upon fir-tree branches, and sustained by horizontal twigs. Nidification must take place during the latter part of June, as a nest was found in Labrador by the same gentleman, in the beginning of July, with five rather elongated eggs. These are described as being of a white color, with a sprinkling of reddish dots at the larger end, and as being three-fourths of an inch in length and nine-sixteenths in breadth.

A nest was obtained by Mr. Kennicott near Great Slave Lake, June 12, 1860, which was loosely built and placed within a small spruce, in a dense

woods, at an elevation of two feet above the ground. It was composed almost wholly of fine plant-stems, slender grasses, and a *modicum* of mosses, and was lined interiorly with finer stems, and black herbaceous rootlets. It measured three and a half inches in diameter, and one and a half in depth, with a cavity one inch deep and two and a half inches in diameter.

The eggs are rounded-oval in form, being more pointed at one end than the other, a light ashen hue or dull white on the background, and finely dotted and blotched with light-brown; these markings being chiefly grouped about the larger end.

This bird has been found breeding by R. Deane, Esq., of Cambridge, near Lake Umbagog. The nest was placed about three feet from the soil in the fork of a low spruce, and consisted externally of spruce twigs, rootlets and dry grasses, and was lined with fine black roots. The eggs were described as spherical, creamy-white, and marked with a few large blotches of umber and lilac.

The female is said by Audubon to manifest great distress which is exhibited by fluttering among the branches with expanded tail and wings, when her nest is assailed. According to Dr. Brewer, they also evince much sympathy when the nests of other species are disturbed. He instances a case where the outcries of a pair of the Hudson's Bay Titmice, brought a pair of these Warblers to their aid, which displayed fully as much anxiety as the real parents.

In August, Mr. Audubon observed a number of young accompanying their parents in their southern migration.

Dendroæca tigrina, **Baird.**

The Cape May Warbler, so called because it was discovered near the extreme southern point of New Jersey, is a rare species in this latitude. The first specimen was obtained at this point by George Ord, in 1811, and was described and figured by Wilson who never came across a second specimen. Both Nuttall and Audubon were unacquainted with it; the latter depended for the specimens which he delineated, upon Edward Harris, Esq., who procured them near Philadelphia.

In their northern migrations, these birds reach the latitude of Philadelphia from the 10th to the 15th of May, remaining but a few days, and suddenly departing. They are fond of retired situations, and are remarkably suspicious in disposition. In Delaware County, Pennsylvania, individuals have been shot whilst feeding within alder swamps and along the banks of streams. Their foraging is chiefly restricted to shrubbery; instances being unknown where tall trees are objects of visitation. Their movements are exceedingly active and remind us of both the Flycatchers and Titmice. Unlike many of its family relations, it is a hermit, and shuns rather than courts the society of man.

Its flight is commonly low, undulating, and well sustained. Its movements whilst feeding are both arboreal and terrestrial.

Various small beetles, diptera, and spiders, constitute its bill of fare. *Cymindis viridipennis*, *Cratonychus cinereus*, *Donacia metallica*, *Harpalus compar*, *Tabanus lineola*, *Culex tæniiorhynchus*, and aphides, are eagerly devoured.

Their temporary stay, though brief, is unmarked by the slightest trace of song; not even a single call-note is uttered.

It is very improbable that this species nidificates in the United States, although an egg obtained in Coventry, Vt., in 1836, has been attributed to this bird, from its resemblance to identified specimens from Jamaica. In this island they frequent the mangrove-swamps and river-banks for food, during the early part of their visit, but repair to the highlands for nidificating purposes.

In his ornithological notes of this island, W. T. March, Esq., describes the nests as possessing long and deep cavities, and being wrought of long and thin strips of flexible bark, stoutly and firmly interwoven, with an intermingling of lichens, mosses, and bark of deciduous trees. Interiorly, there is a lining of finer and more delicate strips than are found in the exterior. They measured three and one-fourth inches in diameter, and two and one-half in height.

The eggs are oval in configuration, slightly acuminate at one end, with various shades and tints of brown and purple blotchings upon a pinkish-white background, which are chiefly arranged in the form of an *annulus* about the larger end.

They are .70 of an inch in length by .55 in breadth.

Dendroæca discolor, Baird.

The Prairie Warbler, a not very abundant species in eastern Pennsylvania, revisits us about the latter part of April or the beginning of May. Although a denizen of open plains and thinly wooded regions, it is far from being shy and suspicious, and will permit near approaches without manifesting the least timidity.

In searching for food, they may be seen moving leisurely along the lowermost branches of trees, examining every leaf and blade of grass for insect-life, uttering at irregular intervals a brief *chirr*. Exceedingly active creatures, they resemble the *Paridæ*, and in being expert Flycatchers, remind us of the Redstart and the *Myiodiotes*.

Coleoptera, diptera, spiders, and caterpillars, contribute mainly to its maintenance. In the procurement of food, its habits are both arboreal and terrestrial. *Chrysomela cæruleipennis*, *Platynus cupripennis*, *Donacia metallica*, *Cymindis viridipennis*, *Casnonia pennsylvanica*, *Haltica chalybea*, *Cratonychus pertinax*, *Tabanus lineola*, *Culex tæniorhynchus*, and larvæ of *Anisopteryx vernata*, *Clisiocampa Americana*, and many of the early *Noctuids*, with *Formica sanguinea*, *Apis mellifica*, and various aphides, and others, have been found in the many stomachs which we have examined.

Mr. Nuttall speaks of the slender, filing notes

of this bird, which he represents by the syllables 'tsh-'tsh-'tsh-'tshea sung *crescendo*.

The Prairie Warbler has been supposed by Cassin to breed in New Jersey, near Philadelphia, from the fact that young birds have been met with during the breeding-season. Nuttall describes the nest as non-pensile, placed in a bifurcating branch, and composed externally of strips of red cedar, liber, caterpillars' silk, fibres of *Asclepias*, with an internal lining of the down of *Gnaphalium plantagineum*. The eggs are described as being sharp at one end, and marked with spots of light-brown and lilac-purple upon a white background, which are chiefly annulated about the larger end:

Several nests have been found in Lynn, by Mr. Welch. One built on a wild rose, a few feet from the ground, was compactly, elaborately, and variously interwoven, principally of soft, inner bark of shrubs, with an intermingling of decayed plant-stems, woody fibres, dry rose-leaves, fragments of vegetables, and spiders' webs, &c.; the whole being bound together and strengthened by cotton-like vegetable fibres. The upper rim was composed of vegetable roots and bark, strongly interlacing each other. Internally, there was a layer of vegetable fibres, with a few horse-hairs. In some nests, decayed leaves; in others, weather-beaten cocoons; and, in others, the pappus of plants are more noticeable materials than strips of bark.

This species was found by Dr. Gerhardt to nidificate in northern Georgia, where its nests in position, structure and size, were similar but differed in the materials of composition; being composed, externally, almost invariably of strips of inner bark, and flax-like fibres of vegetable origin, with a lining of fine plant-stems, and in one case of the feathers of *Bubo Virgianus*. In Georgia almost every kind of bush or tree, is selected in which to build; whereas, in Massachusetts, open and thinly-wooded pasture lands, often not very remote from villages, are invariably chosen. In southern Illinois, in the oak barrens where it breeds, it is exceedingly rare, according to the authority of Mr. Ridgway. We have never known it to breed in Philadelphia, and are disposed to view it as only a temporary visitor.

The female is very confiding and approaches the nest without the exercise of any precautions; and seeks not like many species on the intrusion of human beings, to entice them away from the site of her nest.

The eggs vary from three to five and even to six in number; they are oval in form, and marked with spots of lilac, purple and umber-brown, upon a white ground. They measure .68 by .48 of an inch.

Since writing the above, a nest of the Prairie Warbler has been obtained by H. D. Minot, Esq., in Northern New Hampshire, at the latitude of Mt. Washington ($44\frac{1}{2}^{\circ}$), containing four eggs. It is

said to be a summer resident there, though Lynn, Mass., in latitude $42\frac{1}{2}^{\circ}$, has, hitherto, been generally accepted as its northern limit of breeding.

Dendroæca palmarum, **Baird.**

In its habits the Red Poll Warbler is nearly terrestrial. In this particular, it differs very materially from its more intimate relatives. It frequents the borders of thickets and bushes along water-courses. Along the banks of the latter where projecting rootlets are visible, it gleans its daily diet. Occasionally, it visits the lower branches of trees, where it may be seen imitating the activity and gracefulness of the *Paridæ* and *Certhiidæ*. Sometimes its movements are those of the *Muscicapidæ*, but these are exceptional.

This bird is extremely shy, leads a secluded life whilst feeding, and can be approached but with the greatest difficulty. Its flight is ordinarily low, firm, but slightly undulating, and poorly sustained.

Its song is a low, simple chirp, produced very infrequently, and resembling somewhat intimately that of a grasshopper.

From its early appearance in May, till its departure about the 12th of the same month, it is a silent, solitary creature, wholly engrossed from morn to night, in the all-absorbing thought of self-preservation. Unlike many of its kin, it never deserts sylvan retreats for human habitations, even when pressed by hunger. During its brief stay,

which varies from a week to ten days, its food consists principally of insects. Within the stomachs of several individuals which we have examined, have been noticed the following:—*Formica sanguinea*, and *F. subterranea*, in great abundance; *Scarites subterraneus*, *Harpalus pennsylvanicus*, *H. compar*, *Casnonia pennsylvanica*; larvæ of *Cratonychus cinereus*, *Platynus cupripennis*, *Chlænius sericeus*, *Cratonychus pertinax*, *Misca domestica*, *Tabanus lineola*, *Culex tæniorrhynchus*, and others, which we were unable to identify. The berries of *Juniperus Virginiana* are occasionally eaten. With the above a few seeds of graminaceous plants, fragments of leaves of grasses, and buds of *Acer rubrum* were detected.

We are inclined to believe that it does not stop during its southern migration, since its non-appearance in habitual habits, is a notable fact.

Ordinarily, a rare visitor in our latitude, it is very abundant at certain times, but is always observed as isolated individuals. A combination of circumstances apparently determines the period of its maximum and minimum numbers. During the breeding-season, and also during migration, birds are at times very differently circumstanced. Sometimes, surer success attend their procreative and parental endeavors, and larger numbers of young are reared. Again, particular species escape more successfully the assaults of predatory birds, and the warfare of man, and are thus enabled to bring greater numbers to accus-

tomed haunts during succeeding seasons. Perhaps, the same localities are not always annually visited by particular non-breeding species, which would also tend to numerical variations.

The Red Poll generally selects a swampy thicket which is more or less open, for the purposes of nidification. The nest is invariably placed upon the ground. The walls are firmly, closely, and tastefully built of an interweaving of fine grasses, small plant-stems, slender strips of bark, *Hypnum* and other mosses, exteriorly, with a warm and soft lining of feathers and down. It is usually not large, having a diameter of three and a half inches, a depth of two and a half inches, with the diameter and depth of the cavity but half an inch less. The above is substantially the description given by Dr. Brewer.

A nest of this bird found by Mr. Kennicott, June 18, at Fort Resolution, was built on the ground on a hummock, near the base of a small spruce, in swampy ground, and contained five young birds.

It, doubtless, breeds in the vicinity of Halifax, its being a summer resident there from May to September. It may possibly breed in the United States, although we can discover no evidence to justify the assertion.

The eggs are rounded-oval in shape, and blotched chiefly about the larger end with purple, lilac, and reddish-brown spots, blending together upon a yellowish background. They measure .70 of an inch in length by .56 in breadth.

Dendroæca pinus, Baird.

The Pine-creeping Warbler has not been found in our latitude during its vernal migration, to any considerable extent. It is mostly a denizen of pine forests and may be seen running up and down the trunks of trees and along their branches, ever on the alert for the larvæ and ova of insects, which it most dexterously extracts from their hiding places. In southern New Jersey it proves to be more abundant, frequenting low marshy grounds, overgrown with shrubbery and the scrub pine. It reaches the latitude of Philadelphia during the latter part of April, and its visit is usually prolonged until about the 15th of May, when it is notably scarce. During the breeding-period it is unobserved, whence we infer that it does not remain to perform that essential business. During certain mild and open winters, we are informed by reliable authority, that it is common in pine forests in the vicinity of Bridgeton, N. J. An instance is recorded where a stray individual was met in Philadelphia in mid-winter.

This species is both terrestrial and arboreal. It is an active, restless being, generally searching for insects among the blossoms and needles of the pine, or in the crevices of the bark, or seizing them upon the wing; occasionally, it descends to the ground for this purpose. Its movements recall those of the *Certhiidae*. Though chiefly restricted to pine forests, we have never known it to desert such places for open fields and orchards.

Its flight is short and gracefully undulating.

The song of this Warbler is lacking in compass and variety, although, far from disagreeable. Mr. Nuttall characterizes it at times as approximating the simpler trills of the canary, but, ordinarily, a reverberating, gently-increasing or murmuring sound resembling *er-r-rrrrr-ah*. In the spring-time it sounds like *twe-twe-tw-tw-tw-tw* and sometimes like *tsh-tsh-tsh-tw-tw-tw-tw* uttered with an agreeable cadence. The note of the female is said to resemble that of *Mniotilta varia*.

Its food consists of insects in their various developmental stages. Early in the spring many coleoptera are eagerly devoured. We have identified in our examinations remains of *Bostrichus pini*, *Cratonychus cinereus*, *C. pertinax*, *Cymindis viridipennis*, *Platynus cupripennis*, besides the hymenopterous forms of *Formica sanguinea*, *F. subterranea*, and others. Later, the larvæ and ova of *Anisopteryx vernata*, *Clisiocampa Americana*, *Citheronia regalis*, *Eacles imperialis*, besides many mature forms of our early *Noctuidæ* and *Tineidæ*, and earthworms. In the autumn the berries of *Juniperus Virginiana*, *Cornus canadensis*, and the seeds of various species of *Pinus*.

Its most northern breeding-quarters are probably in Massachusetts, where it has been found to be very abundant, particularly in the western part, by Mr. Allen; and in the east as high up as Lynn, by George O. Welch, Esq. There is good reason to suppose that it breeds in New Jersey, since the

surroundings are favorable, and birds already paired have been noticed under the most suspicious circumstances.

Nidification occurs most probably about the 15th of May, as Mr. Nuttall describes a nest which he observed with a full complement of eggs, highly advanced towards hatching, on the 7th of June, which was built about forty feet from the ground, wedged in between two nearly vertical branches of a Virginia juniper tree, in Mt. Auburn. This fabric was composed principally of the wiry stems of *Polygonum tenue*, circularly interlaced with caterpillars' webs, and liny fibres of *Asclepias*. Interiorly, there were noticed fine rootlets, a few bristles, down of fern-stalks, and feathers. Several nests were discovered by Mr. Nuttall of similar manufacture.

Several nests of this Warbler found by George O. Welch, Esq., in Lynn, Mass., differed from the one just described, only in the composing materials. These were built of red cedar bark, the liber of several deciduous trees, dry grasses, and plant-stems, and the exuviae of insects; internally, with feathers, silk of plants, and fur of small mammals, lining comparatively large and deep cavities. There were also some wiry roots noticeable. They measured two and a half inches in height, and three in diameter.

In Massachusetts but a single brood is reared in a season, whereas at the south it is accredited with being triple-brooded.

The eggs are affirmed by Dr. Brewer to resemble in size and appearance those of *D. castanea*, but differ in the spots being more numerous, and the blotches being "larger and more generally distributed." They are rounded-oval in configuration, with a bluish-white ground-color, which possesses subdued tintings of a delicate purple-shade diffused thereon; and the latter rendered other than monotonous, by dark purplish-brown dots and blotches, with a few pencillings of black distributed over its surface. The average length is .71 of an inch, and breadth .55.

Seiurus aurocapillus, Swains.

The Golden-crowned Thrush or Oven Bird as this species is popularly known, appears in unusually large numbers, between the 1st and 12th of May, and restricts itself chiefly to low, damp woods, being seldom, if ever discerned close to human habitations. It is pre-eminently partial to retirement, from which we infer a shy and timid nature, which experience faithfully justifies.

We have occasionally seen it upon wooded hillsides as affirmed by Dr. Brewer; but generally low, humid woods with dense underbrush, in close proximity to water-courses, as described by Audubon, accord more accurately with our experience.

It is chiefly terrestrial; if arboreal, it is during the early part of the season, anterior to mating. It then seeks the tallest trees, the lowest bushes,

and even alights upon the ground, and from its position makes the thickets resonant with song.

Its song may be heard at irregular intervals, from early morn until twilight has melted into dusky night. It is so peculiarly its own, as never to be forgotten when once heard. The following syllables *tswē-tswē-tswē-tswē-tswē* pronounced quickly, so that the final sound of each preceding word glides into the initial sound of each succeeding one, the last syllable ending somewhat abruptly, express its language quite accurately. It is sharply, loudly, and distinctly enunciated, and increases in intonation from the beginning to the end.

Being uncommonly terrestrial in its habits, than otherwise, its diet consists mainly of the seeds and insects which it discovers underneath decomposing leaves, and aquatic insects which it procures along the margins of streams. Its earliest diet consists of *Ædipoda sulphurea*, *Æ. nebulosa*, *Caloptenus femur-rubrum*, *Acheta nigra*, among orthoptera; *Harpalus pensylvanicus*, *H. eompar*, *Pangus caliginosus*, *Cratonychus cinereus*, *Cicindela vulgaris*, *Lachnosterna hirticula*; *Platynus cupripennis*, *Rhynchoenus pini*, among beetles, *Formica sanguinea* and *F. subterranea*, among hymenoptera; besides spiders and earthworms. Later, when lepidoptera are abundant in their larval and mature stages, an important addition is made to its bill of fare. *Anisopteryx vernata*, *Eufitchia ribearia*, and other geometers; *Clisiocampa Americana*, immature specimens of *Promethea*, *Eacles*

imperialis and *Harrisina Americana* in their larval condition, and mature forms of *Spilosoma Virginica*, *Utetheisa bella*, *Eudryas grata*, and many of the *Noctuidæ*, *Tortricidæ* and *Tineidæ*.

Few species among the Warblers possess a more graceful movement upon the ground, than the one under notice. It may be truly said to walk, one foot being slightly raised while the other is being placed upon the ground, and *vica versa*. It may be readily indentified in the distance by the peculiar nodding movement of the head.

Its flight is low, tolerably firm, and well sustained.

Nidification commences usually about the last week of May, but at the time of writing (June 3), this essential operation has hardly begun. This delay is probably due to the backwardness of the season. Both birds work diligently until the completion of a nest which is the labor of four days. A concavity in the ground is selected for the site, which usually inclines at an angle of 45 degrees. The typical structure is said to be oven-shaped with an aperture sufficiently large to admit the ready ingress and egress of the female. We have never observed a single nest which would agree with the above partial description. All that we have examined were modeled somewhat after the fashion of that of *Geothlypis trichas*, being located at the base of a clump of bushes, and carefully concealed by enveloping leaves. Externally, the nest is composed of dry leaves, stems of grasses; mosses, and fragments of vegetables; and is lined

externally with fine stems and leaves of grasses.

After the lapse of a day or two subsequent to the completion of the nest, oviposition commences, and proceeds at the rate of one egg *per diem*. Incubation then ensues, and continues for 11 days. The male bird takes no direct part in this business, save to supply food occasionally to his partner. He is, however, close by, ready to announce the presence of danger, in time to secure a safe retreat. For his mate, the most ardent affection and strongest solicitude are manifested, which do not show themselves after the fashion of *Mimus Carolinensis* by odd gesticulations and noisy vociferations.

The young are objects of especial attention by both parent-birds for three weeks. Their food consists of ants, aphides, earthworms, many of the *Phalænoidæ*, particularly the larvæ of *Anisopteryx vernata*, the common *Geometra catenaria* of Harris, *Clisiocampa Americana*, and mature forms of the *Noctuidæ*, *Tortricidæ*, and *Tineidæ*.

There is but a single brood in a season. When the breeding season is past, the species still lingers within its natural haunts, until prepared to depart to its southern home. Its absence is conspicuous about the first of October. Up to its retirement, its song is kept up with the same perseverance and vim, as characterized it early in the season.

The nest of this bird seems to be a favorite place for the Cow Blackbird to deposit its egg. We have frequently observed nests that contained as many as two parasitic eggs.

The eggs of the Golden-crowned Thrush are oval in shape, with one end the larger. Their ground-color is a beautiful creamy-white which is marked with dots and blotches of reddish-brown, lilac, dark purple, and ferruginous, variously intermingled. In a few instances, there is noticeable around the larger end, a beautiful crown of the above colors, contrasting very markedly with the nearly spotless surface of the residue.

Sciurus noveboracensis, Nutt.

The Water Thrush or Wagtail as we commonly term this species from its peculiar habits of alternately elevating and depressing its tail, cannot be considered either abundant or rare. It makes its appearance in the beginning of May, about the time of the arrival of the subject of the preceding sketch.

Like its near cousin, it is partial to woodlands with a dense growth of underbrush, or in which running water is a noticeable feature. It rarely visits cultivated grounds. It is *par excellence* a hermit. Within its accustomed haunts, it manifests little dread of man. The fondness which it affects for sequestered retreats, is, doubtless, due to the ready supply of particular food-stuffs which it there finds. No feature of woodland scenery is more attractive to the Wagtail than running water. Its appreciation is shown by its common tendency to breed inclose contiguity. The small aquatic insects, in divers stages, which are denizens of such

aces, constitute a permanent part of its diet. To cure which, the birds will often wade in the water to the tibiæ.

Building operations usually commence during the latter part of May, but not later than the first of June. Both birds labor in the construction of the nest almost continually for three days. A cavity in a decayed log is occasionally selected for the site, but, ordinarily, the nest is placed upon the ground within a dense growth of underbrush. The leaves which are abundant in such places, materially aid concealment. It is composed of mosses, leaves, stems of grasses, and rootlets, externally, and has the inner structure mainly lined with various mosses. It is a beautiful fabric, but characterized by a notable flatness and shallowness.

A wonderful degree of affection and solicitude is manifested by the male-bird for his partner. During incubation when approaching footsteps lead him to suspect danger, he endeavors by feint or stratagem, to decoy the intruder from the place of the nest. In this he is singularly successful.

Incubation specicly follows nest-completion, and lasts for 10 days. While the female is thus occupied, the task devolves exclusively upon her, the male-bird remains in the immediate vicinage ready to obey the slightest call, or to guard against encroachment or assault.

The young are objects of the most devoted parental care. The mutual labors of the parents

in their behalf are unremitting during the period of helplessness; at the expiration of three weeks they are thrown upon their own resources. The species is single-brooded.

The following beetles constitute a portion of its bill of fare:—*Platynus capripennis*, *Harpalus pennsylvanicus*, and *Cratonychus pertinax*. Later in the season the neuropterous larvæ of *Agrion* and *Phryganea*, the diptera *Culex taeniorhynchus*, and the larvæ and imagos of *Noctuids* and *Tineids* which abound at the time.

Its song is loud clear and ringing, beginning with a sudden gush of melody and gradually decreasing until scarcely audible. Like most of the Warblers while singing it does not like intrusion. During its winter residence in Jamaica it is devoid of song and merely utters a monotonous *chip*.

The eggs of this species are oblong-oval in figure, pointed at one extremity and rounded at the other. They are marked with dots, lines, and dashes of umber-brown, varying in tints upon a clear white ground, which are more numerous about the larger end. In some, these markings are larger and bolder; while in others they are reduced to mere points, and are pretty evenly diffused over the entire surface, or are confluent about the larger end forming a ring, while the rest of the egg is unmarked. They average .84 of an inch in length and .67 in breadth.

In some sections of the country, particularly in sheltered localities, such as dense woods afford,

small numbers of this species are resident throughout the entire year. Such is not the case in our latitude, as far as our observations have extended.

Seiurus ludovicianus, **Bonap.**

The Louisiana Water Thrush is an uncommonly rare species in eastern Pennsylvania. Like its nearest congener which we have just spoken of, it inhabits the margins of creeks, swampy grounds, and low damp woods. It is pre-eminently the quickest, as well as the most restless of the *Sylvicolidæ* though mainly terrestrial in its habits. When observed upon the wet ground, the posterior part of its body is somewhat elevated, and is being constantly tilted up and down. It makes its appearance about the middle of May, and during its stay, it is exceedingly shy and suspicious. When started it flies up suddenly with a sharp and startling chatter.

Its flight is easy, continued, and low; whereas upon the ground it has a graceful walk.

The song of this species is rich, loud, vivacious. It begins very high and falls with a gentle gradation, until the last notes are scarcely articulated. When singing it perches upon the lower branches of a tree overhanging the water, which it occasionally deserts for the topmost boughs. Audubon speaks of its notes as rivalling those of the nightingale in mellowness, variety, and power. The call-note is a simple sparrow-like chirp.

Insects and their larvæ are mainly its diet.

These are mostly of terrestrial character, although it has been observed to capture them upon the wing. Among beetles, *Chrysomela cæruleipennis*, *Cymindis viridipennis*, *Bostrichus pini*, *Haltica chalybea*, *Buprestis luridus*, *Cratonychus cinereus*, *Platynus cupripennis*, *Pangus caliginosus*, are eaten, besides various dipterous forms, *Tabanus lineola*, *Culex tæniorhynchus*, and *Asilus sericeus*, ants spiders, earthworms, aphides, and larvæ and imagos of *Harrisina Americana*, *Lithosia miniata*, *Anisopteryx vernata*, and other geometers, *Utetheisa bella* and many *Noctuids* which are found in sylvan retreats.

The nest of this bird is generally placed at the base and among the roots of a tree, and frequently alongside of a decayed log. Nidification commences about the middle of May. Externally the nest is formed of dry leaves, grasses, and mosses, and lined internally with fine grasses, and occasionally a few hairs. The period of incubation is between 13 and 14 days; the duty is performed wholly by the female. In from ten to twelve days the young are prepared to leave the nest, but still continue with their parents. When disturbed while with young, the female utters the most piteous and agonizing cries, all the while fluttering about the ground with expanded wings and tail; while incubation is progressing, in case of disturbance, she quietly slips out of the nest, flies a short distance where she remains a passive spectator of the proceedings enacted.

The eggs are four in number, flesh-colored and marked with a sprinkling of dark-red at the larger end.

Oporornis agilis, **Baird.**

The history of this extremely rare and beautiful species, the Connecticut Warbler, is involved in considerable obscurity. Nowhere very abundant, solitary individuals have been observed by us in Delaware Co., Pa., just beyond the limits of Philadelphia. Its appearance occurs between the 1st and 10th of May; and by the 10th or 20th of the month, it resumes its journey for more northern climes. All that we have noticed at this time were males, which fact conducts to the inference either that females retire from their southern homes subsequently to the former or at the same time, and either go directly to their breeding-quarters, or being more retired, seek the coverts of dense thickets.

The males do not appear shy, judging from their behavior. They delight to visit the trees along streams of water, and show a decided predilection for the common *Salix lucida*, doubtless, on account of the ready supply of insects which it finds among its leaves and branches.

Its movements are extremely agile, which its specific name would seem to imply. It has all the address of the *Paridæ*, and in the skill with which it captures an insect upon the wing, it almost rivals the *Muscicapidæ*. It is unquestionably true

that it is sometimes terrestrial in its habits of feeding. Insects of exclusively terrestrial habits, and seeds of graminaceous plants have been found in its stomach. Apart from such evidence, we have the testimony of able writers. According to our experience its habits are mainly arboreal; being only occasionally terrestrial.

When disturbed by the too near approach of human beings, it quietly shifts its quarters by short flights as long as the annoyance continues.

Its only note which it utters whilst gleaning alone for food, is a simple *twēēt*, resembling very closely the ordinary call-note of *Dendroæca coronata*. This is pronounced at irregular intervals and is so intimately related to that of the just mentioned species, that even the most critical ear is apt to be imposed upon.

The following insects are preyed upon in vast numbers:—*Platynus cupripennis*, *Harpalus compar*, *Cratonychus cinereus*, *Bostrichus pini*, among coleoptera; *Culex tœniorhynchus*, *Tabanus lineola*, among the two-winged flies; besides the small pulmonary and tracheary *Arachnidæ* which infest the leaves, and discover suitable lurking places within the creviced bark of trees.

During the autumnal migration, its presence has often been observed by some of our ornithological friends, although not by us.

Of its habits of nidification and incubation, description of its eggs, and the extent of its distribution, our knowledge at present is very limited.

It was supposed by Mr. Turnbull to be a summer resident in Pennsylvania, which is probably not the fact.

Oporornis formosus, Baird.

The Kentucky Warbler, though an abundant species in the Southern and Southwestern States, is very rare in Eastern Pennsylvania. It is never gregarious, but is always observed alone. It makes its appearance during the latter part of April, or the beginning of May, and is always to be found in ravines, or on the outskirts of low woods bordering upon the banks of streams of water. Its habits are eminently terrestrial; but it is occasionally found upon low bushes, but has never been known to visit the tall tree-tops. It is naturally quiet and reserved. Whilst feeding it reminds us very forcibly of the *Seiuri*, especially *noveboracensis* and *ludovicianus*, having the tilting movement of the body, and horizontal perching attitude so characteristic of these birds.

During its brief stay of a week, it does not utter a single note to remind us of its presence. Its sole business seems to be the procurement of food. It is not until it has reached its breeding-quarters, and is in pursuit of a partner, that it essays the power of song. Its usual note, according to Mr. Ridgway, "is a sharp *tship* almost precisely like that of the Pewee (*Sayornis fuscus*), uttered as the bird perches on a twig near the ground, continually tilting its body, or is changed into a sharp rapid

twitter as one chases another through the thicket." Its song is said to resemble in style that of *Cardinalis Virginianus* though finer in tone, and feebler. The song is said to resemble *tweedle-tweedle*, by Wilson.

Like its near relative just described, this Warbler is exceedingly restless, hopping from twig to twig in continual pursuit of insects, larvæ, and berries for food. It seldom pursues an insect on the wing. Its flight is low, slightly sustained, and executed with a gliding movement.

The insects, mostly beetles, which contribute to its nourishment, are chiefly terrestrial in character. We have detected remains of *Cratonychus cinereus* with larvæ, *Harpalus compar*, *Casnomia pennsylvanica*, *Platynis cupripennis*, and *Scarites subteraneus*, besides *Formica sanguinea*, *F. subterranea*, earthworms, a species of *Tulus*, and various spiders.

We have never known it to breed within the limits of Philadelphia. Dr. Brewer describes in "North American Birds," a nest that was obtained from Chester Co., Penn. by J. P. Norris, Esq., that had evidently been located in a bed of fallen leaves. Its basal part was loosely built of dry leaves, upon which was placed a superstructure constituting a coarse lining of plant-stems and long, wiry rootlets. It was a comparatively flat structure, six inches in diameter, and two in height; the cup being only one-half inch in depth.

Dr. Gerhardt speaking of this nest in northern

Georgia, says it is built generally "on the ground under a tuft of grass, often on a hillside and always in dry places." Externally, it is mainly composed of leaves of the oak and chestnut, loosely aggregated, and possessing scarcely any coherence. Internally, a mass of dark-brown roots, compactly interwoven, exists. The nests are awkwardly and inelegantly made, large in comparison with the size of the bird, and measure four inches in diameter, three in height, and two in depth of cavity. Another nest which the same writer describes, was nearly spherical, with an arched entrance, partially lateral in position. It was partly constructed of partially decayed leaves, somewhat loosely impacted together, which were strengthened by a framework of twigs, stems, and rootlets. Within, hair, finer rootlets, and fibres constituted a snug lining. This nest measured six inches in diameter, and five in height.

The eggs are four in number, sometimes three, and often six, and in Georgia are deposited from the 4th to the 15th of May. They are oblong-oval in form, and sprinkled with fine, red, and reddish-brown dots on a clear-white ground-color, which are more numerous about the larger end. They measure .68 of an inch in length, and .55 in breadth.

The young are said by Audubon to remain with their parents until they retire to their winter-quarters in Mexico, Panama, Guatemala, and Cuba.

In the "American Naturalist" for October, 1875,

A. K. Fisher, Esq., of Sing Sing, N. Y., describes a nest which he and a friend discovered in a woods "overgrown with ferns and other perennials." It was built at a slight elevation from the ground, and was composed of coarse grass and dry chestnut leaves, externally, and lined with horse-hair. It was located not more than 20 feet from the public road.

Geothlypis trichas, **Cabanis.**

This beautiful and exceedingly active little species, the Maryland Yellow Throat, generally arrives in the latitude of Philadelphia during the first week of May. It is mostly paired on its arrival; sometimes, isolated individuals are observed. Few species are more eminently social and confiding. At its earliest appearance it consorts with our common sparrows, and delights in the society of man for whom it manifests marked attachment. As the season advances and the time of nesting draws near, it forsakes such places for more quiet retreats.

This species combines the attributes of the *Paridae* with those of the *Muscicapidae*. It moves among the branches and foliage of trees, and often suspends itself from the former with the nimbleness of the little Black Cap; and perched upon a small twig, ever on the alert, it seizes a passing insect with the ease and dexterity of a Flycatcher. It is not strictly arboreal whilst feeding, having been frequently observed by us gleaning among the forest leaves.

Its food consists principally of coleopterous and lepidopterous larvæ, although other kinds are devoured when there is a scarcity of its favorite diet. At first, it subsists upon beetles. Among which may be mentioned *Mycetochares basillaris*, *Isomira sericea*, *Donacia metallica*, *D. confluens*, *Platynus cupripennis*, *Harpalus pensylvanicus*, *H. compar*, *Scarites subterraneus*, *Chrysomela cæruleipennis* and *C. spiræa*; *Formica sanguinea*, *F. subterranea*, *Selandria rosæ*, *Apis mellifica*, *Megachile centuncularis*, among hymenoptera; *Syrphus obscurus*, *Culex teniorhynchus*, *Tabanus lineola*, *Scatophaga furcata* and *Musca domestica*, among diptera; besides small spiders, earthworms, aphides, and the common species of *Julus*. Later, the larvæ of different lepidoptera are eaten in great numbers. Some of these are *Harrisina Americana*, *Anisopteryx vernata*, *Utetheisa bella*, *Gortyna zeæ*, and mature forms of *Spilosoma Virginica*, *Orgyia leucostigma*, *Penthina pomonella*, *Acronycta obliterata*, and numerous *Noctuids* and *Tortricids*. During the past season, the Maryland Yellow Throat has been a common visitant to low, marshy grounds, where it may be frequently observed perched upon a tussock of grass, on the alert for small insects; occasionally, small, shallow pools on account of the aquatic insects which swarm in such localities, are chosen.

The song of this bird is a lively and pleasing refrain, easily recognized, and exhibiting at times marked variety. It resembles very closely that

of the Summer Yellow Bird. When in the full vigor of song, about the 15th of May, this resemblance is not so marked as has been anticipated. Its melody consists of a few short syllables, repeated rather quickly and uniformly, and with a loud, distinct, and sharp intonation, and may be quite accurately expressed in language by *tēē-whīt-tī-tēē-whīt-tī-tēē-whīt-tī*. Whilst the singer continues his protracted search for insects, the irksomeness of the task is occasionally relieved by *whīt-whī-tī-tēē-tēē*. Its ordinary note is a simple *twich* which is uttered very infrequently.

As fond as this species appears to be of cultivated grounds and lawns, subsequently to nidification, it has never been observed by us to build in similar places. For this purpose it usually seeks the retirement of thickets where there is a dense growth of brier-bushes; but, occasionally, the nest occupies the centre of a huge skunk-cabbage, carefully concealed by its broad leaves, a not very agreeable locality judging from a human standpoint. We are told that this species is more partial to low than high grounds, preferring moist to dry situations. Our observations have been such as to warrant the assertion that there is a strong predilection for the latter places. With but a single exception, all the nests which we have discovered during the past five years, to the number of twenty and upwards, have been built upon high grounds along the borders of thickets, in comparatively dry places. Ordinarily, the base of a brier-bush where

there is an accumulation of dry leaves, is wisely selected for building-purposes.

Nidification does not usually take place until three or four weeks after the arrival of the species, which is often during the latter part of May, but not later than the beginning of June; the period apparently depending upon the forwardness or backwardness of the season. Unlike the Redstart, the work is the joint labor of the sexes, and is prosecuted with remarkable diligence until completion. At the ordinary rate of working, a nest is five days in building. But little time is lost preparatory to oviposition. This requires from four to six days, and is dependent upon the number of eggs which is daily deposited, and proceeds at the rate of one egg *per diem*. Incubation takes place on the day of deposit of the last egg, or the succeeding day, most generally the latter, and continues for a period not exceeding 10 days. The duty devolves exclusively upon the female. While she is thus engaged, the male actuated by the purest affection administers to her necessities with the most commendable zeal and alacrity.

When not thus employed he remains in the immediate neighborhood ready to resist any attack which may be made upon the nest. On the approach of human beings he evinces the utmost restlessness and solicitude, and seeks by the most pitiful cries to withdraw the intruder from any contemplated assault.

The young are objects of the tenderest care.

They are fed with the larvæ of small beetles and lepidoptera mainly; but the various species of our common diptera are also freely eaten. But a single brood is reared in a season. The young are able to leave the nest in about twelve days; but remain under parental care for a week longer, when they are obliged to shift for themselves, still permitted, however, to enjoy the society of their parents.

The nest in the latitude of Philadelphia is built after the following fashion. Firstly, there is a periphery of loose leaves chiefly of *Quercus* and *Fagus*, which are held in position by the circumferential walls of the cavity in which they are placed. Internally, there is a layer of bark of the wild grapevine loosely interwoven, and lined with narrow strips of the inner bark of *Quercus* and *Castanea*. In the construction of the rim there is no evidence that would lead a person to suspect the existence of a palisade or hedge for protective purposes. Of the many nests which we have seen and examined *in situ*, not one has ever presented the slightest indication of such an appendage. They have nearly all been inclined at angles varying from 20 to 45 degrees, and have been deeply imbedded among the roots of brambles, and invariably concealed from view by leaves.

After the breeding-period is over, the Yellow Throat revisits but occasionally cultivated districts, preferring, however, the solitary, dense forests. It retires to the south during the latter part of September.

The eggs are a beautiful crystalline-white, and are dotted and blotched around the larger extremity with purple, reddish-brown, and dark umber. They measure about .64 of an inch in length, and .53 in breadth. The size varies with the latitude; the largest coming from Kansas, and the smallest from Georgia. Within its nest, we have frequently found the eggs of *Molothrus pecoris*, as many as two at a time.

Geothlypis philadelphia, **Baird.**

The Mourning Warbler is one of the rarest of our spring migrants. It makes its appearance early in May, and retires north to breed not later than the 22d of this month. We have observed it but once in four years. It is a solitary bird, and delights in low bushes, rather than high, open thickets which most Warblers are accustomed to frequent.

It is fearless and unsuspecting, and suffers itself to be approached without exhibiting the least alarm. In habits, it resembles the species last described in many particulars. In search of insects, it is an energetic creature, clambering along the branches of small shrubs, and freely suspending itself from their extremities, head downward; and as often darting forward with notable skill to secure some passing insect, which it accomplishes with nearly the dexterity of a Flycatcher. When molested, it does not seek safety in prolonged flight, or climb to the tops of tall trees, but merely

avoids any supposed danger by short flights from bush to bush, all the while seemingly manifesting as little timidity and concern as is possible under the circumstances.

Its food consists chiefly of small spiders, and the various species of *Aphidæ* which are the curse of florists, on account of the immense mischief which they commit; besides small beetles as *Bostrichus pini*, *Chrysomela cæruleipennis*, *C. formosa*, *Donacia confluenta*, *Harpalus compar*, *Platynus cupripennis*, which it procures from the foliage of bushes and the surface of the ground; for like its nearest congener last described, this species is both terrestrial and arboreal.

During its stay, not a single note is uttered. It remains the same busy, songless creature to the last; its chief concern being the gratification of a most vigorous appetite. Mr. Maynard in speaking of the song of the male which he heard at Lake Umbagog, Maine, says in substance, it is heard early in the morning from the dead branch of a tree, or the top rail of a fence, and is loud and clear, resembling slightly that of *Seiurus noveboracensis*. Nuttall describes the song of a species which he presumed to be the one under consideration, as a very agreeable warble, resembling the lively chant of the Yellow Throat partially, and to a certain extent the song of *Dendroica æstiva*. Br. Burroughs likens its song to that of *Oporornis formosa*.

From its manner of feeding we should infer that

it builds either upon the ground, like the Yellow Throat, or else upon small bushes; for as a rule subject to some exceptions, however, the site for a nest measurably depends upon the terrestrial or non-terrestrial habits of a species. Birds that generally feed high up in trees, usually nidificate in such places; those that feed within small trees and low bushes, build low down; whereas, species that are eminently terrestrial in their habits of feeding, or frequent very low bushes, build most generally either upon the ground within a tussock of grass, or in a concavity in the soil artfully concealed by dry leaves; but, occasionally, a nest is built upon a low bush. In "North American Birds" we learn that a nest of this species was discovered by John Burroughs, Esq., of Washington, "near the headwaters of the Delaware river in Roxbury, Delaware Co., N. Y." It was placed "in some ferns about one foot from the ground." From the very close resemblance which obtains between the breeding-habits of this species and those of *trichas*, it would be remarkably strange if it should deviate very widely from the latter in habits of nidification.

The nest alluded to was built in a hemlock wood; it was rather massive, and was composed of dry stalks and leaves, externally; its cavity was quite deep and was lined with fine black roots.

It has been known to breed in Waterville, Maine, and there are good reasons for supposing that it breeds in Vermont, as Mr. Paine has ob-

served a pair with their young at Randolph; and also in the Adirondack regions, N. Y., according to the authority of Mr. George Welch.

The eggs are oblong-oval in shape, acuminate at one extremity, and marked with dark purplish-brown dots and blotches of varying proportions. They measure .74 of an inch in length, and .54 in breadth. The probable number is three.

Subfamily Icteriinæ. Chats.

This group is of recent establishment. It was formed to accommodate the North America genus *Icteria* and its two tropical allies. The propriety of considering them as Warblers, has been much questioned. The genus *Icteria* is larger than any other *Sylvicolidæ*, and has the bill short, stout and compressed; the culmen and commissure curved; rictus devoid of bristles, and tip unnotched; the wings are rounded and usually shorter than the tail. The sexes have little color-variation. It is probable that the genus is restricted to a single species.

Icteria virens, Baird.

The Yellow-breasted Chat arrives in Philadelphia not earlier than the first week of May. The males apparently precede the females by at least three days. In disposition this species is remarkably shy, and affects a partiality for retired localities, which high woods with dense underbrush, and uncultivated fields with patches of brambles, afford. It shuns rather than courts man's society.

Its habits whilst feeding are both terrestrial and arboreal; it, however, restricts its foraging to low trees and shrubs. In general movements, there are noticeable remarkable agility and a certain degree of eccentricity. They frequently squat upon the ground, keeping up all the while a peculiar jerking movement of the tail; then spring upon their feet and display the most antic gestures. When surprised while thus occupied, they endeavor to effect concealment among the bushes, or seek security in flight.

The food of the Chat consists mainly of insects, although the fruits of the wild strawberry (*Fragaria Virginica*), *Rubus villosus*, and the common whortleberry are esteemed great luxuries. We have detected in the several stomachs which we have examined, the presence of *Pangus caliginosus*, *Harpalus pensylvanicus*, *H. compar*, *Scarites subterraneus*, *Platynus cupripennis*, *Bostrichus pini*, *Donacia pusilla*, *Chrysomela ceruleipennis*, and many other coleoptera; besides *Formica sanguinea*, *F. subterranea*, small spiders, and the smaller species of *Tulis*. Later, the smaller lepidoptera belonging to the *Noctuidæ*, *Tortricidæ*, and *Tineidæ*, in mature stages, besides the larvæ of *Anisopteryx vernata*, *Eufitchia ribearia*, *Clisio-campa Americana*, *Utetheisa bella*, and *Colias philodice* are eagerly hunted.

Its song consists of a variety of uncouth sounds easily imitated; at one time, comparing favorably with the whistling of the wings of a duck, being

loud and rapid, and produced with a gradual cadence; at another time, closely resembling the barking of young puppies; and, again, resembling the mewling of a cat, only hoarser. These notes are uttered with great vehemence in divers keys, and with peculiar modifications. Its voice, as it shifts from place to place, the possessor being unseen, seems to be more like that of a spirit than a bird. At one time it is close by: the next movement it comes from a distance; so that by these tricks of ventriloquism, it is not always possible to locate its whereabouts with any degree of certainty. The following syllables express its song during the period of nidification quite accurately:—*twi-wi-wi-wi-wi-wi*, *hwāwāwāwāwāwā*, *kūh,-chī-chī-chī-chī-chī*, *twēīīīīīī*, *chwēah*.

Mating commences during the last week of May usually, and nest-building early in June. The nest is generally placed within a forked twig of *Kalmia latifolia*, the smaller growths being invariably selected. It is rarely placed at a greater height than three feet from the ground. In a few instances we have seen nests in brier-bushes.

The nest is the joint labor of both sexes, and is the reward of patient and unwearied perseverance from three to four days. Oviposition instantly succeeds, and proceeds at the rate of one egg per day; this duty is followed by that of incubation which continues for a period of 11 days, the female performing the labor exclusively. Whilst the latter is thus employed, the male becomes a very

faithful and jealous husband. When not engaged in the procurement of food for her and self, he seeks to relieve the monotony of her task by his best vocal performances; and ever and anon, shows his delight by the most ridiculous and unmeaning rhapsodies and gestures. During these exhibitions of overflowing spirits, he chants his prettiest and best. The approach of an enemy on such occasions, is heralded by loud and noisy chatterings between fear and anger; and even frequent attempts are made to repel the intruder.

The young are objects of intense solicitude on the part of the parents. Both are assiduous in their efforts to provide them with suitable and abundant nourishment. Larvæ of various kinds, diptera, smaller lepidoptera, and the berries of *Fragaria Virginica* and *Rubus villosus* are in great demand. As they advance in age, their diet is increased in quality and quantity. In about thirteen days from the time of hatching they leave the nest, and in a week more they are thrown upon their own resources. In this latitude there is but one brood in a season.

In a nest before us which may be considered typical in Eastern Pennsylvania, the exterior is rather loose in structure, and composed almost exclusively of the inner bark of *Betula excelsa*, in strips from one-half to nearly three-fourths of an inch in width and nearly nine inches in length, in some instances. Interiorly there is a thick lining of roots compactly interwoven, and which gradu-

ally diminish in thickness toward the centre. Another nest which we possess differs materially in composition from the foregoing. It is composed exteriorly of skeletonized leaves of *Betula excelsa* in profusion, loosely arranged, and held in *situ* by the small and nearly vertical branches between which it is posited. Within, the inner bark of the wild grape-vine sparingly, culms of grasses, small sticks, and a soft lining of beech-leaves and slender stems of grasses, are noticeable features.

The breeding-period being past, it spends the remainder of its time until its departure early in September, in thick brier-bushes, and within close hedges; but occasionally forsakes such places for cultivated fields. Now its song can be heard at midnight, and frequently continues until daybreak. The early departure of the Chat is not due to the paucity of appropriate food-stuffs, but chiefly to its remarkable susceptibility to cold. On rainy days in August which are often attended with low barometric pressure, this species becomes so affected in consequence, as to render it easy of capture.

The eggs are four or five in number, rounded-oval in shape, and marked with reddish-brown and lilac spots upon a white and slightly yellowish background. They average .88 of an inch in length and .68 in breadth.

Subfamily Setophaginæ. Flycatching Warblers.

While many of the *Sylvicolidæ* are dexterous in

- the capture of insects upon the wing, the representatives of this group, accomplish the task with special address, for which reason they were formerly placed in the extensive old genus *Muscicapa*. The *Setophaginae* are mainly developed in Central and South America, where they embrace three or four genera with more than forty species. As some of them closely resemble the *Tyrannidae*, the presence of only nine primaries and the oscine character of the tarsi will clearly distinguish them from these clamatorial birds.

Myiodioctes mitratus, Aud.

The Hooded Warbler is almost exclusively a southern species, being found in South Carolina in greater abundance than in any other State. It makes its appearance early in May, but does not remain to breed. It leaves us about the 15th of May. It is fond of sequestered situations, and has been observed by us both in high and low grounds, in the laurel thickets of the Wissahickon hills, and in the dense undergrowth of many of its valleys. It is an expert flycatcher, pursuing its prey with spirit and activity until captured, and catching the greater part upon the wing. It is the liveliest of its tribe, and is almost constantly in motion. While gambolling from tree to tree, it has a peculiar graceful fashion of opening and closing its tail, which clearly distinguishes it from any other species.

The flight of this bird is low, gliding, and moderately sustained.

During its brief stay of a week it is apparently silent; not so much as a simple call has it been heard to utter. Coming alone and being a solitary and voracious feeder, its attention is so completely engrossed with appetital gratification, that other influences are temporarily held in abeyance. Its call-note is said by Mr. Audubon to resemble that of *Spiza ciris*, but difficult to distinguish; but its song of three syllables is loud, cheerful and agreeable, and resembles *weet, weet, wæetēē*. The species is pre-eminently vocal in the spring, so says the same writer, but ceases altogether at the time of the first hatching; its song is resumed when the mate is again sitting on her second set of eggs.

Its food consists of beetles, two-winged flies, and lepidoptera, principally. Although chiefly aerial, so to speak, in foraging for food, it is nevertheless, both arboreal and terrestrial. The following insects constitute a portion of its voluminous bill of fare:—*Cymindis viridipennis*, *Donacia metallica*, *D. confluenta*, *Bostrichus pini*, *Chryso-mela cæruleipennis*, *Casnonia pennsylvanica* and *Culex taeniorhynchus*, among diptera; *Apis mellifica*, *Formica sanguinea*, *F. subterranea*, *Selandria rosæ*, *Megachile centuncularis*, and various species of *Halictus* among hymenoptera; *Utetheisa bella*, *Lithosia miniata*, *Anisopteryx vernata*, in larval state, mature forms of *Spilosoma Virginica*, and many of the smaller *Noctuidæ* and *Tineidæ*; besides various species of aphides and spiders.

According to Wilson the nest is placed in the fork of a small bush and is very neatly and compactly built. It is formed externally of flaxen fibres of plants and moss, and lined with hair and feathers. Mr. Audubon says it is placed a few feet from the ground, and is found in low situations. The late Dr. Gerhardt of Georgia, in writing to Dr. Brewer, says that it is built of coarse grass and dry leaves, externally, and internally of pine-needles interwoven with horse-hair and long yellow grasses, and resembles the nest of *Spiza cyanea*, but is larger. The nest he further affirms is placed upon oak bushes, four or five feet from the ground, close by brooks and creeks, Mr. Ridgway states it to be a common summer resident in the bottom-lands of southern Illinois, where it inhabits the borders of bushy swamps and cane-brakes.

The eggs are four or five in number, oval in shape, and pointed at one extremity. They have a beautiful white background, flesh-colored when fresh, and are marked with fine, red spots, and a few of subdued purple. The length is .70 of an inch, and the breadth .50.

Myiodiocetes pusillus, Bonap.

The Green Black-capped Flycatcher is pretty abundant in Eastern Pennsylvania, where it arrives early in May *in transitu*, and leaves about the 15th of the same month. Like its near cousin

which we have just described, it affects a fondness for retired situations, where among the low bushes of low lands, and the small trees and underbrush of wooded hillsides, it is busy gleaning from morning until night. It is exceedingly shy and contrives to keep out of the way of danger. It possesses many of the attributes of the *Muscicapidæ*, and like *mitratus* exhibits much energy and spirit in catching its prey on the wing. It is at the same time both terrestrial and arboreal.

Its flight is low, gliding and tolerably protracted.

In the intervals of feeding, it is occasionally heard to utter a loud chattering song which Wilson was pleased to characterize as a "sharp, squeaking note, in nowise musical." Mr. Nuttall who displayed such a happy faculty in expressing the syllabic languages of birds, calls it a "little, cheerful songster, the very counterpart of our brilliant and cheerful Yellow Bird," and describes its song as resembling 'tsh-'tsh-tsh^{ea}. The call is short and far from being loud.

The following insects constitute a small fraction of its bill of fare:—*Donacia confluenta*, *Haltica chalybea*, *Cymindis viridipennis*, *Donacia metallica*, *Musca domestica*, *Scatophaga furcata*, *Aphis mali*, *Apis mellifica*, *Andrenæ*, *Halicti*, *Selandria rosæ*, *Anisopteryx vernata*, *Colias philodice*, *Eufitchia ribearia* in their larval state and mature forms, with many of the early *Noctuidæ* and *Tineidæ*; besides ants and small spiders.

This species breeds in high northern latitudes,

among the exuberant shrubbery upon the margins of the canyons of the lofty interior mountain ranges. Mr. Nuttall speaks of its breeding in Oregon, and Mr. Audubon in Labrador. We have no evidence that it breeds in our Middle and Northeastern States, but future explorations may show that in limited numbers it does so in North-western Maine.

A nest discovered in Oregon by Mr. Nuttall, on the 16th of May, was placed very adroitly upon a mass of *Usnea*, on a branch of the service-bush. It was composed externally of *Hypnum* mosses, and internally of dry, wiry grasses. Another found in Labrador by Mr. Audubon, was placed in the very centre of a thicket, at the extremity of a horizontal branch, almost concealed by the foliage of a stunted fir. It was composed of pine-twigs and dry mosses agglutinated to the leaves and branch upon which it was hung, and was lined with fine vegetable fibres. The diameter was three and a half, and the depth one and a half inches.

The eggs are usually four in number, obovate in shape, and spotted with reddish and brown dots upon a white background. Audubon describes these markings as forming a circle about the larger end, leaving the extremity plain.

Myiodyctes Canadensis, Aud.

The Canadian Flycatcher is quite abundant in Eastern Pennsylvania *in transitu*, arriving from its genial southern home early in May, and remains

for nearly three weeks, when it resumes its northward-bound journey. It leads a solitary life and being fond of retirement, ordinarily seeks the borders of dense woods, where among the smaller trees and shrubbery it procures a ready subsistence. When the apple and cherry are in blossom it vacates its former retreats for cultivated grounds which yield it an ample remuneration for its trouble.

It manifests but ordinary timidity when approached, and like the little *Parula Americana* before mentioned, only seeks safety in flight when closely pressed by its pursuers, merely indulging in short flights from branch to branch, and from bush to bush.

Whilst foraging, its movements are exceedingly agile and graceful, combining in a remarkable manner the peculiar attributes of both the *Paridæ* and *Muscicapidæ*. Like the former it moves with nimbleness along the trunks and branches of trees, in every conceivable direction; freely suspending itself from their lower surfaces, and occasionally poising itself before an expanding bud or flower; like the latter when the opportunity occurs, it will seize a passing insect with equal ease and dexterity.

Its habits whilst feeding are pre-eminently arbooreal, although there is ground for the belief that it is sometimes terrestrial. Several stomach examinations disclose the presence of beetles whose habits are exclusively terrestrial, as the following list abundantly shows:—*Thaneroclerus sanguineus*, *Haltica chalybea*, *Chrysomela cæruleipennis*, *Fero-*

nia chalcites, *Donacia confluenta*, *Harpalus pensylvanicus*, and *Platynus cupripennis*. Besides coleoptera, our commonest ants and small spiders are articles of diet.

During its temporary sojourn, like many other migrants, it does not regale us with a song; not even a solitary call-note is it heard to utter. Its song is heard in its more northern breeding-quarters. In Massachusetts it is said to be very pleasing, and heard very infrequently, and only in certain places.

There is no evidence that this species nidificates in this latitude. Audubon affirms that it retires to mountainous districts for this essential purpose. It is not easy to assign suitable reasons for such preference. An abundance of suitable diet, the absence of particular enemies, combined with force of habit, may have determined its choice of localities. The nest of this species according to Dr. Brewer, was "built in a trusssock of grass, in swampy woods, concealed by the surrounding rank vegetation, in the midst of which it was placed." It is described as being composed of decayed leaves, grapevine bark, fine stems, and rootlets in small proportion, with an excess of pine-needles, the whole being so loosely interwoven as to render removal impracticable. It was nearly flat and measured three and a half inches in diameter. Its greatest depth in the centre of the cavity was barely a half inch. This nest was obtained by George O. Welch, Esq., in Lynn, Mass., in June,

1856. Another nest which Dr. Brewer describes and which was found by the same observing naturalist, was more carefully and elaborately constructed, and possessed greater compactness.

The eggs are five in number, and marked with dots and blotches of brown and purple upon a clear white background, forming a wreath about the larger end. They measure .70 of an inch in length and .55 in breadth.

It returns early in September, stops a few days from its journey when it frequent sequestered localities, and continues a silent feeder until its departure during the last week of September,

Setophaga ruticilla. Swains.

The Redstart is far from being a rare species. At the time of writing, June 4th, it is uncommonly abundant. It appears often as early as the 20th of April, but never later than the 5th of May. It is never gregarious, but remains a solitary hunter until mating is accomplished: At first its foraging is restricted to high open woodlands, but as the season advances, it becomes more familiar, approaches our principal thoroughfares, visits our orchards and lawns and gleans amid the blossoms and leaves. It now becomes exceedingly tame, and suffers the nearest approach without fear or alarm.

Its movements and habits are those of a Flycatcher. In quest of food it moves with remark-

able agility, assuming a variety of attitudes; mingles among the leaves, and anon darts forward with unerring precision, seizing an unfortunate insect which has unwittingly strayed across its line of vision.

In the procurement of food it is as often found upon the uppermost branches of tall trees, as upon the nethermost, or small bushes. It is not strictly arboreal, having been found by us feeding upon fallow ground. At first it destroys immense numbers of beetles which afford it a rich nourishment; but its appetite soon cloys of such food, and diptera, aphides, and lepidoptera in their larval and perfect stages, constitute a happy exchange. We have detected the remains of *Rhynchænus pini*, *Bostrichus pini*, *Cratonychus cinereus*, *C. pertinax*, *Platynus cupripennis*, *Harpalus compar*, *Donacia confluenta*, *Chrysomela cæruleipennis*, among coleoptera; *Formica sanguinea*, *F. subterranea*, *Apis mellifica*, *Selandria rosæ*, *S. viti*, *Megachile centuncularis*, several *Halicti* and *Andrenæ*, among hymenoptera; *Musca domestica*, *Syrphus obscurus*, *Culex tæniorhynchus*, *Stomoxys calcitrans*, *Tabanus lineola*, *Tipula ferruginea*, among diptera; *Aphis rosæ*, *A. mali*, and other *Aphidæ*, the small spiders that infest the bark, leaves, and flowers of plants; *Tagenaria domestica*, *Epeira diadema*, and mature forms of the lepidoptera *Harrisina Americana*, *Lithosia miniata*, *Spilosoma Virginica*, *Penthina pomonella*, *Orgyia leucostigma*, many of the *Noctuidæ*, *Tortricidæ*, *Lyccenidæ*, and *Tineidæ*, with the

larvæ of *Anisopteryx vernata*, *Eufitchia ribearia*, *Pieris rapæ*, *Colias philodice*, *Pieris brassicæ*, *Utheisa bella*, *Eudryas grata*, *Catocalæ*, cutworms of the genus *Agrotis*, and others, *

The song of the Redstart resembles very closely that of *Mniotilta varia*, but is less prolonged and delivered more quickly and in a sharper key. It may be aptly expressed by the syllables *tsi-tsi-tsiwě*, the last syllable ending very abruptly. Its ordinary call-note is a simple *tsich*, the two final letters have the German pronunciation.

A peculiarity of this species whilst singing deserves a passing notice. As if possessed of a high degree of self-esteem and an over-anxiety to display its attractions to the best advantage, it habitually elevates and opens its wings, expands its tail-feathers with a show of affectation, all in harmony with the rhythm of its song. The females vie with the males in their vocal powers.

We are led to believe that the males migrate several days in advance of the females, as they are the first to manifest themselves. The sexes pay little regard to each other's presence at first; selfish gratifications predominating over every other motive or consideration.

This species breeds mostly in retired localities, as dense woods with a thick underbrush. Occasionally, nidification occurs close to human habitations. After mating, about the 20th of May, the birds commence to construct their nests, which is usually the case during the first week of June,

sometimes during the last week of May. A small bush is selected for this purpose; most commonly *Juniperus communis*; the nest being seldom placed higher than from five to six feet above the ground.

The labor of building devolves upon the female, mainly; the male occasionally rendering a little assistance. While his partner like a true and faithful servant plies her task with indefatigable zeal, he occasionally deserts his post close by, to inspect the character of the work, and occasionally deigns to adjust a stray piece, or to render the structure more symmetrical. The work continues through the day, and is prosecuted with commendable rapidity. Ordinarily, it requires a period of three days to complete a nest, which is about the time the Summer Yellow Bird devotes thereto. Whilst the female is laboring hard under the surveillance of her lord, the male as if to encourage and stimulate her to greater exertions, rewards her occasionally with a juicy *tidbit*.

The nest is built in a crotch, and held in position by nearly vertical branches. It presents, exteriorly, at a short distance, a decided resemblance to the nest of *Dendroæca æstiva*; but, upon critical examination, perceptible differences are found to exist. The periphery of the nest is composed of hempen fibres of *Linum Virginianum* and *L. usitatissimum* almost exclusively, with a few spiders' webs; interiorly, there is a profusion of horse-hairs. The height is four inches, and the diameter nearly two and a half. The diameter at

the mouth and the depth of the cavity are the same, being about two inches. The structure is beautifully symmetrical, hemispherical in shape, and neatly and compactly woven:

Oviposition is closely attended upon nest-completion, and proceeds at the rate of one egg per day, until the number is laid which requires a period of four days. Incubation subsequently follows, and lasts for 11 days, the female performing the labor exclusively. Whilst she is thus occupied, her partner administers to her necessities. When not thus occupied, he remains near by, manifesting the utmost solicitude.

When danger is imminent, he comes boldly to the front, and endeavors by his clamors and menacing attitudes, to inspire fear on the part of the intruders. He is bold and courageous, and like the Ruby-throated Humming Bird, darts with gaping jaws into the face of the person who dares to disturb his nest or mate. The female is so strongly attached to her nest, that she will permit a very close approach before she can persuade herself to vacate.

The young are objects of more than ordinary solicitude. Both parents labor unremittingly to provide them with suitable and abundant nourishment. They are fed upon young caterpillars and larvæ of various insects which the parents procure at great distances. The larvæ of *Anisopteryx vernata* and other geometers, *Colias philodice*, *Harrisina Americana*, *Eufitchia ribearia*, and *Cli-*

siocampa Americana; besides mature forms of *Musca domestica*, *Tabanus lineola*, *Syrphus obscurus*, *S. obliquus*, *Formica sanguinea*, aphides, and small spiders in abundance, are largely devoured. Late in the season, both young and old subsist in part upon the berries of *Juniperus Virginiana*, and the seeds of grasses. The young leave the nest in about 12 days after being hatched, and in a week more are fitted to care for themselves. The species is single-brooded. Both young and old retire to their winter homes late in September, spending the interval of time between brood-raising and retirement, in cultivated fields.

The eggs are usually four in number, grayish-white, and blotched and dotted with purple and brown. They average .63 of an inch in length and .50 in breadth; they resemble slightly those of *D. æstiva*.

Family **Tanagridæ**. *Tanagers*.

This extensive and beautiful family is restricted to America. The species are chiefly tropical. Its precise position is undetermined. The single well-established North American genus *Pyrranga*, embraces birds of brilliant colors with marked seasonal and sexual variations in plumage. In distribution it is rather southerly, never passing beyond the limits of the United States.

Pyrranga rubra, Vieill.

The Scarlet Tanager may be considered as one

of the most conspicuous and brilliant of our summer occupants. From its appearance early in May until its departure during the first week of September, it accomplishes an immense amount of good in the destruction of many insects in their various developmental stages.

Within secluded situations this species displays a certain amount of shyness and timidity, which it throws aside on its visits to the domains of man. We have frequently approached within a few paces of it without exciting undue alarm. In wooded regions it seeks the topmost boughs of the tallest trees, where it gleans for hours its daily subsistence. The apple and pear are its favorite trees outside of its natural haunts. In its habits of feeding it is far from being strictly arboreal, as we have known it to follow the plowman in company with the Robin and Purple Grackle.

This species is never gregarious. Early in the season the sexes are dissociated, and lead solitary lives. From their earliest appearance, it is obvious that the male arrives in advance of the female. Perhaps the modest and unassuming garb of the female renders her a less conspicuous object of notice than her more highly favored partner.

The habits of the males on their arrival confirm us in our opinion. They seek the tops of the loftiest trees, and for an hour at least pour forth their choicest music, doubtless, with a view of attracting the passing females. We have known instances where a venturesome fellow had stationed

himself upon a tall tree by the side of a public road, utterly unconscious of his surroundings and aught else save the task which he had in view, and which he performed with commendable *vim*.

Within the coverts of dense woods, the male invariably seeks the tallest tree-tops, seldom changing his position unless to seize a passing insect, or to obey the call of a kindred species. At irregular intervals he utters his simple call of *chicharr*. The sounds are strangely delusive, seemingly emanating from a distance, when their author is evidently close by. Later in the season when the trees are covered with leaves, he is seldom observed. His gaudy dress needs to be concealed by enveloping leaves from the view of rapacious birds, which his stationary position materially assists in bringing about. In orchards and gardens adjoining occupied dwellings, it is true that his behavior is marked with less shyness and greater freedom. The less danger which such places afford, from the less frequent visits of rapacious birds thereto, doubtless furnishes an explanation to the fact. Birds of prey have a decided aversion to man, and hence the advantage which this species derives by building close to human habitations. The power of ventriloquism which is the peculiar property of the male, enables him to please his mate with sweet music, without revealing to his enemies his precise whereabouts.

The song of the male which is uttered at irregular intervals, is a moderately low and pensive

ditty, and may be quite accurately represented by the syllables *chĭ-chĭ-chĭ-char-ĕĕ-char-ĕĕ-chĭ*. It has been likened to the mellow notes of the Baltimore Oriole, but we are utterly unable even to trace the most distant relationship. In the mating season, and also on the approach of danger, both birds utter a low whispering warble, in a tone of marked sweetness and tenderness, as they move through the branches and foliage together.

The food of this bird consists of coleopterous, lepidopterous, and dipterous insects, with their larvæ. In July, various kinds of berries are eaten, and constitute an important part of its diet. In several stomachs which we have examined, have been found remains of *Harpalus pensylvanicus*, *H. compar*, *H. carbonarius*, *Plinius humeralis*, *Platynus cupripennis*, *Pangus caliginosus*, *Chrysomela cæruleipennis*, *Cratonychus cinereus* and *Lachnosternia hirticula* in their larval forms, earthworms, ants, and small spiders. Later in the season the larvæ of *Gortyna zeæ*, *Anisopteryx vernata*, *Eufitchia ribearia*, *Harrisina Americana*, *Eudryas grata*, the dart moth, with mature forms of the above, besides *Spilosoma Virginica*, *Lithosia miniata*, *Utetheisa bella*, and many of the *Satyridæ*, *Lycenidæ*, and *Tortricidæ*.

During the breeding-period which occurs late in May or the beginning of June, the male keeps at a wary distance, and his less suspicious mate is compelled to yield the protection which he should rightfully bestow. When her nest is assailed she

hovers about the head of the intruder evincing most intense anxiety and distress.

Building operations are begun about the 1st of May, the bulk of the work being performed by the female. The nest is placed upon a horizontal branch of the tulip-poplar or a species of *Quercus* on the outskirts of a grove, or upon an apple-tree in less sequestered situations. It takes but a few days to construct a nest, which is loosely put together and scarcely survives the season for which it is designed. Exteriorly, it is composed of rude sticks, with an intermixture of weeds and grasses; and is lined with roots, grass-stems, and occasionally the inner bark of *Castanea* or *Quercus*. After the completion of the nest and the usual complement of eggs is deposited, and being laid a day, incubation ensues. This devolves wholly upon the female. She is necessitated to provide her own nourishment. The time spent in sitting is about 12 days.

The young are fed by the female principally. Their food consists of the larvæ of beetles and lepidoptera, with mature forms of the same besides, spiders, earthworms, aphides, and dipteræ. In about two weeks the young leave the nest, and in another week, they are thrown upon their own resources.

So susceptible to cold is this species, that unusually chilly weather, many have been known to perish. We distinctly recall a season of unusual cold in May, which succeeded very oppress

weather in April, which was attended with unhappy consequences to the species under consideration. Many individuals were picked up which were so completely overpowered that life was imperilled. It departs for the South during the last week of September; sometimes, earlier, when the season is unusually severe.

The eggs vary from a well-marked shade of greenish-blue, to a dull white. The spots are reddish or rufous-brown, and more or less confluent at the larger end. They are four or five in number, and measure about .95 of an inch in length, and .65 in breadth.

CHAPTER IV.

Family Hirundinidæ. Swallows.

The Swallows constitute a perfectly natural group, and represent among Oscines, the fissirostral type of structure. Their resemblance to the *Cypselidæ* and *Caprimulgidæ* is one of analogy rather than affinity, though these birds were formerly placed in the artificial "order" *Fissirostre*. It is estimated that one hundred species of Swallows are recorded, many of which are probably not genuine. They are universally distributed, some of them like *Hirundo*, being more or less cosmopolitan; each of the grand divisions of the globe possesses its particular subgenera; and the American groups, with the exception of *Hirundo* and *Cotyle* being peculiar to this continent.

Formerly, Swallows bred in hollows of trees, in banks on cliffs, and like places, which is the custom with many yet; but the majority have abandoned their primitive haunts for the artificial nesting places provided purposely, or otherwise, by man. Some at present are in a transition state; for example, the Purple Martin which still clings to its old habits of breeding in hollow trees in our Western States; while here it avails itself of the boxes which are provided for its accommodation.

Stronger evidence could not be adduced to show the modifying influences which civilization has brought to bear upon indigenous birds.

Hirundo horreorum, **Barton.**

No one of all our North American species is more abundant and better known than the subject of the present sketch. From its first appearance in early May, till its departure about the 15th of September, the immense good which it accomplishes should prompt us to accord to it a generous welcome, and bestow upon it the full protection of the laws. The myriads of insects which it destroys during its temporary stay, should commend it to public favor.

It frequents our pastures where the cattle are grazing, and kindly relieves them of their dipterous tormentors, even alighting upon their backs for this purpose; it puts an end to the insects that infest our fruits and vegetables, and indirectly rids man of many of his inveterate insect-foes. It may be justly characterized as an unmixed good. Not the slightest tinge of evil, we are happy to say, exists in its nature, to mar the happy results which flow from its labors.

The solicitude which it manifests towards its fellows is proverbial. Who has not discerned its willingness and readiness to assist a comrade in distress, and the piteous cries of appeal which it utters when danger is imminent! These estimable traits are too well-known to require any portrayal

at our hands. The love which the male cherishes for his partner is remarkable. He feeds and caresses her; and we are informed by a reliable person, that he occasionally relieves her of the irksome duty of incubation.

In the selection of a nesting-place, special regard for the shelter and comfort of the female and the young is of primary importance. To secure these requirements, a barn, porch, or wagon-house, is usually selected. In rural districts, what are familiarly known as overshoots, with which some barns are specially provided for the accommodation of cattle, are called into requisition. Again, unoccupied springhouses, close by streams of water are favorite resorts. The above places are, doubtless, selected on account of the various dipterous insects which are to be found there. Appetital gratification has probably dictated the propriety of nidificating where a ready supply of food-stuffs can be obtained, with but little waste time and expenditure of physical strength.

Nests have also been found attached to the piers of bridges. In many localities there seems to be a decided partiality for such positions. In a rural part of Germantown, upon the east bank of a small tributary of the Wissahickon creek, stands a dilapidated building which is annually resorted to by these Swallows, for nidificating purposes. At this time, solitude and retirement are infinitely more desirable than sociality. Many birds which are pre-eminently gregarious before and after

breeding, manifest an utter repugnance to general society at this time.

Nesting ordinarily commences during the last week of May, sometimes as early as the 15th, and as often not before the first week of June. The labor is performed jointly by both sexes, and is prosecuted with considerable diligence until the nest is completed. The time thus spent seldom exceeds a period of six days.

A nest by our side which was built under an overshoot, and which may be considered a typical structure, is composed externally of ten semi-elliptical series of mud pellets, slightly overlapping each other in the manner of tiles, and intercalated with the culms and blades of fine grasses. Similar grasses in small quantity serve to strengthen the pellets, and thus act as girders to bind the elements of the fabric more closely together. Interiorly, there is an inner layer of the stems of *Phleum prætense*, another compactly pressed, and succeeded by a softer layer of the leaves of *Holcus lanatns*. The cavity is nearly two and a half inches, longitudinally, and about four, transversely; its depth is hardly an inch. The shallowness is compensated for by the greater length in the transverse direction. For a lining, soft feathers take the place of grasses.

After the lapse of two or three days, oviposition commences, and continues during a period ranging from four to six days, in accordance with the rate of laying which is one *per diem*. Incubation is

not entirely performed by the female as stated above; it lasts for a period of 11 days. The male is a very dutiful husband and administers most faithfully to his partner's wants. The young are objects of special parental regard. Their food consists of various diptera, aquatic larvæ, and small lepidoptera. We have never known more than one brood to be raised in a season. The fact that some birds are later breeding than others, has, doubtless, given rise to the impression that in some sections the species is double-brooded. The young are able to vacate the nest in about 14 days after breeding; and in a week or ten days more are prepared to attend to their own wants.

We have found the remains of the following insects in the stomachs of the many individuals which we have examined:—*Musca domestica*, *Tabanus lineola*, *Tabanus cinctus*, *Syrphus obscurus*, *Asilus sericeus*, *Stomoxys calcitrans*, *Scatophaga furcata*, *Culex tæneorhynchus*, and *Tipula ferruginea*, besides the smaller dipterous forms that are found skimming over the surfaces of pools and ponds of water; *Harpalus compar*, *Cratonychus cinereus*, *Casnonia pennsylvanica*, *Platynus cupripennis*, *Donacia confluenta*, *Cymindis viridipennis*, among coleoptera; *Spilosoma Virginica*, *S. acraea*, *Lithosia miniata*, *Utetheisa bella*, *Penthina pomonella*, *Anisopteryx vernata*, and many of the *Lycænidæ*, *Tortricidæ*, and *Noctuidæ*.

Its song especially during flight, is both pleasing and lively. It consists of a succession of twitter-

ings repeated in a very rapid and animated manner. When alighted, the song is slower and less animated, but none the less pleasing. The following syllables give a tolerably accurate representation:—*twit-ti-ti-ti*. Its ordinary call is simply *twit*.

Dr. Brewer affirms in "North American Birds" that "a striking peculiarity of these nests (Barn Swallows'), is frequently an extra platform built against but distinct from the nest itself; designed as a roosting place for the parents; used by one during incubation at night or when not engaged in procuring food, and both when the young are big enough to occupy the whole nest." We have no reason to doubt the above facts, coming as they do from so eminent authority. The existence of such an appendage may be a noticeable feature of the nest in certain sections; but our experience has been different. When a nest is fastened to the horizontal timber of a building, and in unexposed situations, there seems to be no necessity for such an appurtenance; but in the absence of suitable protection and convenience, it may serve a purpose.

The eggs are white with a roseate tinge in unblown specimens, and are marked with reddish and purplish-brown spots chiefly at the larger end. Their mean length is .77, and mean breadth .55 of an inch.

Tachycineta bicolor, Vieill.

The White-bellied Swallow, unlike the species

last mentioned, may be considered the least abundant of all of our swallows in Eastern Pennsylvania. It reaches this latitude early in May a little in advance of the Martin, and like the latter, is known to avail itself of a box for a nest; and from its earlier arrival, frequently lays claims to boxes which the martins by virtue of priority of possession are legally entitled, so to speak. A disturbance ensues, and the latter by reason of inferior strength are forced to seek quarters elsewhere. Where they have been induced to accept the conveniences of man, they soon enter on the most familiar terms with him, and for the many little kindnesses and attentions which he bestows, reward him most gratefully by their eminent services in the destruction of noxious insects.

Its movements are exceedingly active, but less so than the barn-swallow's. Like the latter it seizes much of its food on the wing; but its foraging is more arboreal and terrestrial. It subsists upon the following insects:—*Culex tæniorhynchus*, *Asilus sericeus*, *Scatophaga furcata*, *Tabanus lineola*, *Syrphus obliquus*, *S. obscurus*, *Anthrax elongata*, among diptera; *Harpalus compar*, *Cymindis viridipennis*, *Chrysomela cæruleipennis* among coleoptera; and *Acronycta obliterata*, *Spilosoma Virginica*, *Orgyia leucostigma*, *Pieris rapæ*, *Colias philodice*, *Penthina pomonella*, and many of the *Leucænidæ* *Tortricidæ*, and *Noctuidæ*.

In Eastern Massachusetts this species breeds exclusively in martin boxes; and in the western

part of the State according to Mr. Allen, it is the least abundant of the swallows; and is exceedingly careless in its selection. It has a breeding range from the 38th degree to high northern latitudes. Mr. Richardson found it breeding in trees on the banks of the Mackenzies river; Dale mentions it in Alaska, but it has not been observed in Greenland. In this latitude it is chiefly a denizen of woods, and builds almost exclusively in hollow trees.

Its nest is loosely built and is composed of soft leaves, fine meadow-grasses, and warmly lined with an abundance of down and feathers. We have never met with more than one nest in a season.

Its departure for the West Indies, Central America, and Northern South America, where it winters, takes place early in September.

The parents like those of the species last described, are strongly attached to each other, and manifest the utmost devotion to their offspring.

The eggs are a pure white, with a delicate pinkish tinge when unblown, and unspotted; oblong-oval in shape, and more pointed at one extremity than the other. They measure .88 of an inch in length and .54 in breadth.

Petrochelidon lunifrons, **Baird.**

The Cliff Swallow has been but occasionally observed within the limits of Philadelphia, but in Northumberland Co., to the westward, it is nearly as common as the Barn Swallow is with us. Its

appearance is noticed early in May. It seemingly delights in man's society, and attaches its mud-built nest to the eaves of barns and outhouses. From its first advent to its departure in the latter part of September, it is the same sociable creature.

Scores of birds have been known to nidificate in dilapidated buildings, constituting well-established and peaceful settlements. But most generally there is a strong aversion to such settlements, as evidenced by the many solitary nests which we have observed in comparatively out-of-the-way situations. This species, however, carries this feeling of sociability to the utmost.

The most perfect harmony prevails in each settlement. In a colony which we observed, a few years since, there were counted at least twenty domiciles arranged in a row underneath the projecting eaves of a barn; and what was truly remarkable, there was not discernible during the three weeks we spent in the neighborhood, a single exhibition of ill-nature or petulency.

The song of this Swallow which has been compared to "an unmusical squeak," rather than a twitter, is produced with a geniality of expression which abundantly compensates for its harshness. When the birds in their hurry would jostle each other, the utmost good feeling prevailed as evidenced by the same constant noise which they kept up.

The Cliff Swallow claims our generous indulgences. Like its near relative, the Barn Swallow,

it is vastly destructive to insects. Building close to the barn-yard, it meets a ready supply of its favorite articles of diet, which consists of the larvæ and imagos of *Musca domestica*,* mature forms of *Tabanus lineola*, *T. cinctus*, and the blood-sucking *Stomoxys*, which delight in such places. In the adjoining fields it destroys vast numbers of *Penthina pomonella*, *Anisopteryx vernata*, *Eufitchia ribearia*, and many of the *Noctuidæ* and *Tortricidæ* among lepidoptera; besides the young of *Ædipoda sulphurea* and *Æ. nebulosa*, for which it affects a peculiar fondness.

Nidification commences during the last week of May or the beginning of June. Both birds assist each other in constructing a nest; the principal part of the labor depends upon the male under the supervision of his partner. It has been affirmed that in large colonies it is a common occurrence to find several females engaged in incubation upon the same nest. We have never observed a similar circumstance, but do not doubt its authenticity. The mutual good-will which prevails in a colony would lead us to suspect the occasional existence of such a state of affairs.

The nest is hemispherical in shape, with a small opening at the side just large enough to admit the passage of the female. The retort-like figure, characteristic of the primitive form of structure, has never been observed by us. The exterior of the nest is composed of divers kinds of earth, procured from puddles and low shallow streams.

The interior is chiefly lined with feathers, but, occasionally, with a mixture of feathers and soft grasses, especially *Poa annua*. It is probable that the saliva of the birds materially aids in the agglutination of the particles of mud. The fact that the nests crumble to pieces with great facility, is no argument that this fluid is not utilized. They adhere so firmly to their supporting surfaces as to require considerable physical effort for their detachment. While intact they will endure the peltings of winter. The force requisite to separate them from the surfaces of contact, undoubtedly tends to diminish the force of adhesion resident in the mud-particles, and thus renders the structure exceedingly fragile, which has led some to believe that saliva is not used. The small twigs which compose the nest of the Chimney Swift, it is well-known, are held *in situ* by a viscid secretion elaborated by that species. Experience has taught us that this secretion loses its adhesive property in time, even when the nests are kept in either moist or dry situations. It is difficult to preserve a nest intact for a sixth-month. This is readily accounted for. Clay and earth of any kind being more porous and brittle than wood, it is a reasonable presumption that after the lapse of time when the saliva has lost much of its virtue, that it will yield with great readiness to natural forces. *In fine*, the saliva would mingle with the moisture of the clay, which moisture would be imparted to the clay, even in the driest places, and be equally

distributed among its particles; and the latter, deprived in a measure, of their means of cohesion, by desiccation, would crumble to pieces.

A nest is usually six days in building. Oviposition succeeds its completion. In the duties of incubation which require a period of 11 days, the female is occasionally relieved by the male. While she is thus occupied he is very attentive, vigilant, jealous, and affectionate. A stranger is not permitted within his territory without encountering the most unpleasant reception; the male strength of the whole community is mustered to wreak instant vengeance upon such temerity. Should a human being attempt any familiarities, he is instantly beset by numbers infuriated to the highest degree.

Two broods are generally reared in a season; one appearing early in June, and the other early in August. At the close of the breeding-season the birds still linger in their accustomed haunts, where they remain until the time of their southern departure.

The eggs are white and marked with reddish-brown blotches, which are chiefly placed about the larger end. They are less elongated than those of the Barn Swallow, and measure from .86 to .74 of an inch in length with an average breadth of .60.

Cotyle riparia, Boie.

Unlike the subject of the last article, the Sand Martin is more retired in its habits, but none the

less social in its character. It is less abundant than *Hirundo horreorum*, and makes its appearance about the middle of April, a little before the latter.

Its nests are placed in excavations in the banks along streams, in cliffs by the sea-shore, and in other suitable localities. In Philadelphia they are chiefly found in railroad cuttings, in clusters of a half-dozen or more. Though more retired than many of its family-relatives, this species cannot be said to be unusually shy and timid. It still retains much of its primitive manners.

In the sites which are chosen for nidification, no little forecast is manifested. The insects which are so abundant in such places, yield it an ample supply of food with but slight entailment of physical fatigue. The stagnant water-pools which are so common along railroads, outside the sleepers, are exceedingly prolific sources of insect-life.

While excavating a place for a nest, the birds work by turns; neither bird intermitting the labor until the task is accomplished. The length of time requisite to complete a cavity, depends much upon the character of the earth to be removed. It seldom exceeds four days, even under the most unfavorable circumstances. The requisite depth being attained, a circular apartment is constructed and lined with feathers.

Oviposition immediately succeeds, and is closely followed by incubation which continues for 11 days. In the labor of sitting we are inclined to

think that the male assists. The young are fed by both parents, which vie with each other in endearing attentions. Their food consists of mosquitos, small lepidoptera, and coleoptera; while their parents subsist upon larger insects. The following list embraces the bill of fare of the latter:—*Stomoxys calcitrans*, *Tabanus atratus*, *T. lineola*, *Asilus sericeus*, *Tipula ferruginea*, *Chrysomela cæruleipennis*, *Donacia metallica*, *Spilosoma Virginica*, *Anisopteryx vernata*, *Penthina pomonella*, and many of the *Noctuidæ*, *Lycænidæ*, and *Tortricidæ*; besides spiders and aphides.

Like most of the *Hirundinidæ*, the male is extremely sedulous in his attentions to the female. He is also as jealous as the male *Petrochelidon lunifrons*, and manifests his aversion to interference by repeated vociferations and gesticulations. Both birds are very fond of their young, as shown by the little attentions which they bestow upon them, and by the reckless bravery which they exhibit in protecting them from danger. The young are 12 days old when they leave the nest; in a week more they are able to sustain themselves.

The eggs are five in number, pure white, with a roseate tinge in unblown specimens, oval in shape, and pointed at the smaller end. They measure .71 of an inch in length, and .46 in breadth.

• *Stelgidopteryx serripennis*, **Baird.**

The Rough-winged Swallow is by no means

abundant in our latitude, and is chiefly a denizen of eminently rural districts, where it breeds in small numbers in the excavations of the Bank Swallow, but more generally between crevices in walls and arches of bridges over running water; in some instances, less than a foot above the surface. It arrives about the 20th of April; but in very backward seasons, as late as the 5th of June. During its early visit, it delights in the retirement of solitary streams, and then manifests considerable shyness. Its chief concern is the procurement of food.

Whilst foraging it is not so strictly aerial as the Barn Swallow, but has been observed on several occasions to glean among the foliage and branches of trees, but very rarely upon the ground. Its food consists principally of dipterous and lepidopterous insects, with a small percentage of coleoptera. Remains of the following insects have been found in the many stomachs which we have examined:—*Anthrax elongata*, *Tipula ferruginea*, *Culex tæniorhynchus*, *Tabanus lineola*, *Stomoxys calcitrans*, *Syrphus obliquus*, *Musca cæsar*, and smaller diptera which inhabit aqueous situations; common May-fly and other small neuropterous beings, and *Spilosoma Virginica*, *S. acræa*, *Orgyia leucostigma*, *Utetheisa bella*, *Colius philodice*, the smaller *Argynni*, with the most common of the *Lycænidæ*, *Noctuidæ*, and *Tortricidæ*.

Its flight resembles that of the Bank Swallow in being less firm and sustained than that of *Hirundo horreorum*.

This species is devoid of a song; its only notes being a few chirping calls which are easily recognized.

Nidification takes place generally about the 15th of May, at least three or four days after mating; and in cases where the excavation of a Bank Swallow has been selected for the site of a nest, it is but the work of a couple of days. Where the birds are compelled to excavate a place for themselves, they select a cliff composed of a soft, sandy soil, which prolongs the period for two days more. But where the crevices in the walls of a bridge are chosen for nidifying purposes, the structure being necessarily more compact, it requires the joint labor of the sexes for at least three days. The nest like that of the Bank Swallow is constructed of leaves and grasses, with a lining of soft feathers.

In 1843, in the neighborhood of Carlisle, Prof. Baird met a number of nests of this species, built within crevices in walls, and the arches of bridges over running water; in some instances being so close to the edge of the water, as to suffer material injuries in times of rain. Again, nests have been observed in out-of-the-way-places, for example, between the boards of a building in which was a water-wheel, where the female had to pass through a nut-hole to reach the nest.

Oviposition immediately follows nest-completion, and continues for six days, one egg being deposited daily. Incubation ensues the succeeding day and as far as we have been able to determine is

performed wholly by the female, the male providing her with nourishment. It continues for a period of 11 days.

The young are objects of special regard upon the parental part. Both birds guard them with a jealous care. Their food consists of the diptera before mentioned, spiders, and such larvæ as the parent-birds are able to procure from their surroundings. They are able to leave the nest in from 12 to 13 days, but are still provided for by the parents; the addition of a week to this period produces a marked difference in their development, and fits them for self-maintenance.

In the fall these birds are gregarious especially in the daytime, but on the approach of night the flocks break up and they retire to their resting-quarters for roosting-purposes. Their departure dates from the 20th to the last of September.

The eggs are oblong in configuration, pointed at one end, and of a pure white color. The average length is .75 of an inch and breadth .54.

Progne purpurea, Boie.

The Purple Martin in some parts of Philadelphia is not so abundant as formerly. We remember, when a boy, in our neighborhood, it was a very common visitant, and every available house or box, however rude, was taken possession of, on its arrival during the last week of April. This condition of affairs continued for several years; the birds being encouraged to build by the inhabitants

who often erected very costly buildings for their accommodation. At last the Blue Birds came upon the scene in great numbers, and being possessed of superior courage, and being more pugnacious and quarrelsome, the Martins were driven away; never to return.

Few species are more eminently sociable and confidential, and manifest greater pleasure in man's society, where suitable building conveniences are provided, than the subject of this sketch. In Bridgeton, Cumberland Co., N. J., it appears in immense numbers, reminding us of our childhood days.

Constant association with man for many years, has wrought a wonderful change in its character and habits. Except in special cases, nidification no longer takes place in hollow trees in secluded situations, but is now accomplished within our gardens and lawns. In the selection of a place this bird is not very particular; an old tin can, or a perforated gourd, is as truly acceptable as the most costly structure which affluence can affect. When there is a scarcity of boxes, &c., it does not hesitate to dispute the right of another species; even the mischievous little wren often finds its efforts to bar out intruders completely foiled. What this species cannot accomplish individually, it effects by combination; for in union there is strength.

Like *Sialia sialis* it has a strong attachment to the scenes of past associations, and frequents the same localities year after year, unless driven away.

Its quarrels with others, frequently result from their pre-occupancy of accustomed sites.

The great good which the Martins accomplish should commend them to our favor and esteem, and should be an inducement for us to extend to them our warmest sympathies and fullest protection. The beetles that injure our fruits; the aphides that sap the strength of our useful as well as ornamental plants; the various dipterous insects as *Musca domestica*, *Tabanus lineola*, *Musca cæsar*, and the *Ortalis* and its allies whose larvæ infest our raspberries and other fruits, and produce the galls of many of our commonest plants.

Like the Cliff and Bank Swallows, this species is fond of society. Where several apartments exist in a house, as many pairs take up their quarters; often six pairs have been known to occupy the same dwelling. The most perfect order and harmony prevail among the tenants; but woe to the feathered stranger that approaches; for the combined strength of the male portion of the entire community is summoned, to wreak instant vengeance upon him.

The males are strongly attached to their partners; and faithful and ever attentive to their wants. We are disposed to believe that the species arrives already paired, as we have never observed the least indication of anything that would lead to a different belief. When a male has once selected a partner, we know no instance where she has been abandoned, while living, for

another, during the season for which she was espoused. In some cases this alliance is dissolved at the close of the breeding-season, to be re-assumed during the subsequent spring; in others, the separation is, doubtless, permanent, another taking the place of the discarded suitor; again, the union is life-long. We believe that this relationship in some cases, at any rate, with the present species is life-long, unless this important business is attended to at the time of setting out from its southern home.

Nest-building commences about the 15th of May, and is the joint labor of the sexes. A nest is two days in building. Scraps of paper, leaves, grasses, feathers, and bits of strings, are utilized for this purpose. The whole is quite loosely arranged. Oviposition commences the day after the nest is completed, and lasts from four to five days; one egg being laid *per diem*. Incubation commences on the ensuing day, and continues for a period ranging from 11 to 12 days, according to meteorological vicissitudes, and the assiduity of the female. As we have not detected the male engaged in sitting, we presume that it is wholly-performed by the female. While the latter is thus occupied, he is very attentive, thoughtful, and provident. They are both extremely assiduous in their attentions to the young, and feed them upon the larvæ of various lepidoptera, mosquitos, small spiders, and mature forms of *Tabanus lineola*, *Musca domestica*, and *Ortalis* and its allies.

In about 12 days from the time of hatching the young quit the nest, but still continue to be fed by their parents for a week more, when they are prepared to provide their own nourishment; still continuing, however, to reside with their parents. Occasionally two broods are reared annually. Whilst the parents are engaged in rearing the second brood, the first is scouring the country for food; but returns in the evening to the place of common shelter, when suitable accommodations exist. In August, 1874, we were visiting in Brigeton, N. J., and had the privilege of studying very minutely the history of this species. Close by the place where we were staying, was located a house of considerable capacity, and possessing a dozen apartments. These were occupied by as many pairs of birds early in the season. Two broods had been successfully reared. At the time to which we refer, all the young had attained maturity, and were dwelling with their parents. Early in the morning, the almost deafening clatter that emanated from the building, told that its inmates were astir and prepared to commence their daily avocation. The departure of one from the building was the signal for the rest to do likewise; which they did to the number of sixty and upwards. Instead of leaving *instantly*, they kept circling around the house for at least ten minutes, chattering away at a fearful rate; and, then, as if by common consent, struck off in divers directions, and were not seen again until sunset, when they

returned to renew the circling movements of the morning with the same amount of noise, when one by one with as much regularity as the marching of soldiers, would drop into the building until the last had entered. A little din and chattering over the day's adventures, and all was quiet again. The presence of persons upon the scene did not cause the circle to waver in the least. Being very intent upon this sort of amusement, for such it seemed to be, nothing seemed to distract attention or cause desistance therefrom. The most unbounded confidence in man, acquired and strengthened by the peaceable enjoyment of his society for many years, has rendered this species exceedingly tame and unsuspecting. Few species manifest their trustfulness to such an extent. Their departure for warmer countries occurs usually about the 15th of September.

Their eggs are oblong-oval, being pointed at one end, and of an unspotted, creamy-white color. They measure .93 of an inch in length, and .78 in breadth.

Family Ampelidæ. Chatterers.

With some writers, this arbitrary and unnatural grouping of genera which agree in some, while they differ in other particulars, is placed in *Clamatores*, next to the *Tyrannidæ*. Dr. Coues is of the opinion that this family should be dismembered. The near resemblance of the *Myiadestinae* a sub-family, to the *Turdidæ*, as shown by Prof. Baird,

suggests, beyond doubt, the dissociation of the other two subfamilies.

Subfamily Ampelinæ. Waxwings.

This subfamily as restricted, includes but one genus with three species; one of Asia and Japan, one of Europe and America, and one indigenous to this country. Being songless, they are in marked contrast with the *Myiadestinæ* and *Ptilogonydinæ*. By a strange misnomer, these birds are designated "chatterers" which are in fact the most silent of all *aves*, their only voice being a wheezy kind of whistle. The head is crested, and the wings are provided with curious horny appendages of the color of red sealing-wax, the use of which is unknown. In our species the tail is tipped with yellow; the plumage very smooth and of a nameless color. The young are minus the wing ornaments, and have a streaked plumage.

Ampelis cedrorum, Sci.

The Cedar Bird, as the above species is exclusively called in some sections of the country, is tolerably abundant and exceedingly nomadic. It changes its quarters according as food becomes plentiful or scarce. Late in the autumn small flocks may be observed feeding upon the berries of *Juniperus Virginiana*, *J. communis*, *Vaccinium stamineum*, and *Liquidambar styraciflua*. In the middle of winter we have seen it subsisting upon the berries of *J. Virginiana*, *J. communis*, *Rhus*

glabra, *Lonicera periclymenum*, in sheltered localities, and the seeds of *Panicum*.

At all seasons except the breeding-season, it is pre-eminently gregarious; its continuance in a place being necessarily short. It is exceedingly shy, and can be approached only with much difficulty; the sportsman when desiring a shot is necessitated to take advantage of the cover of bushes.

Thickets of evergreens, particularly of the red cedar, are noted resorting places, on account of the requisite shelter and concealment which they secure. When changing its base of supplies, its flight is always lofty. The sight of birds being keenly developed, a lofty flight enables them to take into the range of vision broader scopes of country; and thus secures excellent facilities for food-detection. This *a-priori* assumption will, doubtless, account for the aforementioned habit ascribed to this species.

We have never observed its presence oftener than once in the same locality, during the cold weather. Late in May, when our cultivated varieties of *Cerasus* are in fruit, it returns in large flocks, and becomes a nuisance to the farmer. Its wanton destruction of cherries renders it exceedingly odious. The farmer's ingenuity is taxed to the utmost in devising means to check its devastation, since the species has little dread of the gun, and still less of contrivances in the guise of scarecrows. Its appetite for the juicy cherry is so perfectly

uncontrollable, that life is often sacrificed in its gratification.

Early in June the flocks break up into pairs, and nidification is the all-absorbing thought. Very few remain to build in the same immediate neighborhood; not more than a half-dozen pairs being seen in a circle of three miles. They have now abandoned their roving habits and the greater part of their shyness, and seek the society of man.

Nidification commences right after mating. For this purpose an apple-tree is usually selected; the nest being placed not more than ten feet from the ground. We have never known the species to build in low bushes. Next to the apple-tree the cedar is preferred. Their nests are rather bulky and compactly built. In "North American Birds," it is said that they generally build a strong framework, exteriorly, six or seven inches in diameter, and "composed of twigs, coarse stems of vegetables, and grasses." Within is placed "a compact, well-made fabric of grasses, grape-vine bark, and other finer substances," the whole being lined "with leaves and root-fibres."

We have examined many nests and they all differ very materially from the foregoing description. The nests according to our experience are far from being bulky. They are firmly built; the external framework is strong, composed of light materials, and is seldom more than five inches in diameter. It is built of a few small twigs, the culms of grasses chiefly *Poa annua* and *Phleum pratense*, fine roots

of grasses, slender stalks of *Ambrosia*, probably *artemisiæ folia*, cucurbitaceous tendrils, undeveloped leaves of *Pyrus malus*, exteriorly; and lined with soft flower-bearing stalks of *Panicum capillare*, and delicate roots of grasses, internally. The above is a description of a typical nest in this latitude. In a single nest before us, a marked deviation from the normal form is noticeable. The exterior is composed of the stems of *Poa annua*, *Phleum præ-tense*, small roots, dried leaves of *Verbascum Thapsus*, young green leaves of *Pyrus malus* and others. The entire framework is compactly bound together by long leaves of grasses, broad strips of colored rags and lint of the same, and variously colored strings. The rags and strips constitute a prominent feature of the structure. The interior is lined with strings, lint, flower-bearing stalks of *Panicum capillare*, fine roots of grasses, and tendrils of *Cucurbita*. The nest is four and a half inches in diameter, and three in depth; the cavity being three inches wide, and two and a half inches deep.

This last described nest was located upon a horizontal branch of an apple-tree near its extremity, and at a distance of fifteen paces from an occupied dwelling. A pupil of ours furnished the strings and rags alluded to. When these articles were first proffered, the birds were not slow to perceive the advantages which might accrue from their use. Even after he had ceased to supply the materials, the birds would fly to the bush upon

which they had been placed, as if to seek further favors. This they did several times. In view of these facts the strongest arguments would be required to convince us that this was not an exercise of reason of a simple order.

Nest-building usually requires a period of six days, and is the joint labor of the sexes; the male is chiefly occupied in fetching the materials, while the duty of his partner is the adjustment of them to their proper places; when disengaged from such services, she willingly assists her mate.

Oviposition commences on the day following the completion of the nest, and continues for five days; proceeding at the rate of one egg per day. Then follows the next day, the essential labor of incubation, which, as far as we have been able to determine, is the exclusive duty of the female, for a period varying from 13 to 14 days. Whilst his mate is thus engaged, the male acts in the capacity of purveyor. When not thus employed, he stations himself close by the nest and keeps the most vigilant guard. The approach of enemies is signalled by a low note. Unlike many other species which we have described, he lacks the courage to defend his nest and partner; but slinks silently away and becomes a passive observer of what follows. The female taking the hint follows his example.

It now feeds upon what berries it can procure, but more exclusively upon diptera, aphides and the larvæ of various species of lepidoptera. The

following insects constitute a portion of its bill of fare:—*Tabanus lineola*, *T. cinctus*, *Stomoxys calcitrans*, *Musca domestica*, *M. cæsar*, *Culex tæniorhynchus*, *Anthrax elongata*,* among diptera; *Aphis mali*, *A. rosæ*, *Apis mellifica*, *Selandria rosæ*, among hymenoptera; and larvæ of *Chærodes transversata*, *Angeronia crocataria*, *Ennomos subsignaria*, *Zerene catenaria*, *Anisopteryx vernata*, *A. pometaria*, *Lozotænia rosaceana*, *Anchylopera fragariæ*, and mature forms of *Utetheisa bella*, *Ægeria tupiliforme*, *Limacodes scapha*, and *Plusia precatio-nis*, among lepidoptera. In the fall it is less insectivorous and more frugivorous; subsisting upon *Juniperus Virginiana*, *Vaccinium stamineum*, *Lonicera periclymenum* and other fruits.

The young venture from the nest when twelve days old, but are not sufficiently matured until a week later, for self-maintenance. They do not, however, dissolve connection with their parents, but wander about from place to place with the latter, subsisting upon small lepidopterous larvæ, diptera, and the smaller coleoptera, until there is a scarcity of such food. On the approach of cold weather, they feed, as before remarked, upon various kinds of berries. The flocks at first are made up of individuals of the same family. But later, by the continual additions of small families which are met with in roaming from place to place, a large flock is the ultimate result.

Besides the low lipping call which the Cedar Bird possesses, it has a song which is uttered in a

very low key, so as to be almost inaudible at a distance of twenty paces, and which may be represented by *tzē*——*ē* produced with considerable uniformity of sound.

The eggs are slate-color, with a tinge of olive, and marked with blotches of dark purplish-brown, with penumbrae of light purple surrounding the darker spots. The average length is .86 of an inch, and the average breadth .65. In shape they vary from oblong-oval to nearly rounded forms.

Family Vireonidæ. Vireos and Greenlets.

This family which was formerly united with the *Laniidæ* which it resembles in the structure of the bill, has structural peculiarities in the feet by which it may be readily discriminated. The Greenlets are peculiar to America, and embrace five or six genera with nearly seventy recorded species, one-sixth of them being probably not genuine. The typical genus *Vireo* embraces thirty species, specially characteristic of N. America, seven occurring in the West Indies and Central America, one being exclusively West Indian, and the rest occupants of South and Central America.

Vireo olivaceus, Vieill.

The Red-eyed Vireo is one of the most abundant of our breeding species, in Eastern Pennsylvania. It arrives generally during the last week of April, but, occasionally, as late as the second week of May. It is a bold and fearless creature, entering

the principal thoroughfares of towns and cities, where its agreeable notes may be heard among the foliage of the maple, and other trees. It only occasionally nidificates in such places, from which we infer that it is only attracted thither by the necessity of food-stuffs. A nest, however, came into our possession lately which was found suspended from a maple twig in a densely-populated portion of our city.

In this neighborhood it nidificates almost entirely in thick woods. Its appropriate food-stuffs being more abundant in those places, it is natural to infer that it would resort there for the purposes of nidification. There are, doubtless, a few cases where building is performed close by occupied human dwellings, which the birds in their migrations would revisit under the spur of past associations. If nests exist in this latitude, in such places we are not aware of the fact.

In the pursuit of food which is chiefly insects, this species, in some particulars, resembles the Kinglets, and in others, the Flycatchers. It occupies the tallest tree-tops where it may be seen running along the branches, and mingling among the leaves, for whatever of insect-life abounds. When not thus engaged we have seen it perched upon a branch on the alert for insects which it would seize with the address of a *Muscicapa*.

Their food consists of various arachnids, cynips, diptera in their larval and perfect stages, hymenoptera, lepidoptera, and small beetles. Among dip-

tera they feed upon *Culex tæniorhynchus*, *Tipula ferruginea*, *Asilus sericeus*, *Tabanus lineola*, *Musca domestica*, and many species of *Anthomya*, *Ortalis*, and *Scatophaga*. The larvæ of *Anisopteryx vernata*, *Zerene catenaria*, *Anisopteryx pometaria*, *Chærodes transversata*, *Hybernita tiliaria*, *Asopia costalis*, *Halesidota tessellaris*, *Callimorpha Lecontei*, with mature forms of *Agrotis tessellata*, *Plusia precatationis*, and others among lepidoptera. *Selandria rosæ*, *Apis mellifica*, *Megachile centuncularis*, and many of the *Cynipsea* that puncture our oaks, producing the galls thereof, among hymenoptera; and *Chrysomela formosa*, *Cymindis viridipennis*, *Haltica chalybea*, and other beetles.

From our knowledge of this Vireo, we are satisfied that it prefers retirement and loves to suspend its domicile from the pendant branches of the beech, maple, and sassafras. It builds mainly on high grounds. The nests are never placed higher than ten feet from the ground and occasionally at a less elevation. While the female is incubating she is readily approached, and manifests, seemingly, neither timidity nor alarm. We have known instances where she would permit us almost to lay our hand upon her, without leaving the nest. She would gaze intently upon us for a few minutes, as if to learn our motives; but when conscious of impending danger she would glide noiselessly out, and perch very demurely upon a twig close by, and become a quiet observer of our proceedings. She will permit a person to pass and

repass the nest within two feet, without manifesting much concern.

Nidification is begun about the 12th of May, but, occasionally, as late as the 20th of the same month. This labor is performed by both birds. For this purpose, a forked branch is ordinarily chosen, to which a beautiful pensile nest is attached. A delicate framework, somewhat purse-shaped, is first fastened to the bifurcating twig, by means of spiders' webs, long strips of the inner bark of *Quercus alba*, tangled masses of *Hypnum squarrosum*, floss of *Bombycidæ*, silk of plants, and the untwisted silk of the capsules of spiders. This structure is composed mainly of strips of bark, fragments of decayed *Pinus*, and bits of *Hypnum*, which are held *in situ* by spiders' webs, the webs of several species of *Epeira* being utilized. At this stage there is little resemblance to the perfect structure, being a long and narrow fabric. In order to give symmetry and form thereto, the birds now construct an inner nest of fragments of paper, parchment-like capsules of spiders, bits of papery material from nests of *Vespa maculata*, spiders' webs, inner bark of *Quercus alba*, which are adjusted so as to strengthen the outer fabric. It is now the duty of the female, by bodily evolutions, to reduce the whole to some sort of symmetry. Narrow strips of the inner bark of *Vitis cordifolia*, *Quercus alba*, and spiders' webs, variously intermingled, constitute a cozy lining; occasionally, a profusion of white and black horse-

hairs take the place of the former. In another nest which we have before us, the fabric, exteriorly, is composed of strips of rags and strings curiously woven together, and lined with spiders' webs, and the inner bark of the wild grape-vine. The period required for the completion of a nest is from six to seven days.

That this species constructs its nest in the manner described, we have both direct and indirect evidence; direct, as furnished by our own personal observations; and, indirect, in the possession of several incomplete nests which show the primitive pensile character, without the internal structure. These incomplete nests were given to us by persons who had little knowledge of the appearance which a perfect nest should present.

The foregoing description will be found to vary in many particulars from the one given in "North American Birds." The latter leads to the opinion that the entire fabric constitutes one structure, which may be the case in certain localities. It is obvious from our experience, that there is an outer structure as well as an inner one, which are ultimately conjoined by interlacing bark-fibres, and the floss of spiders' cocoons. Careful examinations of many nests have convinced us that saliva is unnecessary to the agglutination of their constituent elements. The materials are so completely interlaced and held together by spiders' webs, &c., that the requisite compactness is secured without the use of saliva. Add to this fact their tendency

to become more adherent and impacted on exposure to the elements, and the necessity of a fluid can be dispensed with.

After the nest is finished, the female commences on the ensuing day, the duty of oviposition, which proceeds at the rate of a deposit of one egg *per diem*, until her complement has been laid, which requires from three to four days. Incubation commences on the day succeeding the last deposit, and requires a period of 11 days. In this duty we have known the male to perform his share of the labor. While the one is thus engaged, the other is absent from the immediate neighborhood, either designedly, or in quest of food. When the nest is assailed, there are manifestations of uneasiness; but the earnest scolding and hoarse mewing that are so peculiar to its near cousin, the *Vireo noveboracensis* of Bonaparte, are traits which it has not developed.

The young are assiduously fed by their parents until sufficiently matured to look after their own temporal concerns. During their state of helplessness, they are nourished with the larvæ of *Anisopteryx vernata*, *A. pometaria*, *Zerene catenaria*, *Hybernia tiliaria*, *Ennomos subsignaria*, *Limacodes scapha*, and mature forms of *Musca domestica*, *Tabanus lineola*, *Tipula ferruginea*, aphides, and small spiders. In about 12 days they leave the nest, and in a week longer they are prepared to earn their own subsistence.

There is but one brood in a season, although

nests have been taken early in July which contained eggs, and which we attributed to birds whose early designs had been frustrated. After the cares of brood-raising are over, both old and young, the latter, in imitation of their parents, seek the tops of the highest trees in their predatory excursions. Occasionally, they descend from such lofty eminences to glean among the grasses, and, as if disdainful too near an approach to the earth, ultimately perch upon some tall shrub to feast upon its berries, as those of *Cornus florida* and *Viburnum Lentago*. It continues in its favorite sylvan retreats, until its departure for the South, during the last of September or the beginning of October.

The song of the Red-eyed Vireo is simple, musical, and pleasing. It is uttered in short emphatic bars in the intervals of feeding; and so unsuspecting is the male while thus occupied, that he heeds not the presence of human beings. It may be heard even, during the sultry hours of noon, when most other songsters are panting in the refreshing shade of some tall tree. From its first appearance until its departure, its song is continued with undiminished ardor. Its notes being but moderately loud, are uttered with a somewhat plaintive intonation, and may be represented by the syllables *tē-tē-twēāh-wē-āh-twēāh-twēāh-twēēt*, produced rather hurriedly.

The eggs are white, and marked at the larger end with reddish-brown spots and dots. They

measure .82 of an inch in length, and .56 in breadth.

Vireo philadelphicus, **Baird.**

This species called the Philadelphia Greenlet is certainly very rare, and has, doubtless, been observed in this latitude but once, when it was discovered by Cassin, in a woods near Philadelphia, in September, 1851, whilst stopping from its southern migration. There are but three specimens of this species known.

Vireo gilvus, **Bonap.**

The Warbling Vireo arrives in this latitude about the 15th of April. It is tolerably abundant, but not so much so as *Vireo olivaceus*. On its arrival it frequents villages and towns almost exclusively, and chiefly delights in the tall tree-tops around our houses, to pour forth its song, and to suspend from their highest branches its pensile nest. From its first appearance until after summer has gone, during the livelong day, its notes may be heard. It is a very sweet and constant singer, but does not possess a voice that is powerful, but one that is melodious, flute-like, and tender. Even during the noontide heat its song is heard, while other birds are silent. From early dawn until nightfall it is in motion, in quest of insects, and ever and anon gives expression to its jubilant feelings in the luxury of song. Its departure happens late in September.

It probably spends its winter-quarters about Orizaba, as numbers have been observed there at this time, by Sumichrast; and most likely reaches this latitude by entering Texas, and following the courses of the Mississippi and Ohio rivers.

Like *Vireo olivaceus* in habits, and equally as expert, it does immense service to man, in the destruction of vast numbers of injurious insects, as well as those that are beneficial. Its food is principally of a dipterous and lepidopterous character, and consists of *Musca domestica*, *Tabanus lineola*, *T. cinctus*, *Tipula ferruginea*, *Culex tæniorhynchus*, and others among the two-winged flies; and *Anisopteryx vernata*, *A. pometaria*, *Zerene catenaria*, *Ennomos subsignaria*, *Eufitchia ribearia*, *Angeronia crocataria*, *Limacodes scapha*, among lepidoptera; besides, aphides, and the hymenopterous forms of *Apis mellifica*, *Selandria rosæ*, and *Megachile centuncularis*.

Its nest is usually placed in the vicinity of dwellings as previously remarked, and very often over frequented streets. We have known cases where secluded localities have been selected, but very rarely. Nidification commences ordinarily about the 15th of May. The nest is an elaborately woven basket-like structure, carefully, neatly, and closely built, and suspended from a forked twig near the top of a tree; and, occasionally, at the extremity of an upper branch, at an elevation of thirty feet from the ground. The birds mostly select a Maple for this purpose. The nest is se-

cured to twigs by a felting of flax-like fibres, plant-stems, and bark, which are carried around the outside of the nest, which is lined with flexible bark of deciduous trees, and fine stems of plants, with horse-hair, occasionally. It measures two inches in height, and three and a half in diameter in the centre, and narrows towards the supporting surfaces. The time spent in building is about 8 days.

Oviposition follows on the day following the completion of the nest, and continues for five days; one egg being deposited daily. Incubation commences the day after the last egg is laid, and lasts from 10 to 11 days. In its duties the female is assisted by the male. His affection for his partner is very devoted, and is shown by the most endearing attentions. Unlike the Red-eyed Vireo, he is jealous of strangers, and will not brook their presence with impunity. Whilst his mate is incubating, he is close by, ready to administer to her wants, or protect her when danger is imminent. The young are able to leave the nest in about 12 days, and in a week more, are able to provide for themselves. They are fed upon the larvæ of the lepidoptera, diptera, and aphides, mentioned above.

The eggs are a beautiful white, and sparingly marked with dark and light-brown spots at the larger end. We have never seen any unspotted specimens as Dr. Brewer alleges to have met with. Their average length is .74 of an inch and breadth

Vireo flavifrons, Vieill.

The Yellow-throated Vireo is less abundant according to our experience than the one last described. It makes its appearance during the last of April, or the beginning of May, and confines its foraging to the tall tree-tops in retired places, generally in high woods, seldom visiting the habitation of man. It is more shy than even the *Vireo solitarius*. Like the most of its family relations, it is characterized by remarkable agility, and is a busy gleaner among the leaves for insects, which it also secures after the fashion of the *Muscicapidæ*. Unlike the Kinglets it is a more careful insect-hunter, thoroughly searching one tree before leaving it for another.

Its food consists chiefly of diptera, hymenoptera, and the larvæ and imagos of the smaller lepidoptera, with a small percentage of beetles and berries. It feeds upon *Musca domestica*, *Tabanus lineola*, *T. cinctus*, *Culex teniorhynchus*, *Syrphus obliquus*, *S. obscurus*, *Anthrax elongata*, among diptera; the larvæ and mature forms of *Thecla humuli*, *Callimorpha Lecontei*, *Cimacodes scapha*, *Argynnis bellona*, *Plusia precatationis*, *Chærodes transversata*, *Ennomos subsignaria*, *Zerene catenaria*, *Anisopteryx vernata*, *A. pometaria*, *Lozotænia rosaceana*, and other lepidoptera; besides, *Aphis mali*, the hymenopterous forms of *Apis mellifica*, *Megachile centuncularis*, *Selandria rosæ*, with many *Andrenæ* and *Halicti*, and a small number of the phyllophagous coleoptera.

Nidification commences from the 15th to the 20th of May, continues for a period varying from six to seven days, and is the joint labor of the sexes. The nest is suspended from a forked twig, and is generally occupied by the female before its completion; the external improvements, in the shape of mosses and lichens, being adjusted by the male, whilst she is engaged in oviposition. When he is not employed in beautifying her domicile, his time is varied by capturing winged and creeping insects, which like a faithful and devoted husband he carries to his partner. Occasionally, he seeks to relieve the irksome duties by the voluntary offering of a song. He is exceedingly jealous and will not permit any intrusion upon his premises without venturing the full force of his vengeance upon the rash intruder.

Sometimes the nest is so completely enveloped with mosses and lichens, as to present at a distance, the appearance of a moss-grown protuberance, which must assuredly be protective in its tendency. It is fastened to its supporting surfaces by a combination of materials, such as spiders' webs, the thread of cocoons, ingeniously interwoven, and with an intermingling of mosses and lichens which constitute the exterior of the nest, and which are held together and strengthened by strips of bark of the grape-vine. Internally, there is a lining of fine stems, and bark of grape-vine; occasionally horse-hair. The nest is symmetrical and well-made, measuring four inches in

diameter and two and a half in height, and is placed from ten to fifteen feet above the earth.

The young are objects of the tenderest solicitude upon the part of the parents. They are fed upon the dipterous and lepidopterous insects mentioned above. Between the ages of 11 and 12 days they quit the nest, but are still fed by the parents for a week longer, when they are compelled to provide their own subsistence.

This species is chiefly insectivorous, and subsists mostly upon insects, with the exception of a few berries as those of the *Juniperus Virginiana*, until its departure for Central America, and the United States of Columbia in South America, during the last week of September. In the fall its food consists of the larvæ of *Colias philodice*, *Orgyia Leucostigma*, *Clisiocampa Americana*, and many of the *Phalænidæ* and *Tineidæ*.

The eggs are white, with a slightly-roseate tinge when fresh, and are marked with blotches of reddish-brown, more or less. The average measurement is .83 by .64 inches.

Vireo solitarius, Vieill.

The Blue-headed Vireo arrives usually about the 15th of April, and, occasionally, as late as the beginning of May. It prefers most generally solitary situations, and unlike *Vireo olivaceus*, delights to nidificate on the confines of dense forests, and along roads where travel is of rare occurrence; Its favorite trees for building-purposes are *Juniperus*

Virginiana and *Vcer rubrum*. When the nest is built by a road-side, the red cedar is generally chosen, as it affords the requisite shelter and concealment. On the borders of woods the red maple is its choice. In the latter situation considerable attention is paid to the character of the country. Comparatively low grounds being chosen with an eastern and western exposure, as being more secure against prevailing storms and winds.

Although affecting a partiality for retired situations, it cannot be considered a shy and timid species. Like many others have done, as time advances, it will become more familiar with man. It is but three years ago since we first met this species in this part of the country, in anything like great numbers. Last spring it was nearly as abundant as *Vireo olivaceus*. As the forests disappear, and new conditions are imposed upon its environment, a change of nidification will be the inevitable result.

From observations extending over three years, we are satisfied that the sexes arrive together. The females being more modest and retired than their mates, and comparatively songless, are less observed. In less than a fortnight after their arrival, a site is chosen for a nest which is a matter of some moment. After a couple of days thus spent, a place is mutually agreed upon, and nidification at once begun. This happens about the 20th of May, and sometimes as late as the 10th

of June; about the time usually when *Quercus palustris* has doffed its ripened catkins, which are principally utilized in the construction of its nest. Each nest is uniform in structure, and remarkably homogeneous in composition. Where the tassels of the pin-oak are used, nothing else is to be found. Where grass is the favorite article, as a species of *Aira* in exceptional cases is, this alone is a noticeable feature.

The nest is gracefully disposed between the bifurcating branches of a twig, and presents a neat and cozy appearance. The interior is comparatively even, and strictly symmetrically cup-shaped. The exterior with its roughened aspect, produced by the projecting catkins, is a rather imposing sight.

The female adjusts the materials while the male is busy in fetching them. On the completion of the structure, which is the work of three days, the female on the succeeding day, begins to deposit at the rate of one per day, her complement of eggs, which requires from three to four days, according to the number laid. On the ensuing day, incubation takes place, and continues from 10 to 11 days, and is the sole labor of the female. While thus occupied, the male like a dutiful husband supplies her with nourishment.

Like its near congeners, the female of this species is very unsuspicious, and lacks timidity. Persons may pass and repass underneath the nest, which is mostly placed ten feet from the ground,

without exciting distrust or creating alarm. But when an effort is made to violate this confidence by hostile intentions, the female glides silently out of the nest and does not exert herself in the least to ward off any attack; but the male when not absent on foraging business, is close by the nest and ready by his valor to resent an injury or to deter an assault. With open bill and vehement scolding he hazards his own life; resembling in this respect both *Vireo noveboracensis* and *V. gilvus*.

After incubation, both parents are kept constantly employed in furnishing their young with suitable nourishment. Their bill of fare consists of the larvæ of *Anisopteryx vernata*, *A. pometaria*, *Eufitchia ribearia*, *Zerene catenaria*, *Chærodes transversata*, *Hybernia tiliaria*, and other geometers which infest our trees; *Tabanus lineola*, *Musca domestica*, various species of *Ortalis* and *Anthomya*, the common *Culex*, and others. Add to these the various species of *Cynips* that infest our oaks, and small lepidoptera, both diurnal and nocturnal, with a few coleoptera, and we have a bill of fare which cannot fail to please the most fastidious *bon vivant* among *aves*.

When the young are able to provide their own food, which is the case in about a week after leaving the nest, (they being between 11 and 12 days of age at the time), they are no longer dependent upon their parents. But a single brood is reared in a season.

After the breeding-period is over, the male

becomes a selfish gourmand. His partner is now necessitated to look after her own salvation. For the purposes of subsistence they seek the solitude of dense woods, where they glean among the leaves and branches of the tallest tree-tops; sometimes they may be seen perched upon a rotten twig on the alert for insects which they seize with nearly the adroitness of the *Muscicapidæ*. Although insects now contribute the principal part of their diet, yet the berries of *Cornus florida*, *C. circinata*, *Viburnum Lentago*, and *V. dentatum*, are eaten with a *gusto*. Except at breeding-time we have known this species to be of a quiet and reserved disposition, never venturing into the disputes of other species, and dwelling in peace and harmony with its own *kith* and *kin*. It retires for the South during the last of September, or the beginning of October.

Before closing this narrative, a few thoughts on its style of architecture may not be amiss. As its present habit of nidification in this latitude varies materially from what has been recorded, a few hints in reference thereto may be highly interesting and instructive. In localities much visited by the Blue-headed Vireo, we have frequently seen masses of catkins of the pin-oak, which at a short distance were very deceptive in appearance, and bore every indication of being genuine nests. The question naturally occurs, may not some formerly existing individuals possessed of a due amount of sagacity and forethought, have dis-

cerned the utility which a nest composed of such materials would secure in a conservative point of view? It is true our smaller species have inveterate foes which are ever on the *qui vive* to gratify their rapacity, and it behooves them to encircle themselves with such guards as best conduce to their preservation. Birds of prey having been frequently deceived by masses of the kind, which they at first probably regarded as nests, would cease to regard them in such a light and pass them by. It therefore follows as a logical sequence, that the utilization of such substances in the manner of nests, from their fancied resemblance to loose clusters of catkins, are best adapted to the security and well-being of the species, and now constitute in certain localities the typical structure.

Its song differs from that of any other Vireo. It is a protracted and peculiar ditty which is heard at irregular intervals, and begins with an animated warble, which gradually increases in sound until a certain pitch is attained, when it breaks down to a falsetto note, then rises again, and ultimately ceases.

The eggs are five in number, oblong-oval, and slightly pointed at one end; the ground-color is a transparent white, flesh-colored in unblown specimens, and chiefly marked with reddish-brown spots about the larger end. They measure .77 inches in length and .52 in breadth.

Vireo noveboracensis, **Bonap.**

The White-eyed Vireo is neither so abundant nor unsuspecting as *Vireo olivaceus*. It arrives ordinarily during the first week of May, and at first confines its foraging to high, open woodlands, where among branches, both high and low, it gleans a ready subsistence. Later in the season, during the second week after its arrival, it is an occasional denizen of cultivated fields and gardens, where its presence is clearly indicated by its loud and peculiar song. Although more suspicious than the Red-eyed Vireo, it cannot be justly accused of undue shyness.

Besides the above situations, it is a not uncommon occupant of wild, open grounds on the borders of woods, where there is a preponderance of thickets of *Smilax*, briars, and wild vines, in which it commonly delights to suspend its beautiful pensile nest.

During our perambulations we have often diverted ourselves by imitating the notes of this Vireo, with a view of eliciting a song so as to determine its whereabouts, in order to witness its eccentric movements. On all such occasions the bird would manifest intense wonderment, and gradually approach the place whence the sound emanated, and when apprised of its source by the discovery of the author, as quickly retreat to the adjoining bushes as it came.

This Vireo is one of the most conspicuous of our songsters. Its songs are louder and more

earnest than those of any of our Eastern species, and exhibit most astonishing variations. Early in the spring it begins with a low whistle; which it changes to a very quaint and peculiar succession of irregular notes, as the season advances; some of these notes are softly and gently uttered, while others are produced with a vehemence and shrillness truly remarkable for so small a species. The following syllables will express with considerable accuracy, the language of its song:—*tehick-tchick-a-tee-way-äh*; *tchükä-wäyöc*; *tchick-way-äh-tchickä-wäy-öc-tchick*. Sometimes *tchickä-way-öc-tchick* pronounced in a clear mournful manner, and so distinct as to be heard at a great distance. Again, the following syllables have been occasionally heard early in the morning:—*tchück-chück mää-chück-chück-chëëëëë-tchick-twüüü*.

Like the subject of the preceding sketch, this species combines in a remarkable manner the attributes of the *Paridæ* and *Muscicapidæ*. Its agility in the procurement of food surpasses that of *Vireo olivaceus*. Beetles constitute a large portion of its diet during its early stay; but, later, various hymenopterous, dipterous, and lepidopterous insects, are devoured in immense numbers. The following insects constitute a small portion of its voluminous bill of fare:—*Donacia confluenta*, *Chrysomela cæruleipennis*, *Harpalus compar*, among coleoptera; *Tabanus lineola*, *Syrphus obscurus*, *S. obliquus*, *Culex tæniorhynchus*, *Tipula ferruginea*, *Musca domestica*, among diptera; *Apis mellifica*,

Selandria rosæ, *S. vitis*, *Formica sanguinea*, species of *Halictus*, *Andrena*, and others; larvæ of *Eufitichia ribearia*, *Chærodes transversata*, *Ennomos subsignaria*, *Zerene catenaria*, *Hybernia tiliaria*, *Anisopteryx vernata*, *A. pomataria*, *Plusia præcationis*, *Thecla humuli*, *Limacodes scapha*, and mature forms of *Argynnis myrina*, *Eudamus tityrus*, *Ctenucha Virginica*, *Halesidota tessellaris*, *Utetheisa bella*, *Anchylopera fragariæ*, *Clisiocampa Americana*, *Spilosoma Virginica*, and others, especially the most common of the *Noctuidæ* and *Tortricidæ*; besides *Apis mali* and other aphides, small spiders &c., which it procures from the foliar surfaces, and extracts with considerable skill from blossoms while hovering with fluttering wings before them.

Nidification usually commences during the last week of May, say about the 25th, or the beginning of June, and requires a period varying from five to six days, both birds laboring with marked diligence till the completion of the nest. Oviposition follows on the next day, and continues during four days, one egg being deposited daily. In the duties of incubation which then succeed and last for 11 days, the female is solely occupied. The male while his partner is thus engaged, occasionally administers to her wants by bringing her a racy *tidbit*. When sitting, the female is readily approached, and even remains in her nest until a hand is stretched forward to seize her, when she quietly slips out and alights upon a branch close by. Like the female of *olivaceus*, she gazes upon

the intruder in perfect silence, and will suffer her nest to be outraged without, seemingly, manifesting any anxiety. The male has never been observed by us; in the immediate neighborhood of the nest, from which we infer, that he keeps at a wary distance. But, however, he is a very attentive provider for the wants of his progeny. In his attentions to the latter he is unrivalled by his partner. The young are prepared to leave the nest in about twelve days after hatching, and in a week more are fitted to attend to their own necessities. A single brood is raised in a season.

A typical nest of this species is generally suspended from a small bush, or the lowermost branch of a tree, seldom at a greater elevation than twelve feet from the ground. It is neatly and compactly woven, and is as beautiful an example of the pensile style of nest, the orioles' excepted, as can be conceived. Exteriorly, it is composed of leaves, fragments of decayed wood, inner bark of deciduous trees, culms of grasses, vegetable fibres, held together by impacted masses of divers mosses, which also attach the nest to the twigs from which it is suspended. Interiorly, there is a lining of fine grasses, with horse-hair, occasionally; the whole being smoothly and neatly adjusted.

The young are fed with the larvæ of the *Phalænidæ*, diptera, spiders, aphides, and ants as above mentioned.

This species retires to its winter home early in

October. After the breeding season is over, it is again the same solitary being as characterized it early in May.

The eggs are oblong-oval, crystalline-white, and marked at the larger end with dark-purplish and reddish-brown spots. They measure .78 of an inch in length and .56 in breadth.

Family Laniidæ. Shrikes.

This family is characterized by weak passerine feet, and notched, toothed and hooked bill, recalling that of a bird of prey in size, configuration and strength. Two hundred recorded species, referred to many genera, and divided into three groups, belong to this family. The following group only occurs in America.

Subfamily Laniinæ. True Shrikes.

The genus *Collurio* the only one in America, is characterized by having ten primaries in the wing, and twelve rectrices in the tail, both being quite rounded and nearly equal in length; rictus provided with stout bristles, and circular nostrils more or less hidden by thick tufts of antrorse bristly feathers. The tarsi differ from the usual oscine character, by being scutellated in front and on the exterior. In color our species are quite similar, and curiously resemble the mocking-bird.

They are bold and spirited birds, quarrelling among themselves, and tyrannical towards weaker species. They are carnivorous, and subsist upon

insects, small birds, and quadrupeds which they overpower; their most remarkable habit is the impaling of their prey upon sharp twigs, and leaving them there. Various attempts have been made to account for this curious habit, but the most of them are very unsatisfactory. These birds cannot be considered as strictly migratory. The sexes are nearly alike. There are two well-determined American species, the habits of one of which we shall now proceed to portray.

Collurio borealis, Baird.

The Butcher Bird as we know this species of shrike, is but a temporary resident in Eastern Pennsylvania. It arrives in Philadelphia during the latter part of October, and remains with us until the last of March or the beginning of April, when it retires to more northern habitats for breeding purposes. The length of its sojourn depends very materially upon climatic conditions. It is never a very abundant species, and prefers to lead during its stay a solitary life. Early in Autumn it seeks the retirement of woods and low valleys which are places of resort for our smaller winter denizens upon which it mainly subsists.

When the ground is covered with snow, and the smaller birds are driven by necessity to seek their own fare in the fields and yards of man, this Shrike becomes less shy and ventures boldly into such places. When not foraging it remains perched upon a dead twig for half an hour at a

time, taking a calm survey of the surrounding prospect, unless disturbed by intruders, or aroused from its apparent listlessness by the cravings of appetite, which are doubtless sharpened by the accidental appearance of a feathered stranger.

When thus disturbed it utters a sharp piercing shriek and sails away to some distance; but returns when the source of danger has vanished, and resumes its posture as though nothing had occurred.

The female, like the male, also passes the autumnal and winter months in solitude. It leads a more secluded life, however, than the male, being seldom observed close to human habitations. She delights in the coverts of deep and gloomy forests where she procures her nourishment under greater difficulties than the male. She lacks, however, the spirit and daring of the latter.

This species possesses remarkable powers of imitation. It imitates the cries of *Melospiza melodia* and *Spizella monticola*, apparently to decoy them within its power; but, ordinarily, it disdains to practice such deception and prefers to await its prey, or overtake it in pursuit. Its movements recall those of our smaller hawks. When in quest of game it seldom misses it, but pursues it with notable pertinacity.

Nuttall ascribes to it the power of song. He says substantially that he heard it as late as November 10th, uttering a low soft warble which resembled at first that of *Melospiza melodia*, and

which the bird instantly changed to the notes of *Galeoscoptes carolinensis*. Having frequently encountered it from early November until its departure for more northern quarters in April, we have never heard anything which would impress us with the idea that it is a singer. During the cold months when food is scarce, and the chief anxiety of our winter denizens is its procurement, the pleasures of song are, doubtless, forgotten. Indeed, when it is known that the greater part of the day is devoted to this essential business, it is not at all surprising that such enjoyment should be temporarily forgoone; besides, it is possible that the dreariness of winter so effectually dampens the ardor of feeling, that song which is the result of overflowing spirits, having no stimulus to arouse it into being, dies a temporary death. The spring, with its balmy breezes, mild climate, and joyous prospects, sends the blood tingling through the arteries, re-animates the torpid feelings, and fills the brain with the most exhilarating impulses which manifest themselves in meaningless antics and voluptuous song. The season of cold being considerably advanced on its arrival, and everything bearing the impress of winter; and its retirement in spring being unusually early, it is obvious that its surroundings are of such a character as not to awaken joyous impressions. Besides, the males and females lead solitary lives during their stay, and depart as they come, alone; and there is wanting besides that

ardor of feeling between the sexes which exhibits itself in the power of song.

With most species song is assumed about the mating-period by the males, in order to attract the females on their arrival, or to captivate them by the power of its charms. Darwin in speculating upon this subject, views it in this light. The most highly favored males in this respect, possess a decided advantage over their less favored brethren; and, consequently, stand the better chance to be selected by the more specially favored of the opposite sex. Thus, by natural selection, would have been developed from a few rude inharmonious sounds, that succession of agreeable notes called melody, which characterize, in an eminent degree, many of our *aves*. As a rule, though subject to some exceptions, however, beauty of song and plainness of attire are co-existent. On the other hand, a showy garb is mostly attended with lack of song. So it happens that either, separately, or the two in conjunction, are the objects of special attention by the sexes.

While song is mainly designed upon the part of the male to influence the female in the matter of choice, it is plain that it is often indulged in as a thing of enjoyment. Primitively, and at present to a certain degree, it is awakened by amatory influences. Coming back from this digression, it is probable that the species under consideration in its northern quarters is possessed of a song, and even also in certain localities where the sur-

roundings are of such a character as to inspire feelings which would naturally tend to awaken it.

It has been intimated that this Shrike is exceedingly destructive to our smaller birds. In rapacity it rivals *Falco sparverius* of Linnæus. Its captures are mostly confined to *Junco hyemalis*, *Spizella monticola*, *Melospiza melodia*, and, occasionally, to species as large as *Passerella iliaca*. Its favorite food, however, during the winter is our common *Junco hyemalis*, which from its abundance and apparent lack of timidity, requires but a paltry effort to capture. It has been said in "North American Birds" that the English sparrow, since its introduction, is an object of special regard in the city of Boston, Mass. We have never met with any illustrations of the fact, but are led to the opinion that their remarkable prevalence and astonishing tameness, would naturally render them objects of easy capture. An examination of the stomachs of several birds, showed a remarkable predominance of the Black Snow Bird, which was clearly identified by the feathers which had been profusely swallowed. Birds are not exclusively eaten. Coleoptera and orthoptera in great numbers are also devoured. Among the broken fragments found in the stomachs of several individuals associated with the remains of Snow Birds, were identified fragments of *Lucanus dama*, *Lachnosterna quercina*, *L. hirticula*, *Ædipoda nebulosa*, and *Æ. sulphurea*.

But a single instance is recorded of this species

breeding within the United States, although it is possible that it may be found to do so in Northern and Eastern Maine. Mr. Boardman met with its nest within twelve miles of St. Stephen, in the British province of New Brunswick, during the last of April, which was built upon a low spruce tree. A nest was discovered by R. R. Macfarlane, Esq., at Anderson River Fort, June 11, 1863, which was a felted structure of various materials, elaborately and symmetrically worked. It was seven inches in diameter and three and a half in height, with a cavity four and a half inches in diameter and two in depth. The base is composed of twigs, coarse plants, and the residue of feathers of divers birds, down of Eider and other ducks, fine mosses and lichens, slender stems of grasses, &c., skilfully and artistically interwrought and strengthened by slender twigs and stems, without affecting the character of the entire structure.

The eggs are six in number, light greenish ground-color, and marked and streaked with obscure purplish and rufous-brown. They measure 1.10 inches in length, and .80 in breadth.

CHAPTER V.

Family Fringillidæ. Finches, &c.

This is the largest North American family and comprehends nearly one-eighth of all our birds. It is the most extensive group in ornithology, and represents in round numbers 500 current species and 100 genera in nearly all parts of the world; except Australia; but in the northern hemisphere and throughout America, it attains its greatest development. Any locality of the United States of average attractiveness, has its avifauna over 200 species; and, at a distance from the sea-coast unoccupied by marine birds, one-fourth of its species are *Sylvicolidæ* and *Fringillidæ* together, the latter in excess.

The *Fringillidæ* represent more particularly what used to be designated "conirostral" birds. Their bill approaches nearest to the ideal cone, and unites great strength with delicacy of touch.

The cone is sometimes nearly expressed, but often turgid and conoidal; convex in most directions and so contracted as to become concave in some of its outlines. Nostrils are ordinarily exposed, but in many northern genera the base of the bill is provided with a ruff and two tufts of antrorse feathers which more or less cover the opening; cutting edges slightly notched, but

otherwise plain; a few inconspicuous bristles about rictus, ordinarily somewhat lacking, in some, highly developed. The wings are composed of nine developed primaries, variable in size; the tail is variable but always composed of twelve rectrices; feet scutellate in front and covered on side with an undivided plate which produces a sharp ridge posteriorly. The most tangible character is the angulation of the commissure; this character runs in a straight line or with slight curvature to or near the base of the bill, and then bends abruptly downward at varying angles. The cutting edge of the upper mandible forms a re-entrance, lower a corresponding salience. This character separates the group pretty sharply from other *Oscines*, except the *Icteriidæ*. Our species might be thrown into several groups, but the distinctions are more or less arbitrary. The division of the family is but a conventional matter at present.

It includes all sparrows with allied finches, buntings, linnets, grosbeaks, and crossbills. There are 71 well-determined species referrible to 34 genera in North America. They are mainly granivorous, but occasionally subsist upon buds of trees, berries, and insects. The species which are more or less abundant in Eastern Pennsylvania, we shall now proceed to mention in the order of their systematic arrangement, giving a detailed and succinct account of the habits of each.

Pinicola enucleator, **Cabanis.**

The Pine Grosbeak is but an occasional visitant in Pennsylvania, and then only during the winter; driven by necessity, doubtless, from its more northern habitat it reaches this latitude about the beginning of December. It is a denizen of dense pine forests during the cold weather, which it forsakes in the Spring for our apple and pear orchards, where it commits an immense amount of mischief by the destruction of the buds. It is very unsuspecting and familiar. Like many other species whose history we have delineated, this one is a solitary feeder. Though chiefly arboreal, it occasionally descends to the ground and forages among the fallen leaves for the seeds of various species of *Pinus* and grasses, and the beetles which seek cover under such warm substances.

The following articles contribute slightly to its maintenance during the prevalence of winter:—The seeds of the various species of *Pinus*, as *Pinus strobus*; *P. inops*, *P. rigida*, *Abies nigra*; *A. canadensis*, *Betula excelsa*, and the berries of *Juniperus Virginiana*, *J. communis*, *Lonicera periclymenum*, and others. Besides the eggs, pupæ, and imagos of *Cratonychus cinereus*; *C. pertinax*, *Pangus caliginosus*, and other coleoptera. Early in the spring the buds of *Acer rubrum*, *A. saccharinum*, and the tender cones of the various species of *Pinus*; with *Harpalus compar*, *H. pensylvanicus*, *Bostrichus pini*, and *Chrysomela cæruleipennis*.

This species is slightly gregarious. When an individual is shot, the others instead of flying away, still linger about on the lower branches, gazing with a look of wonder and curiosity unmingled with aught of conscious danger.

Mr. Dall says that it is extremely common near Nilato, wherever there are trees throughout Yukon Territory, and frequents in the winter, groves of poplar and willow near open places, especially waterside, and in summer seeks sequestered localities for breeding-purposes.

This species undoubtedly nidificates in borean regions. A nest was found by Mr. Boardman near Calais, about the authenticity of which there can be little doubt, although the parent was unobserved. It was built in an alder-bush in a humid situation, at an elevation of nearly four feet from the ground, and was composed wholly of coarse, green mosses.

The eggs were two in number, and undistinguishable from those of the European *enucleator*. No certainly identified eggs of the American Pine Grosbeak are known in collections. The eggs found by Mr. Wolley, in Iceland, 1858, were oblong-oval, slate-colored with a greenish tinge, and plashed with clouded patches of brown chiefly, and slight spots principally about the larger end of blackish-brown and dark-purplish. They measured 1.02 inches in length, and .70 in breadth. The descriptions of nest and eggs have been substantially taken from the latest work on "North American Birds."

Carpodacus purpureus, Gray.

The Purple Finch is very abundant in Eastern Pennsylvania during the autumnal and winter months. It has been observed by us from early October until the middle of April, but never during the breeding-season, from which fact we are led to infer that it migrates. It may possibly breed among the Wissahickon hills, but if so, at that time it becomes so shy and retired, doubtless, building in some sequestered nook seldom visited by human footsteps. Many and diligent explorations have utterly failed to reveal to us the slightest evidence of its presence during this period.

On its return early in the autumn, it is eminently gregarious; but in January and February, when there is a paucity of food-stuffs, as was the case in the winter of 1875, the flocks dissolve into pairs which forage together. These pairs in all cases where an opportunity is afforded for determination, are invariably composed of the sexes. When mild weather returns and there is a growing increase in articles of diet, these re-unite into flocks of six or more. In this manner they retire.

This Finch is exceedingly tame, coming about our doors and mingling with the Snow Birds and Sparrows for a share of the scraps that are discarded by man; and is even found among our common fowls receiving its part of the cracked corn.

In their movements among the tree-branches in quest of food, they resemble the Black Cap and Nuthatches; 'sometimes clinging to the under surface in an inverted manner, and at others, running along them with the address of *Sitta carolinensis*.

In early autumn it enters our gardens and lawns and subsists upon the seeds of *Raphanus sativus*, *Amarantus hybridus*, and *Chenopodium album*, together with those of many of the smaller graminaceous plants. Later, when the snow is upon the ground, it revisits similar situations and feeds upon the berries of *Lonicera sempervirens*, *L. pirtclymenum*, for which it affects a decided partiality. When foraging in open fields or on the borders of thickets, the berries of *Juniperus Virginiana*, *J. communis*, and the seeds of *Liriodendron tulipifera* which are persistent through the winter months, are eagerly devoured. Though chiefly a vegetarian, yet the ova, pupæ, and imago's of insects are eaten. The remains of *Ædipoda sulphurea*, *Æ. nebulosa*, *Dicælus dilatatus*, *Pangus caliginosus*, *Cratonychus cinereus*, and *C. pertnax*, have been found in its stomach.

When *Acer rubrum* is in blossom in March, small flocks may be seen in the lowlands and about our houses, feasting upon the stamens and pistils which they esteem great luxuries, if the eagerness with which they are devoured, affords any criterion. It is highly probable that the small coleopterous and dipterous insects which are attracted to the blossoms by reason of their honey-secretions, are some inducement.

During its stay it is comparatively songless. In some parts of the country it is said to resume its song before its departure. Dr. Coues has observed it in full song near Washington, in May. In this particular there is a close resemblance in habit to *Spizella monticola*, which for weeks preparatory to leaving, enlivens its surroundings by the gayety of its ditty. This has not been our experience. We have observed the species in small flocks up to the period of departure, and have never heard more than the ordinary daily language. If it indulges in song, which we have no reason to doubt, it is mainly after it has attained its breeding-grounds. There may, however, be exceptional instances.

The flight of the Purple Finch is affirmed by Audubon, to bear some resemblance to that of *Loxia chloris* of Europe. The birds fly in close flocks with an undulating movement, and alight simultaneously. They remain but a brief time and then as if suddenly startled, instantly take to flight. But they soon return to the same tree after having received hope and courage. A renewal of the fright so strongly impresses them, that a second return is not to be looked for until after the lapse of a protracted period of time. ...

The song is said to resemble that of the Canary, being less varied and powerful, but softer, sweeter and more touching. In beauty and pathos it rivals that of the Warbling Vireo, but possesses greater power. When engaged in singing, the

male is so completely absorbed as to be oblivious to all around him. He has a peculiar habit of erecting his crest and expanding his throat. On the intrusion of a feathered stranger he ceases his song, and in a fit of anger, gives chase to the presumptuous intruder.

The nest of this species is placed in fir spruces, or cedars, ordinarily, but, sometimes high up in an apple-tree, at an elevation in the generality of cases, of about five feet from the ground. It is built upon a branch, and measures two and a half inches in height and three and a half inches in breadth, and has walls less than an inch in thickness. It is shallow and consists of a framework of vegetable fibres, grass-stems, strips of bark, and woody fragments. The rim is constructed of herbaceous stems, with their ends projecting into a sort of low palisade. The inner-structure is composed of minute fibres closely woven together. Sometimes the nest is lined with down and feathers of birds, and fur of small animals.

The eggs are oblong-oval, considerably acuminate at one end, and vary in size and configuration. They are a pale emerald-green, and spotted with a dark brown which is almost black in some species at the larger end. The ground color is brighter when fresh, but assumes a lighter shade on exposure to light. The average measurement is .86 by .68 of an inch.

Curvirostra leucoptera, Brehm.

The White-winged Crossbill is undoubtedly

a very rare visitor in Eastern Pennsylvania; very few individuals have been observed by us during the last five years. Particular species appear only in special localities in unusually large numbers, after the lapse of a certain number of years. In Southern New Jersey, however, it is encountered in flocks of a score or more. It restricts itself mostly to pine barrens, where a plentiful supply of its favorite food abounds, seldom visiting human habitations.

Although preferring wooded regions for the obvious reason that supplies are more easily procured in such situations, yet it must not be presumed that the species is unnecessarily shy. The reverse of this will be found to be the case. For lack of suspicion it is only surpassed by *Aegiothus linarius*. Like the latter it will permit the sportsman to approach within a few paces, without manifesting the slightest distrust or timidity. On account of the existence of suitable and abundant food, there is much less of that nomadic life which in so strikingly characteristic of *Ampelis cedrorum*, and other species. Its occupancy of a region being more permanent and stable.

In winter its food consists mainly of the seeds, of *Pinus inops*, *P. rigida*, and *Abies nigra*. The berries of *Juniperus Virginiana*, *J. communis*, and *Lonicera periclymenum*, and graminaceous seeds are occasionally eaten. These with the ova, pupæ, and imagos of *Cratonychus cinereus*, *C. pertinax*, and mature forms of *Harpalus compar*, *H. pensyl-*

vanicus and *Bostrichus pini*, constitute the larger half of its winter diet. On the approach of spring when insects become more prevalent, principally such coleoptera as *Pangus caliginosus*, *Cymindis viridipennis*, are eaten. But its chief delight is the tender buds of the maples, and soft and fleshy cones of various species of *Pinus*.

It arrives in our midst most generally about the 15th of October, and retires about the middle of March. From our experience we are satisfied that it does not remain with us to breed.

Its flight resembles that of *Chrysomitris pinus*, and is firm, undulating, and well-sustained. Its movements along the branches and trunks of trees recall those of the little *Parus atricapillus*, and others. Like these it moves along the under surface of a branch with body inverted, as readily as in the upright position.

The plaintive cry of *wēēk* which it utters while on the wing, apprises us of its approach. This sound is materially different from the full, clear call-notes of its nearest ally *C. Americana*.

It is probable that this species breeds in Eastern Maine, as it is a permanent resident there. A nest discovered in 1868, by Dr. A. Adams, at Frederickton, New Brunswick, as described by Dr. Brewer, is "deeply saucer-shaped," and is composed of fibrous pale-green lichens, covered exteriorly with spruce twigs, and lined with a thin layer of fine bark-shreds and coarse hairs. The rim is described as nearly circular; the external

diameter nearly four inches, and the cavity two and a half inches wide, with a depth of an inch and a half.

The egg is said by the same eminent authority as being slightly elongate-oval, with the small end somewhat obtuse, and spattered with black and ashy-lilac dots upon a pale blue ground. It measures .86 by .56 of an inch.

Curvirostra Americana, Wils.

The Common Crossbill is an abundant autumnal and winter visitant, but has never been known to breed in Eastern Pennsylvania. It arrives late in October or early in November. It is quite gregarious, being found in flocks of twenties or thirties. During the beginning of its stay it subsists upon the berries of *Juniperus Virginiana*, *Lonicera sempervirens*, and the seeds of the various species of *Panicum* and *Aira* among gramineous plants, besides those of many of the *Aster* and *Solidago*. Among insects, *Cedipoda sulphurea*, *C. nebulosa*, the North Carolina grasshopper, *Scarites subterraneus*, *Dicælus dilatatus*, *Cratonychus cinereus*, *C. pertinax*, &c., are eagerly devoured. During the winter it feeds almost entirely upon the seeds of various species of the *Coniferae*, *Pinus inops*, *Abies nigra*, and *Pinus strobus*, and also *Betula excelsa*.

During the spring it subsists upon the tender cones of *Pinus* and *Abies*, and the blossoms of *Acer rubrum*, *A. saccharinum*, besides divers dip-

terous and coleopterous insects. Among these *Tabanus lineola*, *T. cinctus*, and *Musca domestica*, of the former, and *Lachnosterna quercina*, *Corymbites Æthiops*, *Dicælus dilatatus*, &c., of the latter. Before retiring to its breeding-quarters during the latter part of March or the beginning of April, it destroys many canker-worms and mature forms of the various species of *Noctuidæ* which abound at the time.

Within the pines of New Jersey, great numbers winter. They are always accompanied by *Chrysomitris pinus* which feed at the expense of its more favorite and more highly endowed yet distant relative. The seeds which drop from the pine-cones and elude the skill of the Crosshills, are picked up by the Pine Finch which is waiting below.

Fond of secluded situations, it seldom visits the habitations of man, unless attracted thither by the prospect of meeting coniferous trees. Pine forests for the conveniences which they afford, are generally chosen for occupancy. Whilst feeding it is readily approached without evincing the slightest timidity.

Its flight is lofty, graceful, undulating, and much prolonged, resembling very closely that of *Carpodacus purpureus*. Its movements whilst feeding are imitative in many particulars of those of the Black-capped Titmouse. It may be frequently seen clinging to the under surface of a cone, busily engaged in separating its parts by means of its curved jaw to get at the seeds concealed within.

Its presence is always indicated by a low, soft *tchick-tchick-tchick*, repeated at irregular intervals, but differing very much from that of *C. leucoptera*. It has a song which it is probable it does not utter, until it has reached its breeding-grounds. During its prolonged stay, we have never heard its song; the same dull monotonous note always 'greeting our ears. Dr. Brewer describes its song in the spring and summer as "varied and pleasing," but not powerful nor in any degree remarkable.

We have no reason to believe that this species breeds in our midst, much less in any part of Pennsylvania, although Mr. Audubon inferred that it bred in pine forests in this state, from the fact that birds had been seen by him in August. This does not necessarily follow, as their breeding takes place so early as to render it possible for birds to be seen in midsummer after a migration from remote localities. Prof. Baird affirms, however, that he has seen them in the coal regions of Schuylkill Co., Pa., during every day of the summer feeding in pairs.

This species breeds early in March, a nest and eggs having been obtained then by Mr. Charles E. Paine, in East Randolph, Vt. This nest was built upon a leafless elm-branch; the ground was covered with snow, and the weather very severe at the time. The birds were extremely tame, and refused to leave their eggs. While Mr. Paine was descending a tree with the nest in his hand, the female resumed her position as if to shelter

the eggs from the cold. The above is substantially given by Dr. Brewer in the work on "North American Birds."

The eggs are beautifully blotched and dotted with purplish-brown markings upon a greenish-white ground, and measure .84 of an inch in length and .52 in width. The usual complement of eggs seems to be four.

Ægiothis linarius, **Caban.**

The lesser Red Poll is a rare and occasional visitant. It is a denizen of more northern climates, only migrating as far south as Philadelphia, during unusually severe weather, and when there is a paucity of food-stuffs in its northern habitats. We are told that it is chiefly gregarious. During the few times that we have observed it, in early April, it has always been alone. Mr. Wilson says that these birds were very abundant in Western New York in his time; and were called Snow Birds; Mr. Ord in a subsequent edition of Wilson, states that it rarely visits Philadelphia, but observes that during the winter of 1813-14 a flock of nearly one hundred were seen feeding upon *Atriplex hastata*. Mr. Nuttall wrote that numbers appeared Nov. 1, 1833, in Massachusetts, which were so tame while intently feeding upon the seeds of the birch, that it was possible to strike them off the branches without their taking to wing. He says further, that they were attracted to the pines where they busied themselves in feeding upon the seeds which

the Crossbills had dislodged from their lurking-places, and which the latter had failed to secure. Mr. Verrill says it is met with in Norway, Me., in the fall, winter, and spring; and Mr. Allen claims for it an irregular and occasional visitant in Springfield.

During its brief stay it never visits our yards and gardens, but is chiefly a frequenter of low marshy grounds, and along water-courses, where the common alder, *Alnus serrulata* grows luxuriantly; and also in low humid meadows where there is a rich growth of *Betula nigra*.

In its movements along the branches of trees and shrubs, and in the suspensory attitude which it frequently assumes, there is a marked resemblance to *Parus atricapillus*.

Few species display such a lack of suspicion as the one under consideration. When disturbed by human footsteps, the coolest indifference is manifested, as evidenced by the fearless and confident manner in which it passes from branch to branch, or from shrub to shrub. When intently busy in foraging, we have been able to approach within a foot of it without producing the slightest distrust; and when perceived it would only gaze into the face of the intruder with the most perfect innocence, and only shift its position when the hand was opened to receive it, and then only in the most unsuspecting and quiet manner. Unlike most species, even frequent attempts to capture it did not lessen apparently its confidence, one iota.

In feeding it never visits the tall tree-tops, but rather prefers low bushes and weeds. In the cold season it feeds upon the seeds of *Pinus strobus*, *Pinus inops*, *Abies canadensis*, *A. nigra*, *Betula excelsa*, *Rhus glabra*, and those of various grasses, asters, and solidagos. In early spring it feasts largely upon the catkins of *Alnus serrulata*, and *Betula nigra*, and later, just before it takes its departure upon the tender and fleshy cones of the *Coniferæ* and the buds of *Acer rubrum*, *A. saccharinum*, and *Pyrus malus*. Among insects, the eggs of the *Aphidæ* and *Coccidæ* that are adherent to the branches of the common alder and other shrubs, with the ova and pupa of *Cratonychus citereus*, *C. pertinax*, and other beetles, are esteemed racy tidbits. While feeding upon the buds of alder it will not hesitate to seize whatever of insect-life should pass athwart its vision.

Its flight is graceful and undulating, and resembles that of *Chrysomitris pinus*.

During its stay it is devoid of a regular song. The only note which it utters is a low soft call which resembles that of the Goldfinch, and which is produced in the intervals of feeding and during its passage from bush to bush. Dall says its only song is a few cheerful twitterings and chirpings.

According to Mr. Dall it is a very abundant summer resident at Nulata, and builds in bushes near the ground a nest which is composed of dry grasses and mosses, exteriorly, and is lined with hair on the inside. Nidification commences

about the 15th of May, the eggs are laid. June 1st, and the young are able to fly near the end of July. At St. Michaels, owing to the lack of trees and scarcity of bushes, the birds nidificate in grasses. Their fearless and familiar manners, bright plumage, and elegant nests, are sufficient to make them general favorites, so says that distinguished writer. Richardson affirms it to be a permanent resident in fur countries where it frequents the banks of lakes and rivers, to glean among the reeds that grow in such places. In British Columbia it is very rare, and occupies swampy localities where alder bushes and water plants grow, and may be seen pecking at seed pods, or searching for insects among the flowers.

Holboll speaks of it as irregularly distributed over Greenland, building near the shore in birches, willows, or alders. At the end of August it separates in small flocks and feeds upon the seed and tops of lichens. By October it has entirely disappeared. The eggs, he says, are five in number, and spotted with pure brown upon a bluish-white back ground.

In Europe as in America, this species nests in low bushes, from two to six feet from the ground. In habits and appearance it seems identical with our own. Mr. Yarrow, an eminent English ornithologist, says that it is readily domesticated and can be made to breed in confinement. He describes the nest as being placed within willows and alder bushes, and as constructed of dry grasses

and mosses, with an intermingling of willow catkins which also form a cozy lining interiorly. The young are produced late in the season and are seldom able to fly before July 1. The parents are remarkably devoted to their offspring. Pennant mentions a case where the female was so devoted to her duty that she refused to leave her nest and had to be taken off with the hand. When feeding upon the buds of the birch and alder, they are so intent upon their business that they are readily taken by means of a long pole smeared with bird-lime.

The European eggs are five in number, pale bluish-green and marked with orange-brown, especially about the larger end. They measure .65 by .50 of an inch. American species are rounded-oval in shape, and generally dotted with ferruginous upon a light bluish-white back-ground. This color is somewhat difficult to preserve in the collection. They measure .65 of an inch in length and .52 in breadth.

Chrysomitris pinus, Baird.

The Pine Finch is a very common winter resident in Eastern Pennsylvania. It arrives from the north late in October usually about the 20th and continues in our midst until the last of April, when it retires whence it came. During the autumnal months it is gregarious and scours the county in quest of food in flocks of twenties and thirties; but, as the season advances and winter

arrives and there is a consequent decrease in food-stuffs, these flocks dwindle down into smaller ones, and finally into pairs, each pair consisting of a male and a female. When spring opens with its mild weather, and plenty again reigns, the small parties re-unite into larger ones, and hunt in common. In this manner they retire to their breeding-quarters.

In mid-winter when the temperature is low and the ground is covered with snow, driven by necessity, it seeks the habitations of man, where it mingles with the snow birds and sparrows for its share of the scraps and crumbs which have been discarded by man. At this time it is exceedingly tame and enjoys a near association with man; but when once in its favorite haunts, the woods, it relapses into its former state of shyness. When disturbed now, it easily takes to flight, and does not return to the same locality for hours afterwards. It delights most particularly in pine forests, where the dense foliage of the trees affords its rather comfortable shelter, and the fissured bark in a measure panders to its appetite.

The flight of this species is lofty, graceful, and undulating. Its movements resemble those of the *Carpodaci*. Whilst feeding we are reminded of its presence and whereabouts by a sharp, piercing *swe-er*, repeated at irregular intervals. On the wing a similar note is heard, which is uttered at somewhat regular periods until the birds are completely out of sight. According to Audubon its

notes are sweet, varied, and mellow, slightly resembling the song of *C. tristis*, but quite distinct from it.

Its food consists of the seeds of grasses and weeds, together with various berries. In the autumn after its arrival it subsists upon the berries of *Juniperus Virginiana*, *J. communis*, *Lonicera periclymenum*; and, later, upon the seeds of *Pinus strobus*, *P. inops*, *Abies nigra*, *A. canadensis*, *Betula excelsa*, and *B. nigra*. The eggs and pupæ of *Cratonychus cinereus*, *C. pertinax*, and the eggs of many of the *Aphidæ* and *Coccidæ*. Early in the spring these birds subsist upon aphides, small spiders, and the larvæ of *Anisopteryx vernata*, *A. pometaria*, and mature forms of the smaller *Noctuidæ* and *Tinsidæ*, and *Formica sanguinea*. The buds of the maple, apple, and cherry, and the succulent cones of various species of *Pinus* are eagerly devoured.

This species does not breed in our midst. According to Dr. Brewer, early in May, 1859, a nest was found in the garden of Prof. Benjamin Peirce in Cambridge, Mass., by Fr derick Ware, Esq. The base of this structure was a mass of loose materials, lower portions of the sides scarcely different, with the upper and inner parts impactly and neatly felted together. Externally, were noticed twigs of *Thuja*, grasses, carices, fine roots, fine vegetable stalks, ends of pine twigs, coarse hair, and scraps of wool. Internally, there was a close lining of fine roots of herbaceous plants, and

the hair of small animals. The nest was four inches in diameter, and three in height; with a depth of cavity and diameter at the rim of about two inches.

The eggs are four in number, oblong-oval, light green, and spotted chiefly about the larger extremity with light ferruginous markings. They measure .70 of an inch in length and .50 in breadth.

Chrysomitris tristis, Bonap.

The Goldfinch is moderately abundant in Eastern Pennsylvania during the dreary winter months, being to a certain extent a permanent species. It occurs mostly in small flocks of a half-dozen, and frequently in pairs. In early autumn these flocks are rather large, and also early in April, when there is an increasing development of food-stuffs.

Throughout the winter it leads a nomadic existence, in consequence of the scarcity of food. It often seeks the habitations of man where it freely mingles with the snow birds and sparrows, like the subject of the preceding sketch, and derives a subsistence from the refuse matter of the kitchen. It now becomes exceedingly tame and approachable. While enjoying our hospitalities it does not disdain its own natural food. If a bush of *Lonicera periclymenum* is close by and in fruit, it does not hesitate to enter and gorge itself to satiety. For this fruit it affects great partiality. Like *Carpodacus purpureus*, it feasts upon the seeds of *Raphanus sativus*, *Amarantus hybridus*, *A. albus*,

and *Chenopodium album*. In forests the seeds of *Abies canadensis*, *A. nigra*, *Betula nigra*, and graminaceous seeds, form a considerable part of its diet. When the red maples are in blossoms we have often discerned small flocks subsisting upon the tender stamens and pistils, and the small insects which infest them. As the season advances and the trees come into bloom, the apple and cherry are objects of special attention. It is a source of annoyance to the gardener, often visiting his broken ground for the tiny beetles and earth-worms unearthed, and espying the freshly-sown salad seed, never ceases, unless driven away *per force*, until nearly every seed has been stolen from its hiding-place. In the summer and autumn both sexes are found feeding upon the seeds of *Taraxacum Dens-leonis*, *Cirsium discolor*, *C. pumilum*, *C. arvense*, *C. altissimum*, *Helianthus tracheliiifolius*, *H. divaricatus*, *H. annuus*, *H. tuberosus*, the cultivated salad, and various solidagos and asters.

The Salad Bird is chiefly a granivorous species; although having a preference for seeds, yet it destroys numbers of small insects for its own appetital gratification, as well as that of its young. The larvæ of *Anisopteryx vernata*, *A. pometaria*, *Chærodes transversata*, *Ennomos subsignaria*, *Zerene catenaria*, *Hybernia tiliaria*, and mature forms of *Limacodes scapha*, *Halesidota tessellaris*, *Plusia precatationis*, and other lepidopterous species; *Musca domestica*, *Tabanus lineola*, *Stomoxys calcitrans*, *Anthomyia elongata*, and various species

of *Culex*; among diptera; *Selandria rosæ*, *S. vitis*, *S. caryæ*, *S. tiliæ*, *Apis mellifica*, *Formica sanguinea*; and various species of *Cynips*, among hymenoptera; besides *Aphis rosæ*, *A. mali*, and others.

In the month of April the flocks dissolve into small parties preparatory to mating. It is quite common to see two males and one female together; the former lavishing the most endearing attentions upon the latter, and, besides, occasionally regaling her with the most delicious melodies. Whimsical and exceedingly variable, she selects one suitor, and almost the next moment discards him for the other, which at this moment is perched near by pouring out his love in the most charming manner. This condition of things lasts during a couple of days before a final choice is made. It seems to require the utmost condescension, as well as the greatest effort for the successful suitor, to retain his hold upon her affections, for she is likely to waver in the interval of time which elapses before nidification is begun. This duty so completely engrosses her time and attention, that the tendency to flirtation, so to speak, has not time to manifest itself, and is soon abandoned.

Subsequent to mating and just before nidification, the successful mate and his partner ramble together in quest of food; when weary of this business, they may be seen perched upon a common twig, when the former with his sole energy pours out his passion in the most charming language; ever and anon turning toward the object

of his love, as if to ascertain whether it meets her approval or not. A soft low note which may be expressed by *twē-yah*, is her sign of recognition. The song of the male is loud and clear in intonation, and produced with the varied moderation of *Fringilla Canaria*.

The flight of this species is lofty and undulating, and resembles very closely that of *C. pinus*. A soft *twē* repeated with moderate slowness, and at measured intervals, indicates its presence when in a state of repose. In early spring it seeks the tops of the tallest trees in very dense forests, and being gregarious, the individuals of a flock alight in a compact body. Later, low trees and bushes are its delight. It sometimes condescends to feed upon the ground.

Now, as when the ground is covered with snow, it seeks the abodes of man. To our gardens and orchards it is a common visitor and commends itself to our favor and clemency, by its want of timidity, gentle demeanor, and agreeable ditty. It is not readily intimidated and permits the nearest approach without manifesting alarm.

In the summer it is fond of bathing and seeks the low gravelly beds of brooks for that purpose. Its movements upon such occasions resemble those of the Canary.

When confined it becomes very docile and familiar, and under proper instruction learns to rival the Canary in the compass and brilliancy of its song. A friend of ours possessed a male-bird

which he reared from the nest, that was trained to vary and modulate its song in time with the movements of the index finger, increasing and decreasing the volume of song by the elevation and depression of the finger, and accelerating and retarding the time by the lateral movements of the same.

In Eastern Pennsylvania, according to our experience, but a single brood is raised in a season. The time of nidification is somewhat irregular, commencing sometimes as early as the 15th of May, but generally from the 10th to the 15th of June. Nests have been taken with eggs as late as the 12th of July, and occasionally with young during the last week of August. These delays were doubtless, due to the fact that the authors of such nests had been frustrated in their early endeavors. The destruction of a nest whilst incubation is progressing, will generally lead to the renewal of the attempt in some other place; the desire for offspring triumphing over the most insuperable difficulties. We have known instances where the same pair had been baffled four times in succession, and as often renewed the attempt. Again, where adverse circumstances have operated against the fulfilment of this important business, the birds have been compelled to abandon their labors unwillingly, before the consummation of the task.

Perhaps an unfortunate female or male has been doomed to lead the life of a celibate, by reason of the scarcity of individuals of the opposite sex.

An event may have occurred which has placed a new aspect upon affairs. A male has died and the female deprived of his assistance deserts the home, and rambles abroad. In her flights she encounters a male, which has been compelled by due necessity, or otherwise, to lead a single life.

A friendship takes place, and after a brief courtship, the two become mated. These preliminaries ended, and a suitable time having been spent in the selection of a proper locality, a nest is built, and the subsequent duties of oviposition and incubation accomplished.

For nidificating purposes, a maple or pear tree is usually chosen. The nest is placed about fifteen feet from the ground; never less, but frequently at higher elevations. Sometimes a horizontal branch of the pear with diverging twigs is selected. Than the nest of the "Thistle Bird" there is no more beautiful structure of the basket in form, and the felted in texture. The structure is symmetrical in shape; delicately and neatly woven, and skilfully and finely fastened to the forked twigs between which it is placed. For beauty of design, and neatness of finish, it is a perfect model of architectural skill. A nest before us from this neighborhood, may be considered as typical. It is placed in a crotch, and held *in situ* by four small upright branches which are partly wrought into the fabric. The exterior is composed of the tassels of *Castanea vesca*, stems of *Polygonum*, a few leaves and fragments of a fun-

goid growth, woven together, with an excess of slender vegetable fibres of *Linum Virginiana*, and *L. usitatissimum* occasionally interwrought with vegetable wool plucked from *Verbascum Thapsus*. The interior is lined with a commingling of divers shreds of *Taraxacum Dens-leonis* and *Cirsium* neatly and cozily felted. It measures two and a half inches in diameter, and the same in height. The cavity is two inches wide at the rim and the same in depth.

Another nest which we have before us from Union Co., Pa., distant 180 miles from the former site, varies materially in size and in the composing elements. It was placed when discovered between two horizontal twigs joined at right angles to a third, to which it was firmly attached by hempen strings, and still further secured to a vertical twig at right angles to the latter by similar cords. The exterior is composed mainly of twisted and untwisted hempen strings of the color of tow, cotton string, fine roots of grasses, spiders' webs, narrow shreds of *Linum usitatissimum*, neatly and compactly felted together. The interior is lined with fine yellow rootlets and an excess of white horse-hair. It is hemispherical in shape with a diameter and depth of three inches each. The cavity is two inches wide at the rim and of equal depth. This nest when found about the 15th of August contained young birds.

Still another nest which we have is somewhat exceptional in its position. It rests upon a hori-

zontal limb which is nearly three-fourths of an inch in thickness, with three inclined twigs situated anteriorly, to which the nest is fastened by cotton string and the ravellings of variously colored cotton fabrics. The outside is composed mostly of raw cotton, animal wool, hempen and cotton strings, ravellings of cotton fabrics, vegetable fibres, rootlets of grasses, finely and ingeniously interwoven. Interiorly, there is a commingling of vegetable wool and horse-hairs. The bottom of the cavity is hardly covered, the twigs which form the basis of the nest being clearly discernible. This structure is two and a half inches in diameter and two in depth. The cavity is one and three-fourth inches in width at the rim and the same in depth.

After the completion of the nest which ordinarily requires a period of six days, oviposition commences on the ensuing day. The eggs usually five in number are deposited at the rate of one egg *per diem*. Incubation commences the day subsequent to the last deposit, and lasts for 10 days; the chief part of its labor devolving upon the female-bird; the male meanwhile furnishing his companion with suitable diet. When not thus employed, he occasionally cheers the tedium of her task with an agreeable ditty. His affection for his mate and young is unsurpassed. When the nest is assaulted by enemies, both parents become exceedingly clamorous, and with fiery eyes and open jaws unite to expel the common intruder.

The young are from 11 to 12 days old when

they leave the nest. The addition of a week or 10 days to this period, finds them sufficiently matured to feed themselves. At first they are fed by both parents. Their diet mainly consists of the larvæ of *Anisopteryx vernata*, *A. pometaria*, *Zerene catenaria*, *Eufitchia ribearia*, *Limacodes scapha*, *Chærodes transversata*, and mature forms of *Tabanus lineola*, *T. cinctus*, *Culices*, *Musca domestica*, *Aphis mali*, *A. rosæ*, and others. Later, the smaller *Noctuidæ*, *Tortricidæ*, and *Tineidæ*, with *Apis mellifica*, *Selandria vitis*, *S. caryæ*, and and many species of the *Andrena* and *Halictus*.

After the young are able to provide for themselves, they continue with their parents, and, doubtless, constitute the small flocks which are seen in September and October feeding upon the seeds of *Cirsium*, *Aster*, and *Solidago*.

The eggs of this species are sharply acuminate at one extremity and rounded at the other, and of a uniform bluish-white color. The average measurement is .66 by .53 of an inch.

Plectrophanes nivalis, Meyer.

The Snow Bunting is an occasional winter resident in Eastern Pennsylvania, appearing with the first snows in December and January. In autumn in their northern habitats, they are quite gregarious, and seem to prefer the vicinity of water, most probably on account of the abundance of certain aquatic plants which exist in such localities, upon the seeds of which they subsist. In this

latitude we have never seen more than three or four individuals at a time, frequently less, consorting with *Juncus hyemalis* and our common winter sparrows.

On their visits about our yards in quest of food, they betray but little timidity and behave themselves with all the familiarity of the Black Snow Bird. In the rural districts, however, they appear less tame and affect a predilection for running water, where in early spring they may be seen feasting upon the tender catkins of the *Alnus serrulata*.

Their food consists of the berries of *Juniperus Virginiana*, *J. communis*, and *Lonicera periclymenum*; besides, the seeds of *Pinus inops*, *Abies nigra*, *A. canadensis*, *Betula nigra*, and those of *Amarantus hybridus*, and various grasses. In the winter they feed upon broom-seed, cracked corn, and the scraps and refuse matter which are discarded by the cook. Just before retiring in early April, the eggs and pupæ of *Cratonychus cinereus*, *C. pertinax*, and other beetles are eagerly devoured.

During their stay they are devoid of song; not even so much as a simple call-note have we heard them utter. In Scotland their call-note is said to be very pleasing and often repeated during their flight in a compact body. Before alighting upon the ground they make several sudden turns coming into contact with each other and uttering several guttural notes. They seldom perch but

move about upon the ground with nearly the facility of *Sturnella magna*.

Mr. Dall describes this species as building on the hillside and under the lee of a stone, in Alaska, where it is sometimes very common, and, at other times entirely absent. Richardson states that it breeds on all our continental shores from Chesterfield's Inlet to Behring Strait, the most southerly breeding place known to him being Southampton Island. The nest is usually composed of dry grass externally, and lined with a few feathers and deer's hair. It is ordinarily placed in a creviced rock, or in a loose pile of stones, or timbers. Nest-breeding certainly takes place during the last of June, or the beginning of July, as a nest was discovered by the last mentioned individual, July 22, which contained four young Snow Birds. In this instance the young were fed by both birds quite frequently with various grubs.

A nest with young birds is said to have been taken by Kirk Boott, Esq., of Boston, in the summer of 1834 among the White Mountains, which was probably an accidental occurrence. The only authenticated nest and eggs in the Smithsonian collection were taken on the Arctic coast east of Fort Anderson by R. MacFarlane, Esq. This nest bears the label, "Nest situated in a cave in a sand-bank." It is built of wiry grass stems externally, and lined with a few feathers. In slope it resembles a deep saucer, and has an external and an internal diameter of 3.75 and 3.00 inches respectively, with

an outer and an inner depth of 2.50 and 1.50 inches.

The eggs are five in number, dull white, and spotted with slightly yellowish-rufous markings, which are more plentiful about the larger extremity. They measure .95 of an inch in length and .65 in width. The above description of nest and eggs is substantially taken from the work on "North America Birds."

Passerculus savanna, Bonap.

The Savanna Sparrow is principally a maritime species, and only occasionally found inland. In Eastern Pennsylvania it is by no means common, and is found mainly in lowlands of a humid character. It ordinarily visits this latitude from the 1st to the 15th of April, and after a stay from a week to ten days, retires north to breed. In habits it is pre-eminently terrestrial. We have seldom observed it on a bush, or tree, or even a fence-rail.

It is far from being shy, and can be approached without difficulty. In some parts of the country these birds are quite gregarious, and move in large flocks and associate with other species, which is particularly the case about Columbia, South Carolina where they winter from October to April, according to Dr. Coues. During their short stay with us in April, we have generally observed solitary individuals, very seldom as many as two or three together.

Their food consists of the seeds of grasses of last year's growth which they procure in their accustomed haunts, besides various small insects which venture forth at the season of their arrival. We have detected remains of *Cratonychus cinereus*, *Harpalus compar*, *Casnonia pennsylvanica*, *Haltica chalybea*, of a coleopterous character, and *Formica sanguinea*, and other species of ants.

The flight of this species reminds us of that of the Fox-colored Sparrow in being low, undulating, and slightly sustained. Its ground movements are strikingly characteristic of the same species.

In Massachusetts it is only a summer resident, in a few restricted maritime districts, according to Dr. Brewer; while in the West, Mr. Allen says, it rarely, if ever, stops to breed. In Western Maine, Mr. Verrill states it to be a common summer occupant, and as breeding there in the latter part of May. In the neighborhood of Eastport, and in the Grand Menan group of islands, Dr. Brewer affirms that they invariably nidificate in great numbers, in the depressions on the margin, or just under projecting bluffs of land close to the sea, many nests being built in close proximity to each other. They arrive there in April and retire in September, their departure being apparently regulated more by the scarcity of food-stuffs than by thermometric changes.

Dr. Coues found this species quite abundant in Labrador, in 1860, where it fed on the beds of eel grass, along the rocky shores, in company with the small Sandpipers and the Titlarks.

Although this Sparrow affects a fondness for low, humid grounds, yet it nidificates invariably in dry and usually slightly elevated places. The nest is generally sunk into the ground and built of grasses, loosely arranged and lined with softer materials of the same. Dr. Brewer says this species is particularly wary and mistrustful when with nest. Both birds according to the same author incubate alternately, but one when not thus occupied remains within hailing distance, and by a given signal reminds the other of the approach of danger, when the latter glides out of the nest and runs along the ground like a mouse.

The eggs are five or six in number, rounded-oval, with one end more acuminate than the other. They are partially covered with reddish-brown blotches upon a greenish-white ground-work; the blotches being more numerous and confluent about the larger extremity, constituting a corona. In others, in addition to the above, the ground-color is almost obscured by fine ferruginous dots. They measure .67 of an inch in length, and .54 in breadth.

During its autumnal migration this species is seldom observed; but when it is seen, it is a denizen of low, humid grounds where it subsists upon the seeds of graminaceous plants, asters, solidagos, and divers small insects which are occupants of such localities.

Pooecetes gramineus, Baird.

The Bay-winged or Grass Finch is tolerably abundant in Eastern Pennsylvania during the early spring, but few remain, however, to breed. It usually makes its appearance about the 15th of March, and sometimes in very backward seasons, not before the first of April. Along the Wissahickon hills in unusually mild winters, in sheltered situations, we have met individuals throughout the winter months. Its stay is uncommonly prolonged until the last of November, but ordinarily it retires about the last of October.

It is partial to dry, open fields and pastures, where it procures its subsistence, and mainly delights to place in depressions in the ground of its own construction, with no attempt at concealment, its simple nest of grasses. It is a fearless and unsuspecting species, neither courting nor shunning the society of man. We have never met with its nest near human dwellings, but have frequently observed it chanting its simple and not unmusical lay, while perched upon a fence-rail by the roadside, and ever and anon stooping from its elevated position to dust, which operation it practised with seeming fondness.

Its song is a simple succession of pleasing notes with some resemblance to those of the Canary, but much weaker. It is not unlike the song of *Melospiza melodia*, but neither so varied nor powerful; and like the same commences early in

the morning and after a few hours' continuance, is relaxed to be renewed at sunset. Its song is continued until late in the season.

The flight of this bird, like most of the *Fringillidæ*, is low, undulating, and but slightly prolonged.

Its food consists of insects and seeds of various kinds. It loves to visit fallow ground, where it derives a considerable portion of its food, being exclusively terrestrial while searching for the same. We have observed it feeding upon the seeds of *Phleum prætense*, the various species of *Panicum* and *Poa*, *Amarantus hybridus*, *A. albus*, and occasionally upon the freshly sown seed of *Raphanus sativus*, and the common salad. The following insects have been found in several stomachs which we have examined in the spring-time:—*Harpalus compar*, *Casnonia pennsylvanica*, *Platynus cupripennis*, *Haltica chalybea*, *Scarites subterraneus*, *Cratonychus cinereus*, *Formica sanguinea*, *F. subterranea*, and *Lumbricus terrestris*. Later in the season the larvæ of *Anisopteryx vernata*, *A. pometaria*, *Zerene catenaria*, *Eufitchia ribearia*, *Gortyna zææ*; and mature forms of *Penthina pomonella*, *Halesidota tessellaris*, *Limacodes scapha*, *Plusia precatiosis*, and others. The young are fed upon the larvæ of the foregoing lepidoptera, aphides, spiders, and earthworms. The fruit of *Fragaria Virginica*, *Rubus villosus*, and the wild choke-cherry are also eaten.

Nidification commences during the last of April or the beginning of May. The nest is mostly

placed upon the ground and is the joint labor of the sexes during a period of three days. It is composed almost exclusively of dry grass-stems, and is lined with soft materials of the same. Oviposition commences on the day following the completion of the nest, and continues for four or five days, according to the complement of eggs laid. Incubation then ensues and lasts for 12 days. We have never met with more than two breeds in a season.

When the nest is approached, the birds seek by various stratagems to draw off the intruder, sometimes counterfeiting the most astonishing lameness. The parents manifest the utmost devotion for their young. The latter are confined to their nest until they are from 12 to 13 days old when they quit it, but still continue under the watchfulness and care of the parents from 7 to 10 days longer, when they are fitted to provide themselves with nourishment.

The eggs are oblong-oval, more acuminate at one extremity than the other, and marked with divers tints of reddish-brown spots, lines and dots upon a light greenish-white ground-color. In some eggs the spots mainly constitute an *annulus* about the larger extremity, and in others, the ground-color is scarcely distinguishable from the abundance of spots. The eggs average .85 of an inch in length and about .64 in breadth.

Coturniculus passerinus, **Bonap.**

The common Yellow-winged Bunting is quite

irregularly distributed. In some portions of New Jersey it is a very common species, while in Eastern Pennsylvania it is found in limited numbers. We have never known it to nidificate within the confines of Philadelphia. It is a migrant and appears with the chipping-sparrow during the last of April, or the beginning of May.

It is extremely partial to low sandy fields during its brief sojourn, and is mainly found upon the ground like the subject of the last sketch, searching for the seeds and insects upon which it subsists. Occasionally we have found it upon small bushes and weeds, but never upon trees even of moderate growth.

From the manner of its occurrence we are led to infer that it is not gregarious. It is sometimes found associated with the field and other sparrows, but this association is doubtless purely accidental.

Though mainly restricted to rural districts, and seldom if ever visiting the haunts of man, it may be presumed in the absence of evidence *per contra*, to be a shy and timid creature. Though extremely unobtrusive in its manners, it manifests, however, a confidential mien, and can be approached without displaying a shadow of fear or alarm.

The song of this species is short and feeble, and bears a marked resemblance to that of a grasshopper. It lacks variety and expression, and may be well characterized as an "unmusical ditty" in the language of Audubon.

It is pre-eminently terrestrial in its habits, living, feeding, and nesting on or close to the ground. It subsists upon the seeds of asters, solidagos, *Aira flexuosa*, *Amarantus hybridus*, *A. albus*, and various species of *Panicum*, during the early part of the season; and, later, upon *Raphanus sativus*, common salad, *Ambrosia artemisiæfolia*, and the berries of *Juniperus Virginiana*. Among insects we have observed the remains of *Cedipoda sulphurea*, *C. nebulosa*, *Dicælus dilatatus*, *Harpalus compar*, *H. pensylvanicus*, *Formica sanguinea*, and earthworms, besides the dipterous forms of *Musca domestica*, *Stomoxys calcitrans*, and *Culex teniorhynchus*.

Its stay is brief and lasts but a week. It retires as silently and as unexpectedly as it came. During its autumnal migration, it rarely stops, usually passing rapidly through in its southward-bound journey to Mexico and Central America, where it passes the winter-months.

In the vicinity of Newark, N. J., it is a very abundant species, and nidificates in great numbers. Mr. Maynard says it breeds abundantly on the island of Nantucket, and Mr. Allan claims for it an abundant summer visitant in Western Massachusetts where it breeds in dry fields and pastures, and is double-brooded. Mr. T. S. Brandigee, according to Dr. Brewer, found several nests in the neighborhood of Hartford, Conn., which were built in a field of thin grass upon the ground, and nearly hidden from view. In Northfield, Ill. ac-

According to Robert Kennicott, Esq., it breeds quite abundantly.

The nest is placed on the ground, most generally in a tuft of grass or in a cluster of plants, and is built of dry grasses and lined with horse-hair. The young, it is said, follow their parents for a brief period, but soon separate and care for themselves.

The eggs are rounded-oval, and dashed and blotched with golden-brown markings upon a clear white background. They measure .74 of an inch length and .62 in breadth.

Melospiza lincolni, **Baird.**

Lincoln's Finch, so called by Mr. Audubon in honor of Mr. Thomas Lincoln, one of his companions, is an exceedingly rare species in Philadelphia, although more abundant to the westward. It makes its appearance during the latter part of April or the beginning of May, and is generally found consorted with other species of sparrows. Its habits, in some particulars, remind us of those of *Melospiza melodia*. Like this species it perches upon the top of a small bush or low tree, and chants its song for an hour at a time. When disturbed it moves quickly away and precipitates itself into the densest bush with which it meets. Unlike the Song Sparrow it is more suspicious, and can be approached only with great difficulty. It shuns rather than courts the society of man, and affects a fondness for thick bushes along water-courses, in secluded valleys.

Its song is characterized for its sweetness, and surpasses in strength that of any of our ordinary sparrows. Mr. Audubon describes it as compounded of the notes of the Canary and the European Woodlark.

The flight of this species is low, rapid, undulating, and but moderately sustained.

This bird subsists mainly upon seeds and berries, although many insects are eagerly devoured. The seeds of various species of *Panicum*, *Amarantus*, and *Solidago*, among plants; besides *Casnonia pennsylvanica*, *Harpalus compar*, *Platynus cupripennis*, *Formica sanguinea*, and other species of ants have been identified in several stomach-examinations.

According to Mr. Audubon this species breeds in Labrador, where young birds were met with as early as the 4th of July. Dr. Hoy found them breeding near Racine, Wis., and Mr. Audubon met them during the breeding-period on the Upper Missouri. In the weedy pastures in Parley's Park, in Northern Utah, a nest with young was discovered by Mr. Ridgway imbedded in the ground, underneath a bush. In high Arctic latitudes, it has been found breeding, and on the top of Mt. Lincoln, at an elevation of eight thousand feet, it has been found to be a very abundant species by Mr. Allen.

Mr. Kennicott observed its nest as early as June 14, and remarked that it was placed on the ground in a clump of grasses, in an open and dry

place; another structure was built in a bunch of grass in the midst of a small grassy pond. The complement of eggs, according to the last named authority is five.

The eggs discovered near Racine by Dr. Hoy, according to Dr. Brewer, are a pale greenish-white, and densely marked with ferruginous brown dots and blotches, to such an extent as sometimes to disguise the ground-color. They measure .74 by .60 of an inch.

This species probably winters in Guatemala, and certainly in Mexico as it is quite common here in the winter.

Melospiza palustris, Baird.

The Swamp Sparrow is an occasional winter resident in Eastern Pennsylvania, but is principally a migrant species, where it arrives during the last week of April or the first week of May. Among unscientific persons it is not generally known in consequence of its love of retirement and its peculiar haunts. It seldom if ever visits the habitations of man, but chiefly delights in low, marshy grounds, and the borders of streams. For a week after its arrival it is somewhat gregarious, the bulk retiring farther north, while a few remain here to brea

Though partial to places which are seldom visited by human beings, save where a love of nature is their controlling motive, yet we are assured from a long experience that it manifests less

timidity than is customary with many species that frequent less quiet and more exposed localities. We can rightly claim for it as much confidence and familiarity as is possessed by *Melospiza melodia*, a very near relative, which freely delights in the companionship of man.

Unlike this last mentioned species, and other congeneric species, it rarely takes to trees while feeding, but is either found upon the ground or in low bushes. In some particulars it reminds us of *Seiurus noveboracensis* of Nuttall from its peculiar fondness for streams of water.

The seeds and other articles of diet, which it readily discovers in low, marshy grounds and along water-courses, doubtless, operate as a strong incentive to such predilection. Perhaps this custom is of long continuance, and the species has not yet encountered those changes in its environment, which must determine corresponding changes of habit. The abundance of marshy ground and their probable existence for years to come, have a tendency to induce this species to traverse the "old beaten road of habit."

In its movements from bush to bush, or upon the ground, its only note is a hoarse *cheep*, uttered at irregular intervals. Its song though harsh and lively, lacks the variety and modulation which characterize that of the Song Sparrow. Its flight is low, undulating, and poorly sustained.

Early in the season its food consists of the seeds of grasses and weeds, with a few insects. Among

the former may be mentioned the seeds of *Poa trivialis*, *P. nemoralis*, and *Arrhenatherum arenaecum*; and, among the latter, *Harpalus compar*, *Casnonia pennsylvanica*, *Cratonychus cinereus*, *Culex tæniorhynchus*, and various dipterous and coleopterous beetles that are indigenous to low, aqueous situations. As the season advances, *Haltica chalybea*, *Cymindis viridipennis*, *Chrysomela cæruleipennis*, among coleoptera; and the larvæ of *Limacodes scapha*, *Agrotis tessellata*, *Chærodes transversata*, *Ennomos subsignaria*, *Anisopteryx vernata*, *Hybernia tiliaria*, and mature forms of *Plusia*, *Acronycta*, and many of the *Tortricidæ* and *Tineidæ* are devoured and fed to the young.

Nidification commences ordinarily about the 15th of May. A tussock of grass is ordinarily selected for the site of a nest. The latter is placed in a depression in the ground, and is held in position by the surrounding grasses. It is constructed almost entirely of dry grasses which are gathered in the vicinity. It is neither so large nor so firmly woven as that of the Song Sparrow. To the labor of building both birds apply themselves with commendable assiduity. On the completion of the nest which requires not more than three days, the female commences oviposition, which proceeds at the rate of one egg daily for four days, until the complement is deposited. Incubation follows the next day, and continues for a period of 11 days. We do not think the male takes any part in this essential operation, save to

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supply his companion with food, which like a faithful and affectionate husband he willingly performs. When not thus engaged, he perches upon an adjoining tussock or bush, and exerts his utmost to defend his mate and nest against the encroachments of enemies.

The young are fed alternately by both parents. The solicitude of the latter for the former is truly remarkable, and continues sometimes after the young have assumed their independence. The young leave the nest 12 days after hatching, and in ten days more are prepared for self-maintenance.

Two broods are reared in a season; the second during the month of July, the first being fully matured and out of the way when preparations are begun for a second. After the breeding-period is over, both old and young subsist upon the seeds of meadow-grasses, sedges, rushes, and berries of the common red-cedar, and a few insects, until their departure during the last of October.

The eggs are a light green, and are marked with reddish and purplish-brown spots which are confluent about the larger extremity, constituting an *annulus*. They measure .76 of an inch in length and .50 in breadth.

Melospiza melodia, **Baird.**

The Song Sparrow is one of our permanent residents, and is universally distributed. In the winter it is one of our most agreeable guests, fre-

quenting our yards and gardens in company with *Junco hyemalis* and *Spizella monticola* for the crumbs and scraps which have been cast away by the cook. It commonly associates with our ordinary barn-yard fowls for its share of cracked corn, broom-seed, and wheat-screenings. It delights to build in low bushes by the sides of open fields, or on the borders of thickets, and frequently in depressions on the ground surmounted by tall grasses.

For weeks anterior to nidification the males seek the tall tree-tops and regale us with the most delicious music. Its song is heard as early as the 15th of March, and continues from early morning until long after sunset with scarcely an intermission. In the middle of the day when most other species are silent and have shrunk away to the refreshing shades, its song is as ardent as ever. For variation and modulation of voice it is unexcelled by few species. Some of its strains recall to mind the delicious symphonies of *Turdus mustelinus*; and others, again, bear a close resemblance to those of *Spizella monticola*. At most times its song is lively and vivacious, and occasionally assumes a plaintive character. The Canary's exceeds it in variety, but lacks its sweetness and pathos. The following syllables express with tolerable exactness the song of a capital singer:—
tsi-tsi-tsi-t'wē-tō-tw'-tw', *whā-whāāāāā-kē-kē-kē*,
tsi-tsi-tsi-twē-twīīīī, *tsi-tsi-tsi-twā-tūrrrr*, *tsi-tsi-tsi-*
t'wā-tūrrrr, *tsi-twā-twā-twīīīī-tw'*. Its ordinary

call-note is a simple *hwit* produced slowly and at regular intervals during feeding and perching. The same syllable pronounced sharply and hurriedly is expressive of anger* and also of disappointment. The prelude to its song resembles nearly the first measure of that of *Spizella monticola* and may be written *twi-twi-twi-twi-twi-i-i-i-i*, but is pronounced with less animation.

The flight of this Sparrow is low, undulating, and but moderately protracted.

Its food is principally procured from the ground and among the leaves and branches of trees and shrubs, and consists of the seeds of various plants, and divers insects. Early in the spring it is chiefly a vegetarian. An examination of the contents of many stomachs discloses but few insect-fragments, in comparison with what is found in the Phœbe bird. The blossoms of the red maple, particularly their stamens and pistils, the green berries of *Juniperus communis*, are devoured with avidity. In the months of March and April, we have detected in stomachs, seeds of *Amarantus albus*, *A. hybridus*, *Raphanus sativus*, common salad, and common beet, with the young of *Acheta nigra*, *Caloptenus femur-rubrum*, *Platynus cupripennis*, *Donacia confluenta*, *Formica sanguinea*, and earth-worms.

As spring advances into summer, the eggs and larvæ of various fruits and insects are devoured with a *gusto*. The cultivated varieties of *Prunus cerasus*, and the wild and cultivated species of *Fra-*

garia are especially esteemed. Among insects the larvæ of *Anisopteryx vernata*, *A. pometara*, *Zerene catenaria*, *Eufitchia ribearia*, *Angerina crocataria*, *Ennomos subsignaria*, *Chærodes transversata*, *Limacodes scapha*, *Asopia costalis*, *Lozotænia rosaceana*, and mature forms of *Thecla humuli*, *Callimorpha Leconter*, *Lithacodes fasciola*, *Utetheisa bella*, *Spilosoma Virginica*, *Lithosia miniata*, *Penthina pomonella* and many of the *Tineidæ*.

Mating commences about the 20th of April, ordinarily, and nidification about the 25th of the same month, two weeks after the robin has commenced. Instances have been met with where this business has been deferred, owing to meteorological conditions, until the middle of May. Young birds select for a nest a shallow cavity by the roadside, or on the borders of a field in the midst of a dense growth of grasses; while old birds, ordinarily, build in low bushes. The former soon learn to disregard such places for the security which elevated localities afford. Nests constructed amid branches are generally more compact, and display better taste and skill than those placed upon the ground. The latter being less exposed to the influence of the wind, require less compactness than the others.

Both birds labor with remarkable diligence until a nest is built which is the result of four days' application during the cool of the mornings and afternoons. The birds commence at sunrise and work for three hours; then desisting therefrom

and reassuming the work at 4 P. M., and continuing until sunset, and often later. The labor of the female seems to be the suitable adjustment of the materials supplied by her partner.

Nests built in trees differ not only in compactness from those placed upon the ground, but also in dimensions; the former having a less peripheral extent, and being more neatly and firmly constructed. Exteriorly, the nest is composed of the culms of fine grasses so adjusted as to present a decided contrast to the nest of the *Spizella monticola*; the ends of the stems of which a nest of the latter is built, project considerably at the rim, and present the appearance of an enclosure of palisades. Interiorly, there is a lining of fine stems of *Panicum*, or horse-hairs. Another nest which may be considered typical and which was placed within a cluster of grasses in a cavity in the ground, consists of a framework of coarse grasses and roots of the same, leaves, fragments of paper, somewhat loosely aggregated, and held together by surrounding grasses. Within, is a neat, symmetrical, and firmly built cup-shaped structure formed of grass-stems of *Panicum capillare*, which is lined with horse-hair. In the work on "North American Birds" it is said that the two types of nests are similarly constructed. Our experience, especially in this section of the country, shows a marked difference. The tree-nests resemble the cup-shaped structure of the former but are devoid of the underlying basis.

Another nest which we possess, has the exterior composed of fine grasses with a slight intermingling of raw cotton. The interior is lined with slender stems of *Panicum*, and a few horse-hairs. The most beautiful as well as the most neatly built nest we have ever witnessed, was obtained by us in Cumberland Co. N. J., in the summer of 1872. It rests upon a horizontal twig and is supported by two others which incline at an angle of 60° to the former. It is composed externally of fine branches of *Panicum* neatly and compactly interwoven, and lined with raw cotton, vegetable down, and the silk of *Asclepias*; the entire outer surface is covered with raw cotton which almost completely conceals the grass-stems from view. This nest is hemispherical in shape, and has a diameter at the rim of five and a half inches, and a height of two and a half. The cavity is circular with a diameter of two and a half inches and a depth of two.

The period of oviposition immediately follows nest-completion and continues for five days, when it is succeeded on the ensuing day by incubation which lasts about 11 days. During the operation the male occasionally relieves his partner. Whilst she is occupied, he provides her with nourishment; and when not employed in such matters, he stations himself in close proximity, ready to resist the slightest invasion. The tedium of the time is occasionally relieved by an agreeable ditty.

Both parents are extremely devoted to their

young, unwearied in their attentions, and seek by loud cries and menaces to drive away intruders.

The young are fed upon the larvæ and mature forms of divers insects. The following list comprehends a portion of their bill of fare:—*Lumbricus terrestris*, *Anisopteryx vernata*, *A. pomataria*, *Zerene catenaria*, *Chærodes transversata*, *Hybernia tiliaria*, *Leucania unipuncta*, *Agrotis tessellata*, *Pieris rapæ*, *Colias philodice*, *Utetheisa bella*, *Thecla humuli*, *Gortyna zææ*, in their larval stages. *Musca domestica*, *Tabanus lineola*, *Culex teeniorhynchus*, *Aphis mali*, *A. rosæ*, *Lachnosterna quercina*, in larval forms, and many of the smaller moths of *Noctuidæ*, *Tortricidæ* and *Tineidæ*. As they mature, food suited to their development is administered. They are from 12 to 13 days old when they leave the nest, and in ten days more are able to maintain themselves. Two broods are reared in a season; the latter during the beginning of July.

After the breeding season is over both young and old collect in small flocks and feed together. We deem it highly probable, owing to the small size of these autumnal flocks, that they are composed of individuals of one family alone. When food becomes scarce in consequence of climatic changes, the greater number of these birds depart for the South; a few remaining as before remarked, during the entire winter.

Whether those that have been bred in the neighborhood remain it is difficult to affirm with certainty. As the winter occupants seem to be

hardier and more robust than our summer denizens, we incline to the opinion that the latter retire to the South in the autumn and are succeeded by sparrows, from more northern latitudes. We are confirmed somewhat in this opinion by the simultaneous occurrence of these hardier sparrows with the Black Snow Birds.

The song of our winter denizen commences with that of *Spizella monticola* about the middle of March, and ceases with it about the 12th of April, when both species depart. Its song is more varied, and possesses greater sweetness and power of expression. A capital singer which we observed very closely during the past season, was capable of producing no less than ten distinct measures in regular succession. The individuals which arrive from southern latitudes in the spring, as far as our experience extends, seldom produce more than five separate measures; and the contrast between the two is so great that the dullest ear can appreciate it with facility.

The eggs are a dingy white, and marked with ferruginous and light purple blotches equally diffused over the entire surface. In some specimens these markings are so numerous as to conceal the ground-color; in others, they are irregularly scattered, leaving spaces unmarked. They measure .81 of an inch in length, and .59 in breadth.

Junco hyemalis, **Sclater.**

The Snow Bird driven from its northern home

by the necessity of food, mainly makes its appearance with the snow, or a few days anterior to its advent. Its coming is unattended with any demonstration. Silently it arrives and as quietly retires. We have occasionally discovered its presence as early as the 15th of October, when the weather has been unusually severe, but its arrival is most generally in the month of November.

During the early part of its stay it frequents low meadows, open fields, and the borders of forests. But when the weather becomes more rigorous and the ground is covered with snow; impelled by hunger it seeks the abodes of man, when it becomes extremely familiar and obtrusive, and our yards and gardens are places of daily visitations for the crumbs and scraps which are thrown away by the cook. It becomes on familiar terms with the poultry and share their cracked corn and broom-seed. During the autumnal months the berries of *Juniperus Virginiana*, *Viburnum Lentago*, and seeds of *Ambrosia artemisiæfolia*, *Chenopodium album*, *C. anthelminticum*, *Panicum*, *Aira*, *Calamagrostis*, are favorite articles of diet. Whereas in the winter it has a decided preference for the seeds of *Amarantus albus*, *A. paniculatus*, *Chenopodium album*, and *Raphanus sativus*; and the eggs and imagos of *Cratonychus cinereus*, *C. pertinax*, and other beetles. During its vernal stay it devours with seeming relish the stamens and pistils of *Acer rubrum*, *A. saccharinum*, and others. An examination of the stomachs of several individ-

uals showed besides small stones and seeds, entire specimens of *Formica sanguinea* and fragments of *Harpalus pensylvanicus*, *H. compar*, *Cratonychus cinereus*, *Bostrichus pini*, *Casnonia pennsylvanica*, and *Haltica chalybea*.

The flight of this species is low, undulating, and moderately rapid. When gleaning for food it is chiefly terrestrial, seldom visiting the tall tree-tops, but preferring small trees and bushes to the latter. While thus employed it will permit the nearest approach without taking to wing. The rustling of the leaves will infuse a momentary fear, when the flock, for the species is eminently gregarious, will instantly leave but to return quickly, on the subsidence of the noise, to the identical spot where it soon becomes busy again as though nothing had occurred.

Its chief note in the winter is a low *tstc*, pronounced rather quickly in the intervals of feeding. When spring opens, it again seeks the retirement of open fields and the borders of forests. It now becomes less tame and friendly, but appears at the same time one of the most active and the happiest of the feathered creation; alighting upon a tree or bush it chants a sprightly air and is soon off to repeat the same elsewhere. Both song and movements recall to memory our ordinary *Cicada canicularis*. In syllabic language it may be quite accurately represented by *twē-twē-twē-āh-twēēēēē-āh*, commencing in a medium key and increasing gradually in pitch. Accentuation is sharp and the

movement *allegro moderato*. It resembles in part the song of *Spizella pusilla*, but is neither so loud nor sustained.

At the time of writing, June 23, 1875, these birds are as seemingly abundant as during the winter, and manifest considerable activity and vivacity. Their long stay is certainly due to the lateness and backwardness of the season. Their late departure would seem to indicate that their breeding-quarters cannot be far away. It is probable that these late sojourners repair to the nearest mountains for nidificating purposes. Indeed, we are led to this opinion from the following consideration. The appearance of a few mild days in April has been signalized by their complete abandonment of accustomed haunts; but let those days be followed by others of low temperature, and they are speedily ushered into our presence, which could not happen did they come from places very remote. Were our mountains more thoroughly explored by persons interested in ornithological pursuits, new facts would be brought to light of which we now have no adequate conception. To unscientific persons, the breeding of so common a species as the one under consideration, would attract but little notice.

This species nests as far south as Virginia in mountainous regions, thence to New York, the northern portions of the New England States, nidificating only in highlands, but coming down to the plains gradually as we proceed in a northern

direction. According to Mr. Kennicott few birds were found by him breeding as far south as Fort Resolution, but were discovered nesting rather abundantly about the 65° of latitude. Mr. MacFarlane found them in great numbers breeding on the borders of the barren-ground region along the Anderson river. The nests discovered by him were all on the ground and hidden by dry leaves, tufts of grasses, and projecting roots, in dense woods or in open grounds. Dr. Brewer says that it breeds more or less abundantly in northern and eastern parts of Maine, and throughout New Brunswick and Nova Scotia, and especially at Pictou, where it was observed in repeated instances to nidificate within out-houses. "In a woodshed connected with the dwelling of Mr. Dawson," he saw several nests "built within reach of the hand, and in places where the family were passing and repassing throughout the day." The last mentioned writer says on his way from Halifax to Pictou he found them "breeding by the roadside often under the shelter of a projecting bank in the manner of the *Passerculus savanna*." In Western Massachusetts they breed in all parts of the Green Mountain range. Wilson met them breeding among the Alleghanies in Virginia, and highlands of Pennsylvania and New York. In Otsego County in the latter state, and especially in the town of Otsego, they have been discovered breeding in great numbers.

According to Dr. Brewer, the nest of this

species is composed externally of coarse straws, fine roots, strips of bark, and horse-hair, and is lined with the fur of small animals and fine mosses. It has an external diameter of four and a half inches, and a depth of two, and possesses a deep and capacious cavity for the size of the bird.

The eggs are described by the same authority, as rounded-oval, and marked with reddish-brown spots upon a creamish yellowish-white background, which are confluent about the larger portion of the egg, but seldom covering either end. They measure .75 of an inch in length and 60 in breadth.

Spizella monticola, **Baird.**

The Tree Sparrow in some sections of the country is a very common winter resident. In Eastern Pennsylvania it is less abundant than *Melospiza melodia* which is our commonest species. In small numbers it consorts with the Song Sparrow and Snow Bird, arriving with the latter and like it is restricted during the autumnal months to open fields and the borders of thickets. In these situations it manifests a certain degree of timidity, but as autumn advances into winter and there is a growing scarcity of food-stuffs, it covets the companionship of man, when it becomes exceedingly tame and familiar, even venturing into outbuildings for the gratification of the cravings of hunger.

Its food consists of the berries of *Juniperus Virginiana*, *J. communis*, *Viburnum Lentago*, *Lonicera periclymenum*, and the seeds of divers weeds and

grasses. In our yards the crumbs and scraps that are wasted, and the cracked corn, broom-seed, and wheat-screenings which it shares with the chickens. In the spring it repairs to open fields and the margins of forests where it varies somewhat its bill of fare. Besides the seeds of grasses and other plants, it manifests a decided partiality for the tender buds, and the stamens, pistils, and ovaries of blossoms. The flowers of *Acer rubrum* are particularly chosen. A further advance in time with its consequent increase of sun-power, is attended by a development of insect-life which contributes an essential portion to its diet. We have detected remains of *Cratonychus cinereus*, *C. pertinax*, *Harpalus pennsylvanicus*, *H. compar*, *Musca domestica*, *Tabanus lineola*, *Formica sanguinea*, *Casnonia pennsylvanica*, *Scarites subterraneus*, *Lumbricus terrestris*, &c, in many stomach-examinations.

The flight of this species is moderately lofty and performed in graceful undulations. When not engaged in the procurement of food it reposes upon small trees and shrubs, never seeking for this purpose the summits of larger growths. Its song ordinarily commences during the first week of April, and for fifteen minutes or more at a time, from the summit of a small tree or bush it is heard with scarce an intermission. There is a resemblance to the song of the Field Sparrow, being, however, sweeter and more varied. It consists of a repetition of a simple sound, uttered sharply and quickly,

The nests were built exteriorly of grasses and dry bark loosely aggregated, and warmly lined with feathers; and when placed upon the ground were generally hidden within a tuft of grass. The complement of eggs varies; the usual number being four or five, while some nests contain occasionally, six, and others, seven. The duty of incubation apparently devolves upon the female, her partner as in the case with others which we have mentioned, being seldom seen in the immediate vicinity.

The eggs, according to Dr. Brewer, are a light green, freckled with fine foxy-brown markings which are uniformly distributed, but in such a manner as to leave the ground distinctly visible. They measure .85 of an inch in length and .65 in breadth, and are much larger than the eggs of any other species of *Spizella*.

Spizella socialis, Baird.

The Chipping Sparrow so familiar to all, is one of our most abundant migrants. Its presence is unnoticed long after the Song and Field Sparrows have made the fields and woods vocal with their melodies. It arrives in our midst during the last week of April. Unlike its near relative *Spizella pusilla*, it prefers occupied and cultivated grounds, rather than waste fields and the borders of thickets. It is a cheerful and active little creature, and commends itself to our favor by its remarkable tameness and sociability. It is a frequent visitor to

our door for crumbs, and when the latter is thoughtlessly left open it enters with an air of confidence, and deliberately sets to work, even while the room is occupied by some of its rightful tenants. So accustomed does it become to man's society, that we have known individuals to present themselves regularly thrice a day for food, and even to accept crumbs from the hands of its benefactor.

Its flight resembles that of *Spizella pusilla*, but is less elevated. Its movements are the very impersonation of activity. It is chiefly to be found upon small trees and bushes, when not foraging upon the ground for insect and vegetable diet.

The food of this species consists mainly during the spring and summer months of the larvæ and imagos of various kinds of insects. The following list embraces the most important of those which constitute its bill of fare:—*Formica sanguinea*, *Musca domestica*, *Stomoxys calcitrans*, *Harpalus pensylvanicus*, larvæ of *Cratonychus cinereus*, and caterpillars of *Gortyna zea*, *Anisopteryx vernata*, *A. pometaria*, *Zerene catenaria*, *Ennomos subsignaria*, *Chærodes transversata*, *Plusia precattonis*, *Pieris rapæ*, *P. brassicæ*, *Colias philodice*; and mature forms of *Spilosoma Virginia*, *Penthina pomonella*, *Thecla humuli*, *Ctenucha Virginia*, and many of the *Noctuidæ* and *Tineidæ*.

The song is but a monotonous repetition of a single syllable. This species has very slender claims to be reputed as one of our songsters.

This simple and unpretending ditty, throughout the month of June, is kept up for hours together with scarce an intermission. The note of complaint or uneasiness is expressed by a simple *chip* uttered rather slowly and at measured intervals.

Early in May, say about the 15th, mating commences; and about the 18th the birds are ready to commence nest-building. The nest is generally placed in low bushes, and but occasionally in small trees. A suitable site having been selected, both male and female apply themselves assiduously to the work, until the structure is finished, which usually requires four days. Considerable variation is discernible in the architecture of different individuals; some nests are rudely constructed and are so exceedingly loose and tenuous as to be distinctly seen through; while others have much of periphery with little of thickness and depth of cavity. A typical nest is beautifully hemispherical in configuration, neatly though loosely built, and possesses a cavity artistic and symmetrical in contour. Exteriorly, it is composed, unless in rare cases, of fine rootlets, and is lined with black and white horse-hairs. In a beautiful domicile before us, very few roots are discernible; the bulk of the nest being composed of horse-hairs, densely and compactly interwoven, and covered exteriorly with a few twigs and lint. Again, we have nests which are made entirely of fine rootlets. A curious anomaly is sometimes met with in nest-building. When a nest is placed in a thicket of bushes and

well secured laterally by enveloping leaves and twigs, it is slightly inclined in position, and bears a circular aperture sufficiently capacious for the passage of the bird's body. This opening is located in the superior third of the nest. When the bird is in position its bill projects through the aperture. It is obvious that the position of the nest is designed by its authors to afford the requisite protection to the female and young during inclement weather; this inclination causing one side to serve as a roof. The angle which the nest makes with the supporting surfaces is about 45° .

One of the most curious exceptions to the normal type of nests, was noticed by us in the spring of 1870, in Northumberland Co., Pa. This nest was located upon a small bush, at a slight elevation above the ground. It is composed, externally, of small branchlets of *Draba* with seed-vessels attached, a few rootlets, and is lined with white horse-hairs. It has a diameter of nearly four inches, and a thickness of three and a half inches. The diameter of the cavity at the margin is two inches, and the depth nearly two inches. It is a magnificent structure, thickly and firmly woven, and hemispherical in contour.

The differences just noticed in nidification, are doubtless due to the skill of the architects. As remarked previously, birds like men, have their skilful as well as unskilful mechanics. The latter embrace besides the talentless, the immature and inexperienced.

The period of time devoted to nest-building depends materially upon the style of the nest and the character of the builders. The nest being completed, oviposition commences the following day, and proceeds at the rate of one egg per day, and lasts from four to five days. Incubation ensues the succeeding day, and continues for ten days; the male occasionally relieving his mate; but the chief part of the responsibility devolves upon her. Whilst the female is thus occupied, the male carefully attends to her wants.

These Sparrows are devoted parents, expressing considerable anxiety when their nests and young are interfered with. The young are fed with the larvæ of small insects chiefly of a lepidopterous character. Various diptera and coleoptera, constitute a meagre portion of their diet; but the caterpillars of *Anisopteryx vernata*, *A. pomataria*, *Zerene catenaria*, *Ennomos subsignaria*, are devoured in prodigious numbers, besides those of *Pieris rapæ*, *Colias philodice*, *Asopia costalis*, *Gortyna zeæ*, *Plusia precatationis*, *Agrotis tessellata*, *Ctenucha Virginica*, and mature forms of *Musca domestica*, *Tabanus lineola*, *Stomoxys calcitrans*, and earth-worms, aphides, ants, and mosquitos.

In about twelve days the young are able to leave the nest, and in eight or nine days more, are sufficiently matured to look after their own welfare; they still, however, consort with their parents, and both young and old forage together. In this latitude there is only a single brood in a season.

During the months of August and September, in conjunction with the above insects, the seeds of various species of grasses, weeds, and berries, occasionally, are greedily devoured. Prominent among these are the seeds of *Amarantus albus*, *A. paniculatus*, *Ambrosia artemisiæfolia*, *Chenopodium album*, *Raphanus sativus*, *Panicum Crusgalli*, *Phleum prætense*, *Juniperus Virginiana*, &c.

In the autumn these Sparrows are gregarious, and as early in the season, confine themselves to cultivated fields and occupied grounds. These flocks are ordinarily small, and, doubtless, consist of members of one family. Their migration for the South depends in a great measure upon climatic influences, and ordinarily happens early in October.

The eggs of this species are oblong-oval, bluish-green, and spotted slightly about the larger end with umber and dark brown markings. They average .72 of an inch in length and .54 in breadth.

Spizella pusilla, Bonap.

The Field Sparrow arrives in Eastern Pennsylvania usually from the first to the tenth of April, and is found chiefly in open pastures, old fields, clearings remote from villages, and occasionally in cultivated grounds about our buildings, where it becomes quite tame and unsuspecting. In open grounds it manifests no little shyness. It congregates in small flocks for a short time after its arrival, and also in the autumn before it takes its departure.

Its flight is low and in graceful undulations. In the procurement of food it is chiefly terrestrial. It is occasionally found upon small trees and bushes in quest of larval insects. Its bill of fare is both vegetal and animal. Among insects we have met with evident traces of *Cratonychus cinereus*, *Harpalus compar*, *Casnoia pennsylvanica*, *Formica sanguinea*, *Tabanus lineola*, *Tipula ferruginea*, *Culex tæniorhynchus*, in our stomach-examinations. During the breeding-season it subsists upon and feeds to its young the larvæ of *Anisopteryx vernata*, *A. pomataria*, *Zerene catenaria*, *Ennomos subsignaria*, *Hybernia tiliaria*, *Eufitchia ribearia*, *Chærodes transversata*, *Lozotania rosaceana*, *Limacodes scapha*, *Pieris rapæ*, *Gortyna zea*, *Utetheisa bella*, *Thecla humuli*, *Halesidota tessellaris*, besides aphides and micro-lepidoptera. In the autumn the seeds of *Amarantus albus*, *A. hybridus*, *A. paniculatus*, *Chenopodium album*, *Ambrosia artemisiæ-folia*, and many graminaceous plants as *Phleum prætense*, *Panicum Crus-galli*, *P. capillare*, *Poa annua*, and *Raphanus sativus*, the cultivated salad, and others. The berries of *Juniperus Virginiana*, *Fragaria Virginica*, and several species of *Rubus* and *Ribes*.

The song of this sparrow is quite varied and fine. Its notes are not powerful and cannot be heard at a great distance, but are nevertheless quite pleasing. It continues in the full vigor of song while the second brood is hatching, when it relaxes but does not altogether cease until its de-

parture in September or October. At noonday when most other songsters are silent, its song is occasionally heard. The following expresses quite accurately its ordinary ditty:—*twiii*. This is uttered sharply and with a gradually increasing intonation.

The Field Sparrow nests both on the ground and in low bushes. The site of its nest seems to depend upon its environment. In low grounds and in marshes, bushes are usually chosen; whereas in elevated regions, the nest is placed upon the ground in the midst of tall grasses. It is a happy foresight that enables a species to regulate its habits in correspondence with changes in its surroundings. Nests which are built upon the ground, are more loosely arranged than those placed within bushes which are more carefully and neatly constructed. There is a very close resemblance in some structural parts to the nest of *Melospiza melodia*, but very little similarity to that of *Spizella socialis*.

Nidification begins about the middle of May, about four days after mating, and is entered into with considerable diligence by both birds. At least three days are devoted to the labor. Oviposition follows on the ensuing day, and lasts from four to five days, according to the complement of eggs deposited. Incubation commences on the day following the deposition of the last egg, and continues during a period of 10 days.

While the female is thus engaged, the male

when not administering to her wants is ever on the alert for intruders. His affection for his mate and young is so strong, that he will even risk his own life in their behalf. During incubation he occasionally relieves his partner.

When the young are hatched they are alternately fed by the parents upon the larvæ of various kinds of insects, particularly upon the caterpillars of *Anisopteryx vernata*, *A. pomctaria*, *Zerene catenaria*, *Gortyna zea*, *Pieris rapæ*, *Colias philodice*, *Ennomos subsignaria*, *Chærodes transversata*, *Hybernia tiliaria*, besides earthworms, *Aphis rosæ*, *A. mali*, and the common house-fly.

The young leave the nest in about 12 days after being hatched, and in eight or nine days more, are fitted to take care of themselves, which is usually the case during the last of June or the beginning of July. The parents now busy themselves about a second brood which is also matured in due time.

A normal nest is composed externally of weeds and grasses, loosely aggregated and adjusted so as to project beyond the rim, which, as Dr. Brewer says, gives it the appearance "of an enclosure of palisades." The interior is lined with horse-hairs. It has a diameter of six inches and a depth of three inches. The mouth at the margin is two and a half inches wide, and the cavity has a depth of one and three-quarter inches. Nests built within bushes are composed of similar materials, and are of a more rigid character and closer texture.

A beautiful fabric before us is deserving of a passing notice. Its base and the greater part of its periphery are constituted almost exclusively of floriferous stems with dried flowers intact, of *Trifolium repens*, which are rather compactly adjusted, and cause the nest to resemble, externally, the typical structure just described, with this unimportant difference, that the palisade-like arrangement is restricted entirely to the inferior two-thirds of the nest, while the remainder is rather neatly composed of the flexible culms of grasses, and the inner bark of *Quercus rubra* interwoven so as to present a rounded edge interiorly. The inside is very uniformly lined with black horse-hairs, exclusively.

The eggs are oblong-oval, and marked with ferruginous-brown upon a whiteish clay-color, which in some specimens are arranged about the larger extremity; and in others are so diffused as to impart a rusty color to the entire egg. They measure .70 by .51 of an inch.

Zonotrichia albicollis, **Bonap.**

The White-throated Sparrow has proved itself to be a not very abundant species in Eastern Pennsylvania during its winter stay. It makes its appearance about the 20th of April, and is always to be found in company with *leucophrys*. It frequents low, damp woods, in rather retired situations. Like the latter it is rather tame, and can be approached with considerable ease. Its general

habits are like this species, and although not strictly terrestrial, it seldom perches high upon trees, and ordinarily flies very low, except in its protracted migratory flights.

Its song is a loud, distinct, and prolonged whistle, and consists of twelve separate notes, repeated without variation from early morning until late in the evening, and becoming quite monotonous.

During its sojourn which lasts until the 20th of May, it feeds upon the seeds of grasses and weeds, and upon various coleopterous insects which it is enabled to procure in its accustomed haunts. Among the former we have detected seeds of *Amarantus hybridus*, *A. albus*, *Chenopodium album*, and *Ambrosia artemisiæfolia*; and among the latter, remains of *Harpalus pensylvanicus*, *H. compar*, *Scarites subterraneus*, *Platynus cupripennis*, *Donacia metallica*, *Haltica chalybea*, and *Cratonychus cinereus*; besides *Formica sanguinea*, earthworms and diptera. The buds of *Acer rubrum*, *A. saccharinum* are eaten, together with the stamens and pistils of the same in expanded specimens.

An experience of several years has convinced us that none remain to breed. According to Dr. Brewer a few breed in favorable situations in extreme northwestern parts of Massachusetts, and quite abundantly in New Hampshire, Vermont, and Maine, and in all the British Provinces. Sir John Richardson discovered a nest near the Cumberland House on the Saskatchewan river, as

early as June 4, which was built of grass and lined with a few feathers and deer's hair. It was placed under a fallen tree. Another was found at Great Bear's Lake, which was lined with the *setæ* of *Bryum uliginosum*. Mr. Kennicott found it breeding on the southern shores of Slave Lake, and also on English river. Dr. Brewer has met with its nests repeatedly among the White Mountains, placed invariably upon the ground, sheltered by grasses, at the foot of a bush or tree, or under a fallen log in a thicket. There the species was exceedingly shy and distrustful, and never found nesting in cultivated fields or by the side of human dwellings. At Halifax they were discovered breeding in gardens close to houses, with the apparent familiarity of the Song Sparrow.

The nest of this species is invariably placed upon the ground, but in various places; on a hillside at the base of a tree, in a swampy woods within low underbrush, by the margin of a pond, or in a hollow stump. It is large, deep, and capacious, and consists of a basis of coarse grasses and mosses with finer stems above, and is lined with soft grasses, fine plant-rootlets, feathers, and hair.

These Sparrows winter in South Carolina and Louisiana, and constitute groups of fifties which live together in perfect harmony and subsist upon divers seeds.

The eggs are from four to seven in number, greenish-white, and are marked with ferruginous brown spots over the entire surface, generally so

abundant as to conceal the whole egg, through which the normal color is scarcely distinguishable.

They measure .90 of an inch in length and .68 in breadth.

Zonotrichia leucophrys, Swainson.

The White-crowned Sparrow is always observed within the limits of Philadelphia throughout the winter in well-wooded and sheltered localities. From the 20th of April to the middle of May it congregates in flocks of a dozen or more. It delights mainly in the borders of thickets, and waste grounds. Whilst writing, May 4, vast numbers are daily observed within our gardens and the adjoining fields. Wherever found, remarkable tameness and lack of timidity characterize it.

In open grounds this Sparrow is peculiarly gregarious, whereas in secluded situations a solitary existence seems to be preferable. Much of its time is spent on the ground in searching for food; but when not thus occupied, it perches upon small trees and shrubs, never visiting tall trees. It associates with *albicollis*, but generally discards the society of our smaller sparrows. Its resemblance to *albicollis* is so close, as to be clearly undistinguishable at a short distance.

Its flight is low, undulating, and but slightly sustained, except during its migratory trip. When alarmed whilst feeding, it flies to a short distance but as quickly returns to the identical spot when the danger has passed. In wooded regions, how-

ever, it merely seeks safety by hopping rapidly into the adjoining bushes.

The food of this species consists chiefly of insects, berries, and seeds of divers plant-species. Whilst a resident of thickets, it delights in the shade of *Abies canadensis*, where it discovers a full and ready supply of food in the shape of seeds which have dropped from trees of mature growth. The seeds of various species of *Panicum*, *Aira*, and other graminaceous plants, together with those of *Ambrosia artemisiæfolia*, *Amarantus hybridus*, *A. albus*, and the berries of *Juniperus Virginiana*. The crumbs and scraps which have been thrown out by the cook, and the cracked corn and broom-seed which are fed to the chickens, are also eagerly devoured in their frequent visits to our yards and gardens. We have detected in the many stomachs which we have examined, *Formica sanguinea*, *Harpalus compar*, *H. pensylvanicus*, *Casnonia pennsylvanica*, *Scarites subterraneus*, *Rhynchænus pini*, *Cratonychus cinereus*, *C. pertinax*, *Pangus caliginosus*, *Lachnosterna quercina*, and *Lumbricus terrestris*.

This bird is a silent feeder. When perched, however, it utters a low, simple call which sounds like *tsz*, and which can be heard at a very short distance. Its song which is heard at intervals from early morning until night, is a mellow whistle which consists of two long-drawn syllables uttered with a rising intonation, and succeeded by five others repeated rather quickly and with a falling

cadence. It can be quite accurately expressed by *pēē-dēē-dēē-dēē-dēē-dēē-dēē*. When interrupted by the presence of human intruders, it ceases immediately, and only resumes its ditty when the interference has vanished. While thus engaged it perches upon the extremity of a branch of a small tree, or the summit of a low bush, and pours forth its melodies at graduated intervals.

This species does not breed in Eastern Pennsylvania, as its presence is never observed after the middle of May. After the breeding-period is over it returns during the last of September or the beginning of October, and confines itself to waste fields and the borders of forests, where it congregates in small flocks until ready to assume its southern journey. Though tolerably abundant at this season, yet a few remain to spend the winter, and are chiefly found in low grounds where there is a dense growth of coniferous trees which afford the requisite shelter.

In Labrador, according to Mr. Audubon, this bird is abundant and quite a late breeder. He records finding a nest as late as July 6, which was placed among the moss at the base of a low fir, and was composed of matted bunches of dry hypnum mosses, externally; and, internally, of fine grasses neatly arranged to a thickness of one-half inch, and lined with the yellow fibrous roots of *Coptis trifolia*. It was five inches in diameter and two in depth, with a cavity two and a quarter inches wide and one and three-quarters in depth.

Dr. Coues states that it affects a fondness for deep, thickly-wooded, and sequestered ravines, enveloped by lofty, precipitous cliffs; and in less secluded places restricting itself to patches of scrubby firs and juniper.

Whilst the female is engaged in incubation, her partner ascends the summit of a cliff, or neighboring dell, and pours forth his pleasing but somewhat monotonous ditty, for the space of several minutes. When the nest is disturbed, the female flutters away silently, while the male-bird utters an angry remonstrance and manifests his indignation in an energetic manner by jerking his body and flirting his tail. The nest is located upon the ground in dry places, generally amid patches of low heath.

The eggs are oblong oval, and densely marked with reddish-brown, and obscure purplish-brown markings upon a light greenish-white background, which are principally arranged about the larger extremity. The average length is .93 of an inch and breadth .70.

Passer domesticus, **Degland & Gerbe.**

This little Sparrow of foreign extraction, bids fare to become one of our commonest species. But a few years have elapsed since its first introduction in this city, yet, it has, with remarkable rapidity spread beyond the municipal limits; and in some rural districts has grown to be the principal species. In sections where our native

sparrows, bluebirds, and robins were wont to build, we no longer behold their agreeable presence as of yore. To be sure there are places where these latter breed as freely as formerly, but they are merely found in localities in which the quiet and harmony have not been disarranged by the subject of the present sketch.

This species is exceedingly tame and unsuspecting, and delights to nidificate in close proximity to houses. While thus manifesting considerable confidence in man, it is possessed of so many unenviable traits as not to command his esteem and favor. Its pugnacity detracts much from its general behavior. It lays claim to a particular place to the exclusion of the rightful proprietors, and prepares to defend it at all hazards. What individual strength fails to accomplish, is brought about by combination, for in union there is power. Many of our most useful birds are objects of its unprovoked vengeance, and unable to cope with prodigious numbers, are forced to forsake the scenes of past associations and joys for less congenial places. Many of the lawns and groves which surround the residences of opulence, which once rang with merry songs of the robin, bluebird, and song sparrow, now resound with the harsh and inharmonious voices of this species.

The bird deserves our detestation for other reasons than those just enumerated. Our own experience as well as that of many friends, most conclusively prove its power of destructibility. It

has received its full share of praise from casual observers, but we confessedly cannot bear the best of testimony to its usefulness; and as it is not as destructive to obnoxious insects as the most of our smaller birds, its presence is not necessary. It is true that during the breeding-season it destroys many caterpillars for the support of its young, but this good is more than outweighed by the mischief which it commits. Its seeming hate of our own birds, combined with the depredations which are perpetrated upon the tender buds of herbaceous plants, shrubs, and trees; the wholesale destruction of the blossoms of the apple, pear, and cherry, and the fruits of the same in the spring, with the wanton devastation which it commits upon the vines when the grapes are mellowing, are powerful incentives for those who have suffered from their ravages, to urge the authorities to colonize and send them back to England [where the peasantry are paid for potting them into sparrow-pies. They are always feeding, but unlike most species grow corpulent upon what they pilfer, and thus set the unwholesome example of consuming what they do not earn.

By Dr. Brewer it has been affirmed that the male birds are only pugnacious when actuated by amatory influences. Our experience during the past season shows that the same ugly spirit is manifested even at other periods. On our premises the birds are so numerous and so daring, that they will assemble in the poultry-yard while the

fowls are being fed and deliberately cheat them out of their proper allowances. Our smaller winter residents are compelled to keep at a wary distance, and only venture to peck a few grains during the temporary absence of the sparrows. In early spring *Passerella iliaca* occasionally frequents similar situations, and although a rather large bird, is compelled to give way before the pugnacious little creatures.

Its food is chiefly obtained upon the ground, but occasionally it visits small trees and shrubs to procure it. In the winter it derives a rather precarious subsistence from the seeds of our commonest weeds and grasses, and the crumb, and scraps which it finds about our doors. It is not at all fastidious in its appetite. Within city limits numbers may be seen in our principal thoroughfares, searching within the excrement of horses for whatever of nutrient qualities may be found therein. The principal seeds which conduce to its sustenance are those of *Chenopodium album*, *Amarantus hybridus*, *A. albus*, *A. paniculatus*, *Rumex sanguineus*, *Ambrosia artemisiæfolia*, and many of the asters and solidagos. In the months of April and May the flowers of *Accer rubrum*, *A. saccharinum*, besides *Cerasus* and *Pyrus*, and many of our herbaceous plants. Among insects we have discovered traces of *Harpalus pensylvanicus*, *H. compar*, *Casnonia pennsylvanica*, and *Fornica sanguinea*, in many stomachs which we have examined. It is only while with young that the

parent-birds destroy great numbers of noxious caterpillars.

Its flight is low, firm, and but slightly sustained. Its general movements are the impersonation of agility. It is mainly terrestrial in habits, and seldom attains to any considerable height in its search after food.

Its ordinary call-note may be quite accurately expressed by *hwī* repeated at irregular intervals. A simple *twīchē*, the last syllable repeated quite sharply, is expressive of anger; while its cry of vexation and disappointment is indicated by *twī-twī-twoo*, *twī-twī-twoo*, iterated in a harsh and disagreeable manner. Finally, its song lacks both variety and expression, and is in striking contrast with the songs of *Melospiza melodia*, and *Spizella pusilla*, and cannot fail to attract attention by its utter inharmoniousness.

This bird mostly builds in a hollow tree or a box. In walls overgrown with the ivy, scores not only find comfortable shelter during the rigorous winter months, but also suitable accommodations for nesting purposes. Where the above conveniences are not available, actuated by a true parental instinct, a couple sometimes nidificate between the forked branches of a maple. A case in point came under our immediate observation during the summer of 1874.

During favorable seasons nidification ordinarily commences in the early part of April. The spring of 1875 being an unusually backward

one, somewhat retarded its labors. Instances have fallen under our notice where preparations were begun as early as the first week of February. On such occasions a pair of females and a single male, on warm, sunshiny days would busy themselves for hours together in carrying dried grasses and feathers into a hollow tree. Labor would be suspended when the weather was unusually severe, and resumed on the accession of mild weather. A noticeable feature was the perfect good-will and harmony which prevailed among the individual members of this trio. We anxiously awaited the ultimate result of this tripartite covenant, but before the completion of the nest, from some cause unknown to us, the locality was abandoned and has not since been occupied. It might be presumed that as these Sparrows resort to hollow trees for shelter during cold winter nights, that the aforementioned articles were designed to render their roosting quarters more comfortable and desirable.

A nest which we possess and which was built in a hollow branch of an apple-tree, measures fifteen inches in length and has a diameter of four inches. The basis is composed of a heterogeneous medley of feathers, divers grasses, and various leaves, and the periphery of a thick wall of dry plant-stems intermingled with feathers. The labor of building is performed jointly by both birds. The nest just described is unusually large, and was the result of continued additions to the origi-

nal structure after each succeeding brood-raising. The authors of this nest had successfully reared three broods and at the time of the severance of the limb from the trunk of the tree, were preparing for a fourth. From the remarkable depth of the cavity, the labor of removing the befouled materials which would have been exceedingly arduous to the birds, was spared, a fresh supply of feathers being carried in for each successive brood. The preparations for a fourth brood occurred during the last week in August.

Another nest which was taken late in June, was built upon a tree of the red maple, and is composed externally of fine and coarse strings, from the thickness of twine to that of sewing silk, carpet rags, a few small branches of *Populus dilatata*, and rootlets. Interiorly, it is lined with a thick layer of raw cotton. It measures four and a half inches in diameter by less than two and a half in a vertical direction. The cavity at the rim measures three inches in width, and one and a half in depth. The outer materials of the nest are far from being tastefully interwoven, and display but a slight degree of artistic skill. The cotton had evidently been found *en masse*, and was carelessly adjusted, if the present appearance affords any criterion.

Ordinarily the labor lasts from four to five days. The eggs are begun to be laid on the succeeding day, and are deposited at the rate of one per day, which makes the period of oviposition from four to five days. Incubation takes place on the day fol-

lowing the last deposit, and continues for 11 days. Sometimes the male bird shares with his partner the duties of sitting; but generally the burden of the responsibility devolves upon the female, while the male becomes a faithful guardian and most willing provider. He displays the utmost affection for his mate, and is indefatigable in his exertions to render her comfortable and contented. His jealousy is unbounded, and will not permit a feathered stranger to venture within his precincts, without chastising his temerity. When unable to cope with an antagonist, a cry of distress soon brings numbers of his brethren to his aid. He seldom strays any considerable distance from the nest, except when foraging for himself and partner.

The most devoted affection and solicitude are manifested for the young. They are fed with the larvæ of insects particularly caterpillars, and diptera. The principal insects which constitute their dietary are the larvæ of *Gortyna zeæ*, *Anisopteryx vernata*, *A. pomataria*, *Zerene catenaria*, *Orgyia leucostigma*, *Pieris rapæ*. *Colias philodice*, *Hybernia tiliaria*, *Ennomos subsignaria*, *Chærodes transversata*, *Plusia precatationis*, *Thecla humuli*, *Utetheisa bella*, among lepidoptera; and *Musca domestica*, *Culex tæniorhynchus*, *Stomoxys calcitrans*, besides many of the *Aphidæ*, and the ordinary *Lumbricus terrestris*.

When the young have attained the age of from 12 to 13 days, they quit the nest, but are supplied

with food by their parents from 10 to 11 days longer, when they are sufficiently matured to shift for themselves. They still linger about their homes and seek shelter in the boxes and hollows which served as nests, during inclement weather and winter nights.

The ivy in some localities affords both suitable breeding and lodging quarters. In some places in Germantown, especially upon the north side of the mansion of Mr. John Button, carefully protected from the cold winds by surrounding houses, within an extensive vine, at least a hundred, or more sparrows find lodgings during the winter. The continual clatter which the birds produce early in the morning, and just before night, is almost deafening. During the breeding period the ivy is literally filled with nests. We cannot be accused of misrepresentation or exaggeration in asserting that fifty pairs, at the lowest calculation, nidificate within it. Notwithstanding the pugnacious disposition ordinarily manifested by the species, even by individuals towards each other, a due degree of harmony pervades the entire community. This may be readily accounted for. At first the vine was occupied by a single pair, and the many which now occupy it are the results of this union.

Generally three broods are reared annually. Instances are known where preparations were making for a fourth brood, when the designs of the birds were frustrated by human interference.

Hollow trees, ivy-vines, boxes, eaves of buildings, and outbuildings, are appropriated for roosting purposes during the continuance of the cold weather.

An incident which was related to us by a friend cannot be out of place in this connection. Having erected a house with several capacious apartments for the accommodation of the sparrows which were frequent visitors to his garden, he was surprised to find that they could not be induced to take possession, although the house was built long before the breeding season commenced. Unable to offer anything like a satisfactory solution of the problem, he applied to us. After a little conversation and the propounding of a few questions upon our part, we elicited a number of facts which enabled us to solve the problem, when coupled with others of our own finding. To make a long story short, several attempts had been made by different pairs to build in the house, but which had finally to be abandoned owing to inimical relations which sprung up between the different families. Other pairs had undertaken the business with no better success. Now experience has taught us the fact where houses or vines are occupied by near relations, but few difficulties of not more than passing moment, occur; but, on the contrary, where the kin of different families, like different clans, come together, there is more or less of jangling and quarrelling. In view of the foregoing facts we think we are safe

in concluding, that, however suitable our friend's building was for the purposes of nidification, for we are convinced that the sparrows like our common *Troglodytes ædon*, are not at all fastidious in the selection of a place, its abandonment was due solely to the conflicting natures of the parties which sought to possess it.

The eggs of this sparrow are oval, pointed at one end, and blotched, streaked, and dotted with divers shades of cinereous brown upon a light ashen back-ground. The average length is .91 of an inch and average breadth .62.

Passerella iliaca, **Swainson.**

The Fox-colored Sparrow though not a winter denizen with us, is quite an early spring visitant. Its presence has been observed as early as the 18th of March. Though usually a somewhat retired species, occupying during its temporary stay, open fields, waste grounds, and the boundaries of thickets, yet it is not necessarily so. In small numbers it visits our yards and gardens in company with *Melospiza melodia*, *Spizella monticola*, and *Junco hyemalis*, for the crumbs and scraps which have been cast away, and the broken corn, wheat-screenings, and broom-seed, which have been fed to the chickens. It now becomes very tame and is readily approachable. When the ground is covered with snow, which is often the case at the time of its return, its presence is more frequently observed, being, doubtless, drawn to

the habitations of man by necessity of food. At the time of its arrival, there is little to satisfy appetite, except the seeds of last year's maturing, and the few coleopterous and hymenopterous insects which have endured the rigors of winter underneath stones, prostrate logs, &c., and which have now crept forth from their lurking places to enjoy a milder climate. As these are mainly found upon the ground, its supplies are principally cut off when the earth is snow-clad; hence its appearance around our dwellings.

Few species affect a greater fondness for running-water, where during the months of March and April, it may be found, doubtless, on account of the bushes of *Alnus serrulata* which grow luxuriantly in such places, more especially in low humid grounds, for their tender catkins which constitute an important article of diet. Like a *Pipilo*, it may be often seen busily scratching in the earth for its food. In open grounds, at this season, its habits are not dissimilar to those of gallinaceous birds.

Its food consists of the seeds of weeds and grasses, with such insects as are common. Among the former, the seeds of asters, solidagos, *Amarantus hybridus*, *A. paniculatus*, *A. albus*, *Ambrosia artemisiæfolia*, *A. trifidum*, *Chenopodium album*, &c., are greedily devoured. Among insects, *Harpalus pensylvanicus*, *Cxatonychus cinereus*, *Formica sanguinea*, constitute an important part of its diet. Like many of the *Fringillidæ*, the tender buds of

plants, and the stamens and pistils of *Acer rubrum*, *A. saccharinum*, *Pyrus malus*, *Prunus cerasus*, &c., are esteemed great luxuries.

Its movements are mostly performed in silence. Occasionally, in the intervals of feeding, a low, simple call-note is uttered. The male is reputed a very fine singer; but it is an unusual occurrence to hear its song in this latitude; it probably reserving this power until it has attained its more northern habitat. Dr. Brewer says "his voice is loud, clear, and melodious; his notes full, rich, and varied; and his song is unequalled by any of this family that I have ever heard." It generally disappears about the time *Spizella monticola* takes its departure.

The breeding range of this species, according to Sir John Richardson, extends to the 68th parallel of latitude. It breeds in the wooded regions of fur countries. Mr. Dall has found it breeding abundantly at *Nulato*, where it arrives from the 10th to the 15th of May; and also on the Yukon river. Messrs. Kennicott, Ross, MacFarlane, and Lockhart, have discovered it breeding at various places in British America. According to the reports of Mr. Kennicott and Mr. MacFarlane, this species' nidificates both on the ground and in trees; and in one instance, a nest was found at an elevation of eight feet above the ground. In structure, it is affirmed to be similar to that of *Turdus aliciae*. Nidification evidently takes place before the middle of June, between that and the first of the same month, as complete nests were

taken before the 7th. A single nest was discovered at the base of a clump of dwarf willows, which materially assisted to hide it from view. This was constructed out of coarse hay, a *modicum* of deer hairs, and fresh, young moss, variously intermingled together; and was lined with a finer quality of hay. Mr. MacFarlane, to whom we are indebted for this discovery, considers this as an exceptional nest, as all the nests he had previously found, had been placed in the midst of branches of pine or spruce-trees, and had been like those of *T. aliciaæ*. Other nests were discovered similar in structure to the last, which seemed to make it highly probable that in certain instances, some birds had occupied old nests of *T. aliciaæ* for incubating purposes. Richardson says the nests are built in low bushes, and are composed of dry grasses, feathers, and hair. He describes the eggs as being marbled with irregular brown spots upon a mountain green background, and gives the number as five.

According to Audubon who discovered several nests in Labrador, near the sea-coast, the nest is large for the size of the bird, and is ordinarily built upon the ground, surrounded by tall grass or moss, and concealed from view by the branches of a creeping fir, near the stem of which it is placed. Exteriorly, it is composed of moss and dry grass, and an inner layer of fine grasses carefully adjusted circularly. The lining consists of fine thread-like roots, and the feathers of water-fowls; in one in-

stance, the down of *Somateria mollissima* was a noticeable feature. The eggs were found from June 15 to July 7, and there is but one brood in a season. The same writer says when the nest is approached, the female by affecting lameness and by the employment of the ordinary arts, endeavors to decoy intruders from its site.

The eggs are oblong, and densely spotted with ferruginous upon a light bluish-white ground, so as to conceal almost completely the ground-color. The measurement is .92 by .70 inches.

Euspiza Americana, Bonap.

The Black-throated Bunting is tolerably abundant in Eastern Pennsylvania, and is chiefly a denizen of meadow grounds and waste-fields. It is never gregarious, but is always to be found in pairs. Exceedingly tame and unsuspecting, it can be readily approached, and when fired upon, after the lapse of a few moments, will return to the spot as though nothing had happened. It arrives from the 10th to the 15th of May. When preparing for migration, they collect in particular localities for which they affect a predilection from some peculiar advantages which they possess; but unlike most birds of the family to which they belong, do not associate with other groups.

The flight of this species is low, undulating, and but slightly sustained.

Its song is rather unmusical and makes up in quantity what it lacks in quality. For two months

after its arrival, its favorite haunts resound with its quaint serenade from sunrise to sunset. According to Wilson its notes resemble *chip-chip-chē-chē-chē*, and in manners bear a close resemblance to the European *Emberiza citrinella*. Mr. Audubon compares its song to that of *Emberiza miliaria* of Europe.

The food of this species consists of seeds, berries, and insects which it procures from the ground, and in low bushes and low trees. We have observed it feeding upon the seeds of grasses, particularly those of *Phleum prætense*, *Triticum vulgare*, *Secale cereale*, and those of *Trifolium prætense*; besides the berries of *Fragaria Virginiana*, *Rubus villosus*, *Rubus strigosus*, *R. occidentalis*, *Juniperus Virginiana*, and *Prunus serotina*. The following insects constitute a portion of its bill of fare:—*Cratonychus cinereus*, *Chrysomela cæruleipennis*, *Cymindis viridipennis*, *Harpalus pensylvanicus*, *Formica sanguinea*, aphides, and various lepidopterous larvæ, which it feeds to its young, together with mature forms of the same.

Nidification takes place about the 20 of May or the beginning of June, usually about five days after mating. The nest is invariably placed upon the ground, according to our experience, which has been the experience of both Mr. Ridgway and Prof. Baird; but in some localities it is placed on small bushes at a slight elevation above the ground. Dr. P. R. Hoy, according to Dr. Brewer, has never observed them to nest upon the ground, which

has also been the experience both of Dr. J. W. Velie, of Rock Island, Ill., and Robert Kennicott, Esq. The nest is composed externally of divers grasses and plant-stems, and is lined with finer materials of a similar character. It is the labor of the sexes for a period varying from three to four days. The number of eggs laid is from four to five; the duty of oviposition commences on the day succeeding nest completion. A single ovum is daily deposited. Incubation commences the day following the last deposit, and continues for 12 days, and is the exclusive labor of the female. When the nest is disturbed while she is incubating, she creeps noiselessly out, and conceals herself among the grasses, and permits her treasures to be robbed without manifesting the least outward anxiety, or without uttering a single syllable of complaint.

The young are fed upon the caterpillars of *Hybernia tiliaria*, *Zerene catenaria*, *Eufitchia ribearia*, *Ennomos subsignaria*, *Utetheisa bella*, *Chærododes transversata*, *Colias philodice*, *Argynnis aphrodite*, mature forms of the smaller *Noctuidæ*, *Tortricidæ*, and *Tineidæ*, plant-lice, and diptera. At the age of thirteen days they leave the nest, but are objects of parental care for nine or ten days longer, when they are required to shift for themselves. We have never met with more than one brood in a season. The species retires to its winter-quarters in Central America and Columbia in South America, during the last week of September.

The eggs are a uniform light blue, and present a similarity in tint to those of the *Sialia sialis* of Baird. They measure, on an average, .84 of an inch in length, and .65 in breadth.

Euspiza townsendii, **Bonap.**

This species which is commonly called Townsend's Bunting, has never been observed by us in Eastern Pennsylvania. Only a single specimen of this apparently well-characterized species has been observed. This bird was shot May 11, 1833, by J. K. Townsend, Esq., in an old field, overgrown with cedar-bushes, near New Garden, Chester Co., Penn. Dr. Coues says: "It is a standing puzzle to ornithologists in the uncertainty whether it is a good species, or merely an abnormal plumage of the last." Nothing is known of its history.

Goniaphea ludoviciana, **Bowditch.**

The Rose-breasted Grosbeak is a somewhat rare and irregular visitor in Eastern Pennsylvania. It arrives about the 15th of May, and is mainly a denizen of high, open woods, where it delights in the tallest tree-tops. We have never observed it along water-courses, which has been the experience of others. Few species are more shy and affect greater fondness for places of retirement. While gleaning amid the branches of the tallest oaks; almost beyond the reach of effective gunshot, the presence of a human being upon the scene, infuses a feeling of dread, and leads to its hasty depart-

ure. When absorbed in feeding, or in their gambols with each other, the sexes will remain upon the same tree for hours together.

This species is not gregarious, but appears to arrive already paired; for it is not an uncommon occurrence, even from its first arrival, to find the sexes feeding and rambling together, and in the intervals of gleaning, dallying together; and lavishing upon each other the most endearing attentions. Either the species arrives already mated, or performs this indispensable business immediately on its arrival. Diligent searching has convinced us that it does not breed within our limits, although these movements would seem to warrant the belief that it does. Why these tokens of endearment and affection? On the supposition that the birds arrive already paired, and are devotedly attached to each other as evidenced by these actions which are the promptings of an overflowing love, and which must manifest itself in some such way, when not otherwise diverted by the duties of nidification and incubation, they can be readily accounted for. We have occasionally observed a lonely male to come upon the scene in the midst of these wooings or caresses, when a conflict would ensue, which would last a long while. The female would remain a passive spectator of the struggle, not deigning to enter into it, as long as victory seemed ready to crown her favorite. But when her partner wavered in the conflict, she would come to his rescue, and deal most summary blows upon his antagonist.

Its flight is lofty, slightly undulating, and generally protracted. In feeding its general movements are mainly arboreal; seldom terrestrial, unless at the time of breeding.

Sir John Richardson who met with this species on the Saskatchewan, during his first trip with Sir John Franklin, describes its song as clear, mellow, and harmonious. Mr. Nuttall, who kept one in confinement, in speaking of this bird, says it is a melodious and untiring singer, frequently spending the greater part of the night in warbling its various tunes. These notes are loud and distinct at times, and at others, querulous, cheerful, and pathetic. When singing it would mount on tiptoe, as if in an ecstacy of delight at the unrivalled beauty of its own voice. Its powers of song, are by him considered, as unexcelled by any species save *Minus polyglottis*. Its ordinary call-note is a faint *chuck*.

During its stay of two weeks, it subsists upon the ova and pupa of insects, which it espies in fissured bark, mature forms of various coleopterous and dipterous insects which are found in its accustomed haunts, and the seeds and berries of divers plants. Before taking its leave, it feasts largely upon the tender buds of trees, the succulent cones of *Pinus*, and the stamens and pistils of *Acer rubrum*, It is said to affect a fondness for the berries of *Liquidambar styraciflua*. The following insects have been found among the undigested contents of many stomachs which we have examined:—*Cratonychus cinereus*, *C. pertinax*,

Chrysomela cæruleipennis, *Ptinus humeralis*, *Rhynchænus strobi*, *Formica sanguinea*, *Ædipoda sulphurea*, *Æ. nebulosa*, and *Acheta nigra*.

As before remarked, it does not nidificate within our limits. Mr. Allan states that it breeds in Springfield, Mass., though not abundantly. In the vicinity of Hamilton, Canada, Mr. McIlwraith gives it a summer resident. It is common in the neighborhood of Randolph, Vt., where it is a regular breeder. In Eastern Massachusetts, says Dr. Brewer, it arrives about the 15th of May, and nests during the first week of June. It nests, according to the same authority, in low trees on the borders of woods, often in small groves on the margins of streams. Their nests are coarsely constructed of plant-stems, bits of leaves, and waste stubble, which are intermixed with coarser stems and twigs which serve to strengthen them. The superior portion is ordinarily built of dry *Usnea* mosses, and a few twigs. The interior is lined with finer twigs. They measure eight inches in diameter and three and a half inches in height. The cavity is three inches wide, and is quite shallow, being only one inch in depth.

Within six miles of Racine, Wisconsin, Dr. Hoy discovered seven nests within a piece of ground not exceeding five acres. Six of these were placed in thorn-bushes in the central portion of the tops, and within six to ten feet from the ground. He was assured that the above locality was annually visited for purposes of nidification when the same

sociality existed. Upon the males mainly devolve the responsible duty of incubation. During this period the male bird is so persistent and enthusiastic singer, even while in the presence of his partner, as to betray his nest by the power of his song. Whilst sitting he is so apparently utterly oblivious to the task he is performing, as to attract by his melody, intruders to his nest.

The eggs are usually a light verdigris-green or greenish-white, and are marked with ferruginous spots, more or less diffused over their entire surface. They resemble very closely those of the Tanagers', but are generally larger. The average length is .94 of an inch and breadth .68.

Cyanospiza cyanea, **Baird.**

The Indigo Bird is quite abundant in Eastern Pennsylvania, where it arrives usually about the 12th of May. It prefers the borders of thickets, and fields overgrown with brier-bushes. Although an uncommon visitor about houses, we have never known it to nidificate in such places.

Though partial to sequestered situations during the breeding-period, it would seem that this species is shy and suspicious; but we are convinced that it manifests but ordinary timidity during the continuance of its stay. The localities which it frequents, doubtless, possess advantages which others do not present.

Arriving at a time when insect-life is already abundant and steadily on the increase, a plentiful

supply is obtained with but a trifling outlay of physical strength. The following insects constitute no mean part of its dietary:—*Musca domestica*, *Stomoxys calcitrans*, *Tabanus lineola*, *Tipula tricolor*, *Syrphus obscurus*, *S. obliquus*, *S. americanus*, *S. politus*, *Culex tæniorhynchus*, and *Anopheles quadrimaculatus*, among diptera, and during the breeding-season, the larvæ of *Eufitchia ribearia*, *Anisopteryx vernata*, *A. pometaria*, *Zerene catenaria*, *Ennomos subsignaria*, *Chærodes transversata*, *Gortyna zææ*, *Colias philodice*, *Thecla humuli*, *Anchylopera fragariæ*, *Utetheisa bella*, *Halesidota tessellaris*, and mature forms of *Noctuidæ* and *Tineidæ* which are also fed to their young; besides, aphides, and small beetles. The seeds of grasses of last year's growth, and later the berries of *Juniperus Virginiana*, *Fragaria Virginiana*, *Rubus villosus*, *R. strigosus*, and the seeds of *Cirsium altissimum*, *C. discolor*, *C. canadensis*, the common salad, and various species of aster and solidago among composite plants, and *Panicum*, *Aira*, *Poa*, *Triticum vulgare*, and *Secale cereale*, among graminaceous plants. The stamens and ovaries of blossoms, and various buds are also eagerly eaten.

The flight of this species is low, moderately rapid, and in graceful undulations. In gleaning for food it confines itself to bushes and low trees. It is sometimes terrestrial. While perched upon a weed or bush, we have observed its capture of insects upon the wing with considerable dexterity. Its general movements are characterized by wonderful agility.

Its song consists of a few short syllables repeated loudly and rapidly at first, but gradually diminishing in pitch, until it becomes almost indistinct, and finally ceasing altogether. It resembles *tshe-tshe-tshe*. When the male is ready for a song, it perches upon the summit of a small tree, and utters his notes with considerable vim, for hours at a time, with but brief intervals of repose. In the heat of the day, when the most of his feathered brethren are silent and have sought the cool and refreshing shade, he still iterates his musical ditty with nearly the same ardor and vigor as in the cool of the morning. Through the entire months of May and June, he continues to sing with all the power that characterized him at first, relaxing this power, however, during the ensuing months, when he is heard at irregular intervals, and before his departure becoming almost silent. Even during the breeding-period he essays an occasional ditty to relieve the *ennui* of his mate while engaged in incubation. The song of the Indigo Bird resembles *tsēwě-tsich-tsich-tsē-wě-tsich-tsich-tsē-wě-tsich*, produced very hurriedly and with a rather indistinct articulation.

In about six days after their arrival, mating commences. This accomplished, a suitable locality is selected for building purposes. A nest is the joint and mutual labor of the sexes. A brier-bush in the midst of a thick cluster, is ordinarily chosen. Very seldom is an isolated bush selected. The centre of a patch is available for the obvious

security which it affords; the nest is thus placed out of the reach of viciously inclined birds, and equally mischievous boys. Both birds apply themselves vigorously to the task until the nest is completed, which requires a period from three to four days. The duty of adjusting the materials belongs to the female, while that of fetching the same appertains to her partner. On its completion, very little time is wasted before oviposition commences. A single egg is deposited daily, until the complement of four eggs is laid. Incubation begins on the following day, and continues during a period of ten days. This labor is entirely performed by the female. While the latter is thus engaged, the male contributes his share of labor by administering to her wants; when not thus employed, he takes a position close by the nest, and exercises the most unremitting vigilance. Should the nest be assailed by intruders, with loud noises and menacing gestures, he essays to drive them off, not even hesitating in the case of human foes to offer an assault. At last conscious of his inability to prevent any contemplated depredation, all further efforts are desisted from, and loud and bitter expostulations are indulged in by the offended parents.

Their attentions to the young are unwearied, and prompted by the purest love. Their solicitude is unbounded. Both parents labor vigorously to provide them with suitable and abundant nourishment. In about eleven days the young quit the

nest, and in an additional period of ten days are compelled to feed themselves. They still continue, however, with the parents, thus constituting the small flocks which later in the season display such an appetite for the berries of *Juniperus Virginiana*.

Their nest is usually built about three feet from the ground, and is composed externally of leaves, mainly, intermingled with grasses, spiders' webs, and the inner bark of deciduous trees. It is lined with fine stems of grasses. The diameter is four and a half inches, and the height about four inches. The cavity at the mouth is three inches wide and two and a half inches deep. The typical nest is firmly and cozily built; occasionally, nests are found which are characterized by a looseness of arrangement and lack of symmetry, which are undoubtedly the work of young birds, or unskilful mechanics.

A much neater and firmer structure before us, has the inferior third composed of fragments of paper held together by many intertwining strings and rags, and the superior two-thirds built of the inner bark of deciduous trees and a few weeds. Interiorly, there is a thick lining of the leaves and culms of very fine grasses. Another fabric in our collection, is composed almost exclusively of narrow strips of the bark of *Phytolacca decandra*, with small scraps of paper, strips of rags, and a few leaves; the rim of the cavity is neatly and firmly bound around with the leaves

and stems of fine grasses and rootlets. The cavity is beautifully and evenly lined with black and white horse-hairs.

The Indigo Bird is very abundant, and ordinarily rears but one brood in a season, in this latitude. We have, occasionally, but rarely, met with two broods. When a second brood is raised, it is unusually late in attaining maturity, the parents being detained long after their usual time of departure, which is the last week of September, or the beginning of October.

In confinement this species thrives well and readily subsists upon a mixture of rape and canary seeds. In time, it becomes as tame and trustful as *Fringilla canaria*. Old birds have been captured and caged which in a brief period displayed as much tameness and docility as those reared from the nest. Mr. John Strouse of Chestnut Hill, who has had considerable experience with birds, informs us that this species, under proper domestication, soon becomes a good singer. He has known birds when placed in close proximity to a caged canary, to imitate in a few weeks, with considerable accuracy, the song of the latter.

The eggs are rounded-oval, light bluish-white, and unspotted. They measure .75 of an inch in length and .57 in breadth.

Cardinalis Virginianus, Bonap.

This beautiful species which commends itself to our favor not more by the gorgeousness of its

plumage, than by the variety and brilliancy of its song, is but tolerably abundant. It is a permanent resident, and chiefly delights in low damp woods where junipers and kalmias are exceedingly abundant; in shady and secluded valleys along water-courses bordered with alder-bushes. It is a shy and timid bird, and difficult to approach.

The Cardinal Grosbeak, as this species is popularly called, is mostly found in pairs, male and female together. From the many kind attentions and endearments which the sexes manifest towards each other, it is highly probable that a portion of the same affection that characterizes the sexes during the breeding-season, still remains and prompts to such actions. The spirit of selfishness is akin to its nature.

Its flight is low, firm, and but moderately sustained. Its habits of feeding are slightly terrestrial, the principal part of its time being spent in low bushes. When closely pursued, it seldom betakes itself to tall trees, even when the latter are quite convenient, but always indulges in short and rapid flights from bush to bush.

The song of this species is varied and quite melodious. From the variety and power of its song, it is sometimes inaptly designated the "Nightingale of America." It lacks the copiousness, variation, and sweetness of the European Nightingale, which is frequently known to utter twenty-four distinct combinations of harmonious sounds in rapid succession. The female bird which

is rarely the case among birds, rivals the male in the power and brilliancy of her song. On clear moonlight nights, the song of the male is often continued until daybreak. Its song may be expressed in part by the syllables *hwǎ-chēē-hwǎ-chēē-hwǎ-chēē*, *koo-chē-koo-chē-hwēē-to-tiou-tiou-kwēēt* pronounced rapidly and in a loud, clear, and distinct manner. In case of surprise its ordinary note is a loud and sharp *chip*.

The food of this species during the autumnal and winter months, consists of berries, and the seeds of weeds and grasses. The principal of these are the berries of *Juniperus Virginiana*, *J. communis*, *Viburnum lentago*, *V. dentatum*, *Pyrola rotundifolia*, *Amelanchier canadensis*, *Gaultheria procumbens*, *Liquidambar styraciflua*, and the seeds of *Amarantus hybridus*, *A. albus*, *Ambrosia artemisiæfolia*, *Apios tuberosa*, and various species of panicum, aster, and solidago. During unusually severe winters when pressed by hunger, they will not hesitate to visit the farmers' cribs where for days together they will manage to eke out a precarious existence, by extracting the grains from the cob, through the slats. In the spring, vast numbers of the tassels of *Alnus serrulata* and *Betula excelsa* which are abundant along meadow streams, and in dense high thickets; and, later, the berries of *Prunus Virginiana*, *Rubus villosus*, and *Rubus strigosus*, which are very prolific in their accustomed haunts. The following insects contribute slightly to their subsistence:—*Cratonychus*

cinereus, *Harpalus compar*, *Macroductyla subspinososa*, among beetles; *Ædipoda nebulosa*, *Caloptenus femur-rubrum*, among orthoptera; and *Zerene catenaria*, *Halesidota tessellaris*, *Plusia precatationis*, *Hybernia tiliaria*, *Chærodes transversata*, *Anisopteryx vernata*, *Utetheisa bella*, *Colias philodice*, in their larval stages; and many of the smaller *Noctuidæ* and *Tineidæ* in their perfect stages; besides ants, aphides, and diptera.

This species is exceedingly voracious. To satisfy its voracity it exposes itself often to imminent peril. In such demand is it in certain districts that advantage is taken of its love of appetite. Traps are placed in localities which these birds frequent, and baited with buckwheat for which they have a great fondness. As an inducement for them to enter, a stuffed female is also used as a decoy, and placed so as to be visible at a distance. To attract attention, a person conceals himself close by, and imitates as nearly as possible the call-note of the female, which generally has the effect of enticing an unwary male to his doom.

Nidification commences about the 15th of April, and is entered into by both birds with considerable alacrity. A thicket of brier-bushes is generally selected as a suitable situation for a nest; occasionally, the wild grape vine *Vitis cordifolia*, or *Juniperus Virginiana*, is chosen. The construction of a nest requires the joint labor of the sexes for a period of four days. It is composed exteriorly of bits of sticks as a foundation, upon

which is reared a superstructure of coarse weeds and grasses. The lining is made of soft meadow grasses. In size it equals the nest of *Turdus migratorius*.

Besides lowlands, its most usual places of building, we have known instances where uplands have been chosen for this essential purpose. From four to five eggs are deposited in a nest, at the rate of one *per diem*. Oviposition follows the day after the nest is completed. On the day subsequent to depositing the last egg, sometimes on the identical day, the female begins the trying duty of incubation which devolves exclusively upon her. While she is thus occupied, the male exercises a close watch over her, and provides her with necessary food. The period of incubation is about fourteen days. When with young, both parents are unusually attentive and vigilant. On the approach of human beings, the male endeavors by a little stratagem of his own to divert the intruder from the real situation of his nest, by assuming an air of distress which is rendered more genuine by a kind of mournful click, which he utters with astonishing rapidity. Two broods are reared in a season. In about fifteen days after being hatched, the young are able to leave the nest; and in eleven or twelve days more, are prepared to feed themselves; but they continue with the parents long after they are able to shift for themselves. Their food consists of the larval *Phalænida* mentioned above, *Lumbricus terrestris*, plant-lice, dip-

tera, and the berries of *Rubus villosus*, and *Ame-
lanchier canadensis*.

The eggs are oblong-oval, and thickly marked with asy-brown blotches upon a white ground-color, and lavender tints which almost completely conceal the ground. The eggs have an average measurement of 1.05 by .79 of an inch.

Pipilo erythrophthalmus, Vieill.

The Towhee Bunting or Chewink is quite abundant in Eastern Pennsylvania in the spring, where it arrives about the 15th of April. At this time it is quite gregarious. Still later, the flocks dissolve, and for a while anterior to mating, each bird leads a solitary existence; its sole object now seems to be the acquirement of food, for which a life of solitude eminently qualifies it with a better show of success. This species chiefly delights in waste grounds and thick, damp forests; it does not hesitate to visit less retired localities, even venturing into bushes along frequented roads for the procurement of nourishment. It is far from being shy and timid, and will permit near approaches both while gleaning and nesting, with the slightest manifestation of alarm.

Few species are more eminently terrestrial than the subject of this sketch. It only occasionally takes to bushes and small trees, never or seldom frequenting the tall tree-tops in its search after food. Like its family relations, this *Pipilo* is distinctly rasorial, reminding us of the *Grallatores*.

The peculiar rustling of the leaves which we hear in dense woods and thick patches of brier-bushes on still days, is often due to its movements in quest of food. Its common places of resort for this purpose are among the leaves underneath bramble-bushes and low growths of hemlock-spruce, where it remains for hours at a time. While thus occupied, it is so intent upon its task, as to be scarcely cognizant of intrusion. It is a silent feeder. Its flight is low, but slightly sustained, and with a kind of jerking undulatory movement. Its ground-movements are characterized by notable agility. When disturbed, it seeks safety in short flights, or accomplishes the same purpose, by running.

The call-note of the Chewink is a simple *ko-rēēt*, uttered low, and at irregular intervals. When frightened, or vexed by repeated annoyance, its note then seems to resemble *chē-wīnk*, pitched in a rather high key, produced with a sharp, distinct articulation, and repeated three times in succession, when a lull ensues, to be followed by a similar repetition. Its song may be expressed by the following syllables which will be found to differ somewhat from Nuttall's description:—*t'whīt-t'wītē-tē-tē*.

Seeds, berries, and various insects, compose its bill of fare. Among the former may be enumerated the seeds of *Abies canadensis*, *A. nigra*, *Linaria canadensis*, *Ambrosia artemisiæfolia*, *A. trifidum*, *Chenopodium album*, *Amarantus hybridus*,

and many species of *Aster*, *Solidago*, *Calamagrostis*, and others. Among insects may be mentioned *Formica sanguinea*, *F. subterranea*, *Casnonia pennsylvanica*, *Harpalus pensylvanicus*, *H. compar*, *Cratonychus cinereus*, *Scarites subterraneus*, *Dicælus dilatatus*, *Pangus caliginosus*, *Stomoxys calcitrans*, and the larvæ of *Eufitchia ribearia*, *Clisiocampa Americana*, *Chærodes transversata*, *Ennomos subsignaria*, *Hybernia tiliaria*, *Anisopteryx vernata*, *Utetheisa bella*, *Lithosia miniata*, *Argynnis aphrodite*, *Pieris rapæ*, *Colias philodice*, and mature forms of *Spilosoma Virginia*, *Harrisina Americana*, *Spilosoma acræa*, and many of the smaller *Noctuidæ* and *Tineidæ*.

Mating usually begins about the 15th of May, and by the 20th of the month the birds are ready to commence the building of a nest. The place selected is within the borders of a thicket where there is a dense growth of underbrush. The nest is placed within a depression, and made to project slightly above the margin of the cavity. The great abundance of loose leaves which usually cover the ground in such situations, helps to conceal the nest from view. So perfectly hidden is it, that the most strenuous efforts are often made to discover its whereabouts, but without avail. Both birds enter diligently into the work, and in about two days of hard labor have built a suitable structure. The eggs to the number of four usually, are deposited at the rate of one per day. Oviposition is begun on the day succeeding the comple-

ion of the nest. Sitting commences on the following day, and continues for 13 days.

While the female is thus occupied, the male-bird is very cautious, seldom remaining in close proximity to the nest, for fear of revealing its whereabouts; but steals into the neighborhood after certain intervals, to supply her with food. When the nest has been stumbled upon and his mate is constrained to abandon it, the male does not forsake his hiding-place to come to the rescue. The female, however, by various strategic movements, labors to divert the intruder, by imitating the actions and cries of a crippled bird, until she has decoyed the inexperienced to a remote distance, when she throws off the guise of hypocrisy, and quickly disappears. With those who are trained to such experiences, this *ruse* does not succeed, and the disappointed parent often beholds with feelings of sorrow, her nest and its contents spoiled by ruthless hands.

Both parents are extremely assiduous in their devotions to the young, and carefully and faithfully administer to their wants. They feed them with the larvæ of various insects, besides mature forms of diptera and lepidoptera. The larvæ of *Anisoperyx vernata*, *A. pometaria*, *Ennomos subsignaria*, *Chærodes transversata*, *Colias philodice*, *Eufitchia tibearia*, *Hybernia tiliaria*, besides *Ortalis*, *Scatochaga*, *Anthomya*, among diptera; and *Cynips* among hymenoptera, aphides, and earthworms.

The young are from 13 to 14 days old when

they leave the nest. In 10 days more they are compelled to shift for themselves, being permitted, however, to remain with their parents, thus helping to form the small flocks which are common in the autumn preparatory to migration during the middle of October. This species is single-brooded.

A nest is composed externally of leaves of deciduous trees, the inner bark of *Quercus* and *Castanea*, broad strips of outer bark of the wild grape vine, the *Vitis cordifolia* of Michx., loosely and circularly arranged, and held in position by the peripheral walls of the cavity in which it is posited. Interiorly, there is a rather thick lining of small roots and fine stems of *Larix Americana*, adjusted with the slightest evidence of design and symmetry. It is five inches in diameter and four in height. The cavity is less than four inches wide, and one and a half inches deep.

The eggs are rounded-oval, and marked with dots and blotches of light brown upon an obscure whitish background, which are usually collected about the larger end. They measure .97 of an inch in length and .80 in breadth.

CHAPTER VI.

Family Icteridæ. American Starlings.

This family is restricted to America where it represents the *Sturnidæ* of the Old World. It comprehends one hundred and fifty species, probably about fifty being genuine, and embraced in fifty genera or subgenera. In many parts, they resemble the *Fringillidæ*; while, in others, they grade towards the *Corvidæ*. It is a matter of considerable difficulty to find a character that will relegate the Bobolink and the Cowbird to the *Icteridæ* rather than to the *Fringillidæ*. This group is conveniently divisible into three subfamilies. In all, the sexes are conspicuously dissimilar in size and color; and in this country they are all migrating.

Subfamily Agelæinæ. Marsh Blackbirds.

This subfamily embraces birds which have powerful feet adapted both for walking and for grasping; wings more or less acuminate equalling or surpassing the tail in length; bill conical, acute, with its cutting edges more or less inflected. The species are granivorous, gregarious, and terrestrial to a greater or less extent, being chiefly palustrine. They possess moderate vocal powers, and build rude and non-pensile nests.

Dolichonyx oryzivorus, Swainson.

This well-known and common species reaches Eastern Pennsylvania not earlier than the first of May, and remains but a short time, not longer than ten days at the highest calculation, when it retires further north to breed. It is somewhat retired in its habits, delighting in meadows, borders of thickets, and waste grounds.

Although, seldom, if ever, visiting the habitations of man, it must not be accused of undue timidity. It will permit a very close approach without exhibiting the least dismay. During its sojourn, it occurs in small isolated flocks; but in the autumn, it repairs to the reeds along the Delaware river.

Its habits are mainly terrestrial. Occasionally it frequents small bushes during its vernal stay, but we have never known it to resort to high trees. Its flight is low, slightly undulating, and moderately sustained.

The food of this species in the spring consists mainly of the seeds of weeds and grasses, and insects of terrestrial habits. The flowers of *Taraxacum Dens-leonis*, and matured seeds of the same, are also greedily eaten. The following insects constitute a conspicuous portion of its diet:—*Pangus caliginosus*, *Scarites subterraneus*, *Harpalus pensylvanicus*, *Lachnosterna quercina*, *Cratonychus cinereus*, *Casnonia pennsylvanica*, *Donacia confluenta*, *Chrysomela cæruleipennis*, among coleoptera; *Edipoda sulphurea*, *Æ. nebulosa*,

Caloptenus femur-rubrum. and *Acheta nigra* among orthoptera; besides *Formica sanguinea* and various species of *Aphidæ*. In the autumn it subsists upon the seeds of *Zizania aquatica*, *Setaria italica*, *Poa compressa* and the tassels of corn. It is now in a very fine condition and is eagerly hunted by the sportsman for the peculiar flavor and delicacy of its flesh.

The song of the Bobolink is pre-eminently its own, and cannot be compared to that of any of our feathered songsters. For variety, rapidity, and peculiar and touching pathos and melody of its tune and expression, it cannot be excelled. It is clearly the most attractive and pleasing of all our original songsters. It is rather amusing to listen to a concert which is sometimes given when a number of birds have congregated together seemingly for this avowed purpose. The performance is begun by one bird taking the lead, to be followed by another, and so on until the entire choir have joined their voices, each following the example of the leader, and seemingly at a given signal. A perfect medley of sounds is thus produced, far from being unpleasing, and to which the pen would be powerless to do justice. This concert is repeated whenever the flock alights.

The female is modest, retiring, and humble in her deportment, always keeping near the ground, and is attended by several aspirants for her affection. Each endeavors to outsing his competitors. After a very exciting contest the rivalries are settled;

the rejected suitors are driven away by the successful aspirant, and efforts are made by the loving pair to build themselves a home. It is on such occasions that their song appears to the best advantage. It is in the eccentric pauses which happen in the midst of their song that we detect the word "bob-o-link" so distinctly enunciated as not to be misconstrued.

When the contests are over, the birds select a suitable locality for a nest. A meadow is chosen as its site. The nest is built upon the ground, and so artfully concealed by enveloping grasses, as to be very difficult to discover. It is composed of flexible grasses most carefully wrought into a shallow and compact nest.

When the female is brooding over her charge, the male is hovering over the nest uttering his incessant love-song, or else is swaying to and fro upon some slender weed, eloquent with melody. As domestic cares and responsibilities increase, his song is heard less frequently, until finally it ceases altogether.

The eggs are five in number, and generally marked with rufous-brown and lavender blotches upon a white background, which sometimes presents a tinge of drab or olive. They measure .90 of an inch in length and .70 in breadth.

This species is single-brooded. It breeds from the 42d to the 54th parallel of latitude in North America, being particularly abundant in certain localities.

Molothrus pecoris, Swainson.

This well-known species, the Cowbird, though an early visitor in Massachusetts, which according to the authority of Samuels makes its appearance there as early as the middle of March, from some cause or other, has never been observed by us earlier than the second week of April, long after the bluebird, robin, and blackbird have made the fields and woods resound with their melodies. Its arrival is announced by the coming of the warblers and sparrows between whom and it exist such mysterious relations. The anomalous habit which the female Cowbird possesses of visiting the nests of smaller birds when she wishes to oviposit, and thus shifting a responsibility which she should alone assume, is quite familiar.

It is probable that in primitive times all species were equally as social and gregarious as the one under consideration; and that the present system of mating which is certainly an index of a high state of improvement, has been gradually evolved.

The art of nest-building has, doubtless, also been slowly acquired. In some families it has attained a wonderful degree of perfection; while in others it may be said to be in its infancy. With the Cowbird, either it has never been studied, so to speak, or else it is a lost art which has never been restored.

This species is exceedingly shy and suspicious, and can be approached only with the greatest pre-

caution. It is eminently gregarious, and, like most of its family relatives, is exceedingly terrestrial in its habits of feeding; occasionally visiting, however, small trees and bushes, more for repose than aught else. It is chiefly a denizen of dense forests, and waste fields overgrown with bramble-bushes and shrubs.

Its flight is moderately lofty and quite well sustained, resembling somewhat that of the *Icteriinæ*.

The Cowbird subsists upon seeds, grains, and berries of various kinds, besides divers insects. We have detected in our examinations, the grains of *Triticum vulgare*, *Secale cereale*, and *Hordeum vulgare*; besides the seeds of *Amarantus hybridus*, *A. albus*, *Phleum pratense*, and *Trifolium pratense*. The berries of *Juniperus communis*, *J. Virginiana*, *Prunus serotina*, *Prunus cerasus*, *Fragaria Virginiana*, *Rubus villosus*, *R. strigosus*, *R. occidentalis*, *Amelanchier canadensis*, *Vaccinium stamineum*, and *Liquidambar styraciflua*, are devoured with a gusto. The following insects constitute a portion of its bill of fare:—*Dicælus dilatatus*, *Pangus caliginosus*, *Cymindis viridipennis*, *Scarites subterraneus*, *Cratonychus cinereus*, *C. pertinax*, *Harpalus pensylvanicus*, *Haltica chalybea*, *Macroductyla subspinosa*, *Cetonia inda*, and other beetles; *Formica sanguinea*, *F. subterranea*, *Apis mellifica*, *Selandria rosæ*, &c., among hymenoptera; besides aphides, diptera, earthworms, and lepidopterous forms of *Zerene catenaria*, *Ennomos subsignaria*, *Chærodes transversata*, *Hybernia tiliaria*, *Utetheisa bella*, *Eudryas*

grata, *Clisiocampa Americana*, *Colias philodice*, and many of the *Noctuidæ*, *Tortricidæ*, and *Tineidæ* in their larval and perfect stages.

The Cowbird delights to visit ploughed grounds, where in small flocks it will glean for a long time, unless disturbed. In pasture-grounds where the cattle are grazing, it is a common visitor, nestling among the cattle and sometimes alighting upon their backs and relieving them of their dipterous tormentors which serve it as food; or else searching among their droppings for the same. At times it is somewhat rasorial.

It has no attractions as a singer, and scarcely deserves the name. Its notes are harsh and unmusical.

The species which seem to be the objects of its special regard in this section, are comprehended within the three families of the *Sylviolidæ*, *Vireonidæ*, and *Fringillidæ*. We have detected its eggs within the nests of the following species:—*Geothlypis trichas*, *Dendroica æstiva*, *Sciurus aurocapillus*, *Setophaga ruticilla*, *Vireo olivaceus*, *V. noveboracensis*, *V. gilvus*, *Spizella socialis*, *Melospiza melodia*, and *Cyanospiza cyanea*. There is usually but one egg deposited in the nest, although we have frequently discovered two, and but rarely three. When the egg is laid within the nest of the Summer Yellow Bird, a remarkable degree of sagacity is manifested when there is lacking ability necessary to its removal. To frustrate the design of its author by preventing its hatching, the birds

set to work and completely cover it by an addition to the inside of the nest.

As a general thing, the Cowbird deposits her eggs in the nests of birds smaller than herself; but this is not always the case as instances are recorded where they were dropped into the nests of *Turdus mustelinus* and *Sturnella magna*; but we have never discovered any such cases. Why the smaller birds should be the recipients of such unsolicited favors, it is difficult to guess, unless the cowardly spirit of the species under consideration, operates to prevent similar discourtesies being shown where they would probably be resented. As a proof of such cowardice might be cited the stealthy manner in which the Cowbird approaches the nest of any of the foregoing species. She is ever on the alert for fear of detection. In case of discovery, she takes to flight, often failing to accomplish her wish; but when suddenly pressed, she is constrained to drop her egg, thus accounting for the fact that eggs are frequently seen upon the ground, either entire or broken.

It is said that the egg of the Cowbird hatches rather sooner than those of the species among which it is found, and from this it is argued by some that it is a wise provision of nature, which, were it otherwise, would defeat the end which she had in view. Experience has taught us that a setting of eggs is sometimes longer in hatching than others. The difference of time is evidently due to variation in the amount of heat to which the

eggs are subjected. Now the egg of the Cowbird being perceptibly larger than the others, would receive more heat from the body of the foster-mother than the latter's own, for the obvious reason that it would be in closer proximity to the source of heat. This in our judgment will satisfactorily explain its much shorter period of incubation. Were the eggs hatched by their rightful mother, it is probable that the period would vary but a trifle, if any, from that of the rusty blackbird.

Like the Cuckoos of Europe, this species never builds a nest, and never hatches or attempts to rear her own offspring; but, as before remarked, practises imposition upon other species, which, either unconscious of the fraud, or unable to rid themselves of the foreigner, are constrained to hatch the alien at the peril of their own offspring. The egg of the Cowbird hatching sooner, the stronger has increased somewhat in size, when the others are hatched, and having an insatiable appetite, and continually clamoring for food, it grows at the expense of its foster-companions which either stifle or die from starvation, and are carried away by their parents to some distance from the nest. It is well-known that some species are not slow in detecting the intrusion, which, when they have done so, they do not hesitate to get rid of immediately. Mr. J. A. Allen, says Dr. Brewer, saw a female *Hyporhynchus rufus* feeding a Cowbird in Western Iowa, which had nearly attained maturity. This is the only recorded proof

that we have that these birds are raised by others of greater size.

The eggs of the Cow Blackbird are round-oval and nearly equally rounded at either extremity. They are ordinarily marked with fine cinereous and purplish-brown dottings upon a white ground-color, which render the latter undistinguishable. Others have purple and light brown dashes and blotches over their surface. They vary from .86 to about an inch in length, and from .64 to .70 in breadth.

Agelæus phœniceus, Vieill.

The Swamp Blackbird as this species is commonly designated from the peculiar fondness which it affects for swamps and low humid grounds, seldom appears earlier than the first of April. Like *Quiscalus versicolor* it is exceedingly sociable, many pairs building within a few paces of each other in the same swamp or meadow. On their first arrival they consort together in high open fields, where their songs may be heard at somewhat regular intervals, from early morn until long after the sun has sunk to rest. At this time the birds are rather shy and can be approached only with great difficulty. Eminently terrestrial whilst feeding, they are occasionally found within bushes, upon small trees, and also upon fence-rails during the season of mating, where the males pour forth their melodies into the ears of their listening females, each one straining to outvie the other;

and ever and anon a half-dozen voices are heard nearly at the same instant, producing a perfect medley of sounds. While the females are incubating, and even afterwards up till the time of their departure, we are greeted with the same curious yet agreeable reception on every return to accustomed haunts.

The flight of this species is low, firm, and but slightly protracted.

Its song is loud, clear, and resonant, and has a pleasing intonation which when once heard cannot be forgotten. It is not continuous, but is produced at somewhat graduated intervals. It resembles *h'wā-kēr-ēē* uttered with a rising inflection. Its call-note is a simple *tchick*.

Mating ordinarily begins about the 20th of April in favorable seasons, and by the 28th of the same month, or the beginning of May, the birds are ready for building. A nest is constructed within a tussock of grass, but generally upon the alder bushes so common along the borders of meadow streams, where the young are less liable to the attacks of such snakes as the *Bascanion constrictor* and *Tropidonotus sipedon*, which have such a decided penchant for such fare. Those built upon bushes are more symmetrical and compact in structure than those which are placed upon small mounds in swampy situations, and display occasional patches of mud, exteriorly. The latter are surrounded by tall overarching grasses, and have in consequence a looseness of arrangement and will scarcely bear manipulation.

In the selection of a locality there is a manifest evidence of design. High grounds are seldom chosen for nidification, for the obvious reason that the birds are not so apt to meet with such a ready and full supply of the various insects that pander to their appetites as in the former situations. The insects which afford them nourishment in such localities are the aquatic larvæ and imagos of ephemerids, libellulas, and mosquitoes, which are denizens of shallow pools. The following insects contribute to its bill of fare during its stay:—*Culex tæniorhynchus*, *Anopheles quadrimaculatus*, *Tabanus lineola*, *Stomoxys calcitrans*, *Tipula ferruginea*, larvæ of smaller dragon flies, and caterpillars of *Hybernia tiliaria*, *Anisopteryx vernata*, *Utetheisa bella*, *Ennomos subsignaria*, *Argynnis aphrodite*, *Colias philodice*, and mature forms of *Spilosoma Virginica*, *Halesidota tessellaris*, *Lithosia miniata*, and many of the *Lycænidæ*, *Noctuidæ*, and *Tortricidæ*; together with *Aphidæ*, *Coccidæ*, ants, and earthworms. These last two, together with small beetles, the birds procure while gleaning upon fallow ground. The seeds of various weeds and grasses, besides the berries of *Juniperus Virginiana*, *Prunus cerasus*, *P. serotina*, *Amelan chiercanadensis*, *Fragaria Virginiana*, *Rubus villosus*, *R. strigosus*, and *Vaccinium stamineum*, are also eagerly relished.

It has been affirmed that the Red Wing is very destructive to farmers' crops, but as far as our experience extends, the damage which it commits

is small in comparison with the good which it accomplishes. When a cornfield is in close proximity to a meadow, it is highly probable that a few grains may be exhumed, or a few tender shoots uprooted in early spring, but we are certain that during the breeding-season the birds are so attached to their favorite haunts, as not to be induced to forsake them without urgent necessity. In the autumn they may visit the cornfields and pluck a few grains from the standing shocks, but in view of the manifold advantages which we derive from the myriads of insects which they destroy, we should not grudge them a mere pittance of corn.

A typical nest is composed of stubble and coarse grasses intermingled together, and lined with soft meadow grasses which make a cozy interior. As before remarked, the outside of nests which are built in bushes, exhibit small patches of mud which help to strengthen and bind the ingredients more compactly together; in ground nests, mud is an unnoticeable feature. The nest measures five inches in diameter and three in height, and has a cavity three inches wide at the rim and one and a half deep. It requires the joint labor of the sexes about five days to complete a nest, working during the mornings and evenings. The nest completed, on the ensuing day the female begins to deposit her eggs at the rate of one per day, until the full complement is laid, which requires a period of five days. Incu-

bation succeeds on the day following the last deposit, and continues for fifteen days; the sole duty devolving upon the female, while her partner, like a dutiful husband, guards her from intrusion when not engaged in providing her with food. When the nest is disturbed, the parent-birds flutter over the intruder, uttering the most piteous cries, which are enough to strike a sympathetic chord in the bosom of even the most relentless person. After the nest has been ravished, both parents perched upon a bush or a small tree, continue their lamentations for a half-hour afterwards. The most intense affection is displayed for the young, and the most devoted attention is bestowed upon them. They are fed upon earthworms, plant-lice, diptera, and the caterpillars of the various lepidoptera which we have mentioned above. The young quit the nest in about fourteen days after hatching, and in twelve-days more are able to shift for themselves. Both young and old remain in their accustomed haunts, and collect in small flocks, until ready to depart for their winter homes, during the last of September, or the early part of October.

The eggs are oval and marbled, blotched, and streaked with light and dark purple upon a light bluish background, mainly about the larger extremity. The average length is 1.01 inches, and breadth .76. The species is single-brooded in Eastern Pennsylvania, whilst farther south it is affirmed to be triple-brooded, or even more.

Sturnella magna, Swainson.

This beautiful species, the Meadow Lark, though very common in this latitude during the breeding-season, appears from the 1st to the 15th of April. Unlike the purple grackle which is gregarious in early spring, this species arrives from the South seemingly already paired for the essential duties of nidification, incubation, &c. It is particularly fond of lowlands which it occasionally deserts for more elevated situations, and manifests a degree of shyness and retirement which is scarcely surpassed by none. During some mild winters, we have discerned this species in quiet and sheltered valleys along the Wissahickon creek, subsisting upon the seeds, berries, and coleoptera, which it is able to procure. It shuns rather than courts the society of man, although in Georgia and South Carolina, according to Wilson, it swarms among the rice plantations, and consorts with the Killdeer Plovers about yards and out-buildings where it makes itself perfectly familiar.

The song of the Meadow Lark is characterized by great sweetness. During the love-season they perch upon a bush, or tree, or any other elevated object, give utterance to notes which for sweetness and tenderness of expression, are unrivalled by few of our birds. These notes are sometimes varied by a few chattering calls which add nought to their improvement.

The flight of this bird is generally low, undulat-

ing, and protracted. In the procurement of food its habits are mainly terrestrial; occasionally arboreal, particularly during the breeding-period.

Its food consists of the seeds of various plant-species, berries, and insects. We have found it feeding upon the seeds of grasses, and the berries of *Prunus cerasus*, *P. serotina*, *Fragaria Virginiana*, and *Rubus villosus*. During the early part of the season it derives sustenance from the following coleopterous and orthopterous insects:—*Harpalus pennsylvanicus*, *H. compar*, *Dicælus dilatatus*, *Pangus caliginosus*, *Cratonychus ciperceus*, *Cetonia inda*, *Anomala varians*, *Chrysomela cæruleipennis*, *Ædipoda sulphurea*, *Æ. nebulosa*, and *Caloptenus femur-rubrum*. When with young, which are also fed thereon, the caterpillars of *Eudamus tityrus*, *Argynnis myrina*, *A. bellona*, *Agrotis tessellata*, *Calimorpha lecontei*, *Ennomos subsignaria*, *Chærodes transversata*, *Anisopteryx vernata*, *Zerene catenaria*, mature forms of *Colibia philodice*, *Harrisina Americana*, *Utetheisa bella*, and many of the *Lycænidæ*, *Tortricidæ*, are in great demand. Besides the foregoing, various aphides, ants, and earthworms, are also eaten. *

Building operations do not ordinarily commence earlier than the last of April, or the beginning of May; the interval of time between arrival and nidification, being employed, judging from the manœuvres of the birds, in the selection of a desirable and suitable locality. The site chosen is not always a meadow. Mr. Samuels affirms, the

locality is generally a meadow or low field. We have as often found the nest on upland in a field of red clover, or one of timothy grass. In such situations it reposes in a concavity of the earth, partially hidden and protected by enveloping and over-arching grasses. Nuttall's description thereof, though correct in his day, according to our experience, needs some modification. As the nest of the same species varies somewhat with change of locality, this difference doubtless can be attributed thereto. According to that eminent authority "it is compact, made of wiry grass, to which a hidden and almost winding path is made, and generally so well concealed that the nest is only to be found when the bird is flushed." We have always observed a looseness of arrangement in the structure. The nest is built externally of the hollow stems and leaves of *Phleum pratense* which are accumulated in the bottom to insure protection from the dampness of the ground. The period of nidification is about four days. The labor of building is mutually shared by both sexes. Oviposition commences on the day succeeding the completion of the nest, and lasts from four to five days, according to the number of eggs laid, which is at the rate of one egg per day. Incubation occurs sometimes on the day of the last deposit, but most generally on the ensuing day, and lasts from 14 to 15 days, according to several observations. The duty devolves exclusively upon the female, while the male bird contributes to her maintenance.

It is seldom that the hen bird can be detected on the nest. When alarmed by approaching danger, there is no sudden uprising or whirring of wings. Aware of imminent peril, she quietly slips out of the nest, and noiselessly winds her way through the thicket of grasses, along a well-beaten path which had been made for the purpose. The male is seldom observed. In case of molestation of the nest, not the slightest fuss is made.

The young leave the nest when fifteen days old, and in ten days are prepared to support themselves. In the autumn the birds collect in small flocks, and thus retire to the south, where among the salt marshes of Alabama, and West Florida, according to Mr. Nuttall, they seek food and shelter. In England, individuals of this species have occurred, so says Mr. Sclater.

The eggs are oval, and have reddish-brown spots upon a white ground-color. These spots are mostly equally diffused; occasionally they are mainly found about the larger extremity. The eggs vary much in size, the smallest coming from Florida, and the largest from Massachusetts. In Eastern Pennsylvania the ordinary measurement is 1.18 by .82 of an inch.

The variations that exist in the eggs of the Meadow Lark are doubtless due to the difference in the age of the parents, and also to the circumstances under which the eggs are deposited. Those of old, mature birds, laid in early summer, or the first brood, are usually sub-globular or bluntly-

pointed at one extremity, large in size, and irregularly marked with fine red dots; whereas the eggs of younger birds, or those breeding for the first time, or those that have been robbed, or have a third set, have eggs smaller, more oblong and more pointed at one extremity than the others, and marked at the larger end only with dark-purplish splashes. In this latitude there is but a single brood in a season.

Subfamily Icterinæ. Orioles.

This family comprehends species that are both insectivorous and frugivorous. They are non-gregarious, mainly arboricole, and are distinguished for their pleasing song, brilliant and strikingly contrasted colors, and elaborately woven pensile nest. The bill is more attenuated, more acute, and relatively longer; and the feet weaker, and better adapted to perching than most of the species of the last subfamily. Three of our species are abundant and migratory in the summer; the residue attaining our Southern border from tropical America; but two of which are denizens of Eastern Pennsylvania.

Icterus spurius, Bonap.

The Orchard Oriole is quite as common as its nearest relative, and reaches Eastern Pennsylvania not earlier than the first of May. It is fond of cultivated grounds, particularly old orchards which it visits on its arrival, and where it remains until

its departure during the last of September. At first it is rather wild, but as the season for mating arrives, it becomes rather tame and unsuspecting, and can be readily approached. We have seldom, if ever, observed the species in waste grounds, in dense thickets, or along the borders of woods, except where orchards were adjoining the latter.

The flight of this species is low, graceful, undulating, and but slightly protracted. This bird is strictly arboricole. We have never observed it gleaning upon the ground, although it may probably do so at times. It is active, sprightly, and vivacious, and is remarkable for its song which is enunciated in a hurried and energetic manner. By some it is considered as a medley of agreeable gushing notes which the listener in his inability to follow thus characterizes. The performance consists of rather shrill and sprightly notes, uttered with apparent agitation, and are quite as distinct and pleasing as those of *Icterus baltimore*, but lack their richness. Shortly after his arrival, the male bird seeks the topmost branch of a pear or maple tree, and for a half-hour at a time, unmindful of passers-by, makes the neighborhood resound with his melody. After nesting is begun, and particularly during the incubating process and while with young, his song is seldom heard. Occasionally a young and inexperienced male, in the exuberance of his joy, will break forth in wanton rhapsodies to the peril of his nest and its contents. The following syllables uttered loudly,

distinctly, and with an energy which, hardly can be surpassed, will express a portion of its truly remarkable ditty:—*tw' chē-chē-chē-chē*, varied occasionally by *t'wāh-t'wāh-chē-chē-chē-chē*.

The food of the Orchard Oriole is almost exclusively insects, of which it devours immense numbers; particularly those kinds which perpetrate immense mischief in preying upon the fruit and foliage of trees. For the incalculable amount of good which they accomplish, they are general favorites among husbandmen, and wherever protected, show their appreciation of this good-will by their presence and familiarity. They are wholly innocent of injury to crops, and we know of only one instance where accusations have been preferred against them. At a meeting of the Philadelphia Academy of Natural Sciences held June 2, 1874, Mr. Thomas Meehan stated "that he was not familiar with latest knowledge in ornithology, that not being a special study with him; but if Wilson's Ornithology contained all that was known of the habits of the Orchard Oriole—*Oriolus mutatus*—he might say that the bird did not confine itself solely to insect-food. He had on his grounds a large specimen of the *Staphylea trifolia*, which, when in bloom, was a favorite resort with humblebees and humming-birds, and the Oriole took its share of honey from the flowers as well. It did not rest on the wing as the humming-bird did, but sought a lower branch from which it could leisurely extract the sweets from the flowers above.

He had thought it possible that the bird was in search of insects among the flowers, but a careful examination proved otherwise."

Early in the season it subsists upon *Harpalus pensylvanicus*, *Chrysonela cæruleipennis*, *Donacia confluenta*, *Cymindis viridipennis*, *Cratonychus cinereus*, among beetles; *Aphis mali*, *A. rosæ*, and other aphides, among hemiptera; small spiders, and *Apis mellifica*, *Formica sanguinea*, *Megachile centuncularis*, *Selandria rosæ*, *S. vitis*, *Halicti*, and *Andrenæ*. Later, and while with young, immense numbers of caterpillars are consumed, of which the following are a part:—*Anisopteryx vernata*, *A. pometaria*, *Chærodes transversata*, *Zerene catenaria*, *Eufitchia ribearia*, *Anisota rubicunda*, *Ennomos subsignaria*, and mature forms of *Penthina pomonella*, *Plusia precatationis*, *Clisiocampa Americana*, *Eudryas grata*, and many of the *Lycenidæ*, *Tortricidæ*, and *Tineidæ*. Since writing the above, we have detected in several stomach-examinations, fragments of the petals, stamens, and pistils, apparently of *Pyrus malus*, and *P. communis*.

Mr. Samuels in describing its nest in Massachusetts says, substantially, it is deposited in a forked branch of a tree in an orchard, at an elevation of not more than twenty feet from the ground, and constructed of different grasses neatly and compactly woven together, the whole being lined with fine grasses and a few hairs. Further he says, "it is not pensile but built on a branch." Its style of architecture varies no doubt with the latitude,

as the many nests which we have examined, including many in our collection, with one or two exceptions, were of a decidedly pensile character, uniform in composition, and suspended from slender branchlets after the fashion of *Icterus baltimore*. The exceptional nests were placed between the forked branches of trees. These nests with but two exceptions have been found upon apple and pear trees in close proximity to the residence of man; the others were built on the confines of forests at considerable distance therefrom. It is probable that in earlier times this species was as timid and suspicious as others that might be cited, and as time advanced, gradually lost its timidity. Familiarity with man, the result of long experience, doubtless, taught it to regard him in the light of a friend. In the fact that nests are occasionally found on the borders of immense thickets, we have a hint to its past history. In our opinion, reserve, timidity, and distrust were then the leading elements of its character, as familiarity, a certain degree of boldness, and confidence are traits which now stand prominently forth.

A typical nest is $2\frac{1}{2}$ inches in diameter, and $4\frac{1}{2}$ in depth. It is pouch-shaped and attached to the slender twigs of an apple or a pear tree in such a manner as to be readily swayed to and fro by a gentle breeze. It is built of the soft and flexible leaves of a species of *Poa*, neatly and compactly woven together, and lined with narrower leaves of

closely allied plant-species. The site selected is usually one where the small spurs of the pear and the apple, chiefly the former, with their crowns of leaves can meet over the nest and thereby form a roof which will protect the female and young from inclement weather.

Mating commences about the 15th of May, and by the 20th of the month, the pair are ready to commence the building of a nest which is the joint labor of the two for about six days. Sometimes this essential business, from some cause or other, is deferred until about the middle of June, and sometimes still later, as nests with tender fledglings have been seen in the early part of August. The nest being completed, on the following day the female begins to deposit her eggs at the rate of one a day, which requires a period of three or four days, according to the complement laid; the ordinary number being four. Incubation then ensues, sometimes on the day of the final deposit, but generally on the succeeding day. The period of incubation ranges from 14 to 15 days. This labor is performed wholly by the female, the male-bird standing guard over the nest, or acting as purveyor of food. When the nest is assailed, both birds make considerable ado, and by loud cries and menacing gestures, seek to deter the intruder from any contemplated design, even venturing to attack him with a boldness that deserves commendation.

Their love for their young is intense, and is

manifested by the devotion and care with which they attend to their wants, and the spirit of bravery they display in their defense. The young are fed upon the caterpillars and aphides aforementioned, besides spiders, ants, and small beetles; the latter when they are more fully matured. The young are 15 days old when they quit the nest. In about 10 days more they are able to shift for themselves.

As affirmed by Wilson, this Oriole is easily reared from the nest, and in confinement becomes very tame and familiar. A friend of ours kept one in a cage for several years which whistled with remarkable clearness and spirit. It was a particular favorite with its owner, and learned to come at his bidding; and at a given signal would pour forth its choicest music with an energy and power that were truly astonishing.

The sociability of this species is remarkable, and we have known instances where five nests were found in the same orchard within a short distance of each other, where the most perfect good-feeling and harmony prevailed. Mr. Audubon cites a case where no less than nine were found in the same enclosure. The nests which we have met with in Pennsylvania, all compare in composition with those which Dr. Brewer has seen from Georgia, Florida, Louisiana, and Texas, in being homogeneous, and composed of a flexible kind of grass or reed.

The eggs are oblong-oval, acuminate at one

extremity, with pale purple blotches upon a light bluish-white ground, and dashed with a few deep, dark purplish-brown markings at the larger extremity. In Eastern Pennsylvania the eggs measure .88 of an inch in length and .58 in breadth.

Icterus baltimore, Daudin.

The Baltimore Oriole, the Golden Robin of the New England States, is one of the most common birds in Eastern Pennsylvania, where he arrives about the beginning of May. His brilliant plumage, interesting and vivacious manners, his rare vocal powers replete with variety, beauty, and pathos, render him a great favorite with us, notwithstanding his peculiar propensity for the pea-vines of our gardens. The prematureness and tardiness of the season neither hasten nor retard his coming. We are reminded of his presence by the joyous welcome with which he greets us while perched upon the top of some tall cherry, close to our door, or still taller plane-tree. The male-birds are always unaccompanied by their mates which do not arrive until the expiration of the third or fourth day.

The song at first is unusually loud and shrill, and partakes somewhat of the nature of tender and querulous lamentations. It resembles *twē-āh-twē-āh-twē-āh-twē-āh-twīt*, *twē-āh-twē-āh-twē-āh-twē-āh-twē-āh-too-too*. Its ordinary call-note sounds like *te-kēēēēē*. After the arrival of his mate, the character of the song changes and becomes richer and

more pleasing, as well as lower. During the love-period these resonant and peculiarly mellow notes are heard in every orchard and lawn, from along the highways, and in the public squares and gardens. Nuttall describes the notes of his song as equivalent to *tshippe-tshayia-too-too-tshippe-too-too*, with several other not dissimilar modifications and variations. These syllables give a very poor idea of his song, which needs to be heard to be appreciated. Each individual has variations which are peculiar to himself. The female has her own peculiar and beautiful notes which she continually gives expression to while constructing her elaborately-woven and pensile nest. The song of the male ceases early in July, as family duties engross his time and attention.

At first the males are exceedingly agile and restless, moving rapidly among the budding and blossoming trees, in quest of insects which constitute their principal diet. This Oriole deserves our favor and esteem for the numerous insects of an injurious character which it destroys, which thus compensate for the trifling injuries which it commits in the destruction of the succulent pea, and the few blossoms of the cherry and apple which it rifles of their stamens and ovaries.

This species is strictly insectivorous, and at first subsists upon coleopterous and hymenopterous insects which it gladly exchanges for caterpillars as the season progresses. Early in May we have detected the remains of the following insects in

the many stomachs which we have examined:—*Thaneroclerus sanguineus*, *Cratonychus cinereus*, *Harpalus compar*, *Cetonia inda*, *Chrysomela cæruleipennis*, *Cymindis viridipennis*, *Selandria rosæ*, *S. vitis*, *Apis mellifica*, *Formica sanguinea*, and *Aphis mali*, *A. rosæ*, *A. cerasi*, and *A. avenæ*, among hemiptera. Later, and especially during the breeding-season, vast numbers of caterpillars of *Anisopteryx vernata*, *A. pometaria*, *Eufitchia ribearia*, *Chærodès transversata*, *Ennomos subsignaria*, *Hybernia tiliaria*, *Zerene catenaria*, *Lithacodes tessellaris*, *Limacodes scapha*, *Clisiocampa Americana*, *Orgyia leucostigma*, *Anisota rubicunda*, *Lozotænia rosaceana*, *Eudryas grata*, and mature forms of *Spilosoma Virginica*, *Penthina pomonella*, *Procris Americana*, *Lithosia miniata*, and many of the *Lycænidæ* and *Tortricidæ*.

The flight of the Baltimore Oriole is somewhat loftier than that of the last described species, but in other respects is analogous. It is strictly arboricole, and in only one instance have we ever discovered that it has any predilection for a terrestrial life, and then it was observed gleaning on a piece of ploughed ground.

The birds begin to mate from the 15th to the 18th of May; and about the last of the same month, or the beginning of June, look about for a suitable place in which to hang a nest. The nest-materials are mainly collected by the male, while upon the female devolves the duty of weaving the ingredients together, which is the labor of a week of

almost steady application. Its nidification is so familiar to all, that it may seem presumptuous upon our part to say anything upon the subject. Nuttall has so beautifully and faithfully delineated the characteristic nest, that to attempt any improvement thereon, would seem an utter waste of time; but there is a novelty hitherto unnoticed in a couple of nests which we possess, that renders a description not at all amiss.

In the scores of nests which we have examined, with the above exceptions not included, all were begun as Nuttall affirms "by firmly fastening natural strings of the flax, of the silkweed, or swamp hollyhock, or stout, artificial threads, around two or more forked twigs, corresponding to the width and depth of the nest. With the same materials, willow down or any accidental ravellings, strings, thread, sewing silk, cotton, or wool, that may be lying near the neighboring houses, or around the grafts of trees they interweave and fabricate a coarse cloth into the form intended, toward the bottom of which the real nest, made chiefly of lint, wiry grass, horse and cow hair, &c."

To one of the nests alluded to, the above description satisfactorily applies, but it does appear that the birds from some unaccountable cause, had manifested but little judgment, so to speak; in the selection of a suitable site, for we find them in order to make the best of a bad bargain, erecting a permanent roof to their domicile out of strings, in place of the agreeable canopy which leaves

would afford in more congenial situations. In the other, economy seems to have been of paramount importance, for the nest is a faithful counterpart of the real one of Nuttall's description minus the enclosing pouch.

No. 1 is somewhat cylindrical in shape with the long axis or distance from top to bottom, slightly in excess of the short or distance from side to side, the former being about five, and the latter nearly four and a half inches. It is composed of strings compactly woven together, with a slight intermixture of hairs of the horse and cow; the whole forming a comfortable and cozy structure, and well calculated to protect its inmates from the inclemency of the weather. So nicely is the roof adjusted to the nest, that even the most critical examination fails to discern the union. The entrance is a circular opening situated in the superior third of the nest, facing southwardly.

No. 2 is an inverted cone, with a blunt apex. The greatest diameter at top is four inches, and the less three and a half; depth four and a half inches. It was built between two forks of a pear-tree. It is composed almost entirely of the hairs of the horse and cow, firmly but densely woven together. So slight is the texture that it can be readily seen through. This specimen presents the appearance of an ordinary nest without its customary covering. In Northumberland Co., Pa., where this nest was found in the summer of 1866, we were told that it is the characteristic style. It

is more than likely that in districts far removed from the busy haunts of man, owing to the lack of the usual materials, the birds are constrained to use the hairs of the domestic as well as those of wild animals in the structure of their domiciles. In times very remote, before the introduction of civilized man into the country, there is no doubt that the above was the only style of architecture known to the species. It is evident that in days of primitive gloom, and even at the present time in thickly-wooded sections, a very dense nest is not at all desirable, since the birds obtain the required protection from the weather in the beautiful covering which nature throws over them. Now, in sections where the forests have disappeared by the strokes of the pioneer's axe, such shelter would not afford the comfort and security which the inmates demand. Birds not being slow to discern what best comports with their security, certainly this oriole which displays so much good taste and ingenuity, would readily perceive that a more compact and denser structure would be more desirable. History shows that the highest and most elaborate styles of architecture which man is now capable of achieving, are but the outgrowths of the simpler and less complicated forms that preceded them. Reasoning therefore from analogy, the highest style which the Baltimore Oriole has been able to accomplish, the typical nest, is but an outgrowth of the one which we have last described.

From the plausible remarks advanced, the in-

closing pouch seems but an improvement super-added to the main structure, its being a subsequent operation. This must be apparent to all.

In the first of these anomalous forms of nests still further improvement is manifested in the closely-woven roof. In open nests, protection is partially secured by the cluster of leaves that depend from above; the site being, doubtless, selected with a view to this natural arrangement. As reason tends to improvement, and birds are possessed of a share of this gift, so it is natural to suppose that they must vary their style of nest-building in favorable directions, when both individual and family good will be best subserved thereby.

The nest being completed, the female on the succeeding day begins to deposit her complement of eggs, which at the ordinary rate of one per day, is deposited in four or five days. Incubation follows oviposition on the following day, and continues for 15 days; the labor being exclusively performed by the female, while the male bird is close by ready to defend her and nest, or to provide her with the necessary nourishment. Both parents are devoted and faithful, and courageously defend their young when in peril, and fearlessly exposing and endangering their own lives rather than trust them to the hands of a merciless foe. If the young are captured and incarcerated, the parents if permitted, will follow and continue to feed them. Mr. Ridgway mentions a case where the female entered the nest while he was sever-

ing the branch to which it was supported, and continued to occupy it after it had been detached and carried into the house.

Dr. Brewer mentions a bird which was raised from the nest, in Worcester, Mass., that became so thoroughly domesticated that even when allowed the greatest freedom as when carried by the married daughter of its mistress, perched upon her finger through the open grounds to her own domicile, made no efforts to regain its liberty. It delighted in occasional acts of mischief as putting its bill through the lace curtains, and seemingly enjoying the noise produced by the rending of the threads on opening the beak.

The young are fed chiefly with caterpillars, which are disgorged by their parents into their throats, after having been apparently swallowed. They are able to quit the nest in fourteen days after being hatched, but are subject to parental restraints for, about ten days longer, when they are able to shift for themselves. Before they are fitted for flying, they climb to the edge of the nest, from which they are frequently precipitated in sudden tempests; but by means of bill, wings, and claws, if unhurt, are able to gain places of security. Dr. Brewer speaks of a fledgling that had both legs broken which was placed in a basket to be nourished by its parents, that was able to gain the margin of the basket by means of its wings and bill, from which it took its departure in a few days.

In confinement the young are exceedingly play-

ful and docile, quite musical, and at a given signal will come and perch upon the finger of their master.

The eggs are oblong-oval, pointed at one end, white with a slight roseate tinge in fresh specimens, and variously marked with blotches and irregular lines of wavering lines of purplish-brown. They measure .90 of an inch in length, and .60 in breadth. The species is single-brooded in this latitude.

Subfamily Quiscalinæ. Crow Blackbirds.

Both in structure and in habits these birds are intimately related to the *Agelaiinæ*, but are discriminated by the long and slender bill, curved culmen particularly towards the extremity, and strongly inflected tomia. The typical birds have a crow-like appearance, but are readily distinguished. They have large and strong feet, and are eminently terrestrial, walking or running instead of leaping. They build rude and bulky nests, and possess a voice which can scarcely be deemed musical. There are three genera of this subfamily, two of which are represented in this country; the other (*Cassidix*) being a native of the Old World.

Scolecophagus ferrugineus, Swainson.

The Rusty Blackbird has been met with in Eastern Pennsylvania in small flocks of a dozen and even less as early as the 1st of March in its

northern migration. It is chiefly a denizen of swamps and marshy situations generally, resembling in this particular the Red Wings. We have often detected its presence about our outhouses, from which we infer that it courts rather than avoids the society of man. Its vernal stay is seldom protracted later than about the 15th of March, unless the season has been exceedingly tardy and its advent necessarily retarded. We have also found this species in ploughed fields, subsisting upon the insects which have been turned up by the plow. In the autumn they reach Pennsylvania during the last of September or the beginning of October, and remain often as late as the 15th of November, revisiting similar situations as in the spring. They seem to enjoy the company of the cattle in the pasture-grounds, and even visiting them in the farm-yard.

This species is apparently devoid of a song both during its vernal and its autumnal stay. During the pairing period the birds are said to sing, becoming nearly silent while with young, but resume the song in the autumn. Their notes are described by Mr. Nuttall as quite pleasing, and more musical than those of the other species.

Its flight recalls that of the Purple Grackle, but is less elevated, except during migration, and more sustained.

In the spring its food consists of insects and berries. We have detected in the stomachs of several individuals which we have examined,

the following insects:—*Harpalus compar*, *H. pennsylvanicus*, *Casnonia pennsylvanica*, *Cratonychus cinereus*, *C. pertinax*, *Pangus caliginosus*, *Scarites subterraneus*, *Haltica chalybea*, *Lachnosterna querquina*, *L. hirticula*, among coleoptera; and *Ædipoda sulphurea*, *Æ. nebulosa*, *Caloptenus femur-rubrum*, *Ædipoda corallina*, *Æ. carolina*, among orthoptera; besides *Formica sanguinea*, *F. subterranea*, and *Lumbricus terrestris*. In the autumn it feeds upon the berries of *Juniperus Virginiana*, *J. communis*, *Lonicera periclymenum*, and *Liquidambar styraciflua*. It visits our cornfields and rifles the corn from the shocks. In their visits to moist grounds they feed upon small snails and aquatic insects which they secure among the sedges and reeds which they climb with remarkable agility.

The nests of the Rusty Blackbird are said to be constructed like those of *Agelæus phœniceus*, but being smaller. In Labrador they are lined with various mosses instead of grasses, according to Mr. Audubon. The same authority says their nests are sometimes found in marshes of the *Typha*, to the reeds of which they are strongly attached by interweaving their leaves with fine strips of bark and grass. Near Fort Anderson these birds are not uncommon visitors. Mr. MacFarlane discovered a nest built upon a spruce bush next to the trunk, June 12, at an elevation of eight feet from the ground. Other nests were found which were built in the midst of a bush of the pine. At Nilato these birds arrive, says Mr.

Dall, about the 20th of May; but do not begin to lay before the last of May. Mr. Lockhart procured eggs at Fort Yukon, and Mr. Bischoff at Sitka. Besides the above localities, it has been known to breed as high up as the 69° of north latitude. Coming nearer home it has been discovered breeding at Calais, by Mr. Boardman, and at Halifax by Mr. W. G. Wintin, Esq.

Oviposition commences in Maine about the first of June, and in Labrador about the 20th, one brood being reared in a season. When the nest is approached, says Mr. MacFarlane, the parents seek to divert attention from it to themselves. They manifest considerable uneasiness and by flying from tree to tree, seek to draw the intruder from the exact location of the nest.

This species is readily tamed, becoming quite familiar in a few days, and is easily reconciled to confinement. A friend of Audubon's found a bird of this species which was slightly wounded, near the City of New Orleans, which he placed in a cage with several individuals of *Cyanospiza ciris* which soon became on the most intimate terms of friendship with his new companions. It sung, but with less sonorous notes, than when in the enjoyment of its freedom.

The eggs vary somewhat in different localities. Those obtained from Fort Yukon near the mouth of the Porcupine River are, according to Dr. Brewer, rounded-oval, and densely covered with an intermingling of ferruginous and purplish-brown

blotches, and fine dottings upon a light-green ground-color; and are scarcely distinguishable from some species of *Scolecophagus cyanocephalus*. They measure 1.03 by .75 of an inch. Specimens from near Calais, Maine, says the same writer, are sparingly marked with varying shades of purplish-brown upon a light green back-ground, but with no evidence of lines or marbling. They measure 1.02 of an inch in length and .75 in breadth.

Quiscalus purpureus, Bartr.

The Common Crow Blackbird is a very abundant species in Eastern Pennsylvania where it ordinarily appears during the 15th of March, sometimes while the snow is upon the ground. They arrive in large loose flocks, and frequent meadows and ploughed fields where they destroy innumerable numbers of worms and beetles, &c., upon which they subsist. Few species are more contemned and hated by the farmer than the subject of the present sketch, notwithstanding the vast amount of good which it confers upon him. In the spring it visits his cornfields, digs up the grain before it has had a chance to germinate, and even lays hold of the tender blades as soon as they have appeared above the ground, devour the grain and scatter the blades promiscuously about. So passionately fond of such diet are these birds, that they defy the efforts of the husbandman to check their devastations. Ingenious devices in the shape

of scare-crows, and even the shot-gun have no fears for them. Driven from one part of a field, they instantly seek another, and ply themselves with considerable zeal. When the corn is in ear, the destruction still goes on, the birds stripping the husk and extracting the grains from the cob. Though first exceedingly shy, yet love of appetite soon triumphs over every other feeling, and a spirit of boldness and utter recklessness succeed.

During the early part of its stay, this Blackbird is mainly terrestrial in its habits of feeding; but during the breeding-period it becomes slightly arboricole. Its flight is moderately elevated, firm, undulating, and remarkably protracted.

This species cannot be said to possess a song, strictly speaking. Its ordinary call-note is a simple *tchück*. Vexation and anger are represented by *tchic-kē-yāh*, while impatience by *tē-oo* pronounced as a sharp whistle.

Its food is mainly insects, berries, and seeds, during the early part of the season; with caterpillars of divers kinds which it destroys in prodigious numbers, when with young. We have detected in our stomach-examinations, remains of *Pangus caliginosus*, *Harpalus compar*, *H. pensylvanicus*, *Dicælus dilatatus*, *Scarites subterraneus*, *Passalus cornutus*, *Tenebrio molitor*, *Carabus ligatus*, *Cetonia fulgida*, *Dicerca divaricata*, *Platynus cupripennis*, *Corymbites Æthiops*, and grubs of *Cratonychus cinereus*, *Lachnosterna quercina*, *L. hirticula*, *Pelidnota punctata*, and *Cotalpa lanigera*; besides

Formica sanguinea, *F. subterranea*, *Lumbricus terrestris*, and specimens of *Julus*. Later, the caterpillars of *Hybernia tiliaria*, *Anisopteryx vernata*, *A. pometaria*, *Ennomos subsignaria*, *Zerene catenaria*, *Anisota rubicunda*, *Clisiocampa Americana*, *Colias philodice*, *Eufitchia ribearia*, *Utetheisa bella*, *Gortyna zecæ*, and mature forms of many of the above, with *Spilosoma Virginica*, *Penthina pomonella*, *Lithosia miniata*, and others. Besides the above, small spiders, aphides, and a few diptera are also eaten. Being slightly frugivorous it subsists upon the berries of *Prunus cerasus*, *P. serotina*, *Amelanchier canadensis*, *Fragaria Virginiana*, *Rubus villosus*, *R. strigosus*, *Vaccinium stamineum*, and in the autumn, upon those of *Juniperus Virginiana*, *J. communis*, *Lonicera periclymenum*, and *Liquidambar styraciflua*.

This species has one very bad trait, perhaps, not generally known. Like the common crow, it is fond of birds' eggs and tender nestlings of which it destroys a great many, particularly those of *Turdus migratorius*. Coward-like it lurks in the vicinity of a robin's nest while its inmates are absent, seizes an egg or a young bird, and beats a precipitate retreat. But wary and vigilant as it is, sometimes it is caught in the act, and forced to seek safety from the impetuous attacks of the owners, by flight. We had been aware of its fondness for eggs for several years past, but only lately learned of this carnivorous propensity, which is, doubtless, the natural outgrowth of the habit of egg-sucking.

Nest building has been observed as early as March 15, but then only in sheltered localities on the south slopes of hills. Here the nests are built most generally in the branches of coniferous trees. Usually but a single brood is reared in a season; but we have met with a second brood when the weather has been unusually propitious. In such cases the first batch of young appeared about the middle of April, and the other early in July. Nidification ordinarily commences from the 20th to the 28th of April. A nest is the product of the joint labor of the sexes for a period of six days, working with considerable diligence. The day following the completion of the nest, the female begins to deposit her eggs to the number of six, at the rate of a single *ovum* per day. Incubation follows on the day succeeding the last deposit, and is the sole business of the female for about sixteen days. The male-bird keeps very close watch over his partner in the nest, when not employed in providing nourishment for her and himself. When the nest is assailed, both parents seek to drive away the intruder by loud clamors and threatening gestures; flying close to his head with open jaws and fury-darting eyes. Where the offender has been one in feathered dress, we have known several pairs to come to the assistance of their besieged friends, when the most deafening cries and wildest excitement would prevail. Such is the bravery with which some parents defend their nests and young, that in encounters with human

foes, the birds have often come off victorious. Last spring we employed a lad of fourteen summers to secure a nest which was built in the top of a tall pine-tree, at a height of sixty feet from the ground. After he had reached half the journey, he was beset by the parent-birds which displayed such determination and prowess, that he was glad to gain once more *terra firma*.

The Crow Blackbird is said to nest in low bushes sometimes, but we have invariably found its nests in tall trees, at heights varying from fifty to sixty feet. A writer in the *American Naturalist*, Vol. II., residing in Newark, N. J., speaks of a nest which was built inside the spire of a church, and another in a martin-house from which the lawful owners were forcibly expelled. Wilson informs us that it is a common occurrence for the Grakles to nidificate in the interstices of the nests of the Fish Hawk, when the latter builds in their immediate neighborhood. It is said that several pairs occasionally occupy at the same time the nest of the same Hawk, with which they live on the most amicable terms. Mr. Audubon found these birds breeding generally in hollow trees, which has been the experience also, to a certain extent, of William Brewster, Esq., in Northern Maine, but it is highly probable as Dr. Brewer says, that they refer to the variety *Aeneus*.

The nest is usually placed in a crotch close to the main axis of the tree on which it is built, sometimes on a branch at a distance therefrom, and

held *in situ* by others in close proximity. It is bulky and irregular in shape, and has no claims to architectural beauty. It is coarsely but firmly built of twigs, dry plants, interwoven with strong stems of grasses, which have been picked up from pools of mud with considerable of the latter adherent thereto, which renders them exceedingly weighty and serves to agglutinate the elements more compactly together. Internally, there are a few fine leaves of grasses which add to the comfort of the fabric. They measure seven inches in diameter and about six in thickness, with the diameter at the rim about four inches, and the cavity about two inches, which is very shallow considering the size of the birds.

The young are objects of more than ordinary solicitude by the parents, which vie with each other in parental devotion. They are fed alternately; both parents occasionally being absent from the nest in the procurement of food which consists of grubs, caterpillars, earthworms, and berries, many of which have been enumerated above. When both parents are absent, it is only when a number of pairs have built in close proximity to each other, constituting an orderly and harmonious community which we have noticed to be the case only in certain localities. The young are then, to a certain extent, under the surveillance of others, which are not slow to repel any assault upon their neighbor's household. Upon a lawn adjoining the mansion of Mrs. George Carpenter, in Ger-

mantown, which contains several, probably a dozen fine trees of *Pinus strobus*, during the past four years, we have known as many as a dozen pairs to breed, all within a short distance of each other. The most perfect good feeling exists among the members of the different families. These birds seemingly conscious of protection upon the part of the owner of the premises upon which they build, revisit the scene year after year, and their presence is announced by the almost deafening chattering which issues from the trees during the mating period.

In about sixteen days the young are able to quit the nest, but still require the attention and care of the parents for at least ten days longer, before being fitted to look after their own well-being. Both old and young continue together, however, until they take their departure during the last of September, or the beginning of October, to their southern homes. Immense numbers winter in the lower counties of Virginia, in the Carolinas, and Georgia where they constitute one congregated multitude of many hundred thousands. Wilson speaks of meeting on the banks of the Roanoke River, January 20th, an immense army of these birds which rose from the surrounding fields with a thunder-like noise and settled down upon the road and completely covered it and the fences with black. When they again rose and descended upon the skirts of high timbered thickets, whole trees from the summit to the lowest branches

seemed draped as with mourning, while their notes and screamings seemed like the far off sounds of a huge cataract, but possessed of a more musical cadence.

The eggs of the Grackle in Eastern Pennsylvania have a light greenish-white ground-color. We have never met the deep rusty-brown variety which Dr. Brewer speaks of, in the oft cited work on "North American Birds." They are variously and irregularly marked with black and dark-brown dashes and streaks which are singularly grotesque in their patterns. The eggs measure 1.24 of an inch in length and .90 in breadth.

IMPORTANT CORRECTIONS.

- For *subterraneas* read *subterraneus*, pages 11 and 21.
Scatophago read *Scatophaga*, pages 11, 18, and 48.
Dicælus read *Dicælus*, page 21; for *bear* read *bears*, line 11, page 25.
- Insert those of after *than*, line 4, page 28.
- For *memory* read *mimicry*, line 10, page 30.
- pomonella* read *Promethea*, page 38; for *lights* read *tops*, line 8, page 56.
sends read *send*, line 20, page 60; for *are* read *is*, line 17, page 65.
Rhynchæus pini read *Rhynchæus strobi*, pages 139, 172, 173 and 312.
Rhynchæus pini read *Rhynchæus strobi*, pages 21, 53, 56, 63, 67, 72, and 93.
peritnax read *pertinax*, line 25, page 114.
lineola read *lineola*, line 4, page 121; for *habits* read *haunts*, line 18, page 133
externally read *internally*, line 1, page 141.
permanent read *prominent*, line 1, page 143.
dipteria read *dipteron*, line 9, page 144.
it finds read *they find*, line 23, page 147.
prayed read *preyed*, line 18, page 148.
Tulis and *Julis*, wherever they occur, read *Julus*.
frequent read *frequents*, line 11, page 172.
attend read *attends*, line 26, page 133.
ferruginea read *ferruginea*, page 196; for *Colius* read *Colias* page 197.
Virgiana read *Virginiana*, page 223; *Vcer* read *Acer*, page 224.
pertnax read *pertinax*, page 245; for *tristris* read *tristis*, pages 259 and 260.
Virginiana read *Virginianum*, page 266.
Angeronia, pages 210 and 219, and *Angerina*, page 287, read *Angerona*.
Leconter read *Lecontei*, page 287.
Fragaria Virginica read *Fragaria Virginiana*, pages 161, 163, 275, and 305.
pratense, wherever it occurs, read *pratense*.
Betulu read *Betula*, page 163; for *ground* read *grounds*, line 20, page 282.
beetles read *insects*, line 6, page 283; for *it* read *he*, line 15, page 337.
- Read *Anthomya* after *diptera*, line 3 from bottom, page 348.
- For *Hyporhynchus* read *Harporhynchus*, page 358.
- Procrs* read *Pocris*, page 377; for *Caloptena* read *Caloptenus*, page 11.
brassicæ read *oleracea*, pages 16, 174, and 300.
oleracæ read *oleracea*, wherever it occurs.
Cratonychus read *Harpalus*, page 63.
sanguinalis read *sanguineus*, page 96.
capripennis read *cupripennis*, page 144.
subteraneus read *subterraneus*, page 150.
formosa read *formosus*, page 158; for *viti* read *vitis*, page 173.
teneorhynchus read *tentiorhynchus*, page 187.
Cimacodes read *Limacodes*, page 221.
pometara read *pometaria*, page 287.

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